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Impact of Water Reforms on the Urban Environment

Godrich Ibrahim Mnyone and Stanslaus Mbones Msuya

Institute of Rural Development Planning,
P.O. Box 138, Dodoma, TANZANIA

ABSTRACT: Beyond doubt water is vital in promoting the population's well-being and quality of the urban environment. However, in the cities of the developing countries, the supply of water does not match water demand. This paper briefly present part of findings of a study carried out in Dodoma Municipality on Promoting Low Income Housing for Livelihoods of Low Income Households. The aim of the paper is to create awareness of the public on the impact of water reforms on the urban environment in Dodoma Municipality.

Concerning methodology, the intensive fieldwork was carried out in four study areas namely Chidachi, Chilewa, Chadulu and Maweni because the neighbourhoods have used piped water for a decade thus have adequate and accessible data and information on the impact of water reforms on the urban environment in Dodoma Municipality. Specifically, the study investigated the impact of water reforms on the urban environment in Dodoma Municipality. Data collection methods were documentary review, physical observation, interviews and focus group discussions. The data was analysed by using computer software namely IBM SPSS Statistics.

The study found that one of the water reforms was commercialization of water service delivery. The water authorities got autonomy on water supply. To improve water services, new water tariffs were introduced as a result there was overly high burden water costs which in turn limited availability of water for irrigating flower gardens. For instance, out of 34 institutions involved in the study four have developed and maintained flower gardens. In addition, 35 households out of 240 respondents involved in the study had flower gardens.

The paper concludes that water reforms have brought about negative impacts on the urban environment. Socially, the water reforms have largely benefited members of the high income households who occupy a relatively small area of the urban population. In Dodoma, the high income households also own plots in unplanned settlements. However, due to dispersed nature of the high income plots their flower gardens have improved urban vista at the household level but failed to bring out beauty vista of the entire urban environment.

Basing on the findings, the paper recommends that there is a need to review water tariffs to encourage urban environmental groups to efficiently promote flower gardens. Promoting flower gardens will first beautify the urban environment. Secondly, promote flower gardens will increase employment opportunities. More people will be employed by the environmental groups in growing pot flowers, in landscaping and selling pot flowers.

KEYWORDS: impact, water reform, urban environment.

1 INTRODUCTION

1.1 BACKGROUND INFORMATION ON COMMERCIALIZATION OF WATER SERVICE DELIVERY

Beyond doubt, water is vital in promoting the population's well-being and quality of life and to preserve surroundings (Kessides, 2004). The world population has been growing tremendously from 2,758,314,525 people in 1955 to 7,515,284,153 people in 2017 (Table 1). The population growth and associated anthropogenic undertakings have largely led to over-utilization of water sources (Estache, *et al*., 2005).

Table 1. The World Population 2017 by Regions

Region	Population (2017)	Urban Population (percentage)
Asia	4,478,315,164	49.3
Africa	1,246,504,865	40.5
Europe	1,246,504,865	74.5
Latin America and the Caribbean	647,565,336	79.7
Northern America	363,224,006	82.8
Oceania	40,467,040	70.8
Estimated Total Population	**7,515,284,153**	**54.0**

Source: *United Nations and the United States Census Bureau, 2017*

Before 1980s, the supply of water in the developing countries was a responsibility of the central governments. The system failed to adequately supply the infrastructural investments required to provide water services to all. From 1990s, reforms such as commercialization of water services were introduced (United Nations Research Institute for Social Development, 2004).

Water Commercialization requires water users to pay for water services as a strategy for sustenance of water supply. The water utilities regularly regulate water tariffs to raise adequate funds for system construction costs, Maintenance costs, and operating costs (Alex,2010). In absence of a water metering system, for instance, consumer pays a fixed water bill basing on the volume of water used while in areas where water metering system is applicable varying water charges are charged as economic instruments for improving water use efficiency, enhancing social equity and securing financial sustainability of water utilities and operators (Whittington, 2006).

