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RESEARCH ARTICLE

CHALLENGES OF URBAN WATER SUPPLY SERVICE: CASES OF BOLE AND KOLFE KERANYO SUB CITIES IN ADDIS ABABA

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ABSTRACT

Safe, adequate, and accessible supply of water together with proper sanitation are surely basic needs and essential components of primary health care and vital resources in which access to safe and reliable water supplies has received increased government attention in Ethiopia. As a result, the national coverage rate for this service has gradually improved. Yet still some central and peripheral areas of urban l do not get drinking water from an improved water source. While expanding improved water source schemes is generally essential, it is equally important to ensure that the schemes have increased users' satisfaction with water quality and availability for everyday use. Using household survey, and interviews, focus group discussion and customer forum were the main data of the study. The main aim of the study was to investigate the challenges of urban water supply in Addis Ababa with particular reference to Bole and Kolfe Keranyo sub cities and the effect of access to an improved water source on users' satisfaction with both quality and availability of water.

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INTRODUCTION

Safe, adequate, and accessible supply of water together with proper sanitation are surely basic needs and essential components of primary health care; and since it is one of the precious and vital resources, it needs proper management and use. However, Providing Safe water supply to the urban community in the cities of developing countries is one of the main challenges in meeting the UN Millennium Development Goals (MGT) with respect to water supply services. Very often, the urban poor are not the direct user of urban water supply and paid little attention by the urban water utilities. The urban environment we live in, where there are multiple socio-economic activities and congested types of human settlement is exposed to all sorts of urbanization impacts. Fast urbanization, a growing concentration of industries, intense agricultural activities and an increase in population density has resulted in an accelerated demand for infrastructure like access to water, road, information, social service and other basic needs (Zewdie (1994). In developing countries, providing access to clean water and sanitation reduces mortality and morbidity and increases the productive capacity of people and can affect men and women who are deprived in scarcity of clean water. On the other hand, poor quality of water mostly commit large share of their income and/or time in obtaining water. Although most developing countries have invested considerable fund in water supply and sanitation, new investments are essential in the sector because of the rapid population growth, large unmet needs and postponed maintenance expenditure (Zewde, 1994). Both the urban and rural water supply and sewerage coverage in Ethiopia are low. According to the Ministry of Water Resources MWR (2002), urban water supply coverage is 65.3 percent excluding Addis Ababa. The report of Ministry of Water Resource in 2006 has shown that the coverage of Addis Ababa city's domestic water supply was 90.1 percent and expected to be 100 percent by the end of 2011. In reality, however, water supply shortage in urban area is worse; even in Addis Ababa, in 2009 only, 61 percent of the existing demand is satisfied. Different studies also indicate that the current coverage of drinking water in Ethiopia is only 24 percent which is far less than the sub Saharan African countries (45 percent) with whom Ethiopia is on the same level of development (AAWSA, 2001). Hence, there is a need for the government in general, and for the Addis Ababa Water and Sewerage Authority (AAWSA) in particular to achieve sustainable improvements in water service of the city for the well-being of the dwellers.

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When Addis Ababa was first established the principal sources of water were some springs, and hand dug wells within the city itself. As demand for water led to the construction of the original Dam, Gefersa in 1942/43, which was increased to the capacity of producing 300,000 m^3 of water a day in 1960. Subsequently, another large dam, Legedadi was constructed. The construction and operation of these two dams becomes important milestones in the water service of Addis Ababa, but the demand for water has been increasing from years to year. The actual demand for water is 479,000m^3 in 2008 when water supply is 256,000m^3 which satisfies 53.44 percent. The projection of demand for water for the next fifteen years will be in year 2025 329,000 m^3/day which is 148 percent (AAWSA, 2008). AAWSA as indicated in its mandate provides water supply and sewerage services. But the underlying challenge of the accelerated demand for urban water service results from increasing number of population which was 2,738,248 in 2007(CSA, 2008) and fast expanding metropolitan area, the growing number of industries at unprecedented rate and the unaccounted for water which have aggravated the water supply shortage (AAWSA, 2008).

Consequently, current water supplies and production capacity m^3/day indicated Legedadi dam (16,000m^3/day), Gefersa dam and treatment plant (23,000 m^3/day), Akaki well and springs (43,000m^3/day) and boreholes (28,000m^3/day), surface water source 185,000m^3 (72 percent) which is below the actual demand. Water demand in the city, therefore, driven by the amount of supplied (256,000m^3/day) than the actual demand (4,790,000m^3/day). Therefore The main aim of the study was to investigate the challenges of urban water supply in Addis Ababa with particular reference to Bole and Kolfe Keranyo sub cities.

MATERIALS AND METHODS

Description of the Study Areas

The study was conducted between February and May, 2009 in two sub cities (Bole sub city and kolfe sub city) which was selected through cluster random sampling based on the level of urbanization as centered and peripheral approach and selected kebeles which are found in the sub cities.

