

# Assessment of Water, Sanitation and Hygiene Services in Sub-Saharan Africa

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## Abstract

Adequate provision of water, sanitation and hygiene (WASH) facilities are supporting pillars of healthy living. Hence, this review was aimed at the assessment of the status of WASH services in sub-Saharan Africa. The study used secondary data, sourced from the Joint Monitoring Programme (JMP) report by UNICEF and WHO (2015). This data was used to assess the WASH status of sub-Saharan Africa. Other information highlighted in the paper were obtained from existing literature, in peer reviewed journals, conference proceedings, commissioned studies and the internet. Data obtained were presented in tables and further analyzed using percentages. The review revealed that WASH services are poorly provided in sub-Saharan Africa, with negative consequences on the health and socio-economic development of people who have poor access to WASH services. Some of the reasons that have led to the poor provision of WASH services in the region are broadly classified into natural and human-related. The natural causes are the region's extreme climate and rainfall variability, which has been made worse by climate change, resulting in desertification, shrinkage of some water bodies and growing water scarcity; while the human-related causes include, poor governance, weak institutions, poor financing, and corruption in the WASH sector, amongst others. The study recommends the adoption of a comprehensive, inclusive and integrated WASH strategy that fit the peculiarities of each country in the region. This would help in maximizing the benefits of WASH services and the promotion of healthy living in the region.

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**Keywords:** Healthy living, Hygiene, Sub-Saharan Africa, Water, Sanitation

## 1. Introduction

Inadequate water, sanitation and hygiene (WASH) account for a large part of the causes of illness and death in the world, especially in developing

countries where about 80 per cent of illnesses are linked to inadequate water and sanitation (The Water Project, 2016). Hence, several global efforts have been made to provide the world population with sustainable access to safe drinking water and adequate sanitation. Although these efforts have yielded some appreciable results, however, progress report indicates that there exist sharp regional, socio-economic and cultural inequalities in access to safe drinking water sources and basic sanitation and in some cases have increased among marginalized and vulnerable groups (WHO & UNICEF, 2014). The Millennium Development Goals (MDGs) global targets for drinking water was met in 2010, five years before the target date of 2015, while the target for sanitation was missed. However, sub-Saharan Africa region failed to meet both targets for water and sanitation by 2015. This shows that the global picture does not reflect what is obtainable in all regions of the world. This explains why there is high rate of waterborne diseases in the region, especially diarrhea among children below the age of five (Black *et al*, 2010).

It has been confirmed that diarrhea kills more young children each year than HIV/AIDS, tuberculosis, and malaria put together, which have been described as the ‘big three’ attention-seekers of the international public health community (Boschi-Pinto *et al*, 2008). Although diarrhea can be easily controlled by adequate water provision, sanitation and hygiene (Bartram & Cairncross, 2010) it still poses a serious health challenge in sub-Saharan Africa, in spite, of the reported progress made on water and sanitation coverage during the MDGs period (2000–2015). The probable reason for this is that the proportion of people with access to adequate WASH services in the region is still low. Some of those that were classified as having access to improved water do have issues with the quality of water obtained and sometimes spend over 30 minutes for a return journey from the water source. Although this loss of time was mentioned in the joint monitoring programme (JMP) report by UNICEF and WHO (2010), however, it does not affect the categorization of such water sources as ‘improved’ or ‘unimproved’. In addition, some of the sources or facilities categorized as improved are poorly maintained and easily degraded thereby exposing the users to avoidable health challenges.

The current Sustainable Development Goals (SDGs) for water and sanitation has more detailed and ambitious monitoring indicators; if applied to the current WASH status in sub-Saharan Africa would produce wide gaps from the estimates based on the MDGs. Therefore, as the region sets out with the rest of the world to achieve the more ambitious SDGs, it is imperative to continuously assess the WASH status in the region, so as to provide policy makers and key stakeholders with reliable information to develop strategies and interventions to address observed constraints and shortcomings militating against adequate provision of WASH services. This is an indication that much

work is needed to enhance the provision of adequate WASH in sub-Saharan Africa to maximize its benefits for healthy living in the region. Hence, the aim of this review was to assess the status of WASH services in sub-Saharan Africa.

