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Performance of community based organizations in managing sustainable urban water supply and sanitation projects

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The advocacy of climatic change and ever increasing poverty has its impact on environmental degradation. Most of underdeveloped countries have experienced this impact through technical, economic, institutional and social constraints on water supply and sanitation infrastructures. The impact has much effect in urban areas (informal settlements) due to the nature of such settlements. Lack of a sustainable approach and an appropriate technology for the provision of water and sanitation has resulted in decreased coverage in terms of percentage of the population with access to safe water and adequate sanitation, thus necessitating the need for appropriate and sustainable water and sanitation systems. New strategies for water supply delivery, particularly the community participation has emerged and some Community Based Organizations (CBOs) have made a significant contribution to the development of community participation approaches. This paper analyses the effectiveness of community participation, appropriate technologies and the institutional arrangements for the overall performance. Tanzanian CBOs managing water supply and sanitation systems were studied. Results revealed that CBOs are effective in cost recovery as well as effective water and sanitation provision in low-income earners areas.

Key words: CBOs, community participation, environmental degradation, water supply and sanitation.

INTRODUCTION

There is a direct linkage between livelihood and well being of human beings and water supply and sanitation services. Improved water supply and sanitation ultimately contribute towards nation building and prosperity by enhancing the health status of the common mass and thus, their economic productivity.

Despite significant progress recorded in the extension of basic water supply and sanitation services across the developing countries, climatic change and the ever increasing population and poverty has increased its impact on environmental degradation. Most of undeveloped countries have experienced this impact through technical, economical, institutional and social constraints on water supply and sanitation infrastructures. The impact has much effect in urban areas (informal settlements) due to the nature of such settlements. Lack of a sustainable approach and an appropriate technology for the provision of water and sanitation has resulted in decreased coverage in terms of percentage of the population with access to safe water and adequate sanitation, thus necessitating the need for appropriate and sustainable water and sanitation systems. Moreover,

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the high rate of growth of urban populations in Africa and Tanzania in particular, has resulted partially from an increase in the number of urban households, brought about by changes in standards of living and attitudes towards dependence. The rate of growth in number of households across Africa averaged 3.1% between 1985 and 2000, and is set to continue at this rate until 2030 (Thompson et al., 2001). The consequent increase in demand for basic housing and services for urban populations, as well as skewed distribution of investment towards affluent suburban developments, has resulted in rapid expansion of unplanned and unserviced settlements. Overcrowding exacerbates rate of transmission of infectious diseases, such as gastro-intestinal infections, and respiratory diseases such as tuberculosis, commonly associated with poor water quality, poor sanitation facilities, poor ventilation and air pollution (Esrey et al., 1990).

Population growth in Tanzanian urban areas has been increasing rapidly since 1960s. The 1978 and 1988 national census shows that a bigger share of urbanization results from rural-urban migration (Kaliba, 2002; Kessy, 2002). The resulting fast growth in population in urban areas increases pressures on resources to satisfy the increased demand for clean water and sanitation facilities. The increased demand for urban housing has been accompanied by inadequate planning enforcement that has resulted in increased informal settlements with inadequate water and sanitation services. Unsafe water and poor sanitation are the primary causes for the vast majority of water borne and primarily diarrhoeal diseases. Every year, unsafe water, coupled with lack of basic sanitation, kills at least 1.6 million children under the age of five years; more than eight times the number of peoples who died in the Asian tsunami of 2004 (WHO/UNESCO, 2006). Water borne diseases also inflict significant economic burden through the loss of productivity in the workforce and through increasing national health care costs. As a consequence of these pit falls, a billion people were locked in a cycle of poverty and disease (UNICEF/WHO, 2004).

This paper aims to address the effectiveness of community participation, appropriate technologies and institutional arrangements for the overall CBOs' performance in Tanzania. Through literature reviewed and case study, Tanzanian CBOs performance in managing sustainable urban water supply and sanitation projects was analyzed. The study was based on Hanna Nassif Community Development Association (HNCDA) in Dar Es Salaam, Tanzania (a Community Based Organization (CBO) Project).

METHODOLOGY

The study was carried out through physical observations, documentary analysis, quantitative and qualitative methods. Data for the study was collected through a focused survey group of randomly selected CBOs practitioners and key stakeholders. Interview/questionnaires supported with semi structured interview techniques were used to collect data. The interview with water kiosks operators and public water standpipe operators, water users who were found fetching water at water collection points and head of households were carried out to evaluate the satisfaction of the users and the performance of the CBOs. Findings from the 1994 and 1998 baseline survey studies were used as a basis for comparing the trend of water supply and sanitation services. The 1998 baseline study indicated that the number of registered households at Hanna Nassif settlement area were 1897. These registered households were used as a basis for selection of the households for the study. A total of 96 households (about 5.1% of the total registered households) were randomly selected for interview and physical observation of sanitation systems. In Hanna Nassif settlement area, there were 10 water kiosks and 20 public water standpipes. Interview was carried out with 8 water kiosks operators and 17 standpipes operators, HNCDA Secretary, 3 HNCDA Committee members, HNCDA treasurer, and 270 water users who were found fetching water at the water collection points. A total of 396 respondents were interviewed. Tables 1 and 2 summarize the interview/ questionnaires distribution patterns.

