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Keywords: gender, water, sanitation, facilities, east african universities, makerere university, university of dar es salaam.

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A Gender Perspective of the Status of Water and Sanitation Landscape in East African Universities

Kebirungi, Harriet. [α], Kabonesa, Consolata. [σ], Kimwaga, Richard Joseph. [ρ], Majaliwa, Jackson-Gilbert Mwanjalolo. [ω] & Luboobi S. Livingstone. [¥]

Abstract- Access and utilization of adequate water supply and sanitation facilities is high on the agenda of both International, national, and local communities including East African Universities (EAUs). Despite global demand for higher education characterized with increased male and female enrolment, the current levels of access and utilization to water supply and sanitation facilities remain largely inadequate and gendered in EAUs. Among the contributing factors is limited gender scholarship to question the causes of gender inequalities in access and utilization of water and sanitation facilities in universities including selected EAUs. This paper aims to explore the gender responsiveness of access and utilization of water and sanitation facilities and to ascertain the underlying gendered causes of the current status of water and sanitation facilities in EAUs. The paper adopted cross-sectional gender focused study design. A total of 701 respondents were interviewed at both Makerere and Dar es salaam Universities. Qualitative gender disaggregated data was collected using semi-structured and in-depth interviews, focus group discussions and follow up site visits for observations. Water and sanitation facilities were geo-referenced and analysed using geo-statistics techniques and Euclidian distance in ArcGIS 10.1. Gender concerns were captured both in access and utilization modeling gender related criteria in the reclassification of the number of toilet per person. Strong evidence indicates that EAUs are gendered and exhibit severe deficiencies in water and sanitation facilities. Major contributing factors of the observed deficiencies in water and sanitation facilities were lack of gender focused research, rapid increment of student enrollment, lack of water and sanitation policies and prioritization, decline in government support associated with liberalization and expansion of universities among others. Based on these findings, there is need to improve and engender the current water and sanitation infrastructure, abstraction and storage (water harvesting) to accommodate the increasing number of students in EAUs. There is also need for gender focused research to be carried out to determine the most appropriate design and distribution of water and sanitation facilities to cater for the high numbers and diverse needs and interests of male and female students in EAUs.

Keywords: gender, water, sanitation, facilities, east african universities, makerere university, university of dar es salaam.

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I. Introduction

Increased global demand for higher education, inspired by Education for All (EFA), Millennium Development Goals (MDGs) with specific reference on access and gender has led to increased male and female enrolments (UNESCO 1998; Tiyambe and Adebayo 2004; and Mamdani 2007) in Universities including those in East African Universities (EAUs). For example, student enrolments increased from 2,712 in 1970 to 37,101 (44% females) in 2014 and from 14 in 1970 to 21,502 (36.5% females) in 2012 at Makerere University and at University of Dar es Salaam 2014 respectively. Half the number of these students lived in the same halls of residence designed in 1960s and 1970s.The number of students has exceeded the current university infrastructure, putting a strain on the limited and aged water and sanitation infrastructure most of which was designed in the 1950 and 1960s for very few male staff and students.

Due to persistent gender inequalities, the status of water and sanitation facilities in EAUs hides facts about male and female vulnerability and wellbeing. We need a critical feminist perspective to question the water and sanitation facilities in EAUs. International commitments on water and sanitation in education are useful in this inquiry. The approach presents high potential in understanding gender inequalities rooted in, and reproduced by, historic and structural male favored management to productive resources including water and sanitation resources in universities.

The global water deficit stands at 768 million people lacking access to improved drinking water and 2.5 billion people lacking access to improved sanitation services. The declaration on water and sanitation access and utilization as a human right (UN, 2010); Sustainable Development Goals (SDG) 6 with emphasis on secure water and sanitation for all for a sustainable world; the Millennium Development Goals (MDG) 7c's on the minimum requirement for water at protected community-level sources, such as tube wells, and for sanitation at household-level sanitation facility, such as household pit latrine (Cumming*et al.*, 2014) ; and its benchmark that focus on water and sanitation in some pre- university educational institutions like primary and

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secondary schools in developing countries (Sommer, 2012; Crofts and Fisher, 2012; WHO/UNICEF, 2012) are all recognized in this paper.

This paper highlights gaps in the MDG (7c) on water and sanitation benchmark, which treats communities and households as homogenous; and marginalizes both the qualitative and quantitative gender perspectives of water and sanitation at global level. In addition, the gender aspects in other communities like EAUs who use other sources of water and sanitation facilities like piped water and flush toilets have not been captured in the global water and sanitation statistical deficit. It is also not clear whether the declaration on water and sanitation access and utilization as a human right (UN, 2010) has been realized in EAUs and yet these institutions are least well understood in relation to feminist thinking, about water and sanitation. Male and female students being the main stakeholders in EAUs have diverse needs and interests related to access and utilization of water and sanitation facilities. For example, it expected that female students require more water and sanitary facilities for bathing and washing especially during menstruation cycle than their male counterparts. Therefore it is mostly female students who are likely to be more affected by lack of or inadequate hygiene and sanitation facilities in public places such as universities.

Several university based studies have focused on student enrolments, quality and relevance of education; funding and technological innovations (Kasozi, 2004; Mamdani, 2007; Bhatia; & Dash, 2010). There is limited information on gender responsiveness of water and sanitation access and utilization in Universities. This paper aims to 1) explore the gender responsiveness of water and sanitation facilities' availability, acceptability and accessibility in EAUs and to 2) ascertain the underlying gendered causes of the current status of water and sanitation facilities.

II. Theoretical Considerations

This study uses the theory of political sociology of water resources management (Mollinga, 2008) and the theory of water questions in feminism (Ahlers and Zwarteveen, 2009). The political sociology of water resources management theory stresses that water resources management is an in inherently political process which is based on the idea that water control is at the heart of water resource management and should be conceived as a process of politically contested resource use. According to Mollinga (2008), natural resources management (NRM) including water and sanitation resources has several components and dimensions that influence each other. Mollinga points out that NRM problem require an understanding of both natural resources systems and their interactions with human (management) systems which affect water provision, access and utilization. Water control has three dimensions: a technical/physical, an organizational/-managerial, and a social economic and regulatory. These generic categories refer to respectively, the manipulation of the physical flow and quality of water, the guiding of the human behavior that is part of water access and use, and the social economic, administrative and other structures in which water management is embedded and that constitute conditions and constraints for management and regulation.

