

Investigating Water Poverty in sub-Sahara Africa: Addressing the Potentials for Water Resources Management, and Policy Implications

Ethel Ansaah Addae¹ and Daniel Adu¹

¹School of Management, Jiangsu University, Zhenjiang 212013, China

Corresponding Author: Ethel Ansaah Addae

Email: x25ethel@yahoo.com

ABSTRACT

Article Info

Volume 6, Issue 6

Page Number: 57-64

Publication Issue :

November-December-2020

Water and poverty are indistinguishably related. Absence of clean water and poverty are equally worth to research into; access to reliable sources of clean water is vital in decreasing poverty. Water is an essential commodity in human and aquatic life and plays a crucial role in the development of every country. Water is used for several activities such as irrigation in agricultural, energy generation, domestic use, industry and many more. This study investigates the state of access to water resources in sub-Sahara Africa, discussing the available potentials and addressing the various barriers that prevent the development as well as policies for proper water management. The study reviews the socio-economic and environmental drivers of water poverty. The conclusion of this study can be used to inform policymakers, governments, international organizations and other stakeholders to support in preparing for suitable policies for providing quality and better service in water supply and maintainable water management for countries at a giving time to avoid water poverty.

Article History

Accepted : 01 Nov 2020

Published : 08 Nov 2020

Keywords : Safe Water, Water Poverty, Socio-Economic Drivers, Sub-Sahara Africa

I. INTRODUCTION

Water is one of the most important natural resources that support life and a necessity for every production process. It can be viewed as a resource for domestic use, an input for industrial and agricultural use, as a sustainer of ecosystems, and a hazard in the form of floods and drought (Brown et al., 2013). But in recent times, there has been a growing alarm over water wars

which has led to several challenges in providing portable water from ground and surface water resources to both inhabitants and the ecosystem (Shiva, 2016). At the same time, UNICEF (2015) indicated that water as a natural resource should be readily available and affordable but, in many instances, it is scarce, and beyond the reach of many people, only 64% of sub-Sahara Africa's population have access to improved

water (UNICEF/WHO 2014). Population growth is increasing significantly in Africa, and this is increasing water demand. That is, aside the demand of water for domestic use, the preference for different agricultural and industrial products by the growing population due to better standards of living exert so much pressure on the available water resources.

Sen (1999) have indicated that poverty comes as a result of at least one of the basic conditions that are prerequisites to a useful life of which water is a priority. Lawrence et al. (2003) state that water poverty may exist due to inadequate capacity of the people, unavailability of the water resource, low-income level of the people, and other reasons for which people may not get access to safe water. For this cause, Cook et al. (2009) have considered inadequate water supply as one of the causes, and the result of poverty. Several studies have been conducted on water poverty (Manandhar et al. 2012; Jemmali and Matoussi 2013; Jemmali and Sullivan 2014; Jemmali (2017) to mention a few. But in sub-Sahara Africa, little is said about the causes of water poverty and how it affects the people.

II. A general overview of water situations in sub-Sahara Africa

Water resources have in recent times become one of the leading critically concerned resources which play a vital role in decreasing poverty globally, predominantly in sub-Sahara African where majority of the population do not have access to clean and safe water (Watkins, 2006). The people also face unhygienic environments, even though access to these services are fundamental rights that every individual must enjoy. Sub-Sahara Africa experiences a conflicting case with not more than 40% of the entire 783 million people globally who are without access to clean drinking water (UN Water, 2015). In Ethiopia, for instance, women and children of the villages are

forced to travel long distances on foot to get a minimum level of drinking water. The leading cause of such a situation lies in the unprofessional conduct of existing authorities in the water resources management sectors, and not the shortage of these resources (Jemmali and Sullivan 2014).

Water and poverty are undistinguishably connected. Lack of safe water and poverty are mutually underpinning. Hence, access to a reliable and clean water source is critical in alleviating poverty as stated by WHO/UNICEF (2014) that, about 748 million people presently live devoid of a clean water source, with about 2.3 billion of the population having the right to use improved drinking water as of 2012. Hunter et al., (2010) stated that people living in high-income countries are assured of reliable household supplies of high-quality water through their taps, but unfortunately, most developing countries have a different story; they usually depend on streams, lakes, rivers and to a large extent when interventions occur, dams or boreholes are constructed for the rural communities. But other studies have shown that the rural communities are not able to manage the modern technologies for a continuous number of years, hence a break in the supply of safe water to the people (Schouten & Moriaty, 2003).