Existing conditions of water supply and sanitation services

The problem of water and sanitation in urban and rural areas of developing countries including Tanzania is a major concern. The available water sources throughout the world are becoming depleted and this problem is aggravated by the rate at which populations are increasing, especially in developing countries. Currently, some 30 countries are considered to be water stressed, of which 20 are absolutely water scarce. It is predicted that by 2020, the number of water scarce countries will likely approach 35 (Rosegrant et al., 2002). It has been estimated that, one-third of the population of the developing world will face severe water shortage by 2025. Furthermore, the limited water resources as well as the lack of safe drinking water and sanitation are the most serious challenges of the twenty first century. Over 1 billion people lack access to clean water with nearly all of them living in developing countries. Yet, 2.6 billion people, 40% of the world population, half the developing world lack even a simple improved latrine (UNICEF/WHO, 2004; Elimelech, 2006).

Water supply

According to Antonio (2005), more than 1.2 billion people in the world still lack access to safe drinking water. Barney (2005) noted that, over the next 30 years, virtually all of the world's population growth is expected to be concentrated in urban areas in the developing countries, with its attendant socio-economic and environmental impact. This portrays that developing countries are facing great challenges in meeting community water supply needs.

In Tanzania, increasing levels of poverty, population growth and lack of a sustainable housing policy mean that urban growth is often absorbed into informal settlements. These areas are characterized by lack of basic infrastructure like water (AFTU 1&2, 2002). Many urban residents cannot afford housing, and authorities themselves have few resources with which to improve or maintain infrastructure and services. Consequently housing, health, water quality and environmental conditions in the growing informal settlements of Tanzania's cities are extremely poor (Kessy, 2002).

The National Water Policy of Tanzania stipulates the need to have water resources with acceptable quality. Increased human activities including poor land use practices, as well as uncontrolled abstractions and pollution of water body impact on the quality and quantity of the available water (URT, 2002). Tanzania has a population of more than 38 million, with 25% of this population living in urban areas, while water supply extends to some 85% of the

Table 1. Interview/questionnaires distribution.

S/No	Category	Category population	Total respondents Interviewed
1	Kiosk Operators	10	8
2	Water standpipe Operators	20	17
3	HNCDA Committee members	4	3
4	HNCDA Treasurer	1	1
5	HNCDA Secretary	1	1
6	Head of Households (Hanna Nassif Registered houses)	1897	96
	Total	1933	126

Table 2. Interview distribution at water collection points.

Kiosk	Water collection point	Number of water collection points	Targeted number of interviewees	Total respondents interviewed
1	Kiosks	10	150	97
2	Public water standpipes	20	250	173
Total		30	300	270

urban population service is often poor and at best erratic. The urban poor do not receive adequate services although in some areas this situation is beginning to improve (UWSA, 2001).

The Tanzania urban water and sanitation sector like many similar institutions is undergoing decentralization. This process means a shift away from organizational structures where the district water engineer was responsible technically to the ministry but administratively to the local municipality, which in turn was responsible for managing cost recovery. Since 1994, a new scenario has emerged in Tanzania and now all the responsibility is devolved to the Urban Water and Sewerage Authorities (UWSA). With the support of legislation, the UWSA have significant autonomy linked to the achievement of key performance indicators.

The impact of decentralization is most apparent in the obligations of the Ministry of Water and the UWSAs. The traditional ministry role of 'provider of services' is now one of regulator of policy and facilitator of service expansion through fund allocation and UWSA performance monitoring. UWSAs is responsible for provision of services in quantity and quality standards required, set water and sewerage tariffs, collect revenue and plan and execute new projects for water supply. Table 3 shows the main source of drinking water for Tanzanian urban households in percentage. Table 3 reveals that few people have access to water supply (only 34.1% of the urban households is served by utility directly). Despite the many opportunities UWSAs face, many hurdles including the fact that not all customers pay their water bills, current supplies are intermittent, unaccounted for water (UFW) is in excess of 40% and leakage is also high (UWSA, 2001).

Typically, the urban poor are not seen as a viable customer base as the authority is pre-occupied by an attempt to recover costs for other market segments. Most of the poor segment in urban slum areas makes use of unsafe water for domestic purposes (UN-HABITAT, 2009). The water shortage drives most of the urban poor to fetch unsafe water for domestic use. Figure 1 shows the situation where most of urban poor fetch water for domestic purposes.

Sanitation

In developing countries such as Tanzania, rapid population growth and urbanization is creating an added demand for housing, infrastructure services including sanitation services. Providing sanitation services especially for the poor who are living outside the designated residential areas like illegal settlements or slums (informal settlements) is a challenge. The World Bank (2000) report estimates that almost 26% of the global urban population, over 400 million people, lack access to the simplest latrine.