Bole sub-city, which is one of the study areas of this research, has distinct characteristics and, relatively standardized part of Addis Ababa, constituting modern and high standard residential localities as well as very poor people who live with income of less than $1 per day, commercial buildings, public offices, different social and economic over heads, industrial areas, foreign embassies etc. Bole international air port and Ethiopian Civil Aviation Authority are also found in this sub city. (*Google: Addis Ababa cities administration and sub cities* http://google/Addis Ababa/sub cities/ 8 Nov.2008).

Administratively it is bounded in the North by Yeka sub-city, in the West Kirkos sub-city, in the South Akaki sub-city and in the East Oromia regional state. Bole Sub City occupy 11,711 hectares which is the second largest sub city in Addis Ababa and 308,714 (145,057 male and 163,657 female) people live here. In addition, Bole sub city has 11 *kebele* administration of two *kebeles* are rural; this sub city is expanding fast. These situations trigger population increase and squatter settlements. The second study area constituting major part of Kolfe Keranyo Sub city is found in the western part of the city. Residential use is the dominant land use in the area. Various housing development projects are implemented, mostly serving the middle income residents of the city. There also exist informal housing developments at the periphery of the sub city which require huge infrastructure particularly clean water. There are more than 400 thousand inhabitants in it. Administratively it is bounded in the North by Gulale sub-city, in the West Oromia region, in the South Nifas Silk Lafto sub-city and in the East Addis ketema and Lidata sub cities. Kolfe keranyo sub city occupies 5983 hectares. Sixteen *kebeles* administered under the sub city which actually merged and made ten.

Data source

The study was based on the primary data collected using survey method and document review on water policies, organizational structure and focus group discussion made with the water forum held on March, 2009. i. e. The primary data were gathered from household, interview with Addis Ababa water supply authority officials, discussion forum of customers, document analysis and a total of 286 households from the two sub cities have provided complete information

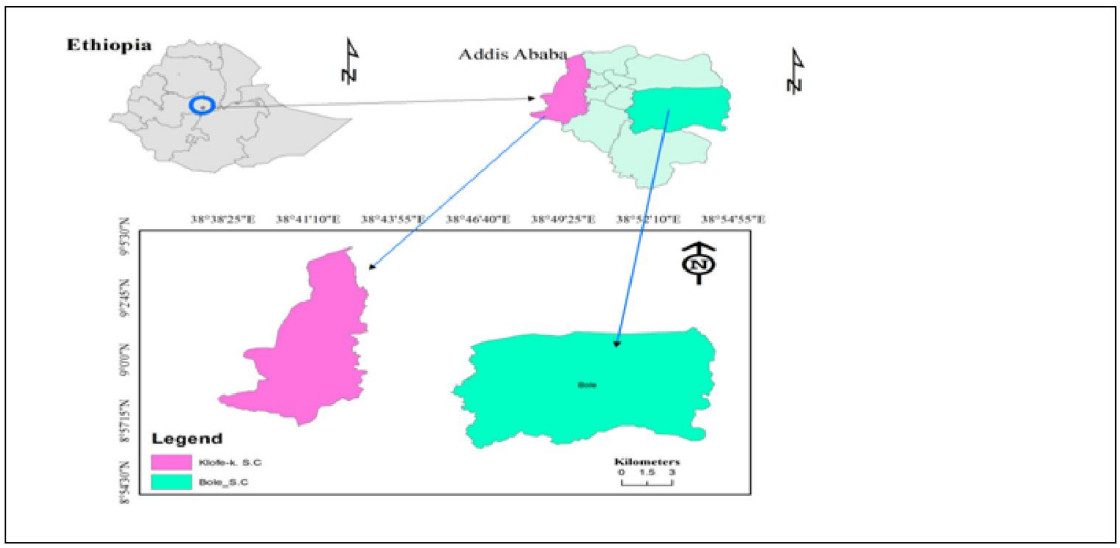

Figure 1. Maps of Ethiopia, Addis Ababa and study area

through questionnaires designed for Survey on water source, water users, cost availability, reliability of the system and willingness to pay for improved water supply system. To substantiate secondary data were used. Information generated through interview, forum discussions and focus group discussions were qualitatively analyzed which is the main focus of the article.

RESULTS AND DISCUSSION

The water demand and supply in Addis Ababa in general and Bole and Kolfe Keranyo Sub Cities in particular have never been matched due to the fast growth of the city in population, economic, institutions, housing development, foreign organization, diplomats (demand side) and inefficient management of the city's water service, lack of financial, technical and institutional capacity of AAWSA to undertake investment on city's water development as well as the stagnant nature of supply which only satisfy 61 percent (2008/9 G C) of the prevailing demand which is supply oriented. The following section discusses issues related to water policy with particular reference to Addis Ababa, water tariff, Experience with Private Sector Involvement in Water Service Provision in Addis Ababa, capacity problem, Water source, Production, Distribution and Coverage in Addis Ababa and finally conclusion and recommendation will be provided at the end.