Studies conducted by Hanjra & Gichuki (2008) have shown that investment in water helps to alleviate poverty since adequate water is an essential prerequisite of economic growth of about 3.7% in low-income countries with improved water. However, improved water is associated with cost, and revenues from low-income countries are often not enough to offset the running cost since the residents are not able to afford the user tariffs.

Safe water means consistent access to, and an adequate supply of clean water suitable for drinking, bathing, cooking, and cleaning (Dinka, 2018). As stated by the WHO (2014) safe water it implies safe

drinking water from a source under 1 kilometre and 62 miles away and not less than 20 litres (5.28 gallons) per person daily. Studies have shown that more than 40 billion industrious hours go waste every year in sub-Saharan Africa for use in fetching water, according to UNDP (2006). In many countries, preventable water-borne diseases keep a large portion of the population in a cycle of illness, illiteracy, and poverty (Liedner & Adusumilli 2011). People in this position may spend most of their time on the daily tasks required for survival, like fetching clean water, making it difficult to organize for community development (Bos et al., 2016).

III. Contextual factors of water poverty in sub-Sahara Africa

In the growing development of environs in countries, studies have shown that the major driving factors that lead to water poverty include population increase and its associated urbanization, agricultural production, and industrialization (Luo et al., 2019). For instance, Cobbinah et al. (2015) posit that by 2050, nearly a quarter (1.3 billion) of the world's population will migrate into the urban centers. This migration may be motivated by lack of opportunities for employment, industrialization, protection from conflict resulting from politics or harm to the environment (Capps et al., 2016). However, an increase in urban population may harm the available water resources because most cities especially in lower-income countries in sub-Sahara Africa often do not have adequate capacity to either convey portable drinking water to the people (Nnaji et al., 2013) or sustainably manage the water resources. In this case, the residents may have money to purchase portable water. However, enough water may not be available to meet the demands of the growing urban population hence, making them water-poor (Jemmali, 2017).

Aside from urbanization, other researchers have explored the link between agricultural production and

water poverty. Moss (2008) stated that agriculture has been contributing to the spread of pollutants into the aquatic environment through wastewater use or reuse for irrigation. He also indicated that the application of domestic bio-solids to the land as fertilizers also seep into the ground and pollute both the ground and surface water resources. This brings to mind a report from Mateo-sagasta & Burke (2012), which indicated that about 34Mha are now impacted globally. Countries such as China, United States, Argentina, Pakistan Sudan, and others are faced with water salinization due to irrigation. In all, agricultural mechanization has helped to boost food production but its effect has been immense since it jeopardizes the quality and quantity of available water resources. It is therefore very important to bring all countries on board to share ideas on the sustainable way of handling agricultural water management issues.

In terms of industrialization and water poverty nexus, several pieces of research have been conducted on the effect of industrial advancement on water resources. In the context of Africa, Pullanikkatil & Urama (2011) investigated the degree and impacts of water pollution from the industries in Lesotho. The results disclosed that pollutants from industries have a substantial adverse effect on the convenience of portable water and domestic earnings in the area.

With regards to the link between climate change and water resources availability, Okello et al. (2015) reported that high concentration, as well as the unpredictability of rainfall is anticipated to exacerbate the dangers of excessive rains and long periods of drought in several areas. Consequently, these dangers are predicted to affect the quality of water resources and result in forms of water pollution. Similarly, Singh et al. (2014) posited that broad evidence of change in annual runoff is observed globally. They cited that some parts of the United States of America have been experiencing an increase in runoff, whereas parts of

West Africa, Europe and South America are challenged with a decrease in a runoff.

Finally, economic growth, according to Everett et al. (2010) is believed to have brought many benefits like raising the standards of living, and refining the quality of life globally but in so doing, economic growth has also caused the depletion of some natural resources and the ecosystems. This implies that as more industries and businesses are established, and agricultural production increases, there is more dependence on available water resources. The findings of Ngoran et al. (2016) states that economic growth in sub-Saharan Africa is mainly dependent on water resources and labour. In the same vein, the GIZ (2019) have documented that, it is likely for several nations in Africa to gain a substantial increase in economic growth due to adequate access to water resources. But there should not be economic growth to the detriment of the sustainability of water resource. This, therefore, calls for appropriate policy and drastic measures to expand the production of safe water for supply while managing the available water resources to overcome the water poverty crisis.