Sanitation coverage in developing countries (49%) is only half that of the developed world (98%). In Sub-Saharan Africa, the coverage is a mere 36%, and over half of those are without improved sanitation. Similarly, nearly 1.5 billion people live in China and India without access to improved sanitation services (WHO/UNESCO, 2006). The number of deaths attributable to poor sanitation and hygiene alone may be as high as 1.6 million a year. Statistics on wastewater treatment reveal that almost 85% of global wastewater is discharged without treatment leading to serious impacts on public health and the receiving water environment.

The situation is even worse in areas of low-income settlements. Septic tanks and feeder networks regularly discharge effluent into street gutters, open streams or drainage canals. This creates unpleasant living conditions, public health risks and environmental damage (GHK, 2002). Sanitation coverage refers to the percentage of the population that has access to safe collection and disposal of wastewater. In the Southern Sahara countries, the coverage increased from 28% in 1980 to 36% in 1990. In 2003, the access to adequate excreta disposal was averaged to only 35% of the population. About 21.7% of the population had access to flush toilets, 66.8% to pit latrines and 11.6% use other options including open defecation (WHO, 2003). According to Ngware and Kironde (2000), only 6% of Dar-es Salaam's population has access to the choked sewers while 8% use septic tanks and 80% use pit latrines. Moreover, in informal settlements, the latrines are constructed in wrong locations due to lack of space. This situation has also been observed in Kinondoni Hanna Nassif Dar-es Salaam, Tanzania (Figure 2).

Summary results of review of existing conditions of water supply and sanitation services in Tanzania

Despite many opportunities, Tanzania has a severe

Table 3. Main source of drinking water for Tanzanian urban households (% of households).

Source	Households (%)	Improved/ unimproved	Utility/ non-utility
Piped into dwelling/yard/plot	18.6	All improved sources: 77%	Households served by utility directly: 34.1%
Public tap	15.5		
Neighbour's tap	32.8		
Protected well / borehole	10.1		
Unprotected well / borehole	8.2	All unimproved sources: 23%	Households not served by utility: 65.9%
Surface sources (river, lake, etc)	4.7		
Vendor / tanker truck	7.2		
Springs	1.6		
Other	1.5		

Source: (TDHS, 2004).

Figure 1. A woman fetching water from a leaking pipe in a grubby area found at Bagamoyo town (a town near Dar es Salaam City). Source: UN-HABITAT (2009).

problem of safe water supply and access to improved sanitation services. Few people have access to water supply, with only 34.1% of the urban households being served by utility directly. Moreover, Tanzanian Urban Water and Sewerage Authorities (UWSAs) face many hurdles such as customers who do not pay their water bills, current supplies are intermittent, unaccounted for Water (UFW) in excess of 40% and high leakage of water. Furthermore, in sanitation sector the situation in Tanzania is even worse than water supply. For example, a survey conducted in 1996 revealed that only 6% of Dar es Salaam's population has access to the choked sewers

Figure 2. In house latrines found in Kinondoni Hanna Nassif Dar es Salaam, Tanzania.

while 8% use septic tanks and 80% use pit latrines. However, the introduction of Community Based Organizations (CBOs) in Tanzania in upgrading informal settlements may improve the situation.

Performance of community based organizations (CBOS) in managing sustainable urban water supply and sanitation projects

Overview

Historically, the performance of urban water and sanitation systems in developing countries including Tanzania remains below expectation. It should be recognized that urban water management poses extraordinary complex problems that cannot be solved by individual stakeholders. The failing of systems particularly in developing countries has been partly the result of a top-down approach with limited involvement of stakeholders (Khatri and Vairavamoorthy, 2007).

At the root of many failures is the lack of public participation, including participation of organized forms of the public such as CBOs and NGOs. Some would argue it is the 4th pillar of sustainable development. Participation is not happening due to governance failures as well as lack of awareness. People still do not understand the concept of sustainability and do not know how they can contribute to its achievement. This leads to gaps and divergences in governments, CBO and NGO efforts to raise awareness among citizen groups.

Conventional wisdom dictates that without community participation, there is little likelihood of sustainability being realized (Narayan, 1995; Oyesiku, 1998). This is in part a pragmatic recognition of Governments' inability to deliver services, but in part an ideological proposition which values concepts such as 'empowerment', and 'capacity building' for their own sake. Even from a strictly practical approach, a number of the issues mentioned earlier illustrate the need for capacity building at the community level as well as at the level of Government or NGO, CBO.

Sustainability of facilities was reported by Overseas Development Institute (ODI) (2004), to be a major concern in the developing countries. Performance on sustainability is often gauged by looking at the number and proportion of functioning and non-functioning facilities. It also further noted that a functioning facility requires attention to a range of managerial, social, financial, institutional and technical issues.

In developing countries (including Tanzania), a significant number of projects, including those in the water and sanitation sector, fail to deliver benefits to society over the long term (Antonio, 2005). Part of the cause of this failure lies in poor understanding of the issues of impact and sustainability. Abrams (1998)

pointed out that, “if the water flows, then all of the many elements which are required for sustainability must have been in place. There must have been money for recurring expenses and for the occasional repair, there must have been acceptance from the consumers of the service, the source supplying the service must have been adequate, the design must have been properly done, and there must have been sound construction”.