## **2. Method of Study**

This review assessed the status of water, sanitation and hygiene services in sub-Saharan Africa. The study adopted a descriptive research design, based on secondary data that were obtained from the Joint Monitoring Programme (JMP) report by UNICEF and WHO (2015). The JMP report contains global data on 25 years progress on sanitation and drinking water – 2015 update and MDG assessment. In addition, the report also contains data on hygiene status of some countries in sub-Saharan Africa. Based on this data, the WASH coverage status of sub-Saharan Africa was extracted and analyzed. The extracted data were presented in tables and further analyzed using percentages. Other information highlighted in the paper was obtained from a review of related literature from peer reviewed journals, conference proceedings, text books, commissioned studies and the internet. The paper was structured into sub-themes which include: status of used sources of drinking water, sanitation and hygiene facilities; consequences of inadequate provision of WASH services; constraints to adequate provision of WASH facilities; benefits of adequate provision of WASH services and way forward for adequate WASH provision in sub-Saharan Africa.

## **3. Status of Used Sources of Drinking Water in Sub-Saharan Africa**

The Millennium Development Goals (MDGs) for water and sanitation (target 7c) focused on halving the proportion of the world population without sustainable access to safe drinking water and basic sanitation by 2015. The Joint Monitoring Programme (JMP) report by UNICEF and WHO (2015) revealed that the target for drinking water (88%) was met globally in 2010, and by 2015, 91% of the global population had access to improved drinking water sources as against the 76% in 1990, the base year. In 2015, 663 million people globally lacked access to improved water sources, out of which, 319 million (48.11%) people were in sub-Saharan Africa. This shows that there exist regional disparities from this global picture. For instance, in Table 1, it is revealed that sub-Saharan Africa missed the drinking water target of 74% by six per cent as only 68% of the population had access to improved sources of drinking water by 2015 as against the 48% of the population in 1990. In spite of the modest improvement on the percentage of the population in sub-Saharan Africa that had access to improved sources of drinking water, however, only 16% of the population had access to piped water on their premises as against the global average of 44%. In addition, 10% of the

population in the region still uses surface water as against the global average of two per cent (UNICEF & WHO, 2015).

Apart from the global and sub-Saharan Africa region disparities on the achievement of the MDG target on water (Table 1), there are also national and urban/rural disparities among the countries in the region. For instance, Table 2 shows that 23 countries met the drinking water target while an equal number of countries also missed the target. On the other hand, four countries (Congo, Somalia, South Sudan and Sudan) were not considered due to lack of reliable data.

Mauritius had the highest percentage (100%) of total improved drinking water sources while Equatorial Guinea had the highest percentage (52%) of total unimproved drinking water sources in the region. Urban/rural inequalities on water coverage show that 45 countries in sub-Saharan Africa had more percentage coverage in urban areas than rural areas. Only Mauritius had equal percentage coverage of 100% each in both urban and rural areas, and the country with the highest percentage coverage (100%) each of rural and urban improved drinking water sources. On the other hand, Angola had the highest percentage (72%) of unimproved rural drinking water sources; while Mauritania had the highest percentage (42%) of unimproved urban drinking water sources. A higher percentage of the global population using improved drinking water sources reside in urban areas. For instance, in 2015, 96% of the global urban population used improved drinking water sources while it was 84% with the rural population. On the other hand, 80% of the global population (8 out of 10 people) still without improved drinking water sources lives in rural areas (WHO, 2015). This is an indication that much needs to be done to increase the percentage of the population with access to safe drinking water in the region, particularly in the rural areas where majority of the population using unimproved drinking water sources live.

Table 1.