Nonetheless, worldwide water supply has gradually developed into a crisis. In many cities, water policies, regulations, and supply processes are blamed as root causes of the imminent water supply (*Dagdeviren, 2008)*. Commercialization of water services and privatization of water service delivery took place concurrently (Marin, 2009). In the developing countries increasing block tariffs are claimed to promote inefficiency, inequity, unfairness, net revenue instability, and other negative consequences (Boland and Whittington, 2000). The evidence concerning the impact of water privatization is mixed. In some cities of Manila, Ecuador, Bucharest, Colombia and Morocco, Côte d'Ivoire and Senegal it has led to improvements in the efficiency and service quality of utilities, increased investment and has contributed to expanded access (Marin, 2009; Segerfeldt,2005; Bailey,2005).

Elsewhere, in Cochabamba, Bolivia, and Dar es-Salaam in Tanzania, Jakarta and Berlin the private sector participation led to tariff increases and has turned a public good into a private good thus found incompatible with the international human right to water (Lobina and Hall,2003*;* Barlow, 2008;_Lohan, 2007; Finger and Jeremy,2002)*.* In short, privatization increased investments and a higher quality of water, supply interruptions have become less (Berg, 1997; OFWAT,2009). In Cartagena, tariffs declined substantially (Gomes-Lobo *et al*., 2007; Marin, 2009; IDB,*2006).*In Cochabamba access to piped water decreased to 40%, and water losses remained high at 40% and water was supplied only 4 hours a day(World Bank,2002; World Bank, 2006*).*

In Argentina, Bolivia and Brazil, access to water supply and sanitation increased. However, the study disclosed that the privatization of water services led to increase in tariffs which in turn ended with reduction in the uses of water particularly to the poor households as a result investors invested more in the effluent settlements than in poor settlements (*Labonte, 2004*). Elsewhere, higher tariffs charged by informal water vendours triggered the low income people to contribute labour, land and local knowledge and materials in supplying water (Matous, 2013).

In Argentina privatization of water reduced child mortality (*Galiani et al*., *2002*). Concerning, water tariffs, in Cochabamba and Guyana water tariffs increased, and in some Sub-Saharan Africa, tariffs did not increase over a long period (Marin, 2009). In addition, the public-private partnerships have displayed higher cost-efficiency and substantial improvement in water supply in Africa, Asia, Argentina and Brazil (World Bank, 2005; Marin, 2009). Contrary, to the previous findings, out of 20 studies, only three studies proved technical efficiency (Gunatilake and Carangal–San Jose, 2008).

Concerning profitability, different utility agencies have different rates of return of the cost of capital (Sirtaine, 2005). As indicated in the previous sections, worldwide water supply has gradually developed into a crisis. Inadequate supply of water negatively affects prospects of industries, farms and household water requirements (Komives, *et al*.,2005). Consequently,

watering of flower, trees and lawns, construction of infrastructure have been expensive and often impossible in cities of the developing countries (Foster, *et al*., 2003).

2 METHODOLOGY

The rapid urbanization in Dodoma town necessitates a need to comprehensively study impact of various reforms to the livelihoods and the urban environment in Chidachi, Chilewa, Chadulu and Kikuyu in the Dodoma Municipality. The study used physical observation, interviews and focus group discussions and the documentary review as data collection methods.

A sample of 332 people was found to be manageable taking into account the budget and time allocated for data collection. This sample includes 240 respondents and 92 key informants. The cross sectional study was considered essential in order to understand of the causal factors for unsustainable flower gardening.

3 RESULTS AND DISCUSSIONS

3.1 CHARACTERISTIC OF RESPONDENTS AND PARTICIPATION OF INSTITUTIONS IN FLOWER GARDENING

About 34 institutions and three housing schemes such as Area "D" Flats, Kikuyu Flats, and Medeli Flats, and four roads name Dodoma bus terminal - Mkonze, Dodoma Bus Terminal –Ihumwa, Dodoma Bus Terminal –Institute of Rural Development Planning, and Dodoma Bus Terminal –Nala were visited. The findings pointed out that all 34 institutions, three housing schemes and the four roads have flower and lawns gardens. Physical observation indicated that the flower and lawns gardens are not well maintained because of high water charges.