Water Supply Policy in Ethiopia with Particular Reference to Addis Ababa

The level of access to clean and safe water supply in Ethiopia can be cited as one of the lower water supply coverage even by Sub-Saharan standards where unsustainable and unreliable water supply in the country poses vulnerability on well being and productivity of Ethiopian people.

This is mainly due to the fact that the county has been lacking clear and comprehensive water resource management policy. This is evidently shown in that the country had adopted its water resource management (WRM) policy not more than a decade ago (MWR, 1999). The existing WRM policy only serves as a general and directive principle in a wide scope where it incorporate irrigation, hydropower and water supply and sanitation policies and lacks detailed action plan and/or activities. The policy is based on the constitution of the Federal Democratic Republic of Ethiopia, macro economic and social policies and development strategies and principles of water resource development objectives that enhance the socio-economic development of the people of Ethiopia. The water supply policy, as an integral part of the Ethiopian water resource management policy, is developed to provide momentum for the development of water supply in terms of coverage, quantity, reliability and acceptable quality for all users considering realities of the country.

The overall objectives of water supply and sanitation policy is to enhance the well-being and productivity of the Ethiopian people through provision of adequate, reliable and clean water supply and sanitation services and to foster its tangible contribution to the economy by providing water supply services that meet the livestock, industry and other water users' demand (MWR,1999). The specific objectives pertinent to implement the water supply and sanitation policy include: Ensuring sustainable and sufficient water supply to all Ethiopian people as much as conditions permit; Satisfying water supply requirements for livestock, industries and other users; Maintaining and operating water supply and sanitation service sustainably and efficiently; Enhancing efficient use and conservation of water resource and Ensuring well being and productivity of all Ethiopians through creating enabling environment for appropriate sanitation services. The water supply policy in general and the drinking water supply policy in particular as components of the water supply and sanitation policy encompasses all areas relevant to boost supply of adequate and safe water as per the standards of all peoples of Ethiopia.

According to Ethiopian Water Resource Management Policy (EWRMP), the drinking water resource policy, being the main concern of this study, envisaged to: develop appropriate water supply planning parameters, design and standards to water supply schemes in the country:

- Promote self financing of programs and projects at local level,
- Provide subsidies to communities who cannot afford to pay for basic service on capital costs only based of criteria set and temporarily,
- Ensure and promote accountability and responsibility in the management of water supply services,
- Ensure equitability and practicality of water supply system,
- Establish "social tariff" to enable the poor to cover operation and maintenance costs only,
- Ensure rural tariff setting to cover operation and maintenance costs where as the urban areas tariff based on full cost recovery,
- Establish "progressive tariff" to urban supplies and "flat rates" to communal services such as public fountain,
- Ensure efficiency, coherence and setting appropriate guide lines to institution in water supply scheme at all levels,
- Develop sustainable and effective collaboration of all stake holders at all levels and legalize forum for their participation and
- Build technical, material, financial and human capacity of water supply organization.

However, many drawbacks and shortcomings can be observed on the practical implementation of the policy that has resulted in poor performance of water supply system of the country and in Addis Ababa city in general and in the study areas in particular. As far as this study is concerned, despite the policy stipulates equitability and practicality of water supply system, in equitability is observed in water distribution system in some areas such as central parts of Bole Sub City, where higher government officials, foreign residents and other well to do people are residing, while many parts of the city are experiencing extreme shortage. Even though some of the components of drinking water policy seem to support the poor urban community, in practice, the poor are neglected. Especially due to poor water service they are often forced to incur high cost in buying water from vendors despite the fact that the tariff is an affordable.

Therefore, the existing tariff is subsidizing the rich rather than the poor in contrast to the principle of utility tariff. The policy had not set guide lines and benchmarks on how to set the price of water for public stand points; for example AAWSA charges Birr 1.75/m^3 but users pay 7.50 to 10.00 Birr in which the urban poor are paying more. Although the policy acknowledges the importance of partnership, there is no legal and institutional framework to private sectors to be involved in water management and service provision.

Studies show that water sector analysts agree that an appropriate and clear legal and regulatory framework is crucial to the success of stakeholders (such as local banks, private sectors and other community organizations) participations; therefore, it is preferable for increased private sector involvement to be preceded by a range of policy reform measures. In Ethiopia also while the policy acknowledges the importance of partnership, there is no legal or institutional framework for the stakeholders to be involved in management and service provision. In general, since public stand points are crucial in urban water service, particularly for the poor, a holistic and sound urban water supply policy that takes in to account specific issues on the management and usage of public stand points is requisite to improve the lives of the urban poor. Specific policy that identifies ways of participate the private sectors in water service provision is also vital to improve urban water service in a sustainable manner. Finally, an in-depth research on the existing urban water supply policy is also important to check the equitability of the water supply system.