Global and sub-Saharan Africa estimates on used sources of drinking water

S/N	Drinking water Sources	1990		2015	
		Global Pop.(%)	Sub-Saharan Africa Pop.(%)	Global Pop.(%)	Sub-Saharan Africa Pop.(%)
1	Piped water on Premises	44	15	58	16
2	Other improved	32	33	33	52
3	Unimproved	17	26	7	22
4	Surface water	7	26	2	10
5	Total improved	76	48	91	68
6	MDG 2015 Target			88 (Met)	74 (Not met)

Source: Adapted from UNICEF and WHO (2015)

**Table 2**  
**Summary of used drinking water sources in sub-Saharan Africa countries**

S/N	PERFORMANCE RATING	COUNTRIES
1	Countries that met the MDG drinking water Target	Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Djibouti, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Malawi, Mali, Mauritius, Namibia, Nigeria, Reunion, Sao Tome and Principe, Senegal, South Africa, Swaziland and Uganda (23)
2	Countries that missed the MDG drinking water Target	Angola, Burundi, Central Africa Republic, Chad, Comoros, Cote d' Ivoire, DR Congo, Equatorial Guinea, Eritrea, Kenya, Lesotho, Liberia, Madagascar, Mauritania, Mozambique, Niger, Rwanda, Seychelles, Sierra Leone, Tanzania, Togo, Zambia, Zimbabwe (23)
3	Countries not applicable	Congo, Somalia, South Sudan, Sudan (4)
4	Country with the highest percentage of total improved water sources	Mauritius (100%)
5	Country with the highest percentage of total unimproved water sources	Equatorial Guinea (52%)
6	Country with the highest percentage of rural improved water sources	Mauritius (100%)
7	Country with the highest percentage of rural unimproved water sources	Angola (72%)
8	Country with the highest percentage of urban improved water sources	Mauritius (100%)
9	Country with the highest percentage of urban unimproved water sources	Mauritania (42%)

Source: Adapted from UNICEF and WHO (2015)

#### **4. Status of Used Sanitation and Hygiene Facilities in Sub-Saharan Africa**

The global and sub-Saharan MDG targets for sanitation were missed in 2015. The global target for sanitation was for 77% of the world population to use improved sanitation facilities; while sub-Saharan Africa had a target of 62%. Unfortunately, the progress achieved with the water target could not be replicated as only 68% of the world population had access to improved sanitation facilities, leaving a gap of nine per cent. The situation in sub-Saharan Africa was worse than this global picture, where only 30% of the population

had access to adequate sanitation facilities, and 32% of the population missed the sanitation target by 2015 (Table 3).

Globally, 2.4 billion people use an unimproved sanitation facility, with sub-Saharan Africa accounting for 695 million (28.96%) of the population. Similarly, of the 638 million people sharing sanitation of an otherwise improved type, the region accounted for 194 million people (30.41%). In addition, 23% of the population in sub-Saharan Africa still practice open defecation as against the global average of 13% in 2015 (UNICEF and WHO, 2015). Hence, it was not surprising that only three countries (Cape Verde, Réunion and Seychelles) in sub-Saharan Africa met the sanitation target among 95 countries globally; while 43 countries missed the target and four other countries (Sudan, South Sudan, Somalia and Congo) were not considered due to lack of reliable data (UNICEF and WHO, 2015). This shows that sub-Saharan Africa constitutes a significant drag on the attainment of the MDG sanitation target at the global level.

Urban/rural inequalities also exist on sanitation coverage just as in drinking water sources in the region. For instance, 44 countries have more percentage coverage in urban areas than in rural areas. In fact, only Burundi and Rwanda had more percentage coverage in rural areas than in urban areas, with 49/44 per cent and 63/59 per cent respectively. Countries with the highest percentage of total improved sanitation facilities are Réunion and Seychelles, with 98 per cent of their respective population using total improved sanitation facilities; while Niger had the highest percentage (89%) of her population using total unimproved sanitation facilities. On the other hand, Réunion had the highest percentage of her population in both rural (95%) and urban areas (98%) using improved sanitation facilities; while Niger had 95% of her rural population and Madagascar had 82% of her urban population using unimproved sanitation facilities (Table 4). Globally, 82% of the urban population and 51% of the rural population use improved sanitation facilities; while 70% of the population (7 out of 10 people) without improved sanitation facilities and 90% (9 out of 10 people) still practicing open defecation live in rural areas (WHO, 2015). Globally, 77 countries met both the water and sanitation targets (UNICEF and WHO, 2015) while only two countries (Cape Verde and Réunion) met both targets in sub-Saharan Africa.

