Ensuring water availability in Mekelle City, Northern Ethiopia: evaluation of the water supply sub-project

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Abstract The need and demand for water in the world are becoming acute with the growing population. This is mostly pressing in developing countries of which Mekelle City in Northern Ethiopia is not an exception. World Bank borehole-support sub-project was aimed at addressing this challenge. The evaluation of the intervention indicates that there is a significant increase in water supply in the city because of the sub-project. However, the increase in water supply has not been able to meet up with the already established and increasing demand. Coupled with this challenge are: the limited capacity of human capital and expertise that will ensure the proper management of borehole interventions; insufficient cost recovery for proper operation and maintenance of the projects; loss of land and farmlands and lack of compensations because of the projects which affect the livelihood.

Keywords Water project · Water demand · Cost recovery · World Bank intervention

Introduction

Access to water of good quality is a challenge in many sub-Saharan African countries. Providing this access was a key in the expired Millennium Development Goals (MDGs) and in the newly advanced Sustainable Development Goals

(SDG) (UNDESA 2015). There was a global increase in improved quality water access from 76 to 91% but a huge gap remains in sub-Saharan Africa (Emenike et al. 2017). Despite many interventions and efforts from international organisations and governmental institutions, the poor performance in ensuring water availability in mostly urban and peri-urban areas are still evident in the sub-Saharan region of Africa (Marson and Saving 2015; Ndikumana and Pickbourn 2017). This, therefore, calls for a considerable reconsideration and evaluation of the efforts aims at ameliorating water (especially drinking water) challenges in the region.

As with most semi-arid areas of the world, Ethiopia has always been faced with water scarcity, and the efforts in meeting this domestic water needs in the face of ongoing El Niño exacerbates this challenge (British Broadcasting Corporation 2015a, 2015b, 2015c; UNICEF 2015). Water scarcity and crises result in harmful effects on human health (risk of hunger and diseases) and/or economic activities, and these are considered the number one risk the developing world currently faces (Oyedotun 2011, 2012; WEF 2015; Sisto et al. 2016), of which Ethiopia is not an exception. To reduce the demand and supply gap for potable water in the entire Ethiopia, the World Bank has been supporting the Government of Ethiopia through various Urban Water Supply and Sanitation Projects (UWSSP)—principally in Addis Ababa and other four main cities in Ethiopia (World Bank 2005). Mekelle City in Northern Ethiopia is one of the four main cities benefiting from the projects. The main purpose of this paper is to summarily evaluate/review the extent of the impacts of the projects in meeting the water supply challenges in Mekelle City.

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Mekelle water supply and sanitation project (WSSP)

Mekelle City

Mekelle is in the Northern part of Ethiopia at 870 km from Addis Ababa, the capital. The city is a mid-sized city (Asgedom 2014) with an estimated population of 233,012 of which 113,247 are males and 119,765 are females (Central Statistical Agency CSA 2009). The city was founded in the thirteenth century but became prominent in the 1871–1889 during the reign of Emperor Yohannes IV who chose Mekelle as the seat of his government (Mekelle City Administration 2009). It is located between 39°21′–39°43′E and 13°24′–13°30′N at an average altitude of about 2084 metres above sea level. It has an average mean temperature of 19 °C and annual rainfall which varies between 50 and 250 mm (Asgedom 2014).

Mekelle water supply and sanitation project

The Federal Ministry of Water Resources of Ethiopia is responsible for setting the national agenda and policies for the water supply sector of the country while the regional water bureau (in this case, Tigray Water Bureau) is responsible for implementation, investment planning and supporting the service providers with the needed technical assistance in the region (Castro and Maoulidi 2009). Within the region, an individual city has a city-level administration which is responsible for the appointment of water board with the responsibilities of making investment planning for the city, setting water pricing tariffs or its adjustment. In this city, Mekelle Water Supply and Sanitation Service (MWSSS) is responsible for the supply of water to the population, determining the water charge tariffs and the overall management of water supply. However, when it comes to the formulation of policies, raising funds for the provision of a supply of water at the regional level, reservoir construction, well drilling and development, etc. the decision is left to the Tigray Water Bureau.

The main source of water supply to Mekelle City is through the groundwater from the 17 boreholes which ranged from 32 to 250 metres in depth mainly (Mekelle City Administration 2008; Castro and Maoulidi 2009) which are distributed through a network of pipelines covering the maximum area within the city and with only a few southern zones yet to be covered. This distribution of water supplies to the city is 8816940 m³ with a coverage area of about 73%. This is with 88.5% supply for residential purposes, 10.12% for industrial and commercial users and 1.35% for governmental/environmental services

(Khwairakpam and Abraha 2015). The pricing medium is through metering supplied to each consumer.

