Water Supply and Sanitation in Karatu - An analysis of the management and usage of water in Karatu, Northern Tanzania[1]

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1. Introduction

1.1. Abstract

During the last three decades, Tanzania faced severe problems in providing drinking water and sanitation facilities to the entire population. After many different water policies and measures failed to improve the situation, the country started new efforts to address the problem in the year 2000. Motivated by the Millennium Development Goals, the Government introduced a new Water Policy, emphasising the economic value of water, the importance of higher efficiency and cost recovery. Decentralisation and Private Sector Participation are the chosen approach to achieve the goal of 100% coverage of water supply and sanitation.

In February 2009, a three-week stay in Karatu town allowed the author to analyse the current situation of water supply and sanitation in a rural area of Tanzania. Besides assessing the present status, it was attempted to find out whether the new water policy, which was developed in Dar es Salaam, was implemented in the rural highlands 550 kilometres away.

Qualitative interviews with stakeholders related to the water sector at all levels were carried out to understand the current situation, the challenges and opportunities of the local water supply and sanitation. The issue of sanitation, first treated equally as water supply, turned out not to be recognised as an equal challenge by the population or other involved stakeholders.

As it turns, although not being a consequence of the national Water Policy, the organisation of water supply in Karatu town is in accordance with the policy guidelines. In Karatu, a decentralised, independent and private company is responsible for water supply since more than a decade, and shows some of the potential positive as well as negative outcomes of a policy enforcing decentralisation and private sector participation.

An increased amount of extracted water, a higher water coverage achieved through new household connections and the construction of many public water points, improved reliability of water supply, adequate maintenance of the infrastructure and financial viability and cost recovery of the operator are amongst the major achievements since a private water utility is responsible for the local service provision.

However, the most visible problem in the area remains the unequal allocation of water points and service reliability between Karatu town and particularly the southern villages, which are located at the far end of the water pipelines. In these areas, the average distances of households to public water points are still at a high level. Particularly during the dry season, but also during wet season regular water shortages occur, as the southern population depends on the water which remains in the pipes after passing Karatu town and other northern villages.

Absent or inadequate contracts between the Local Government and the operator, which should include pro-poor approaches and enforce equal distribution, as well as lack of monitoring and regulation by governmental institutions are amongst the main reasons for this problem.

With the new water policy, it can be expected that a high number of private companies will engage in the rural water sector in Tanzania in the upcoming years. To avoid large negative effects on the lives of the people, future studies and further research on possible consequences should be carried out and their outcomes not be neglected. Because of the long experience with a private company, the case of Karatu provides a great opportunity to deepen studies on the effects of Private Sector Participation in the water sector. The outcomes and questions not answered in this study aim to be a guideline for possible further examination of the subject.

1.2. Methods

This analysis is based on two different methods, research through literature and personal interviews. The research through literature was carried out in three stages:

1. Research through literature before the field trip
2. Research through literature on the field trip
3. Research in literature to find specific information to fill in some gaps after the field studies were completed in Tanzania

A lot of information on the water policies and strategies in Dar es Salaam was already available at the time of arrival in Tanzania, so the literature studied in Tanzania could be more specific. The first days of the field trip were spent in Dar es Salaam to gain more detailed information about the

1 Der Artikel ist eine überarbeitete Fassung eines Projektberichts, der für die Lehrveranstaltung „Projekt 3 - Integrierte Entwicklungsplanung in Tansania“ im Studienjahr 2008/09 erstellt wurde. Diese Lehrveranstaltung wurde von Univ.-Prof. Mag. Dr. Wilfried SCHÖNBÄCK, Ao. Univ.-Prof. Dipl.-Ing. Dr. Georg HAUGER, Mag. Kathrin HAWIGHORST und Dipl.-Ing. Friedbert OTTACHER betreut.

water sector. There, the Ministry for Water, the library of Dar es Salaam University, as well as specific institutes of the University were the main sources of literature relevant to the subject of this report.

In the rural area of Karatu, first of all, the participants in the water sector were identified, and these were mainly:

- The Bureau of Water at the District Council
- The 'Kaviwasu Company which provides water
- One Canadian NGO
- The consumers

The interviews that were carried out were designed to have a qualitative and holistic approach, i.e. "as many people as possible" should report "as much as possible". Nevertheless, it was important that the interviews contained the same major questions which were to form the core of the discussions which were to follow. On the one hand, this method made it possible to explore the differing perceptions of the interviewees on the same topics. On the other hand, the interviewees could individually express their own views and ideas based on their own personal knowledge and experience. In the final stage of the field studies and after enough information had been collected, the questions put to the interviewees could be prepared. These interviews were carried out personally at five different water points, three of which are situated in Karatu town and two are located in the rural area of Gongali. Whereas the structure of the interviews always remained the same (see Annex A), the character of the interviews varied between individual and group interviews, which were sometimes small groups of the same sex or of similar age or just with all the interested persons currently present at one water point. Altogether, 25 persons were interviewed individually, while all the other interviewees, numbering between 100 and 150 persons, could be integrated into the research.

1.3. General information about Karatu

In 2002, the district Karatu had a total of 180,000 inhabitants as a whole, of which 18,000 live in the capital of the same name. Karatu town is situated 120 km north-west of Arusha in the highlands of Tanzania at a sea level of 1,400 m (*Figure 1*). In this region, the average temperature is 20°C and the average annual rainfall varies between 600 mm and 1,500 mm. For comparison, this is about the same amount of rainfall as in Austria.

The economy of the region is strongly dominated by the agrarian sector which is responsible for 80% of the income.[2]

Karatu itself can be called a "tourist-transit" town because all safari tourists going from Arusha to the Ngorongoro Crater or the Serengeti National Park pass through Karatu on the asphalted road shortly before arriving at the tourist attractions.[3] As a consequence, Karatu provides a lot of safari tourism infrastructure, such as banks, petrol stations or garages. Nevertheless, as most of the tourists just pass through or stay for only a short time, Karatu does not benefit very much from its visitors. However, as the number of tourists increases, a lot of new hotels and lodges have been constructed both inside Karatu town and in the surrounding environs.