To quote from the work of Abrams (1996) on the review of the African domestic water and sanitation: “It is generally agreed that community engagement and empowerment is the solution to the sustainability of water supply and sanitation services”. The hallmarks of empowerment and capacity building are factors such as transparency, partnership, flexibility, respect, and empathy.

Education in health and hygiene, training in maintenance and the handling of cash, and involvement of women in community institutions and decision making, are key activities needed to create local capacity to manage. On the part of Governments and NGOs/CBOs, listening and learning from the community, developing respect for existing methods of organization, problem solving, conflict resolution, and decision making, are essential components of such capacity building work. This calls for a fundamentally new approach to water, sanitation and human settlements whose aim is to satisfy the water needs while protecting the eco-systems.

Governments need to support and reinforce the efforts of the NGO/CBO community in this respect. This would lead to greater participation of the public to promote sustainable development at local levels. For example, in the United Kingdom, issues of sustainability are now being included in the school curriculums via for example, the sustainable Design Awards for 16-18 year olds and the sustainable Technology Education Project for 11-16 year olds. Such programmes should be encouraged, replicated and amply funded to raise awareness (UN, 2004).

Two different kinds of partnerships have been tried to increase effectiveness in poverty reduction, and sustainable development. The first is through working with the private sector, especially for urban infrastructure (including provision for water and sanitation) and in some cases housing finance. The second was working with the urban poor, including their community organizations and local NGOs. For extending and improving provision for water and sanitation, privatization proved disappointing; it did not succeed in bringing in large new sources of capital for investment from private markets (which had been one of the justifications for promoting it). Private companies were interested primarily in large cities with sizable middle classes rather than the smaller, poorer urban settlements where most of those without adequate provision actually live.

In Tanzania, CBOs and NGOs are observed currently participating fully in development and capacity building of urban and rural areas’ projects, which central Government and local Governments are embarking upon, particularly with assistance of UNICEF, IMF, World Bank and other international organizations financial supporters. CBOs and NGOs participation coupled with Governments and International supports appeared to be the right step at right time in the right direction in quest to ensuring better access to basic sanitation and safe drinking water.

Performance trend of the Dar-es- Salaam (DSM) water supply

The government of Tanzania like any other developing country is unable to provide and maintain the most needed services to the urban community. This situation calls for more involvement and participation of the community aiming at stimulating the responsibility and willingness of community to operate and maintain their water systems. In DSM, the demand for clean water has in most cases outstripped the supply because the supply has been faced with inadequate and unreliable water sources. Other problems include unreliable power supply, dilapidated main water supply pipes from Lower Ruvu, and Upper Ruvu, characterized by leakages, problems of distribution systems, spaghetti of the subscribers’ distribution pipes as well as illegal connections.

In 1984, the Tanzania government formed National Urban Water Authority (NUWA), in order to redress the problems of inadequate water supply throughout all urban areas in the country. NUWA was expected to start with DSM city and gradually extend its jurisdiction to all urban areas in the country. In 1997, the water demand in DSM was estimated to be 409,500 m^3 while the supply was 191,000 m^3 (Ngware and Kironde, 2000). Therefore, the supply was only 47% of the demand. It was then the same year the NUWA was transformed and renamed as DAWASA to operate in DSM, and was further given mandate to take over sewerage services in the city. In 2003, DAWASA was privatized to a foreign company- the Dar-es-Salaam City Water Company.

DAWASA was privatized by the Government of Tanzania so that to fulfill loan conditions of US$98.76 million (that is, 164.6 billion Tanzanian Shillings (TZS), 1 Tanzanian shilling = 0.0006 US dollars) from the World Bank, International Development Agency (IDA), the African Development Bank (AfDB), and the European International Bank (EIB) for rehabilitation of water supply systems for the Dar-es-Salaam City, Kibaha Town and Bagamoyo (URT, 2004). It was expected that major rehabilitation of the water supply system of the city would be covered both in Lower and Upper Ruvu sources. Table 4 shows the water connection and distribution by City water in Kinondoni Municipal.

The Government of Tanzania expected the water supply service provision within the city to improve after the rehabilitation work, whereby leakages were expected to decrease from the 55 to 28% and revenue collection to

Table 4. Water connection and distribution by City Water in numbers at Kinondoni Municipal.

Domestic	Institutional	Commercial	Industrial	Total
5311	63	1056	6	6436

Source: (URT, 2004).

Table 5. Perceptions of trends in water supply over the last five years.