The theory of water question in feminism highlights that water control perpetuates gender inequities (Ahlers and Zwarteveen, 2009). In the past, water resource management policies were driven by expanding supplies, or developing more sophisticated technologies to capture hitherto untapped sources of water, today's focus is primarily on institutional and legal reform. This raises the question of water allocation whose claim to how much water is provided which overshadows the previous dominant focus on distribution that is how to get a certain volume to a certain location at a particular time. Today's water questions involve complex distributional choices that are intrinsically political, yet it hides political choices of distribution through naturalizing, universalizing and objectifying abstractions (Ahlers 2005b; Boelens and Zwarteveen, 2005; Gleick*et al.*, 2002; Moore 1989; Zwarteveen 1998). This position is useful in articulating water and sanitation problems in EAPUs from a gender perspective by recognizing historical and current power dynamics in institutions which perpetuate gender inequality as a structuring force. To understand access and utilization of water and sanitation in EAUs, we position this study in a gender approach that recognizes the interaction of social, political and economic configurations as historical and dynamic. A gender analysis demands critical scrutiny of how particular conceptual constructs reify and reproduce boundaries and binaries that demand questioning, such as those between the natural and the social, institutions and human, which are important to this study.

Access and utilization of of resources including water and sanitation facilities is a right or opportunity to use, manage or control a particular resource (Nicholas et al., 1999). Resources may be economic (land or credit) political (participation in decision making in government or in local institutions like universities) and social (education and training). In general women require different levels of access and utilization of resources based on their productive, reproductive and community management roles (Moser, 1993), In the context of EAUs, both theories by Mollinga (2008) and Ahlers and Zwarteveen, (2009) question disputes and controversies rising from water resource management, access and utilization which result into gender inequalities. The main concern is that in water resources management, there are different individuals or groups

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involved who have different interests. The focus lies in the fact that societal issues around water management are proliferating (Joy et al, 2008).

Therefore, both political sociology of water resources management and water question in feminism theories are important to the questioning of gender inequalities in access and utilization of water and sanitation facilities and their underlying causes in EAUs. Key variables of investigation and analysis will include: availability (adequacy of water and sanitation facilities); acceptability (gender specific facilities, offering technical safety and use of water and sanitation facilities in a way that ensures privacy and dignity for females and males); and accessibility (whether water and sanitation facilities are accessible to everybody, without any threat or insecurity and discrimination). These concepts are investigated against the duty bearer obligation to respect, protect and fulfill their role to ensure that students' right to appropriate water sanitation facilities is realized.

III. Methods and Materials

The study was undertaken at two East Africa Universities namely; Makerere University, Uganda and University of Dare-salaam, Tanzania (Figure 1). Distance to toilet and number of toilet per person were modelled using spatial analyst in ArcGIS 10.1. For each University, toilet, water and storages facilities were visited and geo-referenced. For each toilet facility observations were made on the toilet type (seating or squatting) and status (availability, accessibility, acceptability, cleanliness).For water reservoir tanks in the toilet and those elevated on the buildings, the capacity of the water tanks was determined. Each facility was geo-referenced using Etrex 10 GPS with 2 m accuracy. The information was entered into ArcGIS version 10.1 to obtain toilet and water facility distribution maps for male and female students (Point maps). The normality of the data was crosschecked using geostatic wizard, and transformation performed to normalize the data. GIS layers were generated for each of the following parameters: toilet per student distribution, and water and storage facility distributions using krigging (interpolation) extended to the boundaries of each University. The toilet per person layer was reclassified using the Planning Guidelines for Minimum Numbers of Toilets at Public Places and Institutions in Disaster Situations adapted from The Sphere Project (2004) on toilet use for both short and long term as: 1 toilet to 30 female students and 1 toilet to 60 male students. Distance to toilet and water facilities maps were generated using the Euclidian distance function under spatial analyst tool in ArcGIS 10.1. These layers were reclassified using the standard plumbing code: residential, (0-10 m), exception (10-91m), public facilities (91-152m) and inappropriate for >152m. The amount of water required for a particular day was computed based on the toilet utilization and the standard required volume of water per person per utilization as 20-40 liters per user per day for conventional flushing toilets connected to a sewer. The water deficit per toilet was computed as a difference between the available water at each toilet and the required amount in a day.

A cross-sectional gender analytical design, using both qualitative and quantitative methods of research was adopted, to explore the gender responsiveness of access and utilization of water and sanitation facilities in EAUs.

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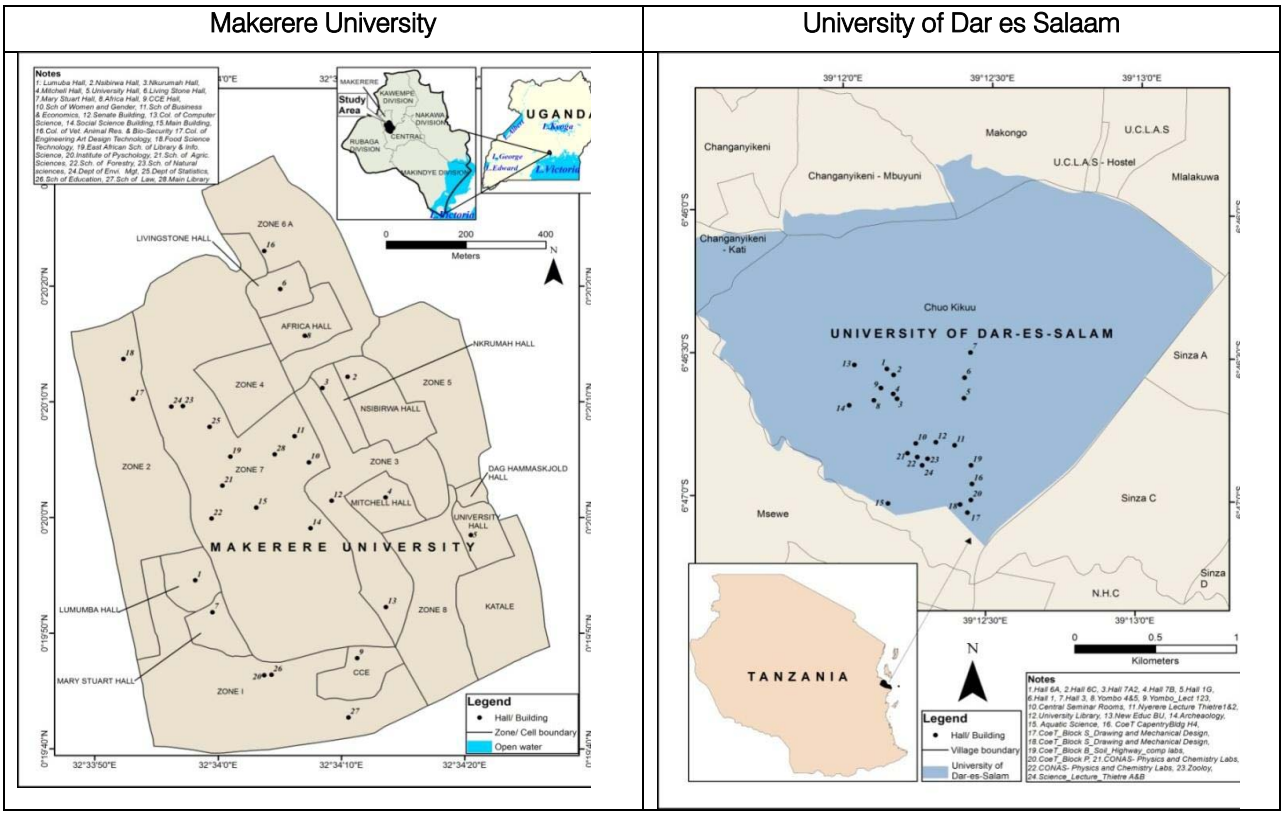