In sub-Saharan Africa there is dearth of comprehensive and up-to-date data on the percentage of the population with hand washing facility with soap and water at home. However, of the 29 countries where data were captured by the JMP (UNICEF & WHO, 2015), it was revealed that all the countries surveyed had less than 50% of their population with hand washing facilities with soap and water at home. The country with the highest percentage was Namibia (47%); while the lowest was in Ethiopia and Liberia, where each had one per cent population coverage. Since the presence of hand washing facility

with soap and water was used as a proxy for good hygiene practice, it therefore means that there is poor hygiene practice in sub-Saharan Africa. It must be stressed at this junction that the gains made by adequate water provision and sanitation can be negated by poor hygiene practices. Since the monitoring indicators in the SDGs for water and sanitation are more robust, sub-Saharan African countries may need to double their efforts at all fronts from the level they operated during the MDGs so as to make reasonable progress towards the attainment of the SDGs. Failure to do this would lead to poor attainment of the set targets, if not outright retrogression because the strict monitoring of the SDGs indicators may likely expose the lapses in the MDGs estimates for water and sanitation in the region.

Table 3.  
Global and sub-Saharan Africa estimates on used sanitation facilities

S/N	Sanitation Facilities	1990		2015	
		Global Pop. (%)	Sub-Saharan African Pop. (%)	Global Pop. (%)	Sub-Saharan African Pop. (%)
1	Improved	54	24	68	30
2	Shared	5	14	9	20
3	Other unimproved	17	26	10	27
4	Open defecation	24	36	13	23
5	Total improved	54	24	68	30
6	MDG 2015 Target			77 (not met)	62 (not met)

Source: Adapted from UNICEF and WHO (2015)

Table 4. Summary of used sanitation facilities in sub-Saharan Africa

S/N	PERFORMANCE RATING	COUNTRIES
1	Countries that met the MDG sanitation target	Cape Verde, Reunion, Seychelles (3)
2	Countries that missed the MDG	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Cote d' Ivoire, Djibouti, DR Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe (43)

3	Countries not applicable	Congo, Somalia, South Sudan, Sudan (4)
4	Countries with the highest percentage of total improved sanitation facilities	Réunion (98%) and Seychelles (98%)
5	Country with the highest percentage of total unimproved sanitation facilities	Niger (89%)
6	Country with the highest percentage of rural improved sanitation facilities	Réunion (95%)
7	Country with the highest percentage of rural unimproved sanitation facilities	Niger (95%)
8	Country with the highest percentage of urban improved sanitation facilities	Réunion (98%)
9	Country with the highest percentage of urban unimproved sanitation facilities	Madagascar (82%)

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Source: Adapted from UNICEF and WHO (2015)

## 5. Consequences of Inadequate Provision of Water, Sanitation and Hygiene Facilities

Inadequate WASH services have health and socio-economic consequences. For example, diarrhea diseases are the most common WASH-related diseases, which kill about 1.7 million people yearly, with 90% of the deaths occurring among children under the age of five in developing countries (WHO, 2009) of which sub-Saharan Africa contribute a significant proportion. For example in 2008, diarrhea disease was found to be the leading cause of death among children under age five in sub-Saharan Africa, which accounted for 19% of all deaths in this age group (Black *et al*, 2010).

Humans especially children need adequate WASH for healthy living. This is particularly true in sub-Saharan Africa where WASH services are poorly provided both in urban and especially in rural areas. Although poor WASH services contribute to increase in child mortality and morbidity, they also contribute to poor education, under nutrition, stunting and other outcomes for children (UNICEF, 2016). For example, a study by USAID (2017) revealed that open defecation was prevalent in the rural areas of Burkina Faso, Ghana and Niger, which has led to the contamination of drinking water sources, resulting in outbreaks of diarrhea, with children showing signs of under nutrition, malnutrition and stunting. The report also revealed that the poor state of WASH services in Niger was responsible for the prevalence of waterborne diseases, which was the cause of 14% of all childhood deaths in

the country. Similarly, WSP (2012) estimated that about 121, 800 Nigerians, including 87, 100 children under age five die annually from diarrhea, of which about 90% of the deaths directly attributed to inadequate WASH services. In addition, the report noted that “poor sanitation is a contributing factor-through its impact on malnutrition rates-to other leading causes of child mortality including malaria and measles” (WSP, 2012).