Source: Original illustration, © Sattler, Wien 2009

Fig. 1. Location of Karatu in Tanzania

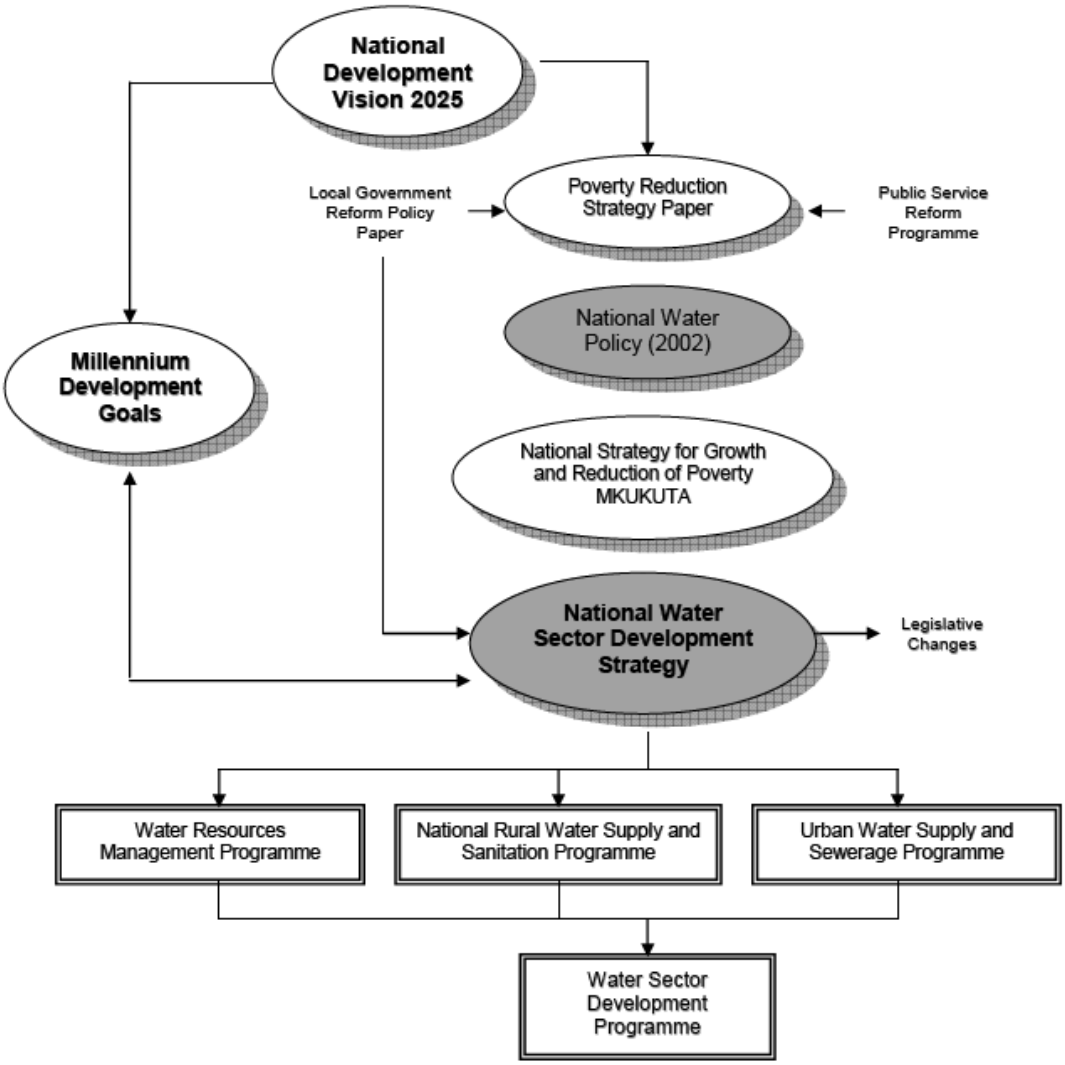
2. Development of a new Water Sector Reform

In 1971, the Tanzanian Government set a 20-year target to supply the whole population with safe and adequate water no more than 400 metres away from every household. At that time, the water supply system in Tanzania was characterised by non-involvement of the beneficiaries, the use of inappropriate technologies and of a top-down approach, and there was no decentralisation. Despite big investments the Government failed to achieve the goal of an adequate water supply and sanitation in the country.

In 1991, the Government responded to the failure with the introduction of a new National Water Policy that emphasised community participation and control, but paid little attention to cost-recovery, sector co-ordination and decentralisation.[4] A water sector review, conducted in 1993 already, revealed that the water policy failed to address many of the goals which had been set. In 2002, 32 years after the proclamation of the target, still only 53% of the rural and 73% of the urban population were able to receive water from a short distance at a water point. Moreover, not less than 100,000 cases of waterborne diseases were recorded.[5]

In the same year, the National Water Policy 2002 (NAWAPO 2002) was to re-organise the country's water supply system once again. In contrast to the situation of the last three decades, the responsibility for the water supply and sanitation should no longer be carried out by the Central Government only, but by various local governments as well as private in-

2 http://www.sido.go.tz/UI/Arusha_Region.aspx (09.08.2009)
3 http://www.reiseweltatlas.de/Karatu.html (09.08.2009)
4 Garriga 2007: 29
5 http://www.irc.nl/page/16771 (09.08.2009)



Source: Garriga 2007:31

Fig. 2. Inter-relationship of the NWSDS with Other Policies and Strategies

stitutions over the whole country. By forming alliances in the Water Users Groups, the population could take over the business of supplying an adequate water supply.[6]

Whereas the Water Policy defines the goals and major changes of the sector, the National Water Sector Development Strategy (NWSDS) of 2006 lays down how the National Water Policy will be implemented and describes the institutional and legislative changes required.

In general, the sector strategy is incorporated into three different programmes: The National Rural Water Supply and Sanitation Programme (NRWSSP), the Urban Water Supply and Sewerage Programme (UWSSP), and the Water Resources Management Programme (WRMP). These are consolidated into a Water Sector Development Programme (WSDP). In brief, the Government aims at bringing together the three sub-sectors – rural water supply, urban water supply and sewerage, and water resources management – under one comprehensive investment and regulatory regime.[7]

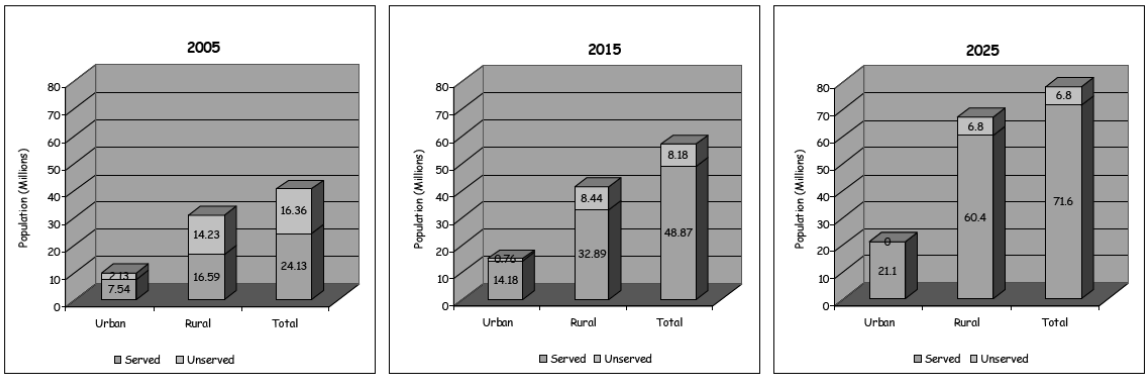
The interrelationship between the NWSDS with other national policies and the sub-sector programmes is shown in *Figure 2*.

All policies are embedded in the National Development Vision 2025, published in 1997, which sets the major goals and strategies that all the important sectors in Tanzania have to achieve by 2025. For the water and sanitation sector, this means universal access to safe water by 2025 through (i) involvement of the private sector; (ii) empowering local government and communities; and (iii) the promotion of broadly based grass-root participation.