Figure 1 : Location of the study area

Both qualitative and quantitative data were collected to explore the current water and sanitation status through key informant interviews and semi-structured questionnaires administered to students at both universities.

Qualitative information was collected through key informant interviews. A total of twenty four (24) in-depth interviews were conducted, 12 interviews at each University with a sample of 16 (10 male and 6 female) from key respondents drawn from the university decision-making bodies and of 8 (4male and 4 female) key respondents drawn from student leaders at both universities. The objective of these key informant interviews was to allow for more in-depth investigation of gender issues related to the current status of water and sanitation and their gendered caused at both universities.

Qualitative information was collected through a questionnaire, administered to 1000 (one thousand) students was randomly selected at both universities with a proportionate distribution in the ratio of 50%. The 50% was again proportionately distributed with a ratio of 25 % male and female students respectively at both universities. This sample included resident and nonresident students. A total of seven hundred one (701) complete questionnaires were returned although the ratio of female to male student respondents was found to be disproportionately low as follows: 333 students [132 (36.6%) female and 201 (60.4%) male] for Makerere University and 368 students [158 (42.9%) female and 210 (57.1%) male] for University of Dar salaam.

Additional information was collected through focus group discussions (FGDs). A total of 8 (4 male and 4 female) FGDs was conducted with student leaders; 4 with custodians and 4 with cleaners at both universities. On average 8 student leaders (4 males and 4 females), 4 custodians (2 males and 2 females), 4 cleaners (2 males and 2 females) were invited for each of the focus group discussion. The objective of these discussions was to elicit information pertaining to gender issues, student's practices and behaviors in access and utilization of water and sanitation facilities in halls of residence and lecture theatres.

Follow-up site visits and observations were also conducted. An observation guide was generated with an intention to assess gender sensitivity and responsiveness of water and sanitation facilities in respect to water and sanitation availability, accessibility, acceptability, and adequacy, cleanliness of the facilities in lecture theatres and halls of residence; and student's behavior towards utilization of water and sanitation facilities.

Data collected from Key informants and observations were coded according to themes. Information obtained through questionnaires was entered in SPSS.

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IV. Results and Discussions

The objective of the study was to explore the gender responsiveness of the status of water and sanitation facilities' availability, acceptability and accessibility in EAUs.

a) Gender and Locations with Available Water and Sanitation Facilities

Distance to water and sanitation facilities is presented in Figure 2 and the area covered under each distance category is presented in Figure 3. At Makerere University, areas around lecture rooms and halls of residence are classified as residential. The pattern of exceptional, public facility condition rings is like an inversed R of 200 m width and about 1 km long. The inside of the above R and the boundaries of the University are classified as inappropriate (>152 m from the nearby water and sanitation facilities (NBWSF)) according to the Standard Plumbing codes. Areas under exceptional condition (10-91 m from NBWSF) (40.2%) dominant followed by public facility (30.9%) and inappropriate (28.1%). At University of Dar es Salaam, most of the northern part of the University has adequate water and sanitation facilities for both male and female students. Most parts of the southern parts are below the number of water and sanitation facilities required for females whereas most of the south eastern parts of are below the number required for females with Collage of Engineering and Technology (CoET) having adequate numbers of toilets for both male and female students. Residential conditions only cover less than 0.14% of Makerere University and 0.67% at University of Dar-esalaam. Residential area at Makerere University and University of as Dar es Salaam has uneven residential distribution of toilets.

With less 1% residential distributions, the female students are at a disadvantage because they require many toilets for their varied needs which make them use the toilets more frequently and for a longer times as explained by Lovell Banks (1991) [1].