Organizational Structure of AAWSA

The AAWSA was established as an autonomous body by order number 68/1971 issued on the 26th February 1971 and proclamation no 10/1995 to reassert its establishment as an autonomous public authority under region 14 following the formulation of regional states. The jurisdiction of the authority was extended to include not only Addis Ababa but also the area located within the confines of the water catchment of the existing dams. The main objectives of AAWSA have to be the supply of safe and adequate water and sludge disposal services. The following are major types of services rendered by the AAWSA relating to water. These are**:** New line installation, Line relocation, Line maintenance, Water meter test, Leakage detection and relating Sewerage like Sludge disposal with vacuum truck, Sewer line connection, Broken sewer line repair, Sewer line leaning and, Sewer line relocation. These activities are assigned to different departments and accomplished by the experts and technicians qualified in the tasks (AAWSA, 2008). Structurally at present the main source of membership of the board are the relevant ministries and organization of the federal government and Addis Ababa city municipality, the pertinent regional state (example, Oromia) the representatives of AAWSA workers association. Internally, it was structured to comprise one general manager and three deputy general managers (Technical, Resource Management and Business Development) appointed by the Board. Down the line of the vertical hierarchy, there are eleven departments, six service and 8 branches located sporadically in the capital. Since the size of the city of Addis Ababa is increasing, correspondingly the demand of water is also alarmingly increasing; making the existing branches of the authority inadequate to render efficient water service to the city. In connection with this, since the authority functions its activities according to the old political structure of the city, it is difficult to know the number of customers going to be served by one branch in one sub city, even though the authority is part of the city administration.

Furthermore, AAWSA has eight branch offices to provide service. They are Addis Ketema, Gulele, Akaki, Arada, Gurd Shola, Megenagna, Nifassilk and Mekanisa. The branch offices are responsible for water distribution lines and for sludge removal using vacuum trucks. Addis ketema branch provides water service for Kolfe Kranyo and GurdShola and Megenagna branch provides water services to Bole Sub City. The supply infrastructure for Kolfe Keranyo Sub-city and Bole Sub-city can generally be classified as places of treatment works, the transmission mains and the distributions network which include the pipelines, reservoirs, pumping stations.

Manpower Resources with a Focus on the Two Sub Cities

AAWSA faces service management and personnel capacity constraints for sustaining and delivering water supply. For instance salaries and incentives are not as such highly competitive with some market wages and benefits. This implies that the authority faces challenges in attracting and retaining competent personnel to serve the community better. Mostly, shortage of manpower is observed particularly in professional employees of second and first degree and technical school graduates. The often missing employees of first and second degree are those of higher level officials, managers and engineers. Particularly, turnover rate of engineers is too high as a result of competitive labor market. Furthermore AAWSA do not mandated and decentralize human resource department at branches level which hinder the branches in hiring competent employees and fill the vacant position. Furthermore, the managers of the branch offices are accountable to the General Manager of Business Development in the central office. In general, Lack of capacity of the authority brings challenges in attracting and retaining competent employees due to absence of competitive benefits compared to other labor markets which cause many experienced professionals to leave for better paid jobs in many affluent organizations and countries, leaving the work to unprofessional and those who lack training. Source of Finance and Capital for Providing Water Service in Addis Ababa Local authorities must be able to develop and maintain infrastructure to serve the interest of urban residents. This involves establishing funding and having access to government grants and loans. Urban water supply utility is one of the important components of the municipal infrastructure whose capital projects are mainly financed by the government. AAWSA cannot secure all of their own funds by their own (except regular expenditures) and this may limit the scope of their operations making them dependent upon other bodies for financial sources. That means, they relay mainly on government financing for construction and management. As of the establishment proclamation, AAWSA is a self financing authority and its source of revenue being sale of water, sewerage service, connection fee, other miscellaneous income, aids grants loan, capital subsidy from Addis Ababa city municipality (see Table 1).

Table 1. Depicts the revenue expenditure of the authority

Fiscal Year	Revenue			Regular Expenditure		
	Planned	Accomplished	%	Planned	Accomplished	%
2001/2	103,662,612	70,415,848	70	118,373,834	85,155,966	71.9
2002/3	111,598,131	97,681,110	87.5	122,448,685	79,326,895	64.8
2003/4	140,433,103	125,768,279	89.56	142,688,379	119,322,540	83.6
2004/5	178,775,134	145,773,404	81.5	206,221,191	95,127,172	76.1
2005/6	213,736,595	189,973,951	88.9	221,113,218	147,198,500	66.6
2006/7	234,265,110	195,890,724	83.6	207,981,324	125,744,886	60.5
2007/8	216,973,221	190,482,873	87.8	224,891,800	209,143,200	93

Source: AAWSA, Annual Report, April 2009

Table 2. Capital expenditure and revenue source performance of AAWSA (2001/2-2007/8)