2.1. The new National Water Policy 2002 and National Water Sector Development Strategy 2006 - 2015

The terms "policy" and "strategy" are often understood differently. The terms can be best differentiated if "policy" is understood to mean what the Government "will do", and "strategy" to mean "how" the respective Ministry will implement the "policy". Legislative changes are normally de-

6 GoT, Ministry of Water 2002:15f
7 Garriga 2007:30



Source: GoT, Ministry of Water 2006a

Fig. 3. Population Projections for Access to a Safe Water Supply

rived from the "strategy" so that the specified actions can be implemented.[8]

As mentioned above, the NWSDS follows the NAWAPO 2002, which states four overall objectives:

- To address cross-sector interests in water, watershed management and participatory integrated approaches in water resources planning, development and management.
- To lay a foundation for the sustainable development and management of water resources by changing the function of the Government from that of service provider to being responsible for co-ordination, policy and guidelines formulation and regulation.
- To ensure full cost recovery in urban areas with considerations for the provision of water supply services to vulnerable groups through various instruments, including lifeline tariffs.
- To ensure the full participation of beneficiaries in planning, construction, operation, maintenance and management of community-based water-supply schemes in rural areas.[9]

The main objective of the NWSDS is to develop a coherent, holistic and integrated strategy for the Water Sector in order to implement the National Water Policy. This will then allow the on-going sub-sector initiatives and projects to be set within the overall strategic and planning framework for the sector. The NWSDS is designed to cover the period from 2006 to 2015 and will be subject to a comprehensive review in the year 2011.[10]

In the new strategy, river basins should be the planning and management units rather than regions. The role of the Ministry for Water will change to become that responsible for policy making, support and capacity building, monitoring and quality assurance, and regulation. Instead, in future, the local governments will have to be responsible for the provision of public services including that of an adequate water supply. The strategy also envisages handing over the responsibility for the provision of water to the users. A legal registration of water-user entities, e.g. Water Users Associations, will be instituted to ensure that communities are the legal owners of their water supply schemes. Another two important changes in the new strategy are the liability for cost recovery in urban areas, and the inclusion of private companies into the water allocation system. Altogether, with the new water policy and strategy, the Tanzanian Government enforces the decentralisation of the water sector. The responsibilities for different parts of the whole system, formerly all held together in the Central Government, are now spread over a wide range of different organisations, e.g. local governments, private companies or water users.[11]

2.2. Institutional set-up and responsibilities

In this abstract, only the most important institutions and their major responsibilities of the new water supply system will be presented. *Figure 4* illustrates the institutional set-up.

The Ministry responsible for Water:

The role of the Ministry will change from that of a service provider to that responsible for co-ordination, policy and guideline formulation, and regulation. Also, it will ensure that the policies and strategies are implemented.

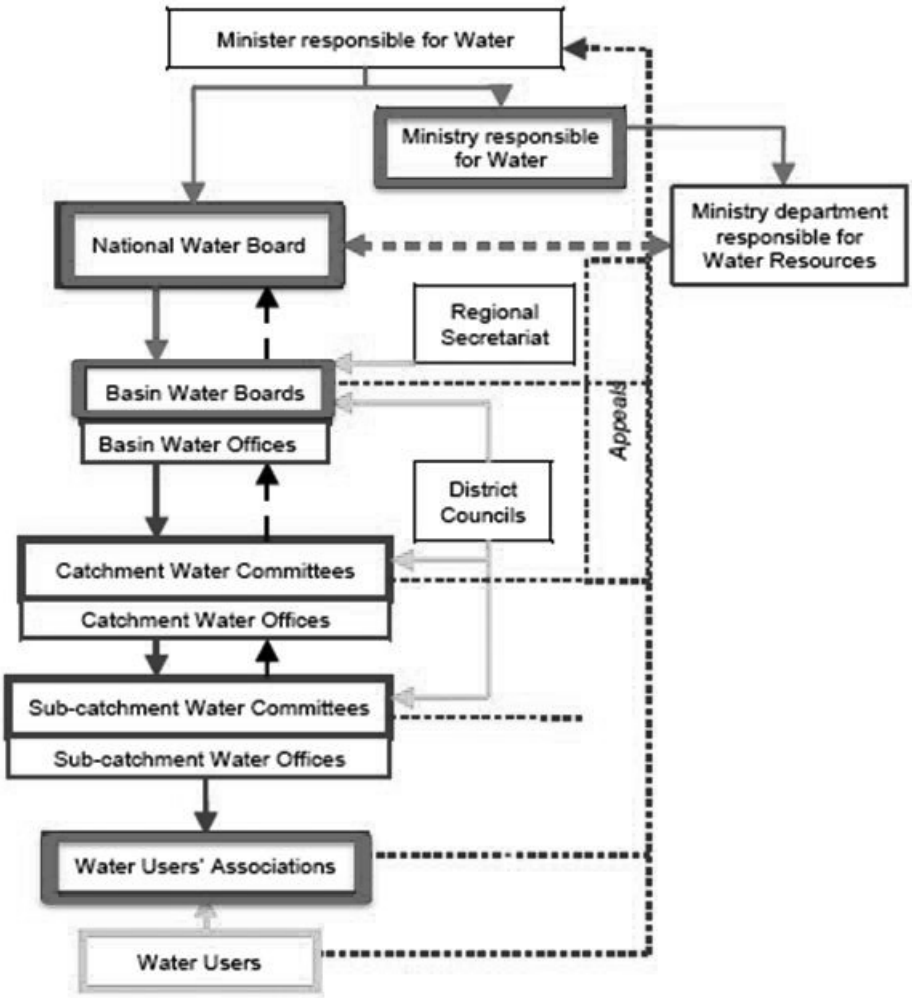
National Water Board:

The National Water Board integrates the inter-sectoral planning and co-ordinates the basin planning and management. Further tasks are the determination of investment priorities and financing patterns, as well as supervising and co-ordinating the data collection and the resource assessment.

Basin Water Board:

The main functions of this institution are data collection and resource assessment of the basin. The Basin Water Board also has to approve, issue and revoke the water-use and discharge permits and to enforce pollution control measures. Resolving conflicts and co-ordinating stakeholders is another part of its responsibility.

8 Doering 2005:40
9 Doering 2005:35
10 GoT, Ministry of Water 2006b:10
11 GoT, Ministry of Water 2002:15-28



Source: GoT, Ministry of Water 2006b:27

Fig. 4. New Institutional Framework for Water Resources Management

Water Users Associations:

The Water Users Associations are the lowest level of management of the water supply system. These associations are responsible for the local level management of allocated water resources, for the mediation of disputes among users, the collection of various data and participation in the preparation of water utilization plans. They provide legitimate representatives in the Basin Boards and Catchment Committees.[12]

2.3. Responsible institutions for the provision of water supply

According to the Water Sector Development Strategy, there are now two institutions for the provision of water supplies and sewerage authorities, the commercial Water Supply and Sewerage Authorities (WSSAs) and the Community Owned Water Supply Organisations (COWSOs) (cf. *Figure 5*).