Indicator	Dar es Salaam (%)		Other urban (%)		Rural areas (%)		All areas (%)	
	I ↑	D ↓	I ↑	D ↓	I ↑	D ↓	I ↑	D ↓
Dry season shortages	20	33	27	26	20	29	21	29
Cleanliness	15	17	17	14	7	22	11	19
Queuing time	12	26	17	14	12	13	12	17
Cost	8	32	14	16	12	8	11	16
Distance	17	13	17	11	9	14	13	13

I ↑, Improved; **D** ↓, deteriorated. Source: Views of the People Survey (2007).

increase from 45 to 90% (URT, 2004). However, people perceived differently. Table 5 shows the perceptions of trends in water supply. The survey data indicators in Table 5 revealed that more efforts are needed to improve the water supply in urban as well as rural areas. However, results from the Jan et al. (1993) on developing, managing and maintaining community water supplies and sanitation projects suggests that water and sanitation targets can be achieved through empowering individuals, households, and communities to take charge of their development needs. Hence, full involvement of communities in all stages of project implementation and management is the correct pragmatic approach for the improvement of water supply delivery and sanitation services in urban as well as rural areas.

CASE STUDY: HANNA NASSIF COMMUNITY DEVELOPMENT ASSOCIATION (HNCDA)

Evolution of the Hanna Nassif Community Development Association (HNCDA)

Hanna Nassif ward is in Kinondoni Municipality Dar Es Salaam, Tanzaina, with three sub-wards; Hanna Nassif, Mkunguni, and Kisutu. The upgraded area covers a part of the Hanna Nassif sub ward and another part of the Mkunguni sub ward. According to the 2002 census report, the upgraded settlements cover an area of 45 ha, with a population of twenty thousand (20000) people. The need for establishing a community based organization in Hanna Nassif settlement stemmed from the commonly felt problems, that is, flooding, poor road and drainage networks, inadequate water supply and sanitary services.

Hanna Nassif was earmarked for upgrading since the second phase of the National Sites and Services and Squatter Upgrading Programme phase II and III that commenced in 1976 and 1981 respectively (Kessy, 2002). The programme was financially supported by the World Bank, but due to some reasons the efforts to upgrade Hanna Nassif could not succeed until 1991, when the move to improve basic infrastructure through community based approach was initiated by the community itself. This was a proper approach since community approach sought to empower local organizations and individuals through an atmosphere of dignity and participation, and an orientation to achieving durable results (O'Regan and Conway, 1993).

The primary objective of infrastructure improvement at Hanna Nassif was to improve the living environment by empowering the community to pioneer the development of basic infrastructure in collaboration with other stakeholders (Kessy, 2002). In recent years, many development agencies have focused on the promotion of participatory approaches to encourage bottom-up planning and empowerment of communities so that they take more control of development activities. It was under this effort that the Hanna Nassif community based infrastructure upgrading was promoted by the National Income Generation Programme (NIGP) (Salewi, 2004). This is in line with the National Water Policy on the issue of water for low-income groups and community user groups (the goal is to improve water and sanitation services in low income urban and peri-urban areas) (URT, 2002).

Performance trend of Hanna Nassif water supply and sanitation services

Performance of water supply services

Water Supply Condition: The Hanna Nassif water supply depends on the water main pipe through the

Table 6. Water supply connection in Hanna Nassif settlement.

Type of connection	1994 Total houses connection (%)	1998 Total houses connection (%)	Remarks
House connection	18.8	20	In house water network
Plot connection	39.4	8	Single tap
No water connection	41.8	72	Were buying water within settlement area

Source: UCLAS/ILO (1994; 1998).

settlement to Kinondoni area. The situation of water supply at Hanna Nassif settlement area is relatively better compared to the situation it was before the commencement of the project, out of 96 head of households interviewed, 85 (88.5%) head of households agreed that the project has reduced water shortage and improved drainage system. The same pattern of result was portrayed from the interview conducted with water users who were found fetching water at water collection points, out of 270 respondents, 246 (91.1%) respondents said that water shortage was reduced and drainage system was relatively improved. They pointed out that before commencement of the project pit latrines flooding was a major problem during rainy seasons. Construction of drainage system has reduced flooding problem. Moreover, the 1994 and 1998 trend of water supply was almost the same. Findings from the 1994 and 1998 baseline studies indicated that the Hanna Nassif settlement area did not experience frequent water shortages either from rationing or low pressure. The 1994 survey revealed that 63.3% of the total respondent households experienced a water shortage only once a month. The results from the 1998 survey revealed almost the same about 60% of the interviewed households experienced a water shortage within the same period. Moreover, findings of the 1994 and 1998 baseline studies showed that majority of the households get their water for domestic use from within the settlement. Furthermore, housing registration survey which was carried out on May 1998 revealed that out of 1897 houses, 20% (373) had private water connection, 8% (149) houses had plot connection and the remaining 72% (1375) had no water connection. People living in houses with no water connection were buying water within settlement area. Table 6 summarizes the water supply connection in Hanna Nassif settlement between 1994 and 1998.