Capital Expenditure and its Sources															
Budget year	From government			From Aid			From loans			From the authority			Total		
	Planned	Accomplished	%age	Planed	Accomplished	%age	Planed	Accomplished	%age	Planed	Accomplished	%age	Planed	accomplished	%age
							-	-		11,628,000	5,558,000	47.8	113,890,000	62,561,000	54.93
2001/2	43,622,000	22,656,000	51.94	586,400,000	34,347,000	58.57									
2002/3	57,278,000	35,833,710	62.56	90,500,000	21,090,000	23.3	-	-		13,451,000	7,860,000	58.43	161,229,000	64,783,710	40.18
2003/4	97,792,000	37,679,486	38.53	117,678,000	11,929,628	10.14	-	-		18,081,000	11,154,709	61.69	233,551,000	60,763,823	26.02
2004/5	113,642,000	42,294,000	37.22	137,580,000	52,459,000	38.13	-	-		40,047,000	20,277,000	50.63	291,269,000	115,030,000	39.5
2005/6	135,363,989	40,965,339	30.26	286,964,741	65,373,066	22.78	-	-		37,993,000	20,510,097	53.98	360,321,730	126,848,502	35.2
2006/7	133,146,852	80,252,803	60.27	158,915,000	36,048,559	22.68	--	-		20,100,000	12,419,164	61.79	312,161,852	128,720,526	41.24
2007/8	303,144,000	186,600,000	61.55	76,300,000	53,744,600	70.04	81,500,000	18,038,000	22.13	18,629,000	14,340,700	76.98	479.573,000	272,723,300	56.87

Source: AAWSA, Annual Report, April 2009

In all the fiscal years except in 2001/2 and in 2007/8 revenue performance was greater than expenditure performance. In these two years, the accomplishment of revenue and expenditure against the planned were 70 percent, 71.9 percent and 87.8 percent, 93 percent respectively. In 2001/2, low performance of the revenue of the authority could be due to poor water tariff structure that made the authority unable to earn large amount of revenue from water sales. Even though the revenue performance increased in 2007/8 fiscal year, expenditure also increased due to reasons associated with skyrocketed cost of materials for operational expenses as a result of inflation. We can see from the Table that unlike other public institutions which are run only by the government budget, AAWSA's revenue performance was almost greater than its expenditure performance. This is mainly because it is self financing authority which reaps its fairly large amount of revenue from water sales even though it is not profit making institution.

According to the interview conducted with the branch offices, Bole Sub City generates greater revenue due to larger number of private connected consumers with larger volume of water consumption compared to Kolfe Keranyo Sub City. The study also shows that even if AAWSA has mandate of self financing, due to poor tariff structure which is still not revised the authorities financial capability is limited to regular expenditure. This is due to Unaccounted for water which affects the volume of water consumed by the households and revenue from sale of water to customers which losses 156,800 daily and Birr 57,232,000 birr annually. Moreover, the study identifies that the size of the city is extensively increasing making the existing branch of the authority inadequate to render efficient water service to the city. In addition, due to the fact that the authority functions in older administrative structure it is difficult to know the number of customers in each sub city. Moreover, the government is by far the dominant player in the water sector and acts as the provider, and regulator, gatekeeper and poacher in the field of water supply.

Capital expenditure and its revenue source performance of AAWSA (2001/2-2007/8)

The AAWSA, obtain funds from four major sources government, foreign aid, loan and from itself through self financing (see Table 2). Out of the four major sources of fund, the performance of the fund obtained from the authority itself was the best; i.e., more than 50 percent except in 2001/2 fiscal year that was 47.8 percent. Lower performance of the capital expenditure from the authority in 2001/2 fiscal year was attributed to the poor tariff structure as it was insufficient to enable the authority to earn adequate revenue. From 2002/3 onwards, AAWSA introduced a new tariff which is operational till today, and the structure of this tariff is relatively better in terms of the volume of water consumed per m^3. After the introduction of this tariff, the authority has started to boost its capital expenditure as it can see from Table 4.3 above. Followed by the performance of the expenditure from its own sources, the second largest was the one contributed by the city government as subsidy which was more than 50 percent in 2001/2, 2002/3, 2006/7 and 2007/8 fiscal years respectively. However, the performance of government subsidy was less than 50 percent in 2003/4, 2004/5 and 2005/6 fiscal years respectively because at that time less attention was given to the water and sanitation sectors from the city administration. But currently, the city administration has more emphasized on the development of drinking water and sanitation sectors, particularly after the end of 2008.

With respect to foreign aid, except in 2001/2 and 2007/8 fiscal years, its performance was too low, and was less than 50 percent. This is because the foreigners did not keep their promises they alleged to give the money to the Ethiopian government, particularly for water and sanitation sector development in Addis Ababa. The second reason for the low performance of foreign aid was due to the incompatibility of the foreigners' process with the existing bureaucratic procedures of the Ethiopian government working systems. Nevertheless, at present, the Ministry of Finance and Economic Development has agreed with the World Bank to finance the water and sanitation sector in Addis Ababa, for at least five years from which the AAWSA is more benefitting. Even though it is planned, the authority has not secured loans except in 2007/8 fiscal year, which had lower performance, only 22.13 percent. In general, the authority depends on subsidy and foreign aid to finance its capital expenditure. Dependence on outside body for finance; make it weak to develop many water source projects, which is one of the reasons of shortages of water supply and its inefficient service in Addis Ababa in general and the two sub cities in particular.