2.3.1. The Water Supply and Sewerage Authorities

The Water Supply and Sewerage Authorities (WSSAs) are financially autonomous statutory organisations, based on the commercial viability of providing these services in a designated area. This may require clustering of the water supply and sewerage responsibilities across a number of local government authority areas. The clustering can be based either on regional and local government boundaries, or on river basins, depending on criteria such as potential viability, social or cultural factors, and geographical proximity. Each authority either provides the services itself or contracts a Service Provider which can be public or private.

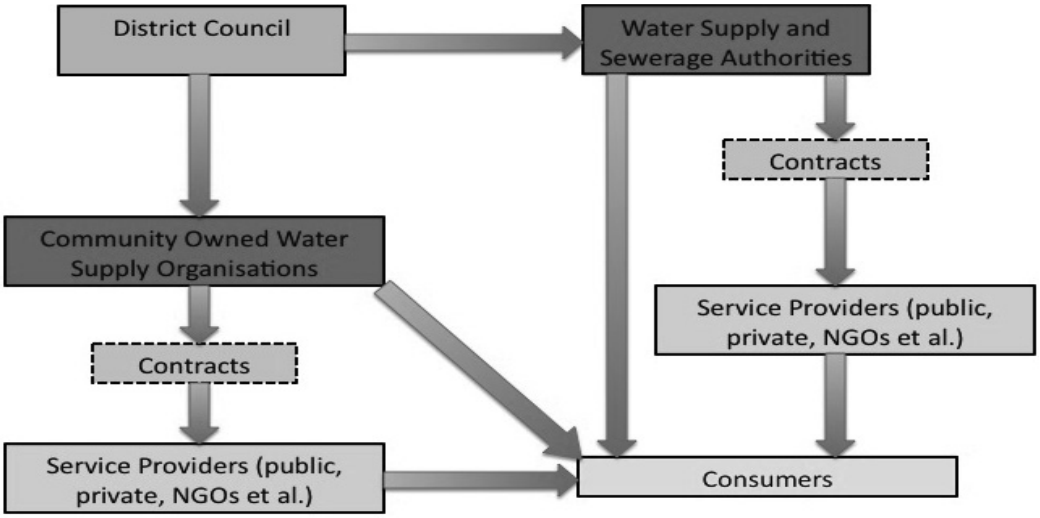
2.3.2. Service Providers

Service Providers may be responsible for providing a water supply and sewerage services on behalf of the WSSAs under varying contractual arrangements. A Service Provider may be a company established by one or more local government authorities, or may be from the private sector, or may be a Non-Governmental or Community Based Organisation.

2.3.3. Community-Owned Water-Supply Organisations

These organisations are bodies legally constituted by a community to own, operate and maintain the water supply systems on behalf of the community. The COWSOs have to meet all the costs of operating and maintaining their water

12 GoT, Ministry of Water 2006b:25f



Source: Original illustration, © Sattler, Wien 2009

Fig. 5. Institutions for the Provision of a Water Supply

supply systems through charges levied on the consumers. The COWSOs may contract part or all of their operation and maintenance responsibilities to private companies, individuals or Non-Governmental Organisations. The performance monitoring and regulation of COWSOs is the responsibility of the Ministry for Water but delegated to the district councils.

3. The Situation of the Water Supply and Sanitation

3.1. Karatu district

Unfortunately, there is no exact data about the amount of water consumed in the Karatu district, but in the whole country of Tanzania, each person uses, on average, 37 litres per day.[13] A survey conducted in 2002 in two rural villages of the district Kasalu in the north-west of Tanzania provides some more information about the water usage in these two rural areas. On average, the persons questioned consumed only 10 litres per day (the same amount can be found also in the Shinyanga region in the Masawa district in the North of Tanzania[14]), which they used for the following purposes:

- Drinking
- Cooking
- Washing utilities
- Personal hygiene
- Washing clothes
- Irrigation
- Cleaning the house
- Watering domestic animals[15]

In the same survey, the households which were interviewed had to declare for which activity they use the water brought to the house (*Table 1*).

Although the results of this study may deviate to a great extent from the habitual use of water in Karatu town, it can be assumed that the water consumption analysed in the surrounding rural villagesis similar.

In the Karatu district, the last analysis on the situation of the water supply and sanitation was carried out in 2002 by the Tanzanian Government. One result showed that, in urban as well as in rural areas, the main source of drinking water was tap water. Nevertheless, in rural areas tap water still accounted for only 53 percent of the households whereas in urban areas the situation was much better, as 99 percent of all urban households used tap water as their main source of drinking water.[16]

The allocation of all water sources used in rural and urban areas is shown in *Table 2*.

For sanitation, the most commonly used toilet facility was the traditional pit latrine (80 %). 19 % of the total households had no toilet facility (cf. *Table 3*).

In another research project carried out by Misereor in 2002, all 43 villages of the district were divided into three groups according to the quality of the water in each (*Table 4*).

In the district Karatu, there are about ten different organisations responsible for the water supply of the population. They all are private organisations, licensed by the Tanzanian Government to operate in a defined area. Besides these, there is a Spanish NGO, called 'Ingenieria sin Fronteras', working in the Manolo Area in the western part of the district.[17]

13 http://www.fairunterwegs.org/laender/tansania/in-kuerze/kennziffern.html (10.08.2009)
14 http://www.aucom.com/tanzanian-water-project.html (10.08.2009)
15 Ölz 2002:102
16 Central Census Office 2004:94
17 Kimaro 2009:Interview

Table 1. Usage of Water Brought to the House in Percentage of Households

Drinking and Cooking	Washing Dishes	Washing Clothes	Batheing	Watering gardens	Cleaning the house	Watering livestock
100	94	76	92	13	6	5

Source: Ölz 2002:102

Table 2. Percentage Distribution of Households by Location and Main Source of Drinking Water

	Piped Water	Protected Well	Unprot. Well	Protected Spring	Unprot. Spring	River/ Stream	Pond/ Dam	Lake	Rain Water	Water Vendors	Other	Tot.
Total	56,92	4,73	4,58	2,64	14,22	16,82	0,00	0,00	0,06	0,03	0,00	100
Rural	53,29	5,13	4,97	2,87	15,44	18,22	0,00	0,00	0,06	0,02	0,00	100
Urban	99,43	0,08	0,00	0,00	0,00	0,38	0,00	0,00	0,00	0,11	0,00	100

Source: GoT, Central Census Office 2004:95

Table 3. Percentage Distribution of Households by Location and Type of Facility

	Flush Toilet	Traditional Pit Latrine	Ventilated Pit Latrine	Other	No Facility	Total
Total	0,50	79,88	0,67	0,01	18,94	100
Rural	0,27	79,07	0,58	0,00	20,08	100
Urban	3,13	89,30	1,77	0,15	5,65	100