3.2 WATER REFORMS IN DODOMA

The government of the United Republic of Tanzania in 2002 formulated the National Water Policy to guide actors in water supply. One among the aims of the National Water Policy is to achieve universal access to safe water within 400 metres in rural areas and 20 metres in urban areas (Mwamaso, 2015; URT,2002).

The Free Water for All Policy was formulated. The Government was responsible for developing, operating and maintaining water supply systems with no cost recovery (Mashauri and Katko, 1993). However, shortage of the services raised a need to change from the provider model to enabling model (URT, 2009).

In 2002, the National Water Policy was formulated insisting involvement of the private sector (URT,2002). The Local Government Reform was inevitable for sustainable provision of water services *(*URT, 2009, URT, 1998). Concurrently, the government of the united republic of Tanzania established the National Strategy for Growth and Reduction of Poverty (NSGPR) (URT, 2005). The Water Aid joined efforts with other actors by establishing WAterAid , Maji, Maendeleo ya Jamii and Afya in the implementation of its new International Organisational Strategy for the period 2005 – 2010 (Kashilila, 2005; WaterAid & WAMMA,1997).

Moreover, the Dodoma Urban Watersupply and Sewerage Authority (DUWASA) was established charged with the responsibility of providing clean, safe, potable water and sewerage disposal services at sustainable and environmental friendly manner (GIZ, 2008). Similarly, the Energy and Water Utilities Regulatory Authority (EUWRA) was established in 2001 to regulate autonomous water supply and sanitation organizations, to protect consumers and ensure fair tariff setting.

3.3 IMPACT OF COMMERCIALIZATION OF WATER SERVICE DELIVERY ON THE URBAN ENVIRONMENT

From 1980s the government introduced privatization policy as a strategy in increasing participation of private actors in water supply. In addition to privatization, the government commercialized water services. Findings disclose that commercialization of water service delivery has increased tariffs. Reduction in cross-subsidy and increased water charge tariffs led to more socially regressive water charge tariffs.

As regards affordability, relating monthly household income and monthly water charges explains affordability of a household to pay water service charges. Studies point out that if households spend more than 3 per cent of their incomes on water, the tariffs are considered to be unaffordable. Finding in Chidachi, Chilewa, Chadulu, and Maweni show that average household incomes are Ths.151,400, 80,810, 162,507, and 133,000 respectively. In addition the findings indicate that households spend 11.8 percent, 16.5 percent, 9.5 percent, and 8.0 percent respectively (Table 2).

Table 2. Average Monthly H/H Incomes and water charges

Neighbourhood	Average Monthly H/H Income(Tshs)	Average Monthly H/H water charges (Tshs)	Water Charge (Percentage)
Chidachi	151,400	17,800	11.8
Chilewa	80,810	13,290	16.5
Chadulu	162,507	15,450	9.5
Maweni	133,000	10, 613	8.0

***Source**: Mnyone,(2015)*

Basing on the findings above, water charges are unaffordable for the poor in Chidachi, Chilewa, Chadulu, and Maweni.

3.4 Decline in Access to Water for Watering Flower Gardens

Commercialization of water service delivery aimed at increasing revenues which in turn increase capacity of water authority in investment in water infrastructure. However, the conflict between social goals and commercial provision of the water supply is apparently visible in the low income settlements. Except for drinking water, use of water for watering gardens has declined. Findings indicate that before privatization and commercialization of water services in 1980s, household members were developing gardens as a strategy in beautifying house compound (Figure1).

During the study about 240 households were interviewed in Chidachi, Chilewa, Chadulu and Maweni.In each settlement, 60 households were interviewed. The findings indicated that in 1980 about 20%, 62%,38%, and 29% households had flower gardens in Chidachi, Chilewa, Chadulu and Maweni respectively. Later in 2015, ownership of gardens declined to 7%,25%,12%, and 4% in Chidachi, Chilewa, Chadulu and Maweni respectively (Figure1).