Water Tariff in Addis Ababa

Many utilities have their own tariff as a major source of finance. AAWSA provides potable water supply on the bases of operation (fuel, lubricant, power, well field pump, auxiliary building and operation building etc) and maintenance (for example pipe line) cost recovery bases, but it has failed to bear O&M costs. On the other hand, water policy of the country stipulates that tariff level should be designed on the basis of phasing out the total subsidy stage by stage. In addition the policy indicates that the tariff level for urban centers should be based on full cost recovery (O and M cost plus investment cost). However, AAWSA faces great challenges in combating the inherent water service problem of the city because of poor operation of the existing tariff as a result of which the authority has been forced to revise the structure of the tariff at different time. Some of the reasons why the authority has been required to revise its tariffs since 1995 (1987 E. C) which was a flat rate of 0.5 birr for all consumption before are: Increase in cost of chemicals from time to time as a result of inflation, Population increase, which increases demand for water and require additional investments to develop the sources of water, The proposal to increase storage point from (90,000m^3) to (132,000 m^3), expansion and rehabilitation of the existing projects and The consumption of high electric power for pumps that distribute water to the required places and etc.

AAWSA has been introducing progressive tariff setting for urban community in justification of enhancing economic and proper use of water resources. This does not include water tariff for public water tabs. As result, public tab users pay flat

rate of Birr 1.75/m^3 that is established on the basis of operation and maintenance cost only. All domestic customers with private meter connection will be charged progressive rate based on volume of consumption divided in to three blocks. Block I who pay Birr 1.75/m3, for consumption 0-7m3, Block II those who pay 7-20m^3, Block III who pay Birr 3.8/m3 for consumption >20m3. All non domestic customers with private connection are expected to pay flat rate of Birr 3.8/$m^3$and this rate is the one that is set for the third blocks. This existing water tariff should have been intended to be functional only up to the end of 2007. But still it is operational and this shows lack of commitment on the part of the authority in quickly revising the tariff and responding to the overwhelming water service problem of the city in general and in Bole and Kolfe Keranyo sub cities in particular (see Table 3).

Experience with Private Sector Involvement in Water Service Provision in Addis Ababa

The role of private sector is crucial in public service delivery including water. However, water as an essential public service mostly delivered by the government though there are countries including Ethiopia who made policies that acknowledge the participation of private sector in water service provision. In Addis Ababa, their participation is limited to only contractors, consultants, and water tap managements. Contract of bill collection has been started as trial in some branches but not yet fully implemented. There are restricted number of consultants and contractors in the water service provision; for example, there are only 21 private consultants working in the water service provision, with the majority based in Addis Ababa. Private maintenance and management actors are not yet involved in providing any water service in Addis Ababa.

Table 3. Existing tariff structure in Addis Ababa

Tariff block	What it recovers	Who pays for	Consumption /month	Tariff rate (2007GC)
Block I	O and M cost only	public fountain users domestic customer	0-7M3	1.75
Block II	Full cost,(break even)	domestic customer	8-20M3	3.15
Block III	Full cost +mark up percentage	Domestic and non domestic users	>20M3 all consumption	3.80

Source: AAWSA Documents, 2007

Capacity problem

According to some documents in AAWSA and interview with some officials, the water sector in Ethiopia and particularly in Addis Ababa suffers from Serious lack of capacity, not only in the government but also in the private sectors; many experienced professionals have left for better paid jobs in more affluent countries leaving the works to un professionals and to those who lack training , Lack of fund: financial constraint for contractors and drillers; the absence of collateral is a major impediment to obtain loans both short term and long term and the government is by far the dominant in the water supply Service; in addition, the division of roles and responsibilities between the water departments is often unclear.

Water source, Production, Distribution and Coverage in Addis Ababa

The major water sources, which are presently serving the residents and institutions of the city, are ground water from numerous Boreholes and Well fields and surface water particularly Dams of (Gefersa and Legedadi) and some springs. But these sources are not enough to meet the water demand of the communities. For Bole Sub City, the entire source comes from Legadadi which covers 80 percent of the supply and some boreholes and springs which cover 20 percent. Currently, the existing boreholes are 9 but only 1 is functional. The reasons are they are under construction and do not meet the network as well as lack of poor engine, pump problem and cost of submersible pump. The situation in Kolfe Keranyo Sub City is not different. Kolfe Keranyo Sub city obtains water from Gefersa and boreholes, wells and springs. It is therefore, not reliable for the community to depend on boreholes because boreholes function when there is electricity. The frequent power interruption makes it difficult for people to have access to water from boreholes all the time.