Source: Central Census Office 2004:96

Table 4. The Number of Villages according to the Water Supply Situation

Well supplied villages	Poorly supplied villages	Non supplied villages
7	25	11

Source: Misereor 2002:9

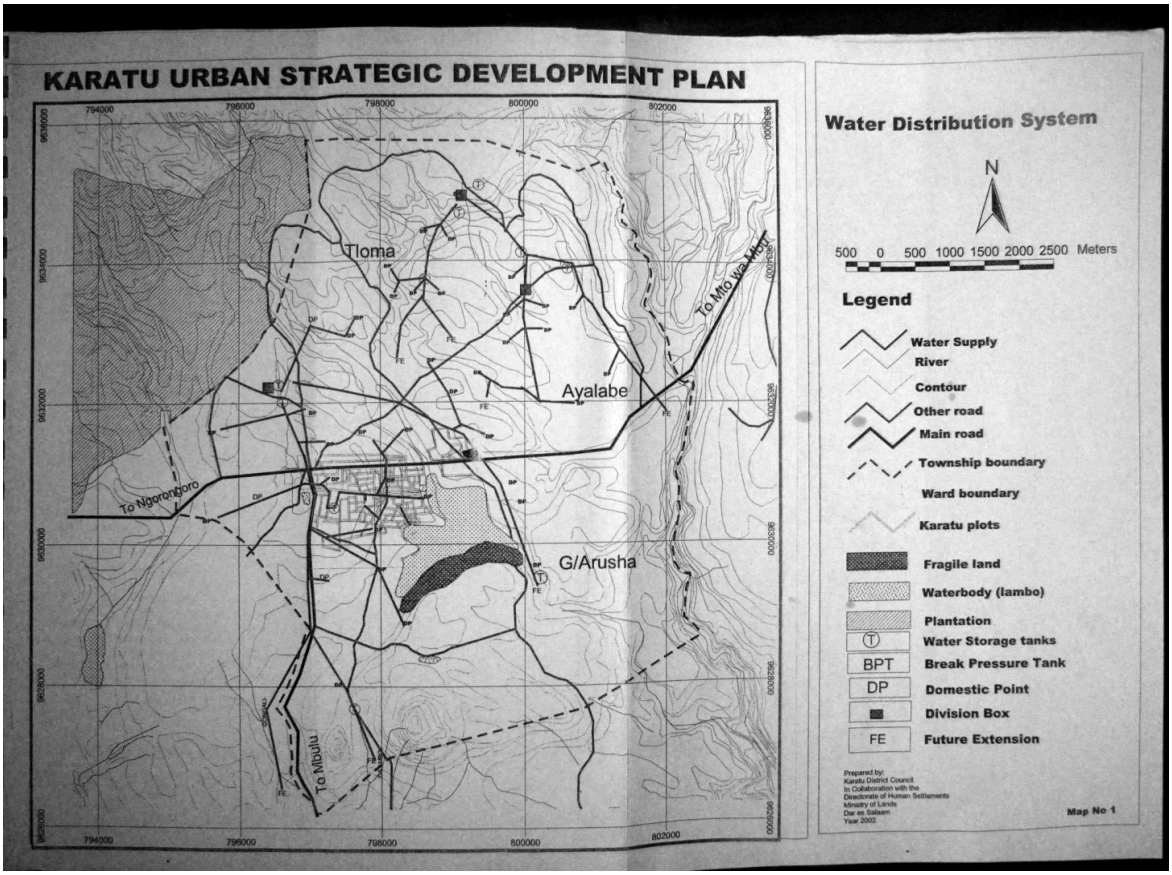
3.2. Karatu town and environment

The first water supply system in Karatu town was developed in 1953 and was envisaged to supply water to Karatu town and four villages in the vicinity, but until recently, water was delivered only to the Karatu urban area and Tloa village. With the increasing numbers of the population, especially in Karatu town, the situation of the already failing water supply system worsened. For at least the past 20 years, Karatu has experienced an acute shortage of water. To improve the situation of the water supply, a water board was founded in 1999, known as 'Karatu Villages Water Supply' (Kaviwasu). Today, Karatu town and five surrounding villages are connected to the water supply system of Kaviwasu. These five villages are:

- G. Lambo
- G. Arusha
- Gongali
- Tloma
- Ayalabe

In 2009, in all six towns together, 41,000 persons have to be supplied with water, a figure which is currently growing by 3% per year.[18] Besides the 700 households which have a private connection, all the other households get their water from one of the total 83 District Water Points. In the same year, the coverage of the area with DWPs was at 80%, which, by definition of the Tanzanian Governent, means that the clos-

18 Kaviwasu Bureau Karatu



Source: Karatu District Council 2002:Map No.1

Fig. 6. Water Distribution System

est DWP is situated not more than 400 metres away from any household.[19] According to the Karatu District Council, through working in close collaboration with the District Authorities and the Roman Catholic Church Mbulu diocese, the problem of having an inadequate water supply was solved, by and large or at least reduced, by the year 2000. Now, the only major remaining problem is the quality of the water which is not classified as potable. This problem is especially severe, as many Karatu residents are not aware of this problem and use the water straight from the tap, i.e. unboiled. As a result, water borne diseases, such as diarrhoea, cholera and typhoid are not uncommon.[20]

With regard to the situation of sanitation, there is no wastewater disposal system in Karatu. The waste water is usually left to flow out of the houses into the backyards and ultimately onto the roads. The water finally ends up in ditches that become breeding centres for mosquitoes and hence a health hazard.[21]

Figure 6 shows a map of the water distribution system in Karatu.

4. Water sources

The water for the whole water supply system comes from three different sources, two on the surface and one underground:

1. The Endorodoro river
2. The Marere source
3. One borehole

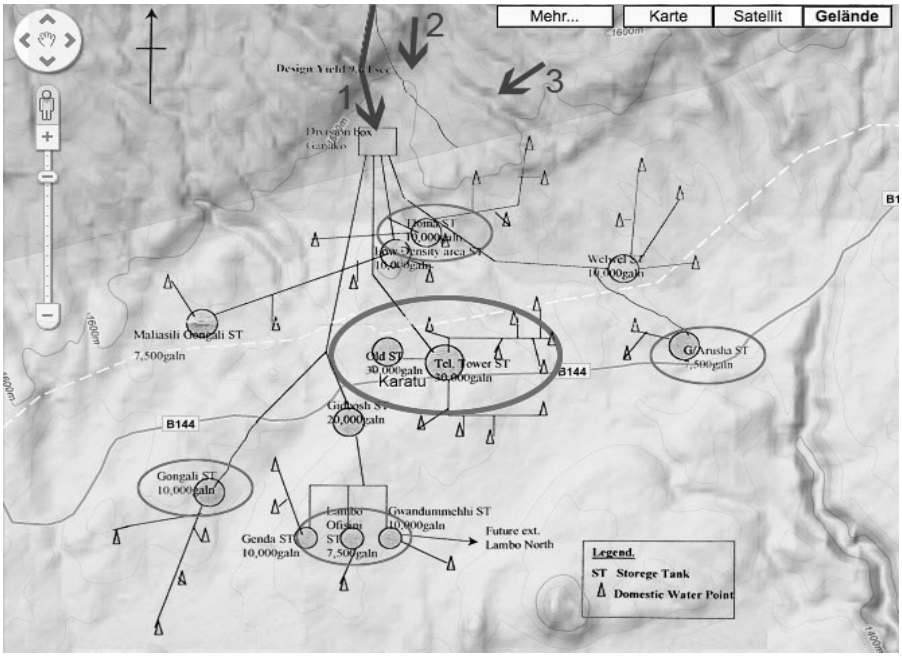
Although the three sources could not be located exactly on the map, *Figure 7* shows that all of them are situated in the forested highlands in the northern region of Karatu. As a consequence, the whole area can be supplied with water just by gravity and so a lot of money and energy usually needed for pumps is saved.