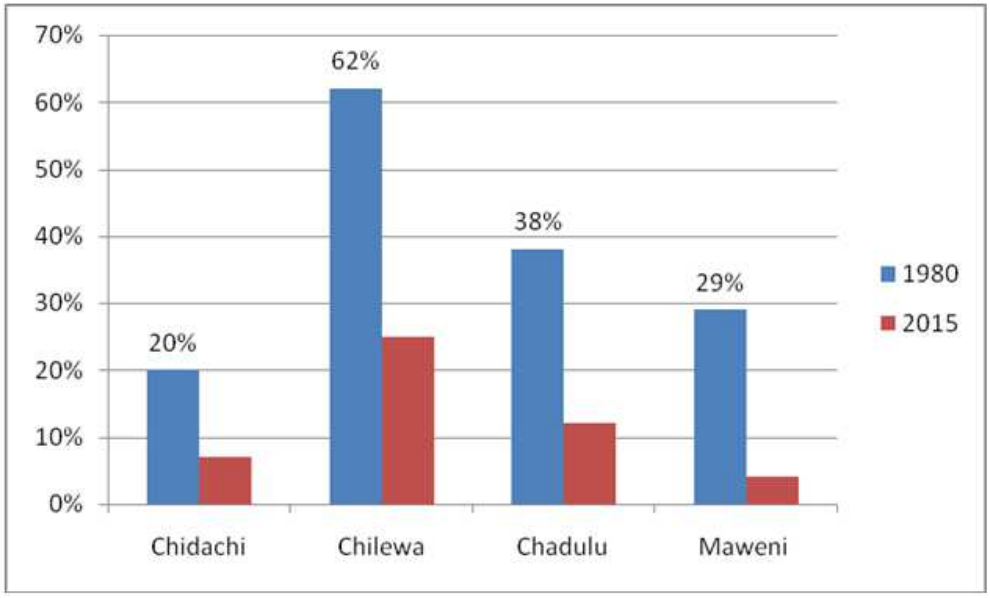

Fig. 1. Flower Gardens Development in Chidachi, Chilewa, Chadulu and Maweni

3.5 Reasons for Flower Gardens Declining

Furthermore, the study investigated reasons for flower garden declining in Chidachi, Chilewa, Chadulu and Maweni. Many respondents acknowledged that High water charges was the main reason for flower gardens declining. Similarly, the respondents reported that lack of interest for flower gardens scored low during the study (Figure 2).