Like other large Ethiopian and developing cities, Mekelle is experiencing rapid growth with its attendance to urban problems and challenges. To assist the city in addressing its water supply problems, the World Bank started the implementation of Mekelle Water Supply and Sanitation Projects (MWSSP), which is one of the main components of Urban Water Supply and Sanitation Projects (UWSSP), in 2005 with the developmental objectives of: reducing the potable water supply–demand gap; improving access to sanitation; improving the urban water and sewer utilities through sector reforms and increment in public–private participation (RPF Resettlement Policy Framework 2007). Specifically, the project aimed at improving the critical water supply shortages faced by the city in the short term. To be able to meet the stated objectives, the MWSSP undertook the drilling of five (5) boreholes, built five (5) water reservoirs with different level of capacities, installed a total of 35 km of water transmission pipes, constructed two booster stations and a collection chamber, built a pump house, guard house and generator houses in each of the five (5) borehole sites (Mekelle Water Supply and Sanitation Office 2011; Sori 2012).

Methods

In evaluating the impacts of the project, a set of questions were prepared and an interview was conducted with a staff of Mekelle Water Supply and Sanitation Office. The discussion was on the main components of the effects of the projects on water availability in the city—which revolved around the impact of the additional boreholes, human capacity in the office, the environmental impacts of the projects, the influence of the donors and the cost of the project. Review of the annual business report of the office was another method adopted in evaluating the effects of the water projects in the city.

Evaluation of the water sub-project

With the completion of the project, total boreholes which supplied the city with potable water are currently 17 with the total average yield of 329,330 m³ per month (approximately, 3,951,954 m³ year^{−1}) (Mekelle Water Supply and Sanitation Office 2015). This shows the significant increase in water supply in the city because of the project. However, the increase in water supply has not been able to meet up with the already established and increasing demand. The current daily water demand—by the approximate 54,073 residential customers, different governmental and non-governmental organisations, industries and service

companies—stands at a $\sim 42,000 \text{ m}^3$, which is $\sim 1,260,000 \text{ m}^3 \text{ month}^{-1}$.

Despite the additional boreholes and increase in water supply, the other main challenges facing the success of the water projects include (after Sori 2012):

The limited capacity of Tigray Water Bureau in terms of human capital and expertise At the time of interview, the bureau had only one (1) water resource manager, two (2) hydrogeologists and four (4) process operators. This finding is not strange as this has been observed to be a phenomenon hampering the efficiency and effectiveness of many African water ministries and parastatals. For example, Mbuvi et al. (2012) observed that many utility industries in Africa face technical inefficiency challenges which hamper the effective supply of water services to urban populations.

Insufficient cost recovery for proper operation and maintenance of the projects In Mekelle, the commercialisation of water services is viewed as a potential of causing tensions as water supply is considered as the public good. This kind of disposition between cost recovery and service rendering combine with inadequate public investments and water price increases have not made the World Bank intervention in the borehole construction to yield the stated aim and desired results in Mekelle Water supplies. This form of challenge is what Mollinga (2008) referred to as the challenge of governance.

The different policies and procedures adopted by other international donors either resulted in the disregard for the population's pressing needs or at times contradicted the Paris Declaration on Aid Effectiveness. There was no record of prioritisation investigation in assessing the most critical uncertainties that may affect the projects. Specifically, uncontrolled demand scenarios, indigenous innovations, sustainable behaviour and local resilience (as suggested by Van der Heijden 1996; Baguma et al. 2013) were not taken into consideration at the inception, during and after the project.

Loss of land/farmlands and lack of compensations because of the projects which directly affect the livelihood is another challenge arising from the projects. Although the farmlands lost to the project are minimal, there are still relative current complaints on the compensation paid to the owners of the lands. For example, two complaints were still being attended to at the time of interview. One, a household that stated he was compensated for the land acquired for the well drilling but not compensated for the crop damaged during the process. Two, a farmland owner complained that he was compensated for one season harvest lost while he could not use the land when the drilling of the wells and construction of the pipelines, generator houses, etc. were in process. However, these complaints are being dealt with by the Mekelle Water Supply and Sanitation Office.

Another impact of the projects raised by the host communities is that most of the sites (villages) of the boreholes were not provided with the pipeborne water that is channelled to the city, which causes a bit of grievance for the local communities. However, further investigation revealed that the project areas are now provided with communal taps which greatly help in saving time that would naturally be spent in fetching water from unclean sources and thereby also protect the local communities from any water-related diseases.

Conclusion

Generally, water supply in sub-Saharan African is very low with Ethiopia being one of the water-stressed countries. Therefore, the situation has attracted the attention of concerned organisations like World Bank in supporting any water projects. However, ensuring water availability in the pressed city like Mekelle City should not only focus on the execution of a project but should take an overall consideration of the whole concept of water supply and demand, capacity and cost management purposes if the overall goal of reducing the water stress situation in developing country is to be achieved.

Both regional and national governments are hereby advised to raise the budgetary allocation to the water supply to complement the World Bank project. In addition, the needed human capacities should be attracted and retained at the water bureau. Policy on a proper pricing of the water and strategic programme in installations maintenance should be advised by Tigray Water Bureau. Lastly, in addition to aid allocation to water projects by donor organisation, donors need to increase the proper follow-up of the project effectiveness, ensure any complaints from the project are timely and promptly addressed and adequate provision for the project host communities to benefit from such projects. With the evidenced progress in ameliorating the water challenges—because of World Bank intervention—increasing the amount of such kind of interventions, therefore, have the propensity to accelerate the progress towards achieving the recent adoption of Sustainable Development Goals by the United Nations.

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