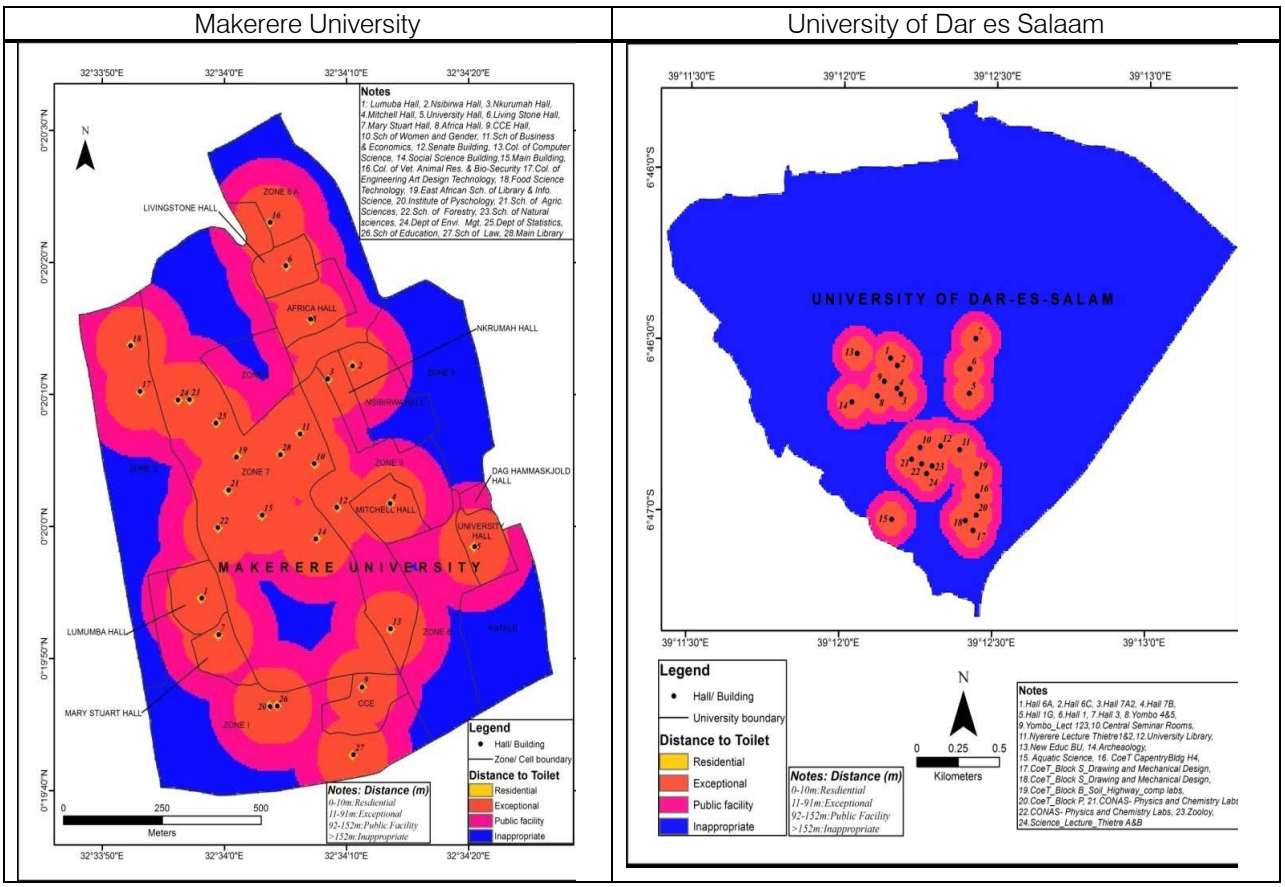

Figure 2 : Distance to toilets and water facilities at both EAUs

…Other factors contributing to longer bathroom stays for women are menstrual periods; urinary tract infections, more common in women than in men, which require more frequent trips to the toilet; pregnancy, which reduces bladder capacity; and, finally, clothing (women have more clothes to manipulate than men do).

(ibid, pg 275)

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Lovell Banks further affirms that availability of toilets for females has been a long standing feminist critique of public facilities that tend to favour males than females cite as: (Taunya, 1991; Barcas, 2005; Greed,1996).

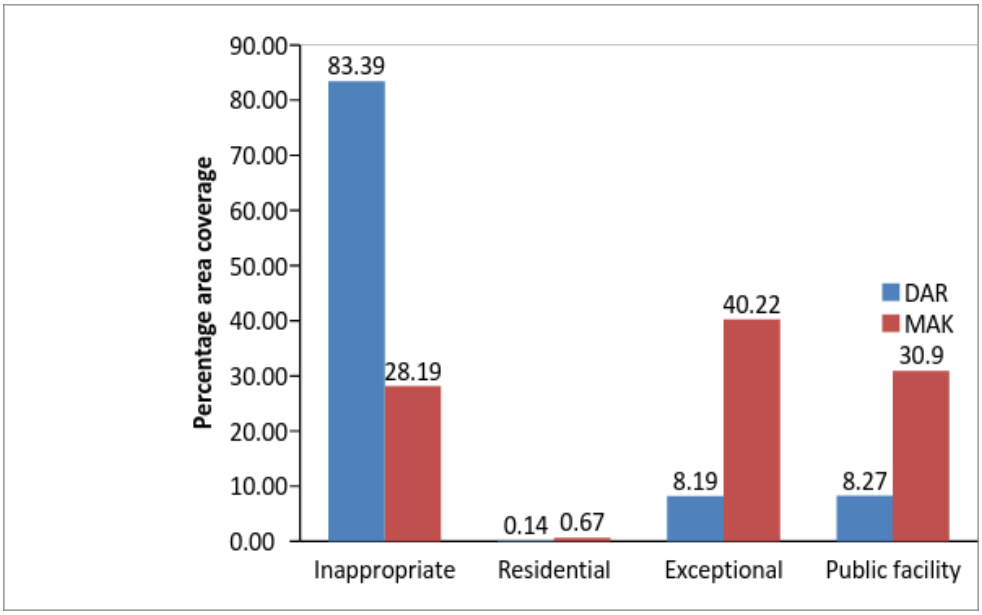

Figure 3 : Percentage of adequacy of toilet *distribution at both EAUs*

b) Gender Relations in Acceptability to Water and Sanitation Facilities

Figure 4 shows utilization of water and sanitation facilities at Makerere University and University of Dar es Salaam. Figure 5 depicts the area covered by each category of toilet per person. Generally at Makerere University there are water and sanitation inadequate conditions. Patches of favorable conditions for males and females are located to the western side, southern and northern zones of the university. Majority of the southern and eastern zones of the University was found to have inadequate water and sanitation facilities conditions. The zones of the University under inadequate conditions represent (66.85%), those adequate for males students represent 17.37% the rest is adequate for female students (15.78%). The rest of the university is inadequate at 84.22% meaning that although the university opened its gates to increased female students in the early 1990s not much has been done to make the environment comfortable for them.

Both universities have not paid much attention to the different interests on campus. Partly this is understandable because these structures were constructed before the female student numbers increased to the current numbers. Because the universities' do not consider the special interests of females therefore they promote a gender inequality that is questioned by feminists.