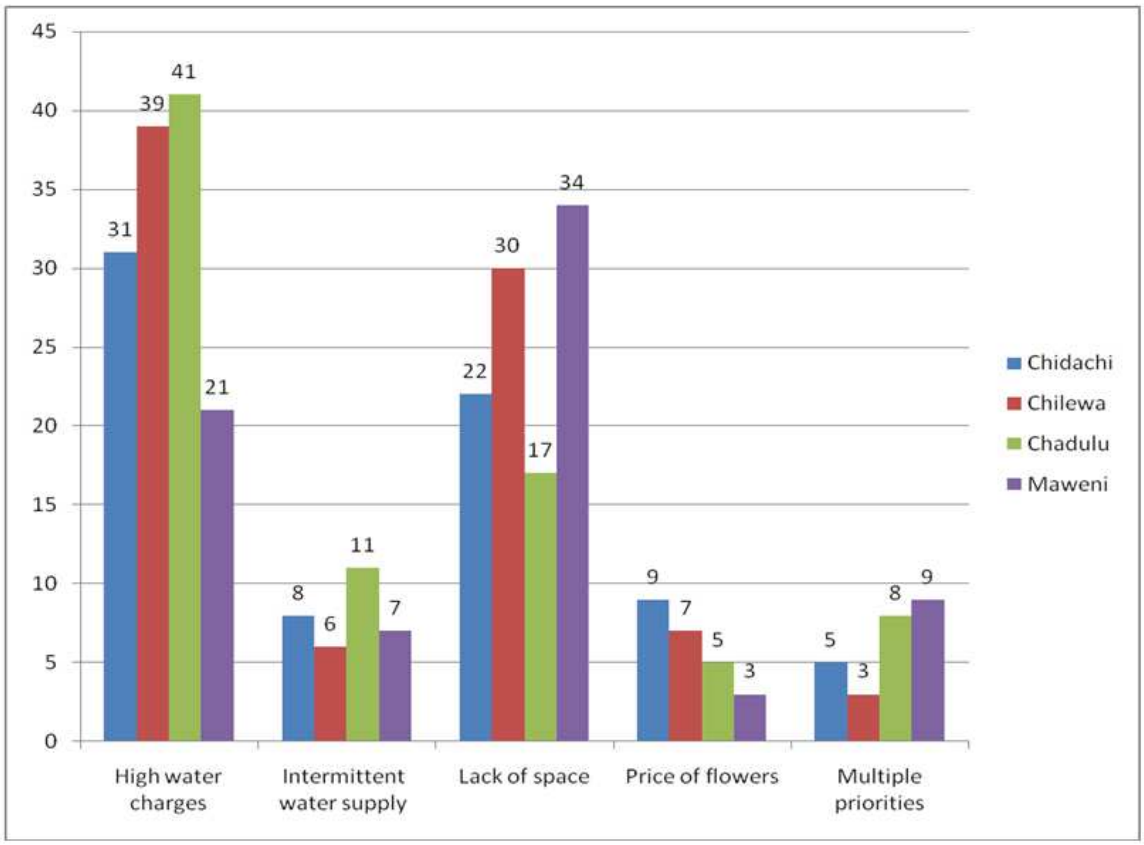

Fig. 2. Reasons for flower gardens declining

3.6 USE OF WATER DURING CONSTRUCTION AND REHABILITATION OF ROADS

During construction and rehabilitation of construction of roads, water is essential in mixing cement and other road construction materials. In addition, water is used for concrete curing and compacting soil. All two respondents from the road construction companies as well as 182 respondents out of 240 respondents interviewed displayed that road constructors do not pour water when leveling land as a prerequisite for reduction of dust. The road constructor use water when mixing cement and other road construction materials, concrete curing and compacting soil. Sometimes, duration for concrete curing is less than recommended twenty one days.

3.7 WATER REFORMS IN THE DEVELOPED COUNTRIES

The sections provide experiences on water supply, privatization of water services, and effects of privatization of water services elsewhere. The Israeli market, for instance, has been dominated by privatization in all sectors including water sector. Advantages and disadvantages of privatization of water services in Israel are many. Among the disadvantages, privatization of water services in Israel amplified the gap between the rich and poor. For instance, marginalized groups are confronting glaring disparities in their access to basic rights and services (Israeli Ministry of Foreign Affairs, 2002;1998).

Concerning gardening and Landscaping, the amount of water allocated to the local authority for domestic consumption includes the use of water for domestic needs, gardening, auxiliary farms, services and public utilities, trades, commerce within the domain of the local authority (The Israel Ministry of Foreign Affairs, 2002).

Like other developing countries, in Zambia one of the reforms in water sector was water privatization which in practice is the private sector participation in the provision of water services and sanitation. The literature available discloses that there is substantial difference in efficiency and water services before privatization and after privatization. Operating profits went up to an extent that it was a burden to the low income water end users (Funga,2001).

4 CONCLUSION AND RECOMMENDATIONS

4.1 CONCLUSIONS

Basing the findings, it can be concluded that commercialization of water service delivery has brought negative effects on the urban environment. Like in both developed and developing countries the impacts of commercialization on the urban environment are mixed. Decreasing in the flower and lawn gardens at the household levels, insufficient management of flower and lawn gardens on both sides of roads, increase in the amount of dusts on buildings and flower and lawn gardens particularly during construction and rehabilitation of roads, , high operating costs of flower vending, and unsatisfactory in the housing schemes indicate negative effects of commercialization of water service delivery services. On urban vista, insufficient development and watering of flower and lawn gardens have reduced urban vista.

4.2 RECOMMENDATION

The intension of the government and other stakeholders in commercialization of water service delivery was good because it aimed at promoting water service delivery. However, it has negatively affected the urban environment. The paper recommends a number of actions.

First, the paper recommends subsidization of water service delivery as a water service delivery strategy that will increase availability of water for watering flower, lawn gardens and trees. Secondly, the paper recommends a minor relaxation of water tariffs to meet costs for management of urban environment such as development, watering, periodic flower, lawn and tree mowing, fertilization, weeding, and pruning.

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