Water Consumption: The HNCDA study indicated that water consumption within the Hanna Nassif settlement was gradually increasing. There was relatively small change of water consumption compared to the water consumption patterns revealed in the 1994 and 1998 baseline studies. The study showed that about 27% of the 396 total respondents interviewed were using less than 5 buckets per day or below 100 Lt per day, 46.2% between 101-200 Lt per day, 18.3% between 201-250 Lt per day and the remaining 8.5%, were using above 250 Lt per day. Findings from the 1994 and 1998 baseline studies portrayed almost the same trend of water consumption. The 1994 survey study revealed that 47.9% of the sample population used below 100 Lt per day, 40.5% between 101-200 Lt per day, 7.2% between 201-250 Lt per day and 4.5% used above 250 Lt per day. The 1998 water consumption pattern indicated that 34% of the sample population was using below 100 Lt per day, 43% between 101-200 Lt per day, 15% between 201-250 Lt per day and the remaining 8% were using above 250 Lt per day. Table 7 shows water consumption pattern within the settlement between 1994 and 1998.

Performance of sanitation services

The HNCDA study revealed that most of the houses in Hanna Nassif settlement area use pit latrines, out of 96 households which were visited, 79 (82.3%) households use pit latrines, 15 (15.6%) households use flush toilets and the remaining 2 (2.1%) households had no toilet facilities. Table 8 shows the summary of the observation results.

Moreover, results from the interview which was conducted with water users who were fetching water at water collection points reflected almost the same pattern; out of 270 respondents, 238 (88.2%) said that they use pit latrines, 29 (10.7%) said they use flush toilets and the remaining 3 (1.1%) respondents said that they had no toilets; however, they further pointed out that their toilets were demolished by flood. Table 9 summarizes the results of the interview conducted at the water collection points.

The 1998 baseline study showed that out of 1897 households that were registered, only 128 (6.7%) were using water closet and septic tanks sanitation system, 1758 (92.7%) had pit latrines and the remaining 11 (0.6%) had no toilets. Moreover, the 1998 baseline study revealed that one among the problems facing residents of Hanna Nassif was that of flooded latrines, about 11% of the sample households had been experiencing the problem. However, recent observations in the Hanna Nassif settlement revealed that this problem has been reduced as a result of improvement on the drainage system.

Table 7. Water consumption pattern.

Amount of water consumption (L)	Year 1994 (%)	Year 1998 (%)
Below 100	47.9	34
101-200	40.5	43
201-250	7.1	15
Above 250	4.5	8

Source: UCLAS/ILO (1994; 1998).

Table 8. Use of sanitation systems at Hanna Nassif settlement.

Sanitation system	Number of households	Percentage
Pit latrine	79	82.3
Closet	15	15.6
No Toilet	2	2.1
Total	96	100

Table 9. Summary of results of the interview conducted at water collection points.

Type of sanitation system	Number of households	Percentage
Pit latrine	238	88.2
Flash Toilet	29	10.7
No Toilet	3	1.1
Total	270	100

Institutional arrangements

The source of the Hanna Nassif community water supply is from the City Water main distribution pipe along Kawawa Road. There are 10 public water kiosks, and 20 standpipes. The land on which the kiosks and the standpipes are installed was obtained from individual landlords. The landlords share the net revenue collected each month as partners in the service (that is, 50% of total collections less operational costs and the City Water bill).

The water supply serves the entire population of the Hanna Nassif sub ward and part of the Mkunguni sub ward. Many respondents of this study were satisfied by the service, but lamented that the HNCDA has raised the price of 20lt bucket dramatically from 0.006 to US$0.012 (that is, 10/= to 20/= Tanzanian shillings (TZS.)). The respondents were comparing the price with those charged by some religious institutions at the area who own deep wells and sell water at a price of 0.006 US$ (that is, 10/=TZS) per 20lt. bucket.

The distribution of water from the main pipes is not reliable due to leakages and the dilapidated condition of the pipes, which has forced the City Water Company to introduce an allocation system of supply to most of the city areas. The introduced water allocation system has caused the community standpipes and some kiosks to remain dry in some days when the area is not supplied from the mains. The kiosks are installed with reservoir five tanks with capacity of 5,000lt, and the remaining five kiosks with tanks of 10,000lt capacity. However, this reserve cannot supply water to the community satisfactorily for a day, where as the allocation can sometimes extend for two or more days.

Since the Hanna Nassif Community water supply depends totally on the supply of the City Water Company, the performance of the Community Water Supply to a greater extent depends on the performance of the City Water. Therefore, the Institutional arrangement with the Community Water Supply Management to a greater extent influences the performance and the assurance of the sustainability of the service to the settlements. The government of Tanzania as in many developing countries is unable to provide and maintain the urban water supply systems. But since water and sanitation are critical components of development, the Central Government, Local governments, and Government Development Partners have a role to play in order to encourage and support the Communities, NGOs and CBOs in developing and maintaining water supply and Sanitation systems. This is critical especially in low-income urban communities.

Figure 3. A woman fetching water at a water kiosk.

Performance of the actors

The performance of the actors in community-based water supply depends on the efficiency of the management team. The community participation in community based water services aims at stimulating the responsibility and willingness of community to operate and maintain their water and sanitation systems. They achieve this not only by training those involved in the day to day operations, but also by participatory planning to tailor services by organizing water committees to represent their community. The organization of water committee should focus on roles and responsibilities of the most affected, for example, the women and the poor, so that they would not be excluded from the use of the system and from decision-making. The HNCDA water committee has only 4 members that include two women. This committee is supposed to administer 20,000 people on water issues. More involvement of women especially in decision-making could help in the improvement of the service provision. Figure 3 shows a woman fetching water at a water kiosk.