4.1. Endorodoro River

The river Endorodoro is located within the Ngorongoro Conservation Area and has been a major source of water for the inhabitants of the area for many decades.

Although the river provides the greatest volume of the water required for the system, it cannot meet the needs of the inhabitants in Karatu town and the surrounding villages to the full. In the dry months from June to September, the run-off

19 GoT, Ministry of Water and Livestock Development 2002:15
20 Karatu District Council 2002:1f
21 Karatu District Council 2002:3



1. Endorodoro River
2. Groundwater pumping station
3. Marere source

Source: Kaviwasu Bureau Karatu 2009

Fig. 7. Karatu Water Sources and Supplied Villages

is usually especially low. This problem is increased by the fact that a coffee farm situated upstream uses a great amount of the water from the river for irrigation.[22] Besides the insufficient quantity, the water of the Endorodoro River is also not potable. Livestock and the wild animals within the conservation area go down to the river to drink and consequently contaminate the river, before its water is tapped and taken to Karatu.[23]

4.2. Marere source

Running east to the Endorodoro River, the Marere source is the second big source of water in the region. Similar to the river, the run-off is not high enough and the water does not have drinking quality. Moreover, even both sources together cannot supply the population with enough water. As a consequence, a third source was opened up recently.

4.3. Borehole

A few years ago, the first groundwater pumping station was constructed to improve the water situation in the region. The borehole is situated a few kilometres north of Karatu between the Endorodoro River and the Marere source. The well has a depth of about 120 metres and a capacity of 35m³/h.[24] Unlike the two bodies of water flowing on the surface, the drawn groundwater has drinking water quality. Up to now, this theoretically huge improvement in the water situation of the area could not be used, as the different waters get mixed up in the water mains system.[25]

22 Misereor 200?:6
23 Karatu District Council 2002:2
24 Kimaro 2009:Interview
25 Kimaro 2009:Interview

5. Water supply system in Karatu

As mentioned above, in Karatu town and the five surrounding villages the Kaviwasu Company is responsible for the water supply of the people there. The organisation was founded in 1999 out of a few former Water Users Groups, which is why it likes to call itself a grass-roots organisation. After registration at the Ministry of Justice as a "registered board of trustees", the Company started to operate in 2001. Kaviwasu is a company independent of the Government but licensed by the Central Government to supply water to 6 villages. According to the Company, as a grass-roots organisation founded by the people, they are not interested in making a profit for themselves but invest almost all their revenue for maintenance and new inventions.

5.1. Distribution of water

Basically, Kaviwasu provides two different options on how water can be made available. The third possibility is invented by the people themselves and carried out independently.

1. The water can be fetched directly at the District Water Points (DWP). At each DWP, there is a member of the Water Users Group who collects the fees on the spot. A meter, installed on the pipe, measures the amount of the water that is tapped water by each customer (*Figure 8*).
2. A private house connection can be installed.
3. Private water distributors collect the water at any DWP and sell the jerrycans, which usually have a volume of 20 litres, at the households. The distributors are usually young men, between the ages of 15 to 25, who transport the cans with a hanger attached to the back of a bicycle.

Source: Original illustration, © Sattler, Wien 2009

Fig. 8. Fetching Water at a District Water Point (DWP)

5.2. Organisation and responsibilities

The company has four operational levels with each having different responsibilities (*Table 5*).

5.2.1. Water Board

The Water Board of Kaviwasu has eight members. The population of each of the six villages supplied with water elect one member directly to the board. The two remaining seats are filled by the Karatu District Executive Director and the Development Co-ordinator of the Diocese of Mbulu. In February 2009, two women were working in the highest hierarchical organisation.[26]

The Water Board is responsible for all project decisions, investments and planning the future for the whole supply area. The Water Board usually meets four times a year.[27]

5.2.2. Main Office Karatu

Currently, the company has ten employees, some of whom are engineers, working in the office in Karatu, where all the daily management and organisational activities are carried out. The engineers employed there are responsible for the construction and maintenance of District Water Points, the tapping of springs, the water pipes and other parts of the infrastructure.

5.2.3. Village Water Committee

The members of the six village water committees are elected directly by the village population. At the village level, these committees monitor all existent District Water Points as well as the pipeline system.

5.2.4. Water Users Groups

For each DWP, there is one small Water Users Group (WUG), whose members are chosen by the households in the vicinity. Each WUG chooses one or more persons to work directly at the DWP. They are responsible for collecting the fees which are sent to the Main Office about once a week. As they usually are the first to witness technical problems at the DWP, they also inform the Kaviwasu Bureau in Karatu about them. A further assignment of the WUGs is the assessment of demand. They inform the Village Water Committees about areas lacking an adequate coverage of DWPs. The elected members of the Water Board carry this information from the village to the Water Board for discussion.[28]

5.3. The Budget and Price for Water

The company earns almost 100% of its budget out of the fees collected at the DWPs. There is no Government support, and usually funds are received only for concrete investments. For example, the borehole was partly financed by Miserio, a German NGO, and SNV, a Dutch NGO.

As mentioned above, the company provides two possibilities to get water, directly at a DWP or by having a private connection. The price of the water depends on the way the water is received.

In February 2009, the price for water collected directly at a DWP was 0,03 €/20 l [29]. With a private connection, the double price, 0,06 €/20 l, was charged. For comparison, the current water price in Vienna is 1,3 €/m^3 or 0,03 €/20 l.[30] This means, that the price for water in Karatu and Vienna is about

26 Jörg 2000:11
27 Kimaro 2009:Interview
28 Kimaro 2009:Interview
29 http://www.oanda.com/convert/classic, Rate frox 20.02.2009
30 http://www.wien.gv.at/amtshelfer/finanzielles/abgaben/wassergebuehr.html

Table 5. Structure of Organisation and Responsibilities at Operational Level

Level	Organisation	Responsibilities
Domestic Water Point (each)	Water Users Groups	Demand Assessment Control of DWP Water Fee Collection
Village (each)	Village Water Committee	Control of all DWPs of the village and the supply system.
Supply Area	Main Office Karatu	Construction of new facilities Maintenance
Supply Area	Water Board	Project Decisions, Construction of new facilities, Maintenance