A study by ACAPS (2015) identified inadequate WASH services as an important factor in the Ebola outbreak in Guinea, Liberia and Sierra Leone. The study noted that the use of unsafe water and pervasive unhygienic conditions were key factors responsible for the thousands of deaths prior to and during the Ebola outbreak. The study concluded that inadequate WASH services would continue to be a burden to the three countries recovery and development in the medium to long term.

Apart from the consequences of inadequate WASH at the household level, regrettably, schools and health care facilities have also been places for the transmission of WASH-related diseases. A report by WHO and UNICEF (2015) on water, sanitation and hygiene in health care facilities in low-and middle-income countries (especially in sub-Saharan Africa) revealed that many health care facilities do not have access to water sources or sanitation facilities, irrespective of how well these facilities function. In places where they are available, the WASH services are unsafe, unreliable and inadequate for the needs of patients, health care staff and visitors. Inadequate WASH services in some healthcare facilities have increased the rate of healthcare associated infections, which affect hundreds of millions of patients yearly, with 15% of patients estimated to contract one or more infections during a hospital stay (Allegranzi *et al*, 2011). In addition, it may discourage women from patronizing such healthcare facilities for delivery or cause delays in care-seeking (Velleman *et al*, 2014) which may encourage home delivery with its attendant risk. Poor hygiene practices by birth attendants can increase the risk of infections, sepsis and death of infants and mothers by up to 25%, yet many health facilities lack even basic water and sanitation facilities; and an estimated 42% of healthcare facilities in sub-Saharan Africa do not have access to an improved water source within 500 metres (WHO, 2015).

The socio-economic consequences of inadequate WASH are as enormous as the health impacts. For example, the World Bank (as cited in Global Public Policy Network on Water Management, 2008) estimated that water insecurity in Ethiopia reduces the country’s GDP growth by 38%. Similarly, WSP (2012) estimated that open defecation cost Nigeria US\$1 billion, while poor sanitation costs Nigeria US\$3 billion yearly, which was an equivalent of 1.3% of the national GDP. In addition to these losses, another estimated sum of US\$243 million is lost each year in access time, as each person practicing open defecation, spends about 2.5 days a year looking for a

private location to defecate, which leads to large economic losses (WSP, 2012). Open defecation also has considerable social cost, resulting from lack of dignity and privacy and risk of physical attack and sexual violence. Cases of women being assaulted or raped have been reported in Nairobi, Kenya, where women tried to access latrines after dark or at night even in short distances of about 100 metres near their homes (Van Houweling *et al*, 2012).

Inadequate water sources have increased the burden of fetching water on women and girls in sub-Saharan Africa. For example, in Mozambique, eastern Uganda and rural Senegal, women spend between 15 to 17 hours weekly fetching water (UNDP, 2006). It has been estimated that these hours translate into 40 billion hours a year in sub-Saharan Africa, which is equivalent of a year's labour of the entire working population of France (UNDP, 2006). Apart from the impact of the weight of the water on the women and girls, it also affects female education, leading to low concentration due to tiredness and fatigue and increasing the rate of absenteeism, which has largely accounted for the very large gender gaps in school attendance (UNDP, 2006).