Accountability

The HNCDA's water supply service has three stages of accountability:
(a) Operators are answerable to the HNCDA water committee.
(b) The water committee is accountable to the executive committee.
(c) The executive committee is held accountable to the members of the HNCDA.

This set up needs frequent reporting of the progress from the operators up to the executive committee and from the committee to the general meeting. Apart from the reporting system, there is a need to have an organ within the system which is directly accountable to the users of the water. Lack of accountability to the users can lead to complaints that are detrimental to the overall performance of the water supply service. Financial accountability is also another issue of concern in Hanna Nassif community water supply. When interviewed, the secretary of the executive committee admitted that the HNCDA has no culture of frequent financial reports by the treasurer and/or the water committee to its members. The HNCDA constitution provides for annual financial reports in each general meeting. Frequent community meetings with an oral report given by the treasurer followed by questions and answers could help to minimize questions on financial accountability.

Financial records and transparency

In Hanna Nassif, the kiosks and standpipes operators are not trained to manage financial recording and reporting. May be that is why the water points' financial records, are

not kept by the operators. All operators who were interviewed in this study said that they are only obliged to collect the daily sales at the water point, and send the sum to a selected member of the water committee, who in turn sends the money to the treasurer.

According to the operators interviewed in this study, daily collections per water point ranges from 1.2 to US$3.00 (that is, 2,000/= TZS to 5,000/= TZS) for the kiosks while the sales at standpipe ranges from 1.2 to US$1.8 (that is, 2,000/= TZS to 3,000/= TZS). Therefore this could be averaged to US$63.00 (that is, 105,000/= TZS) per month per kiosk and US$45.00 (that is, 75,000/= TZS) per month per standpipe. The interview with the HNCDA Treasurer showed that total sales per month is averaged at US$36.00 (that is, 60,000/= TZS) per kiosk and US$24.00 (that is, 40,000/= TZS) per standpipe per month. She said that the HNCDA pays US$236.06 (that is, 393,440/= TZS) monthly bill to the City Water, and she averaged a balance of US$90.00 (that is, 150,000/= TZS) as revenue after deducting all costs.

Satisfaction of the users

Most of the customers interviewed were women found at the water points, who indicated satisfaction with the community water supply. They only lamented on the dramatic raise in price per 20lt. bucket. Responding on the question of the increase in price, the HNCDA secretary said the increase was due to the City Water Tariffs that are US$0.00048 (that is, 80 cents TZS) per liter which amounts to US$0.0096 (that is, 16 /= TZS) per 20lt. Before privatization of water distribution services, DAWASA was charging all community water supplies a subsidized price per liter, US$0.00024 (that is, 40 cents TZS) per liter which amounted to US$0.0048 (that is, 8/= TZS) per 20lt. And the HNCDA was selling at US$0.006 (that is, 10/= TZS) per 20lt.

CONCLUSION AND RECOMMENDATIONS

In recent years, many development agencies in developing countries including Tanzania have focused on the promotion of participatory approaches to encourage bottom-up planning and empowerment of communities so that they take more control of development activities, affecting their lives. Governments' inability largely due to lack of resources (financial) to maintain water and sanitation infrastructure has been the major factor contributing to the need for promotion of community participation in development programmes. Involvement of CBOs in managing water supply and sanitation projects provide an indirect economic impact. The socio-economic impact is attributed in the improvement of living standards of the society. The Hanna Nassif Community

Development Association (HNCDA) was meant for infrastructure upgrading. The HNCDA study revealed that CBOs can contribute in improving water supply and sanitation systems, especially in informal settlements where most of households are low-income earners. However, there are numerous risks that threaten the sustainability of CBOs. These problems include; technical maintenance of the systems, management, cost recovery, planning, transparency in financial matters and in decision-making, as well as communications between committees and the community. Despite of these challenges, it has been revealed that full involvement of communities in all stages of project development, implementation and management lead to successful water supply and sanitation project success. Moreover, it is obvious that this approach does not divest Governments and NGOs of their responsibility for continuing and evolving support of the programmes which the communities promote. As communities change, and the needs of their water and sanitation systems change, the appropriate type of support (education, training, financial subsidy, technical assistance, maintenance, and even rehabilitation) should evolve. Continuous support to community participation and specifically institutional, legal, and contractual links between communities, Governments and NGOs should be developed.

REFERENCES

Abrams LJ (1996). Water Supply and Sanitation Development in Africa, Africa Sector Review-Report, UN Water Supply and Sanitation Collaborative Council, Working Group on Water Supply and Sanitation Development in Africa.

Abrams LJ (1998). Understanding sustainability of local water services. Accessed from http://www.thewaterpage.com/sustainability.htm on January 2011.

Antonio GF (2005). The European response to the challenges of Water and Sanitation in Developing Countries. In TRIBUNE, the document of European Commission.