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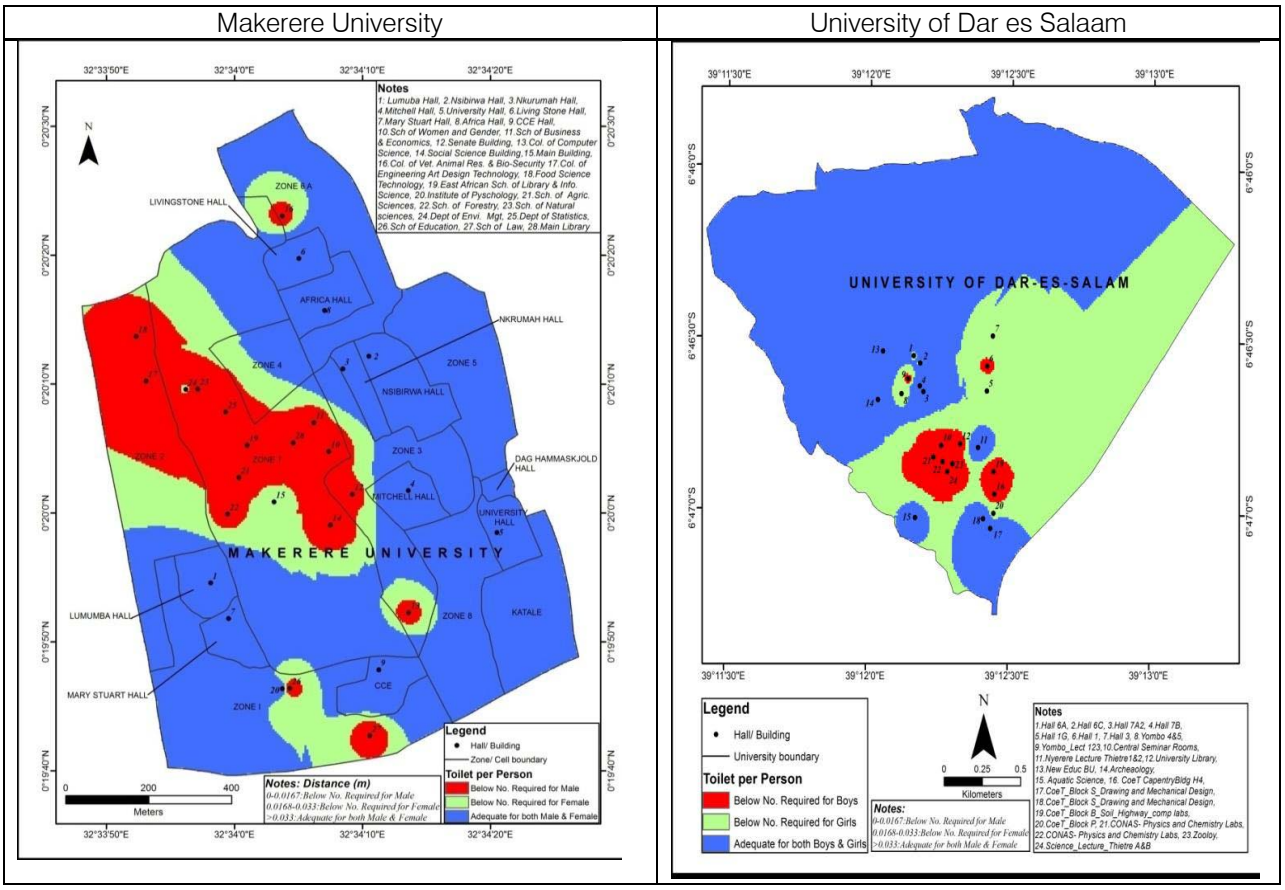

Figure 4 : Toilet per person at both East African Universities

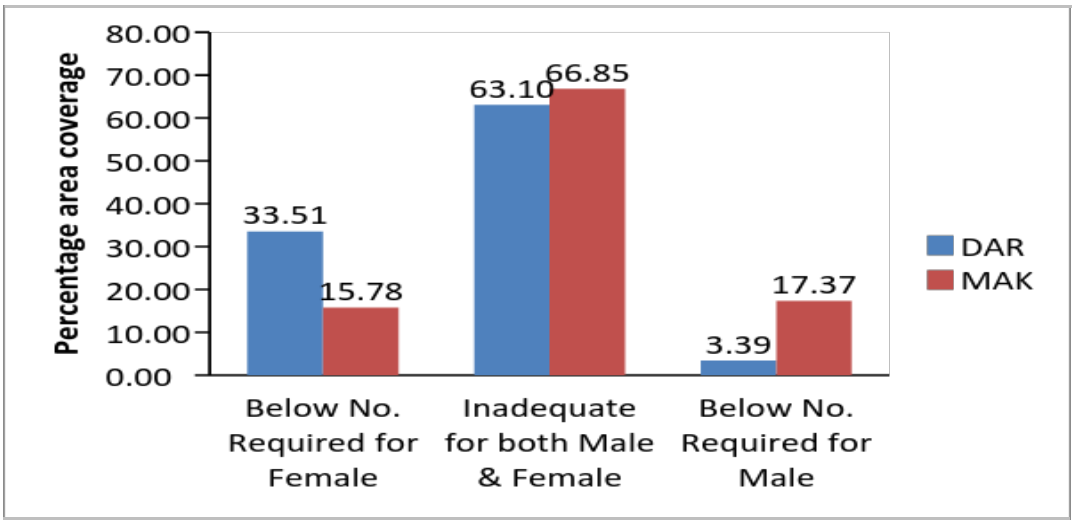

Figure 5 : Percentage area coverage for each category of toilet per person in EAUs

c) Gender differences in Accessibility of Water and Sanitation Facilities

Figure 6 shows water deficiency and Figure 7 depicts area covered by water deficiency. At Makerere University, the entire university is highly deficient in water (97%), and about 2% is moderately deficient, and less than 1% is not deficient. Areas with adequate quantities of water and sanitary facilities are Africa (female hall) and Nsibirwa male hall of residence with a student population of 510. At Nsibirwa, toilets have been modified from seating toilets and increased to squatting toilets with more water tanks installed. On the other hand, Africa (female) with a population of 498 promotes gender equality on campus. However if this residence is compared with Mary Stuart (female hall) with a high raise with 9 floors for female students with a population of 556 and it being located in a zone that is from slightly to moderately deficient in water supply points to the

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political nature of water provisioning across the university. High deficient levels are also evident at entire University of Dar es Salaam, However areas of slight water deficiency at University of Dar salaam are around College of Engineering and Technology (COET) and the new buildings housing at the Faculty of Education, Aquatic Sciences and Archeology.