## **6. Constraints to Adequate Provision of Water, Sanitation and Hygiene Facilities**

In spite of the numerous consequences of inadequate WASH to healthy living, most countries in sub-Saharan Africa are still lagging behind in the provision of improved drinking water sources, sanitation and hygiene facilities due to several constraints. These constraints can be classified broadly into two-natural and human-related constraints. The Africa Water Vision 2025, (as cited in the Global Public Policy Network on Water Management, 2008) identifies a number of natural and human threats to water scarcity in sub-Saharan Africa. The major natural threats it identifies are sub-Saharan Africa extreme climate and rainfall variability, which has been made worst by climate change, resulting in desertification, shrinkage of some water bodies (such as the Lake Chad) and growing water scarcity. These natural constraints have increased the challenges of providing adequate WASH services by national governments in sub-Saharan Africa. Although the natural constraints contribute to water scarcity in the region, there is however, a growing consensus that human action, or inaction, presents the greatest threat in harnessing the existing water resources for healthy living in sub-Saharan Africa. The inability to address these threats is due to weak governance and institutional capacity to ensure that basic WASH services are accessible to all, mediate between conflicting interests and ensure that the needs of the poor are addressed in a sustainable way (Global Public Policy Network on Water Management, 2008).

The human-related threats, as identified by the Africa Water Vision 2025 are: (i) inappropriate governance and institutional arrangements in

managing national and transactional water basins; (ii) depletion of water resources through pollution, environmental degradation and deforestation; (iii) failure to invest adequately in resource assessment, protection and development; and (iv) unsustainable financing of investment in water supply and sanitation. In addition, high levels of illiteracy and poverty; corruption in the WASH sector; poor infrastructure provision (electricity); inadequate National Water Supply and Sanitation Policies (NWSSP); lack of preventive maintenance of WASH facilities, cultural barriers, technical challenges and rapid population growth of most countries in sub-Saharan Africa exacerbate the challenges of adequate WASH provision in the region (see Ohwo, 2016; Mara *et al*, 2010; Cairncross & Valdmanis, 2006).

Highlighting the importance of population growth in meeting the MDG for WASH, Bartram and Cairncross (2010) assert that “the increase in the numbers of people with access is also being partly offset by population growth. Even if the target is met and the proportion of those not served is halved, neither the number of people not served nor the global burden of disease will be halved”. This shows that rapid population growth could be a major constraint to adequate provision of WASH services to all by the year 2030 in sub-Saharan Africa.

Mara *et al* (2010) identified lack of national policies as a major constraint to success in sanitation. They noted that without adequate policies, governments in general and health ministries in particular cannot play their key roles as facilitators and regulators of sanitation. They assert that policies are needed to transform national institutions into lead institutions for sanitation, that increase focus on household behaviours and community action, that promote demand creation, and that enable health systems to incorporate sanitation and hygiene. They criticized the inadequate application of subsidy by national governments, aid agencies and charities, as a strategy for increasing access to improve sanitation. They observed that this approach has resulted in slow progress for two major reasons. First, the privileged few have benefited more from the programmes because they are better informed of the requirements for the subsidies, to the disadvantage of the more numerous poor people who are less informed. Second, such programmes have built toilets that remain unused because they are either technically or culturally inappropriate or the household have not been educated on their benefits. Similarly, Sanan and Moulik (2007) reported that about 50% of toilets built by governments are not used for their intended purpose. For instance, many toilets in India are used as firework stores or goat sheds (George, 2008) in a country where the practice of open defecation is 44% (UNICEF & WHO, 2015). This situation is not far from what is obtainable in sub-Saharan Africa.

Furthermore, Minh and Hung (2011) assert that one of the reasons for the slow progress in expanding improved sanitation coverage in the world and

developing countries in particular was the lack of proper understanding of the importance of improved sanitation solution by policy makers and the general public. They submitted that in developing countries the governments do not see the relationship between improved sanitation and economic development, or source of improved welfare. In addition, cost-benefit analysis has not been commonly used to justify increasing spending on sanitation programmes. Apart from this constraint, corruption in the WASH sector has also been identified as a major challenge for adequate WASH services worldwide and sub-Saharan Africa in particular. For example, the Global Corruption Report, 2008, cited in the report of the First African Water Integrity Summit (FAWIS, 2014) revealed that US\$50 billion, representing 25% of all water investment is lost every year to corruption.