IV. The impact of water poverty on socio-economic development

Improved, and access to adequate water resources can enhance human well-being. However, several studies have shown that water poverty has a negative influence on human health (UN Water, 2015). For instance, Hunter et al. (2010) stated that inadequate water supply have placed enormous burden of diseases such as diarrhoea and cholera on the population. According to Abdelmawla (2017), access to water include the promotion of hygiene and sanitation (toilets). But his findings revealed that water poverty had a significant negative relationship with life expectancy at birth in Sudan. To buttress this, UNICEF/WHO (2014) reported that women and children mostly found in water-poor areas in sub-

Sahara Africa are vulnerable to infections as they have to wait until dark to use a toilet or enter into a bush for open defecation.

Water poverty is said to have an impact on the environment in the sense that, since there are scarce water resources, pressure on the few available water resources increases, and this in most cases result in the deterioration of the quality of the water resources (Cosgrove & Loucks 2015). Again, water poverty may cause flora and fauna within the catchment of a water resource to diminish since their lives depend on the water resource. For instance, Bhatia & Jain (2016) stated that some reptiles, as well as plant species in most basins, are now in extinct due to the anthropogenic activities within the river catchment.

A study conducted by Burke & Beegle (2004), reported that children of primary school age in north-western Tanzania were found searching and fetching water instead of going to school. These children are absent from school, and after some time, most of them drop out of school. Water poverty impact on the health and performance of school children in water-poor areas in the sense that, they often get to school very late and tired when classes have already begun, while others may lose concentration in class since they will be thinking about the hardship in search for water after school (Levison et al., 2018). Research has also shown that girls in their puberty age, especially in water-poor areas often skip school because of inadequate water to clean themselves during their menstrual period in school (UNICEF, 2010).

Limited access to water means that women, who are primarily responsible for providing it, have to spend a long time travelling to, or queue at overcrowded public standpipes and other water sources, sometimes starting their journey in the middle of the night to make sure that the household have water in the morning (Bapat & Agarwal, 2003). In this case, the time that will be required to engage in economic

activities is channelled into an endless search for water thereby, increasing the rate of poverty among women found in water-poor areas (UNDP, 2009).

V. Addressing water poverty challenges to ensure water prosperity in Sub-Sahara Africa

A report by WHO/UNICEF (2014) revealed that about 319 million people in Sub-Saharan Africa are without access to improved reliable drinking water sources. A couple of countries in sub-Sahara Africa are still battling with the problem of water poverty through inadequate availability of the resources, difficulty in access to water supply, inadequate human capacity and infrastructure, water use for diverse purposes, as well as the environmental stress on the water resources (Hutton & Chase, 2016). However, Cosgrove & Loucks (2015) have indicated that these problems can be curtailed by implementing adequate water tariff systems that will encourage low water demands, and introduce sustainable water use technologies that will ensure efficient water use by domestic, industrial and the agricultural sectors.

Policymakers in the various countries in sub-Sahara Africa should promote capacity building on the need to reduce population growth since a large population will demand more water for consumption. Government policies of countries within sub-Sahara Africa must ensure that adequate infrastructure is provided in the rural areas so that the rural-urban migration will reduce. Again, appropriate land-use and land-cover planning methods should be promoted in all countries within sub-Sahara Africa to reduce the inappropriate stress on water resources. Water manager must liaise with other stakeholders in the water sectors to adopt adequate climate change mitigation and adaptation measures. Stakeholders in the water sectors need to build their capacity by being abreast with current technologies and skills in managing water resources as well as the finances to be able to provide all required infrastructure and liaise

with government officials when drawing water resources policies for both short and long-term plans for the countries.

Water prosperity can only be achieved when people are living well and healthy (Jackson, 2011) as well as a healthy ecosystem. This can be achieved when the suggestions above are well implemented. Also, while water managers build their capacity, they can adopt several systems models to examine the impact of different possible future scenarios and find precise and adaptable measures that can ensure sustainable water for all.

VI. Conclusion

This study discussed the state of water poverty in sub-Sahara Africa, such as the physical estimates of water availability with socio-economic drivers of poverty and environmental change. Indeed, water poverty has affected human livelihood in various sectors such as health, education, economic growth, and the environment in sub-Sahara Africa. Providing safe and adequate water for all has been a global concern. But it will require all and sundry to get involved in the battle against water poverty through research and development, engineering, implementation of government's policies for water resources protection, treat water as an economic good, and adopt social measures that will help in ensuring sustainable water for all in sub-Sahara Africa.