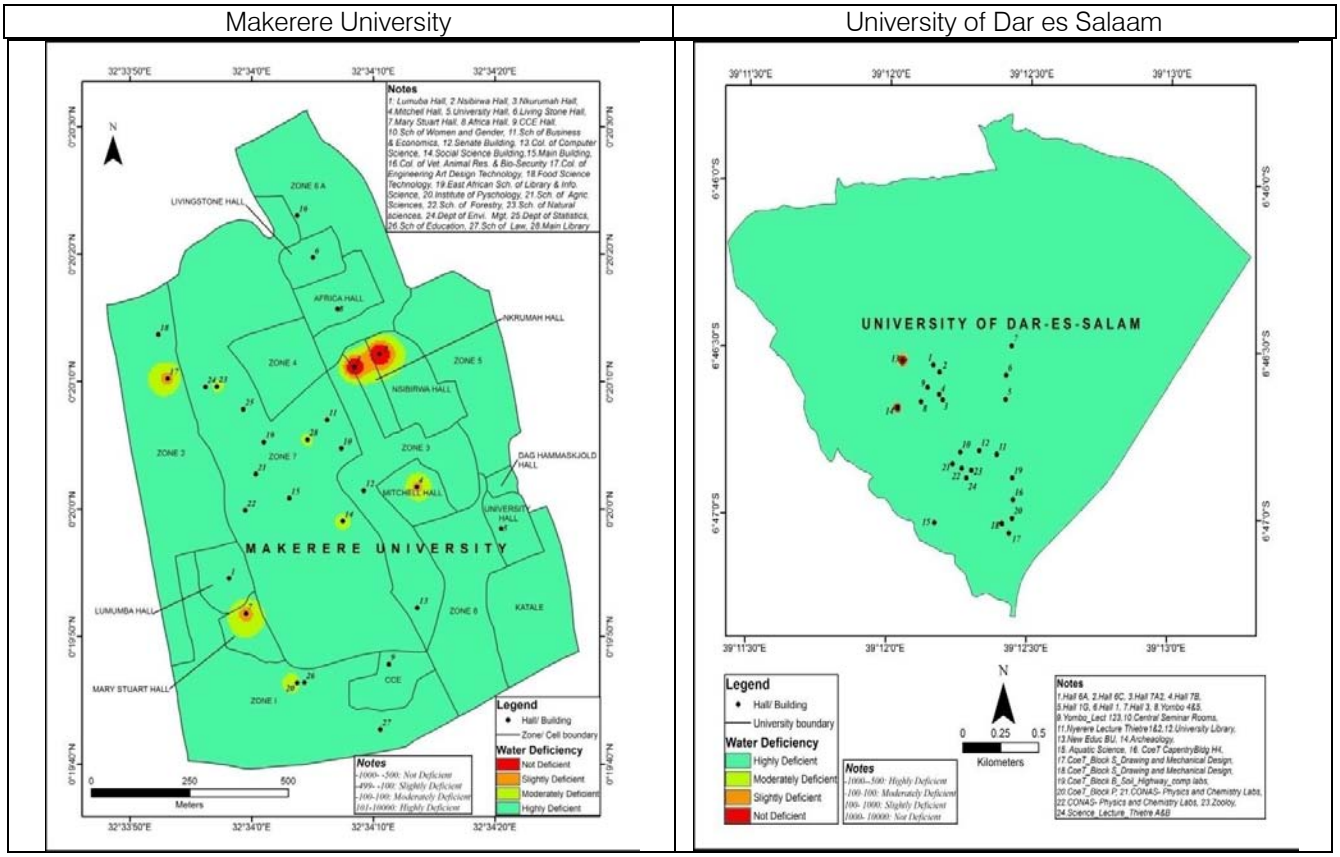

Figure 6 : Water Deficiency in both EAUs

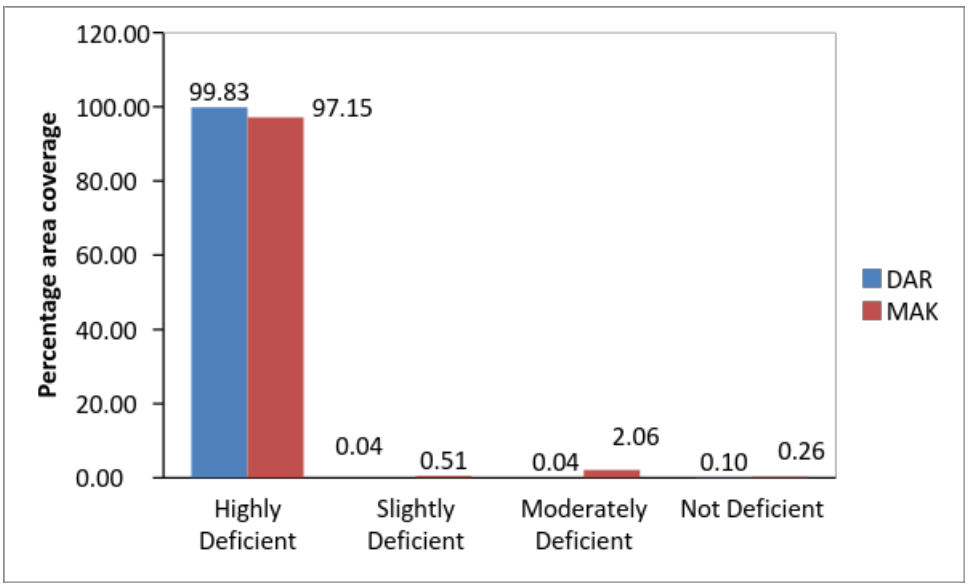

Figure 7 : Percentage area coverage under each water deficiency categories at both EAUs

In the context of the studied East African universities, deficiency in water and sanitation would imply violation of student's right to water and sanitation. This may have serious multiple and overlapping health, economic, and social impacts that disproportionately impact female students via impacts on behaviors like

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academic performance and indignity (Coburn et al. 2015).

According to the United Nations Human Rights (2010), women and girls don't need toilets and bathrooms just for defecation. They also have a much greater need for privacy and dignity when menstruating. Inaccessible toilets and bathrooms make them more vulnerable to rape and other forms of gender-based violence (Sommer, 2010; United Nations, 2010). In East African Universities, inadequate access and utilization of water and sanitary facilities by students would also mean that there has been laxity by university managers who are mandated to manage water supplies to incorporate the principle of human rights to water and sanitation in university planning processes (Hunter, 2010; Heller, 2015; and UN Committee on Economic, Social and Cultural Rights (2003). This also exemplified by the least priority of water and sanitation issues in their strategic plans and other key policy documents, and less more gender aspects.

d) Causes of Gender Inequalities in Water and Sanitation Facilities in EAUs

The study explored the gender responsiveness of access and utilization of water and sanitation facilities in EAUS so as to understand the underlying causes of the current situation. The underlying causes were attributed to:- lack of prioritization of gender needs and interests of water and sanitation facilities ; gender neutral culture of infrastructural maintenance; non existence of gender specific water and sanitation policies and legal frameworks in higher education; gender neutral expansion of higher education institutions; naturalizing and universalizing of higher education; gender inequalities and political choices of distribution of financial resources in higher education; lack of gender disaggregated data or information on water and sanitation in universities; increased demand for higher education and lack of gender responsive sanitary materials and student practices.

i. *Non Prioritization of Gender Needs and Interests of Water and Sanitation Facilities in Universities*

The two universities prioritized physical infrastructure like space shortages in terms of teaching rooms, working spaces, seminar/practical rooms, laboratories, staff offices as well as staff and student accommodation and cleanliness and beautification of the surroundings (University of Dar es Salaam Five-Year Rolling Strategic Plan 2010/2011–2014/2015, Makerere Strategic Plan 2008/09- 2018/19). Although Bartram and Cairncross (2010) highlight water supply and sanitation as development priorities, the ambitions of the two University's strategic plans hardly prioritized water and sanitation infrastructure to address the needs and interests of male and female students increased numbers. This raises the water question in feminism of water and sanitary facilities allocation, claim to how much water and sanitary facilities are provided and distributional dimensions on how to get a certain volume to a certain location at a particular time. In other words, the University's strategic plans hide political choices of male and female who are the main users of water and sanitation facilities in EAUs (Mollinga, 2008; and Ahlers and Zwarteveen, 2009).