Water Production

Even though the production of water fairly increased from time to time as a result of rehabilitations of the existing projects and drilling of many bore holes in the city, the demand is overwhelmingly higher than the supply, meeting only 52 percent in 2008. The treating capacities of the existing plants are high but they are not producing as large volume of water as possible because of shortage of water in their sources.

The survey result indicate that, the largest volume of water for the city is supplied by the Legedadi Dam, which takes 63.28 percent and 56.71 percent of daily production in 2008 and 2009 respectively, followed by Akaki and some borehole which took 16.8 percent and 19.58 percent of water production in the same years. In these years, Gefersa dam supplied the smallest volume of water to the city; that is only 8.89 percent and 10.4 percent of the daily production respectively. In addition, that water production from all the sources has increased in 2009 than that of 2008. But the percentage contribution of Legedadi to the total production has decreased as a result due attention given to the development of many boreholes and springs by the AAWSA which increased volume of water production per day. In fact, the production statement of 2009 is not representing the whole years because the fiscal year is not over when this research is conducted. The actual production statement of five month (from January, 2000 to April 2001 E.C) was calculated and the remaining seven months forecasted. Water production reports of the AAWSA in 2008 show that actual production was less than the maximum capacity of all sources due to various reasons such as less functionality of many of the bore holes due to improper operation, lack of pumping installation for the new ones, shortage of electric power, non functionality of many of the meters, etc that reduced the current production of ground water. With regard to the problems in surface water

production, lack of adequate rehabilitations and maintenance for the existing projects and decreasing in water volume due to mud and dumping down of moist soils in the main sources, particularly in the early beginning of summer season and dry seasons which contribute for decrease in water table.

Water Distribution and Coverage

In Addis Ababa, water travels long distances to be accessible to users. Thus, improper distribution system largely affects the community's access to efficient water service. AAWSA's distribution system has a total of 1,560 km network, of which 500 km constitute for primary network where as the rest 1060 km are secondary distribution pipe lines. The distinction is made based on pipelines' diameters. Pipelines with greater or equal to 125-mm diameters are primary networks and those with less than 125 mm and greater than 50 mm are secondary ones (see Table 4 below).

Table 4. Water storage, distribution and service area in Addis Ababa, 2005

1	Storage	Total(M^3)	87,000
2	Distribution system	Total length(km)	1,560
3	Service Area	Km^2	300

Source: AAWSA, Documents 2009

The problem of water supply in the study areas is multifaceted in terms of efficiency and equity. One of the identified problems was inadequate water supply and inefficient distribution of water ways and low coverage. In this regards, Bole Sub City benefits more water service than Kolfe Keranyo Sub City which implies water distribution is inequitable.

Conclusion

The study shows there is mismatch between water demand and supply in Addis Ababa in general and Bole Sub City and Kolfe Keranyo Sub City in particular is resulted from inefficient management of the city's water service called water and the fast growth of the city in population, economic, institutions, housing development and foreign organization and diplomats in the one hand and lack of financial, technical and institutional capacity of AAWSA to undertake investment on city's water development as well as the stagnant nature of supply which only satisfy 61 percent (20078/9 G C) of the prevailing demand. There are factors that limit the population from access to safe water service such as land ownership called "private title on land", lack of transparency, accountability and responsiveness, poor customer relationships, inequitable service provision, lack of awareness on customer service and inefficient bill reading practices, delay on O & M services, long distance between bill payment station and customer residence are the other factors that affect the quality of water service and customers socio-economic status and ultimately satisfaction toward AAWSA. In addition, quantity, distance to water source, quality, water source, reliability and affordability determine water consumption level. With regards to Customer satisfaction Bole Sub City is rated from very good to excellent considering sense of dissatisfaction in some places of Bole. Whereas, in Kolfe Keranyo Sub City customer satisfaction is rated from bad to good service provision. This require attention from AAWSA in order to revise service provision system Major problems related to water service are malfunctioning of water sources, frequent interruption, and distribution system problems and unaccounted for water. All of these factors affect the volume of water consumed by the households.

Lack of capacity of the authority brings challenges in attracting and retaining competent employees. This is due to absence of competitive benefits compared to other labor markets which cause many experienced professionals to leave for better paid jobs in many affluent organizations and countries, leaving the work to unprofessional and those who lack training. Even if AAWSA has mandate of self financing, due to poor tariff structure which is still not revised the authority's financial capability is limited to regular expenditure. The situations still make the authority depend on government subsidy and foreign aid for capital expenditure which inhibited it from developing adequate water sources.