Source: Original illustration, © Sattler, Wien 2009

the same, whereas the GDP per capita 2008 in Tanzania was about 30 times lower than that of Austria.[31]

6. Sanitation system in Karatu

On the ministry level, there is no law concerning the supply of the population with sanitation facilities. Optionally, village councils can implement by-laws concerning sanitation. Consequently, some villages and cities do have by-laws while others do not have any laws at all regarding sanitation. In Karatu, there are no by-laws, and neither the local government nor Kaviwasu has any responsibility to supply the population with sanitation facilities. There is no sewerage, and because of the high costs this would involve, such a system will not be constructed within the near future.[32] Consequently, the only responsible institution caring about sanitation is that of the village council, and then only when the inhabitants themselves have decided that there is a need for sewerage. The most common private sanitation facilities in the area are pit latrines which are constructed usually in the gardens next to the houses. In Karatu town, about 90% of the residents have access to a private pit latrine, compared with 80% of the population in the rural area.[33] Fortunately, because of the local geology, the groundwater table is 100 to 200 metres deep, and so the groundwater is not contaminated by the waste water or the faeces collected in the pit latrines.[34]

7. Public perception of the Water and Sanitation System

The general opinion of the consumers, with regard to the water supply and sanitation system, was revealed in interviews that were given on the spot at five water points in different locations.

All the persons who were interviewed agreed that big improvements had been made in the local water supply sector in the past ten years. Today, there are not only many more District Water Points than in the past, also the reliability of the supply has improved. Interestingly, the interviewed consumers did not raise any concerns regarding affordability of water at the DWPs.

Nevertheless, some problems remain. In the interviews with customers in the villages South of Karatu it was identified that the number of DWPs per person is much lower than in the rest of the area, and so, for most households, it takes more time to fetch water than on the local average. During the dry season, from June to October, it is very likely that the inhabitants of southern villages (e.g. Gongali) face water shortages, as they are situated at the far end of the water pipelines. During these months, many of the southern DWPs have water for only a few hours per day. If one DWP is out of water, people not only have to walk much further, but also the waiting time at the next DWP is much longer.

Besides the inadequate quantity of available water and the unequal allocation of water points, another big problem is the poor quality of the water. This problem will not be solved unless the surface water sources are cut off from the mains so that the only water source used for the area will be groundwater. Currently a second borehole is in the planning stage, but even then, this will still not provide enough water to be able to abandon the two rivers.

Most of the persons interviewed knew about Kaviwasu and its responsibility, and seemed to be content with the work of the company. There are seldom technical problems, and when there is one, the repair is usually carried out fairly quickly. Although there are many more DWPs than 10 years ago, the construction of new ones should be a priority for the future.

All the interviewees said they have a pit latrine next to their house and described the sanitation situation as sufficient.

8. Findings

First of all, it was shown in chapter three that in Tanzania the situation of water supply and sanitation is much better in urban than in rural areas. As the case study was implemented in Karatu town and villages in the nearby, it is important to con-

31 https://www.cia.gov/library/publications/the-world-factbook/geos/au.html
32 Karatu District Council:3
33 Central Census Office 2004:96
34 Kimaro 2009:Interview

sider that other villages just a few kilometres further away may provide a very different and probably worse picture.

Regarding the reasons for the poor situation of water supply, chapter four on water resources underlines that ecological circumstances are not responsible for shortage of and inadequate access to water. Besides the already used surface water resources, the Northern highlands provide a high amount of clean groundwater that could be extracted in the future.

The current organisation of water supply in Karatu, with a private company having the control and responsibility over the water sector, developed years before the National Water Sector Development Strategy was published. In fact, Kaviwasu started to operate at a time the government did not seek Private Sector Partnership in the water sector. Moreover, only very few interviewed persons in responsible positions at Kaviwasu and the District Council were well informed about the new water policy. Of interviewed customers, none had ever heard about this paper published seven years ago. Therefore it can almost be assured that the present system of water provision in Karatu developed independently of any national policy. Nevertheless, since the Water Policy 2002 enforces decentralisation and private sector participation, which is both implemented in Karatu water supply, today this system and the water policy are in accordance. It can thus be summarised that, although the current situation of water supply in Karatu was not established as a consequence of the Water Policy 2002, they conclude.

Regarding the policy's goal of participation of the community, the picture is ambivalent. On the one hand, the population is directly involved into the practical work, e.g. fee collection at the DWP or the information about technical problems. Also, in theory, Water Users Groups and the Village Water Committees are involved into the demand assessment for new DWPs. On the other hand, regarding the unequal distribution of the DWPs, it is unlikely that all communities were equally integrated into this decision-making process.

Although the situation improved a lot in the last decade, the fact that Kaviwasu is a private company that does not have to legitimate its actions to any institution seems to have brought some negative effects. As already mentioned, full coverage is not achieved particularly in the southern villages. There, the inhabitants usually face lack of water for many months of each year and the number of DWPs per capita is much lower, resulting in long walking distances for the population. In Karatu, which is the commercial centre of the region, has considerable tourism and a relatively high population density, the construction of household connections and DWPs are viable investments for Kaviwasu. Although this might not be the case in the northern villages, the fact that these are located in close distance to Karatu allow the construction of infrastructure at relatively low costs. As a consequence, coverage in these villages with DWPs and reliability of water supply is relatively good. In contrary, three major factors prevent the establishment of an adequate water supply system the southern villages. First, they only receive the remaining water which was left over in Karatu and the northern villages. Second, they are relatively remote so that construction of pipes and DWPs is expensive. Finally, there are no considerable businesses in these villages. They are small, depend largely on rural activities and have a low population density. Thus, as long as Kaviwasu is not forced to reach 100% coverage in the whole supply area, there is little financial motivation for the utility to largely improve services in the remote southern villages.

One major goal of the Water Policy achieved by Kaviwasu is cost recovery of the water supply system. Even though little money is left over for further investments, what there is, is at least enough to slowly improve the system.

As mentioned above, all people agreed that overall water supply improved a lot over the last 10 years. Despite the remaining problems, this shows that a private company can be able to provide water under consumer satisfaction and therefore the new Water Policy, if well implemented, may improve the situation in many parts of the country. The term "well implemented" especially refers to two important issues the government has to take care of to assure the positive outcomes of the policy. With detailed contracts between the local government and Kaviwasu and a better monitoring of the company's activities, some of the remaining problems could probably have been already improved or solved, particularly the low coverage of DWPs in southern villages and continuous shortages in water supply in areas which are of the same low economic importance for the utility.

Regarding sanitation, people did not identify noteworthy problems in the current situation. Out of the perspective of a European researcher used to a very different standard of sanitation, it may be assumed that the fact of insufficient sanitation is covered by more essential problems.