## **7. Benefits of Improved Water Supply, Sanitation and Hygiene Services**

The benefits of adequate WASH services cannot be over emphasized. Several studies have shown that adequate WASH services is key to healthy living as it generates substantial benefits for public health; socio-economic development and the environment (see Hutton et al, 2014; OECD, 2011; Bartram & Cairncross, 2010; Cairncross, 2004). For example, a study by Sommer, Shandra, Restivo and Coburn (2015) based on data from a sample of 32 sub-Saharan African countries from 1990-2005, revealed that access to both improved water and sanitation facilities are associated with decrease in maternal and neo-natal mortality. Adequate WASH services are major factors in protecting children from worm infestations and other illnesses, which contribute significantly to children absenteeism rates in school. A randomized impact evaluation of a deworming programme in western Kenya shows that the worm burden in children accounted for about 25% of the overall school absenteeism rates (Poverty Action Lab, 2007), which was attributable to poor WASH services. In a study in Southern Africa, UNAIDS, UNFPA and UNIFEM (2004) found that 24 buckets of clean water is needed a day to provide home-based care for someone living with advanced AIDS. It was also observed that safe drinking water was critical for maintaining the nutritional requirements for greatest efficacy of anti-retroviral therapy for people living with HIV and AIDS (WaterAid, 2013).

The benefits from adequate provision of WASH services such as those implied by the MDGs and SDGs for water supply and sanitation are huge and far outstrip their costs. The cost-to-benefit ratios have been reported to be as high as 1:7 for basic water and sanitation services in developing countries (OECD, 2011). Hutton, Haller and Bartram (2007) estimated a total benefit of US\$39.7 billion to improved WASH in sub-Saharan Africa, when all monetized benefits were considered. This is a clear testimonial to the

relevance of adequate WASH services for healthy living in sub-Saharan Africa. In most cases the entire benefits of WASH is usually underestimated because the full array of the benefits of adequate WASH services is seldom considered because the non-economic benefits of adequate WASH are difficult to quantify even though they are of high value to the concerned individuals and society (OECD, 2011).

Rapid and effective WASH interventions are critical for saving the lives of children across a range of crises and complex humanitarian situations due to disease outbreaks and public health emergencies, conflicts, acute and chronic malnutrition, forced migration, and natural disasters (UNICEF, 2016). Studies have revealed that adequate sanitation can reduce the rates of diarrhea diseases by 32% to 37% (Waddington & Snilstveit, 2009; Fewtrell, *et al*, 2005). Adequate water at home prevents diarrhea, guinea worm, waterborne *arsenicosis*, and waterborne outbreaks of diseases such as cholera, typhoid, and cryptosporidiosis. In addition, hand washing with soap and water reduces the risk of endemic diarrhea, respiratory and skin infections; while face washing prevents trachoma and other eye infections (Bartram & Cairncross, 2010). Furthermore, improved sanitation has great positive impacts on children's health, gender equality, environmental sustainability, and water resources (clean drinking water). Improved sanitation would contribute both directly and through the various pathways to development, to lifting populations out of poverty, as well as preventing them from slipping back into poverty (Hutton *et al*, 2008).

## **8. Way Forward to Achieving Adequate WASH Services**

The role of adequate WASH services for healthy living as highlighted above has made it imperative for adequate strategies to be developed by sub-Saharan Africa countries based on individual nation's peculiarities to scale-up the provision of sustainable WASH services in their respective countries. Although no single strategy could fit-in and solve all WASH-related issues in the region, however, some tested strategies could help to significantly scale-up the provision of WASH services in the region. Broadly speaking, for any designed strategy for achieving sustainable WASH in the region to be effective and have remarkable positive impact, it must make provision and address issues relating to good governance and institutional capacity building; funding (measuring progress and accountability); public education; adaptation of appropriate technology; focus on bridging the gap of existing disparities; meeting the needs of women, girls and the disabled; develop, harmonize and integrate the various WASH policies and tackling of corruption in the WASH sector. The most important of these strategies is political leadership, which is responsible for establishing clear institutional responsibility, providing budget

lines for sanitation and ensuring that public sector agencies working in health, water resources and utility services work better together (Mara et al, 2010).