Since the size of the city is extensively increasing making the existing branches of the authority in adequate to render efficient water service to the city due to the fact that the authority function in older administrative structure it is difficult to know the number of customers in each sub city. Moreover, the government is by far the dominant in the water sector acts as a provider and regulator that means as game keeper and poacher. Even though some of the components of drinking water policy seem to support the poor urban community, in practice, the poor are neglected. Especially in service because they are often forced to incur high cost in buying water from vendors despite the fact that the tariff is affordable. Therefore, the existing tariff is subsidizing the rich than the poor in contrast to the principle of utility tariff. The policy had not set guide lines and benchmarks on how to set the price of water for public stand points. Despite the fact that the policy acknowledges the importance of partnership, there is no legal and institutional framework to private sectors to be involved in water management and service provision.

The main sources of water for the study area are private connection, public stand points, traditional well and spring Water and the households in the two sub cities do not use the same sources for different purposes rather a combination of it for domestic purposes. And also the majority of households in both sub cities use piped water for drinking, washing, bathing flooring and gardening, with relatively the same percentage implying higher need for protected water.

Problem of water supply in the study areas is multifaceted in terms of efficiency and equity. One of the identified problems was inadequate water supply, inequity and inefficient distribution of waterways and low coverage. According to the research findings, Bole Sub City benefits more water service than Kolfe Keranyo Sub City. The problems impose different challenges on the community in terms of waiting time, wastage of energy to collect water and unnecessary cost which affect the socio economic condition of the households in the study areas. Tariff in the two sub cities is affordable for customers. The problem is accessibility and sustainability of water service. Even they are willing to pay for water if the authority

improves the service. Poor coordination between different urban utilities like EEPCo, ETCo, Ethiopian Roads Authority and AAWSA in urban infrastructural development created inconvenience where the authority faced challenges in controlling un accounted for water. The majority of the consumers in Kolfe Keranyo Sub City and some areas of Bole Sub City experience frequent water supply interruptions as they are not adequately informed prior to service interruption. Besides, according to the technical experts in AAWSA, water is not distributed equitably in the city in general and in the two sub cities in particular, in which Bole Sub City get higher water service than Kolfe Keranyo Sub City because of government influence in favor of the rich, foreign residence, and seat of higher government officials as well as consumption volume/m^3 is high.

Recommendations

Need for regulation: Public water taps provide an important service for the urban poor and there is a need to streamline and monitor all the public stand points in the city under one uniform mandate. It is recommended that AAWSA should be given the responsibility for regulating the overall operation of public stand points. As the regulation and coordination task will take time and resources, AAWSA is advised to establish within its structure a unit dedicated to public stand point management.

***Regulated selling prices*:** The selling price of water to public water tap users can be specific to the conditions of each tap. However, the range of the profit on the buying price from AAWSSA should not be as wide as it is at present. An acceptable price range should be established and public sand points should be regulated to fix their selling prices within the established range.

***Detecting and improving leakage control mechanisms*:** Detecting and improve leakage control methods (through detection mechanisms buck meter, Geographical Information System, changing pipe) may, for example, reduce the demand for water and ease the burden on the water supply system.

***Changing the existing tariff system*:** Revising the tariff structure in which the poor could pay based upon their living standards than that of consumption volume. And other domestic and nondomestic customers could pay progressive tariff that do not have flat tariff system beyond certain level, moreover, the authority is recommended to implement the cost recovery principles that stated in the policy charging the poor less by assuming revenue from the rich and nondomestic consumers. This assists to subsidize the poor and the authority in sustaining the financial capacity which is useful for project expenditure.

Using water container: Water container secures the customer during frequent interruption of water supply.

***Community awareness*:** Print and electronic media are needed to communicate water supply interruption schedules or other water related activities.

***Involving community in water managements*:** Creating awareness in the community how to manage water and training women how to effectively utilize water and allowing them for active participation in project development process (planning, implementation, and analysis) because women play a central part in the provision, management, and safeguarding of water.

***Water Production Development*:** Implement the Siblu and Gerbi surface water supply project through mobilization of resource that bridges the required financial gap and additional developments of ground water which creates potential sources of water supply and panacea for supply driven demand management.

***Building capacity*:** In collaboration with MWR and other stakeholders; AAWSSA is advised to build its capacity *financially* by generating other incomes, loans and grants and *its manpower,* of administrative, customer service, senior engineers and technicians both new and existing, through training and development and equipping them with additional facilities to achieve better service to the city and filling vacant position.

***Good governance in the water sector*:** Introducing good governance in water sector management like public accountability for decisions relating to water system, competence and effectiveness in management and operation and full transparency in decision making.

***Coordination and cooperation among different stakeholders*:** AAWSA has to develop good relationship among different urban utilities and private sectors which directly and indirectly affect the water supply system. It is also recommended to a kind of committee which oversees the situations during digging of land for construction of buildings, road infrastructure, electric city and telephone cable expansion and development which significantly account for unaccounted for water of 30-35 percent through breaking pipe line.

***De facto recognition to squatter settlements*:** Municipal authority and/or public authorities have to grant de facto recognition to informal communities, extending basic services to them. Well before the legal formalization have been completed. This may require commitments of different stakeholders as well as informal settlers themselves.

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