Barney C (2005). Urbanization in Developing Countries: Current trends, future Projection, and Key Challenges for Sustainability, J. Technol. Soc. 28:63-80.

Elimelech M (2006). The Global Challenge for adequate and Safe Water, J. Water Supply, Res. Technol.-AQUA, 55(1):3-8.

Esrey S, Potash JB, Robert SL, Shiff C (1990). Health benefits from improvements in water supply and sanitation, Survey and analysis of the literature on selected diseases. US Agency for International Development (USAID), Washington DC, USA, Water and Sanitation for Health (WASH) Technical /66/Rep.

GHK (2002). Effective Strategic Planning for Urban Sanitation Services: Fundamentals of Good Practice, GHK Research and Training, UK. Accessed from http://www.ghkeurope.com/products/ prd02.asp?id=4 on March 2011.

Jan D, Gerry G, Michad W (1993). Developing and Managing Community Water Supplies. Oxfam Publication Oxford UK, Oxfam Development Guidelines P. 8.

Kaliba RM (2002). Participatory Evaluation of Community Based Water and Sanitation Programs: The Case of Central Tanzania. PhD Thesis, Department of Agricultural Economics, Kansas State University, Manhattan.

Kessy AG (2002). Community Participation in Urban Infrastructure Provision, Research Series P. 33, Dortmund.

Khatri KB, Vairavamoorthy K (2007). Challenges for Urban Water Supply and Sanitation in the Developing Countries: Discussion Draft

Paper for the Session on Urbanasation, UNESCO, Delft, Netherlands.
Narayan D (1995). The Contribution of People's Participation: Evidence from 121 Rural Water Supply Projects: Environmentally Sustainable Development Occasional Paper Series, No. 1, World Bank, Washington DC, USA.
Ngware SSA and Kironde JML (2000). Urbanizing Tanzania: Issues, Initiatives, and Priorities, DUP (1996) Ltd, Dar es Salaam University Press, Tanzania.
O'Regan F, Conway M (1993). From the bottom – up: Towards a strategy for Income and Employment Generation among the Disadvantaged, Aspen Institute, Washington DC, USA.
Overseas Development Institute (ODI) (2004). From Plan to Action: Water Supply and Sanitation for the Poor in Africa.
Oyesiku OO (1998). Modern Urban and Regional Planning Law and Administration in Nigeria, Kraft Books Limited, Ibadan.
Rosegrant MW, Cai X, Cline SA (2002). Averting an Impending Crisis, Global water Outlook to 2025: Food Policy Report, International Water Management Institute (IWMI), Colombo, Sri Lanka.
Salewi KW (2004). Poverty Alleviation through Infrastructure Provision and Development, NIGP, Dar es Salaam, Tanzania.
TDHS (2004) Tanzania Demographic and Health Survey 2004/05.
The World Bank AFTU 1&2 (2002). Country Assessment Report of Tanzania on: Upgrading Low Income Urban settlements.
Thompson J, Porras IT, Tumwine JK, Mujwahuzi MR, Katui-Katua M, Johnstone N, Wood L (2001). Drawers of Water II: International Institute for Environment and Development, London, UK.
UCLAS (1994). Baseline study, University College of Lands and Architectural Studies (UCLAS)/ILO, Tanzania.
UCLAS (1998). Baseline study, University College of Lands and Architectural Studies (UCLAS)/ILO, Tanzania.
UN (2004). Commission on Sustainable Development, Discussion papers submitted by major groups: Discussion paper on water, sanitation and human settlements submitted by non-governmental organizations, United Nations Economic and Social Council, Item 3 of the provisional agenda, Twelfth session 14-30 Apr. 2004. Accessed from http://sdin-ngo.net/csd/pdf/csd12-dicussionpaper-ngos.pdf on November 2012.
UN-HABITAT (2009). Tanzania: Bagamoyo Urban Sector Profile.
UNESCO/WHO (2006). Meeting the MDG drinking Water and Sanitation target: The urban and rural challenge of the decade, United Nations Children's Fund and World Health Organization.
UNICEF/WHO (2004). Meeting the MDG drinking Water and Sanitation target: A midterm assessment of progress, United Nations Children's Fund and World Health Organization.
URT (2002). National Water Policy, United Republic of Tanzania.
URT (2004). Water Supply Development report, United Republic of Tanzania, Kinondoni Municipal Council, Dar es Salaam, Tanzania.
UWSA (2001). Draft Customer Services Guidelines, Urban Water and Sewerage Authorities, Tanzania.
Views of the People (2007). Research and Analysis Working Group, United Republic of Tanzania. "Views of the People 2007: Tanzanians Give their Opinions on: Growth and Reduction of Income Poverty, Their Quality of Life and Social Well-being and Governance and Accountability." Dar es Salaam, Tanzania.
WHO (2003). Water Supply and Sanitation Sector Monitoring Report, World Health Organization.
World Bank (2000). Entering the 21st Century, World Development Report 1999/2000. Oxford University Press, New York.