VII. REFERENCES

- [1]. Abdelmawla, M. A. (2017). Water Poverty and its Impact on Income Poverty and Health Status in Sudan: The Case of Gezira State (1993-2013).
- [2]. Bapat, M., & Agarwal, I. (2003). Our needs, our priorities; women and men from the slums in Mumbai and Pune talk about their needs for

- water and sanitation. *Environment and urbanization*, 15(2), 71-86.
- [3]. Bhatia, R., & Jain, D. (2016). Water quality assessment of lake water: a review. *Sustainable Water Resources Management*, 2(2), 161-173.
- [4]. Bos, R., Roaf, V., Payen, G., J Rouse, M., Latorre, C., McCleod, N., & Alves, D. (2016). *Manual on the Human Rights to Safe Drinking Water and Sanitation for Practitioners* (p. 120). IWA Publishing
- [5]. Brown, J., Hien, V. T., McMahan, L., Jenkins, M. W., Thie, L., Liang, K., & Sobsey, M. D. (2013). Relative benefits of on-plot water supply over other improved sources in rural Vietnam. *Tropical Medicine & International Health*, 18(1), 65-74.
- [6]. Burke, K., Beegle, K. (2004). Why children aren't attending school: the case of Northwestern Tanzania. *Journal of African Economies*, 13(2), 333-355.
- [7]. Capps, K. A., Bentsen, C. N., Dges, B. R. I., Ramírez, A. (2016) Poverty, urbanization, and environmental degradation: urban streams in the developing world. *Freshwater Science* 35:429-435. <https://doi.org/10.1086/684945>
- [8]. Cobbinah, P. B., Erdiaw-Kwasie, M. O., & Amoateng, P. (2015). Africa's urbanization: Implications for sustainable development. *Cities*, 47, 62-72
- [9]. Cook SE, Fisher MJ, Andersson MS, Rubiano J, Giordano M (2009) Water, food and livelihoods in river basins. *Water International* 34(1):13-29
- [10]. Cosgrove, W. J., & Loucks, D. P. (2015). Water management: Current and future challenges and research directions. *Water Resources Research*, 51(6), 4823-4839.
- [11]. Dinka, M. O. (2018). *Safe drinking water: concepts, benefits, principles and standards. Water Challenges of an Urbanizing World*, IntechOpen, London, 163-181
- [12]. Everett, T., Ishwaran, M., Ansaloni, G. P., & Rubin, A. (2010). *Economic growth and the environment*
- [13]. GIZ (2019) *Access to Water and Sanitation in Sub-Sahara Africa*. http://www.oecd.org/water/GIZ_2018_Access_Study_Part I_Synthesis_Report.pdf
- [14]. Hanjra, M. A., Gichuki, F. (2008). Investments in agricultural water management for poverty reduction in Africa: case studies of Limpopo, Nile and Volta river basins. *Natural Resources Forum* 32: 185-202
- [15]. Hunter, P. R., MacDonald, A. M., Carter, R. C. (2010). Water Supply and Health. *PLoS Med* 7(11): e1000361. DOI: 10.1371/journal.pmed.1000361
- [16]. Hutton, G., & Chase, C. (2016). The knowledge base for achieving the sustainable development goal targets on water supply, sanitation and hygiene. *International journal of environmental research and public health*, 13(6), 536.
- [17]. Jackson, T. (2011, August). Societal transformations for a sustainable economy. In *Natural Resources Forum* (Vol. 35, No. 3, pp. 155-164). Oxford, UK: Blackwell Publishing Ltd.
- [18]. Jemmali, H., Matoussi, M. S. (2013). A multidimensional analysis of water poverty at the local scale: Application of improved water poverty index for Tunisia. *Water Policy*, 15(1), 98.
- [19]. Jemmali, H., Sullivan, C. A. (2014). Multidimensional analysis of water poverty in MENA Region: An empirical comparison with physical indicators. *Social Indicators Research*, 115(1), 253-277.
- [20]. Jemmali, H. (2017). Mapping water poverty in Africa using the improved Multidimensional Index of Water Poverty. *International Journal of Water Resources Development*, 33(4), 649-666