The SDG for water and sanitation provides a functional framework for policies on WASH services to be anchored in countries that lack adequate WASH policies. Such policies should develop, harmonize and integrate all fragmented policies that deal on WASH issues and relate them to the targets set for the SDGs. In such policies the national plans of action and the institutional shared responsibilities should be well spelt out, with a lead agency that coordinates the execution of shared responsibilities to all stakeholders. The relevance of adequate institutional capacity was also stressed by Global Public Policy Network on Water Management (2008) that even when there is political will, leadership and adequate funding, the achievement of adequate WASH can only be attained if there is adequate institutional capacity at national, sub-national and regional level to implement national action plans for WASH services.

Corruption in the WASH sector must be tackled to make any meaningful progress in WASH services in sub-Saharan Africa. If the estimated US\$ 50 billion of all water investment lost every year to corruption (FAWIS, 2014) was adequately invested and utilized for the intended purposes much ground would have been covered to increase the service level of WASH in the region. Similarly, Ohwo (2016) also recommends the tackling of corruption in the water and sanitation sector of the Nigerian economy in order to ameliorate the challenges of public water provision in Nigerian cities. In addition, more resources should be budgeted by national governments to the WASH sector based on cost-benefit analysis. The poor application of this analytical mode had made it difficult in some cases to justify the need for increased funding for the WASH sector (Minh & Hung, 2011). Increased funding for WASH is not enough, there must be laid down monitoring and evaluation system to account for released funds *vis-a-vis* progress made on set targets. In such an evaluation system, the beneficiaries of the WASH services should be co-opted, to provide first hand information on the effectiveness and sustainability of the intervention programme. In addition, adapted WASH services should reflect cultural consideration, affordability, willingness to pay, appropriate technology, and other sustainability factors (World Bank, 2006).

Public education and information sharing is key to any strategy on achieving improved WASH services. Efforts should be made by WASH agencies to disseminate relevant information on the consequences and benefits of WASH and how to achieve adequate services, by using improved sources of drinking water, sanitation and hygiene practices to the general public. This will help in positive behavioural change and willingness to pay, use and sustain WASH intervention projects in their communities, as those with education are less likely to defecate in the open compared to those without

education. Generally speaking, the percentage of the population practicing open defecation appears to decline with increasing levels of education (WHO & UNICEF, 2014) and exposure. Furthermore, the property rights of public WASH facilities should be transferred to the community where it is located or any responsible and dependable individual, who would guarantee the maintenance of such facility.

Bridging the gap that exists in the provision of adequate WASH services is a right step towards achieving sustainable access of all, to improved WASH services by the year 2030. Disparities to WASH services in sub-Saharan Africa exist at different levels such as urban/rural, rich/poor and able/disabled. To close this gap and improve on access of all, to adequate WASH services in the region, strategies that focus on meeting the needs of the vulnerable and under served in the society must be addressed. The needs of women, girls, disabled and the poor in the society must be considered as top priority, why those privileged few and wealthy individuals who can afford to provide and pay for these services should be encouraged to do so. This will free up resources to meet the needs of the less privileged in the society, thereby bridging the existing gap in the provision of WASH services in sub-Saharan Africa.

## **9. Conclusion**

Several studies in this review has shown that adequate WASH services are necessary in promoting good health and socio-economic development. Unfortunately, WASH services are still inadequate in almost all the countries in sub-Saharan Africa, as the region failed to meet the MDGs targets for water and sanitation. Now that the journey for the SDGs targets for water and sanitation is on, everything humanly possible should be done so that the region meets the set targets. Considering the current WASH status in the region and the much ambitious SDGs monitoring indicators for WASH services, it will require concerted efforts of all stakeholders to bridge the deficit gaps of WASH in most countries in the region. In spite of the highlighted constraints that have impeded the provision of improved WASH services to the people in the region, the adoption of a comprehensive, inclusive and integrated WASH strategy, that fit the peculiarities of each country could make a great positive difference towards the attainment of the SDGs for WASH in sub-Saharan Africa. Meeting the SDGs for WASH services will help to maximize the inherent benefits of adequate WASH services in the region and enhance the standard of living of the people.

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