9. Conclusion and recommendations

Although the water supply situation has certainly improved a lot in the last ten years, the personal impression gained during the time spent in Karatu and from the interviews with the customers at the DWPs, makes it rather difficult to agree with the Karatu District Council, which claims that "by the year 2000 the problem of inadequate water supply was considerably solved or reduced".[35] Whereas this might be true for most parts of Karatu town and the northern villages, the people living at the farthest end of the water pipes usually face water shortages for many months of each year. As a result, on the one side it can be stated that the situation of water supply improved since the private company Kaviwasu is responsible for service provision. The number of DWPs increased as did reliability of water supply in many areas, repairs are usually done quickly and water seems to be affordable for all inhabitants, if not through household connections than at DWPs. These improvements serve as arguments that justify the development of a National Water Policy which promotes private sector participation.

On the other side, it is evident that specific pro-poor approaches and goals as area-wide provision of water have to be defined in contracts between the company and the Local Government. Also, regulation and consequent monitoring are needed to achieve a better outcome for the whole population of the area. The current capacities of the Local Government

35 Karatu District Council 2002:1

for monitoring might be limited, however the motivation to do so also seems to be low. The Local Government must thus be given clear mandate and the required means by the Ministry of Water for monitoring and regulation of the private water utility. In general, the Ministry of Water must enhance its efforts to increase the knowledge of Local Governments and water utilities operating in rural areas about the Water Policy 2002, which was found to be at a very low level. To enable future adaptions of the rural water sector in accordance with a national policy, both the Ministry of Water and Local Government must find ways to implement national guidelines on the local level in rural areas.

To improve water supply also in the remote southern villages at relatively low-costs, other technical options should be regarded than using the same water sources located in the northern highlands. The appropriateness of deep wells or rainwater harvesting in these locations should thus be assessed. The remaining problem of low water quality has to be addressed. Whereas the author acknowledges that central water treatment facilities are out of the financial scope of the utility, and sufficient production of water through the sole use of groundwater will require a long time, there are options for intermediate improvements. For example, water treatment at household level, e.g. through filtration, cooking of water or simple sun-heating, could be promoted by Kaviwasu.

This study recognises the positive effects of Private Sector Participation in the water sector, especially when national and local governments have limited resources to adequately fulfil the needs of the population. Kaviwasu is able to function as a viable business while expanding and improving the local water supply system. However, the study also highlights the importance of regulation of private companies, which certainly can be improved in Karatu, where at present Kaviwasu does not have to inform any authorisation about its actions.

Finally, the fact that sanitation was not highlighted by the interviewed inhabitants or other involved stakeholders as a major problem should not be regarded as a sign for a functioning sanitation system in Karatu. In contrary, the non-mentioning of sanitation by most interviewees might indicate that the opposite is true. To improve any situation, first of all the negative aspects of the present situation have to be identified. Regarding sanitation, this very first step of awareness raising might still needs to be started.

The author is aware that not only lack of time, but also limited access to data, human resources and language skills have been constraints on this work. Nonetheless, this study might lay the foundation for further studies on water supply not only in Karatu but over the whole country. These studies may show many more positive and negative experiences and aspects not recognised in this report. Altogether, they could provide a comprehensive picture of the consequences of a privatised water supply. The results and recommendations of such studies should finally be included into the Water Sector Strategy.

Amongst many others, the author could not answer the following essential questions:

- How does the water price differ from other comparable areas?
- How much of the revenues are used for infrastructure improvements and maintenance?
- During the dry season, could the water already be distributed more equally?
- What are the determining reasons for the unequal allocation of water points?
- Is the company working under the influence of a local party?
- How many farms and tourist lodges are connected to the public water systems, using high amounts of water?

Future studies may be able to cover these points and to use the limits of this study as a starting point for further and more detailed analysis. These could not only contribute but be essential to, after three decades of failure, finally reach the overall goal of universal access to safe water by 2025.

Annex

Interview Questions

1. Since when do you get the water from this DWP?
2. Where did you get the water before?
3. Who constructed this DWP?
4. Who is monitoring this DWP?
5. Are there sometimes any problems with this DWP? → How many weeks or months of the year is there a lack of water at this DWP?
6. What happens if there are technical problems at the DWP?
7. Who is responsible for the construction of sanitation facilities?
8. Do you have a private sanitation facility?
9. Who is responsible for the water supply in this area? → What is Kaviwasu?
10. Who do you contact if you need any help or support regarding your water supply?
11. Regarding water supply, what do you expect from
    a. The Local Government
    b. The Central Government
    c. Kaviwasu (if known)
    d. Others
12. Have you recognized any changes or improvements in the water supply system in the last 5 -10 years?
13. Elders: How was the water sector organised in the past (about 15 years ago)? How is it organised today compared with the past?
14. Have you heard about the National Water Policy 2002?

References

Doering, Ernst (2005): The Reform of the Water Sector in Tanzania. GTZ – Support to the Tanzanian Water Sector Reform Programme. In: FWU, Vol. 3. Topics of Integrated Watershed Management.

Garriga, Ricard Giné (2007): Strategy Comparisons of Implementation of Water Supply Points and their Sustainability in Tanzania. A review of alternative approaches to the sustained provision of water supplies in Tanzania. Imperial College, London.

Government of Tanzania. Central Census Office (2004): 2002 Population and Housing Census. Volume IV. District Profile Karatu. National Bureau of Statistics, Dar es Salaam, Tanzania.

Government of Tanzania. Ministry of Water (2002): National Water Policy. Dar es Salaam, Tanzania

Government of Tanzania. Ministry of Water (2006a): National Rural Water Supply and Sanitation Programme. Dar es Salaam, Tanzania.

Government of Tanzania. Ministry of Water (2006b): National Water Sector Development Strategy: 2006 to 2015. Dar es Salaam, Tanzania.

Hilgers, Jörg (2000): Zum Beispiel Wasser. In: Habari 3/00. Der 7. Infobrief des Tanzania-Network.de.

http://www.oanda.com/convert/classic (07.08.2009)

http://www.wien.gv.at/amtshelfer/finanzielles/abgaben/wassergebuehr.html (07.08.2009)

https://www.cia.gov/library/publications/the-world-factbook/geos/au.html (07.08.2009)

http://www.reiseweltatlas.de/Karatu.html (09.08.2009)

http://www.tanzania.go.tz/census/census/districts/karatu.htm (09.08.2009)

http://www.sido.go.tz/UI/Arusha_Region.aspx (09.08.2009)

http://www.irc.nl/page/16771 (09.08.2009)

http://www.fairunterwegs.org/laender/tansania/in-kuerze/kennziffern.html (10.08.2009)

http://www.aucom.com/tanzanian-water-project.html (10.08.2009)

Karatu District Council (2002): Karatu Urban Strategic Development Plan (KUSDP). Karatu

Kaviwasu Bureau Karatu (2009): Papers, Statistics, and maps about Karatu district and Karatu town.

Misereor (200?): Das Wasserbauprogramm in Karatu/Tansania. Ein positives Beispiel für die Beteiligung der Nutzer bei Planung, Bau und Erhalt von Wasserinfrastruktur.

Misereor (2002): Evaluation of the Water Programme of the Diocese of Mbulu.

Ölz, Barbara (2002): Qualität versus Quantität. Strategienvergleich in der Wasserversorgung anhand von Fallstudien in Tansania. Diplomarbeit, Wien.