- [21]. Lawrence, P., Meigh, J., & Sullivan, C. (2003). The Water Poverty Index: An International Comparison (No. KERP 2002/19). Centre for Economic Research, Keele University.
- [22]. Leidner, A. J., & Adusumilli, N. C. (2011). Cross-Country Analysis of the Effects of Urbanization, Improved Drinking-Water and Improved Sanitation on Cholera.
- [23]. Levison, D., DeGraff, D. S., & Dungumaro, E. W. (2018). Implications of environmental chores for schooling: Children's time fetching water and firewood in Tanzania. *The European journal of development research*, 30(2), 217-234.
- [24]. Luo M, Liu T, Meng F, Duan Y, Bao A, Xing W, & Frankl A (2019) Identifying climate change impacts on water resources in Xinjiang, China. *Science of the Total Environment* 676 <https://doi.org/10.1016/j.scitotenv.2019.04.297>
- [25]. Manandhar, S., Pandey, V. P., & Kazama, F. (2012). Application of water poverty index (WPI) in Nepalese context: A case study of Kali Gandaki River Basin (KGRB). *Water Resources Management*, 26(1), 89–107.
- [26]. Mateo-Sagasta J., & Burke J., 2012 Agriculture and water quality interactions: a global overview. SOLAW Background Thematic Report – TR08, FAO, pp. 15-22
- [27]. Moss, B. (2008). Water pollution in agriculture. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 363(1491), 659-666
- [28]. Ngoran, S. D., Xue, X. Z., & Wesseh Jr, P. K. (2016). Signatures of water resources consumption on sustainable economic growth in Sub-Saharan African countries. *International Journal of Sustainable Built Environment*, 5(1), 114-122
- [29]. Nnaji, C. C., Eluwa, C., & Nwoji, C. (2013). Dynamics of domestic water supply and consumption in a semi-urban Nigerian city. *Habitat International*, 40, 127-135.
- [30]. Okello, C. A., Tomasello, B., Greggio, N., Wambiji, N., & Antonellini, M. (2015) Impact of Population Growth and Climate Change on the Freshwater Resources of Lamu Island, Kenya. *Water* 7:1264–1290 <https://doi.org/doi.org/10.3390/w7031264>
- [31]. Pullanikkatil, D., & Urama, K. C. (2011). The effects of industrialization on water quality and livelihoods in Lesotho. *Int. J. Environmental Engineering* 3:175–191
- [32]. Schouten, T., & Moriarty, P. (2003). Community water, community management: from system to service in rural areas. Rugby (UK): ITDG Publishing
- [33]. Sen, A. (2014). *Development as freedom* (1999). The globalization and development reader: Perspectives on development and global change, 525.
- [34]. Shiva, V. (2016). *Water Wars: Privatization, pollution, and profit*. North Atlantic Books.
- [35]. Singh, V., Mishra, A., Chowdhary, H., & Khedun, C. (2014). Climate Change and its Impact on Water Resources. *Modern Water Resources and Engineering* 525–569. https://doi.org/doi.org/10.1007/978-1-62703-595-8_11
- [36]. UNICEF (2010). *Water, Sanitation and Hygiene*. Available at <http://www.unicef.org/media/media45481.html> (retrieved on 5 April 2020)
- [37]. WHO & UNICEF Joint Monitoring Programme for Water Supply and Sanitation, *Progress on Drinking Water and Sanitation: 2014 Update* (Geneva: WHO Press, 2014)
- [38]. UNDP (2009). *Resource Guide on Gender and Climate Change*. Available at <http://www.undp.org/chclimatechange/library/gender.shtml> (retrieved on 5 April 2020)
- [39]. UN Water (2015). *Water and Sustainable Development: From Vision to Action*. Means and tools for implementation and the role of different actors. Report of the 2015 UN-Water

Zaragoza Conference
<http://www.un.org/waterforlifedecade/waterand sustainabledevelopment2015/index.shtml>
retrieved on 29/08/2020

- [40]. UNICEF (2015). Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment. Retrieved from:
- [41]. https://www.unicef.org/publications/index_82419.html (accessed on 6 April 2020)
- [42]. United Nations Development Programme (UNDP 2006), Human Development Report 2006, Beyond Scarcity: Power, poverty and the global water crisis (New York: Palgrave Macmillan, 2006) available at <http://hdr.undp.org/en/content/human-development-report-2006>.
- [43]. Watkins, K. (2006). Human Development Report 2006-Beyond scarcity: Power, poverty and the global water crisis. UNDP Human Development Reports (2006).
- [44]. WHO & UNICEF (2014) Joint Monitoring Programme for Water Supply and Sanitation, Progress on Drinking Water and Sanitation: 2014 Update (Geneva: WHO Press, 2014).
- [45]. WHO (2014) Health through safe drinking water and basic sanitation, World Health Organization.
http://www.who.int/water_sanitation_health/mdg1/en/

Cite this article as:

Addae E. A. and Adu D., "Investigating Water Poverty in sub-Saharan Africa: Addressing the Potentials for Water Resources Management, and Policy Implications", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN: 2456-3307, Volume 6 Issue 6, pp. 57-64, November-December 2020. Available at doi: <https://doi.org/10.32628/CSEIT20664>
Journal URL: <http://ijsrcseit.com/CSEIT20664>