Focus group discussions (FGDs) conducted with male and female students pointed out a number of challenges in addressing water and sanitation as priorities. Students reported the diversity among university student population with varied needs and aspirations to life goals. They reported that male and female students develop strong aspirations to life goals towards completion of their studies as their main priority. However, it was noted that majority of student whom are females developed additional needs for water and sanitation than their male counterparts. They reported another set of both male and female students who want to be associated or identified with the universities as a priority regardless of aspirations to life goals. This group of students did not complain of any deficiencies in the university operations. To them they perceived water and sanitation as secondary needs. The study further points out other male and female students who were unaware that water and sanitation are basic needs or human rights which must treated as priorities and claimed from the university authorities who are charged with obligations to provide favorable water and sanitation facilities. While other students perceived toilet issues neither as dirt, private and shameful and not important topics for discussion in public nor cannot be demanded publicly. Lack of prioritization of gender concerns and maintenance of infrastructure poses all kinds possible ill-health to female students. Based on the above analysis in the EAUs, there was lack of prioritization of gender concerns and male and female students have not conceived water and sanitation as gender and basic needs or human rights as requiring political contestation with ultimate goal of improving their health wellbeing

An interaction with a key informant at Makerere University made reference to the mission, vision and core values as university main priorities.

> *We prioritize teaching and learning as our core functions. There are many urgent, yet competing priorities in the university like expansion of study centers, research, increase student enrollments and building institutional partnerships. Water and sanitation facilities which do not attract revenue to the university nor do they add scores on university ranking. These are mere fixed utilities, private and dirt not critical priorities in university budget frameworks.*
>
> *(Male Key informant, Makerere University)*

This statement confirms our earlier statement that water and sanitation issues were not priority issues to university management. This position of university

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management propagates and reproduces gender inequalities at the studied universities.

ii. *Gender neutral culture of Water and Sanitation Infrastructural Maintenance*

There were water and sanitation infrastructure systems e.g. water stand standpipe, water reservoir tanks, toilets systems among others that were no longer used because they were no longer repaired or maintained and they were too old because of lack of maintenance in their earlier stages of deterioration. For example students at University of Dar es Salaam collect water from outdoor tanks provided by water vendors outsourced by the university to supply water using water tracks. This finding is supported by Sanders and Fitts (2011) who indicated that water supply facilities were affected by systems which were not maintained and therefore falls into disuse. Surprisingly, new facilities at the two universities are built, but are left with no funds for water and sanitation operation and maintenance. This creates a "use-it-or-lose-it environment," resulting in future over expenditure when they breakdown (Key informants Makerere University and University of Dar es Salaam Feb. 2015). This again confirms universities' lack of gender prioritization in water and sanitation interventions in EAUs.

An observation was made on status of water and sanitation facilities in halls of residence and lecture theatres at the two universities. Majority of these facilities in the two universities were not adequately functioning due to insufficient water supply. The facilities were characterized with blockages, bust pipes, leakages as a result of aged pipes and overload of water and sanitation wastes causing flow backs. Although Samwel and Gabizon's (2009) recommend indoor toilet facilities for proximity purposes with female friendly facilities, both indoor (halls of residence) and outdoor (lecture theatres) toilets displayed inadequate sanitation with floors covered with waste water, making the environment not favourable, unhygienic and a threat to especially female students' health. This unfovarable status led to less utilization due to the stench coming from dirty toilets. Similar findings were reported in the United Kingdom and Sweden by (Barnes and Maddocks and Lundblad et al. 2002). The findings also support those of Jasper et al. (2012) in their study of developed and developing nations and their findings revealed inadequacies in water and sanitation provisioning in schools. The toilets that were conveniently used in this study were located at Malimu Julius Nyerere and CoET lecture theatres at University of Dar es Salaam and Africa and Nsibirwa halls of residence at Makerere University.

The impact of inadequate water and sanitary facilities was also characterized with long queues as stated:

> *Toilets and bathrooms in university of Dar es Salaam were made for very few students. A room in the hall of residence that was designed to accommodate two students is currently being occupied by eight to twelve students. A proportional increase in toilets and bathrooms has not been made to meet diverse water and sanitation needs of male and female students. In the morning and evening we queue for toilets and bath facilities. We sometimes miss or go un bathed or postponed toilet use especially when students are scheduled for early morning lectures. For us female students when we are in our menstruation periods, our desire is to have adequate privacy. However, we do not enjoy our privacy because bathing facilities are shared due to inadequacy. Students with heavy menstruation period flows that require frequent changing of sanitary towels do not attend lectures due to non functional of water and sanitary facilities*
>
> *(FGD, University of Dar es Salaam).*

A number of feminists have argued that females should be provided with not only adequate toilets but the surrounding environment should be welcoming and allowing females to enjoy privacy while using these facilities as opposed to dirty male spaces (Taunya Lovell Banks, 1991, Barcan, Ruth (2005)[1] Greed (1996)[2]).

> *The construction and built-environment professions which have decision making powers over toilet provision. It is argued that the underrepresentation of women within these groups inevitably affects members' a spatial (cultural and social) attitudes towards toilet provision, and the results are manifest in the nature of the gender-biased nature of the spatial end product (namely lack of provision*)
>
> *(see Greed (1996, pg. 573-574)*

Upadhyay *et al.* (2007) highlights that avoidance of toilet use may contribute to a high risk associated continence-related issues like urinary tract infections. This assertion is supported with the finding of this study that students' common illnesses were urinary tract infections (UTIs) due to postponement of releasing fecal and urine, typhoid due to consumption of contaminated water, malaria as a result of water logging and stagnated pools of water in toilets and bathrooms.

Both the male and female students also reported vandalism and theft of their water and sanitation facilities in the halls of residence and lecture theatres. These acts of vandalism take a number of forms including theft of valuable metal pipes, fittings and manhole covers leading to an increase in the utility's

[1] Dirty Spaces: Communication and Contamination in Men's Public Toilets. Journal of International Women's Studies, 6(2), 7-23. Available at: http://vc.bridgew.edu/jiws/vol6/iss2/2

[2] C H Greed (1996) Planning for women and other disenabled groups, with reference to the provision of public toilets in Britain. Environment and Planning A 1996, volume 28, pages 573-588. http://www.environment-and-planning.com/abstract.cgi?id=a280573

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maintenance costs. The extent of vandalism and theft experienced in studied universities have a direct and significant impact on the performance of a utility, and where the service is negatively affected, this will ultimately impact on the well-being of university communities especially on male and female students who are the main users of water and sanitary facilities on campus. The status of water and sanitation facilities in EAUs is also exacerbated by disputes and controversies, compounded by gender neutral culture of infrastructural maintenance. This status perpetuates gender inequalities in water allocation, distribution and utilization in EAUs.

iii. *Nonexistent of Gender Specific Water and Sanitation Policies and Legal Frameworks in Higher Education*

Gender specific policies and frameworks for sustainable sanitation and water management are a crucial pre-condition for the implementation of any sanitation and water management measure, as they are the basis for their success and sustainability (GWP 2008). Uganda and Tanzania had national water policies developed and were being implemented. The policies lay a foundation for sustainable development and management of water resources in the changing roles of government from service provider to that of coordination, policy and guidelines formulation and regulation (United Republic of Tanzania, (2002) and The Republic of Uganda, (1999). Analysis of National water policies in Uganda and Tanzania were conducted. Roles and responsibilities of different stakeholders and those of educational institutions to provide water and sanitation facilities to their communities were clearly spelt out. This means that the studied universities are responsible for customizing these policies and implementing them on behave of governments. However, responsible ministries and organizations were not disseminating the policies to the intended users including universities. The study also found out that universities had not formulated their own water and sanitation policies and regulations. An interaction with key informants and students at both universities concurred that they had no knowledge of existence of water and sanitation policies and regulations nor were they aware of the importance of those policies and regulations towards improvement of water and sanitation systems and services in the universities.

This means that students who are the main users of water and sanitation are included in decisions making regarding planning, construction, operation, maintenance and management of university based water and sanitation interventions. This may reproduce gender inequalities and further create boundaries and binaries of femininity and masculinity (Knights 2015).

A lack of a sound institutional framework on water and sanitation was found to be another root cause of many failures of water and sanitation provision at the studied universities. Absence of university water policies and regulations impended clear planning, management and coordination of water and sanitation interventions at University based user units. Major outcome due to absence of water and sanitation facilities is declining water and sanitation facilities and services leading to poor cost recovery and ultimately failed investments that do not meet either current or future demand (World Bank, 2014).

A study conducted globally by Montgomery and Elimelech (2007) discussed that in many developing countries, difficulty in enforcing standard creates a situation where water and sanitation does not receive due attention. A study in Romania showed that the government lacked experienced staff, inappropriate institutional framework, unclear role and responsibilities, inefficient management. Another study conducted in Buenos Aires by Hardoy and Schusterman (2000) mentioned that the failure to extend water and sanitation services was due to the lack of appropriate social policies and the lack of proven models.

iv. *Gender Neutral Expansion of Higher Educational Institutions*

The extensive widening of access to primary and secondary education has been attributed to a rapid increase in the number of people at the traditional ages for attending higher education institutions, and a higher proportion of secondary school graduates progressing to thread their way to higher education. Until independence, Makerere University was the only HEI in East Africa. To date Tanzania has 10 public and 18 private universities while in Uganda, there are currently 8 public and 30 private Universities. Expansion of higher education institutions in Africa face social economic challenges that begun from the 1980s and the subsequent structural adjustment reforms undertaken by many African governments led to the gross underfunding of higher education, which had been mainly supported by public funds (Moody's 2012; Arestis & Sawyer, 2004; Teferra and Altbach, 2004). In Uganda and Tanzania, the costs for operation and maintenance of higher education infrastructure face fiscal problems with water and sanitation infrastructure receiving almost no attention. Fiscal challenges problems are also experienced by wealthy industrialized nations, although the magnitude of fiscal problems is greater in Africa than anywhere else in the world (Moody's 2014; Teferra & Altbach 2004).

e) Gender Opportunities and Constraints of Utilization of Water and Sanitations Facilities

i. *Naturalizing and universalizing Higher Education*

Tanzania and Uganda are among the countries who signed the commitment to implement Education for All (EFA) and The Millennium Development (MDG) goals. The purpose of EFA is defined as meeting the basic learning needs by 2015 for every person (Child,

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youth and adults) to benefit from educational opportunities. EFA Goal 2 on access and Goal 5 on Gender remains a strong agenda in education sector implementation in countries of Tanzania and Uganda (ESSAPR 2012-2013, SEDP II 2010). The Millennium Development Goals (MDGs) is meant to be achieved by 2015. The Goals respond to the world's main development challenges. The MDGs were drawn from the actions and targets contained in the Millennium Declaration that was adopted during the UN Millennium Summit in September 2000. MGD Goals 2, 3, 6 and 7 on universal primary education, promotion of gender equality and other diseases and ensuring environment sustainability. EFA and MDGs respectively remain part and parcel of countries national development plans (ESSAPR 2012-2013, SEDP II 2010). Increased demand for higher education is also emphasized in 1998 by UNESCO Declarations during the World Conference on Higher Education. Article 26(1) of the Universal Declaration of Human Rights reaffirms "*Everyone has the right to education . . . higher education shall be equally accessible to all on the basis of merit.*" Increasing the participation and role of women in higher education was also emphasized (Altbach *et al*. 2009).

In response to fulfill the commitments of EFA and MDGs, Tanzania and Uganda Governments established the Universal Primary Education (UPE) policy in 1995 and 1997 respectively. To cope up with increased pupil enrolments governments have established new schools, provided grant aiding of community schools, licensing and registration of private schools.

Tanzania and Uganda governments have used interventions such as liberalization and Public Private Partnership to ensure equitable access to higher institutions of learning. These interventions include; sponsor, support and admit students to tertiary institutions; implementation of the student loan scheme; affirmative action of awarding of 1.5 for and 1.1/2 points for Uganda and Tanzania respectively to all female candidates to assist them gain tertiary admission; implementation of the district quota system for admission of students to public universities; provision of scholarships; License private universities and institutions; and expansion of Higher Learning Institutions.

Despite massification of education in Tanzania and Uganda, there has not been new water and sanitation infrastructure developed to meet increased number of students at universities. The little infrastructural improvement has majorly focused on expansion of teaching and learning and administration with limited consideration to expand water and sanitation infrastructures especially in halls of residence and lecture theatres. A discussion with key informants at the two universities revealed that configurations and modifications of toilets were made on old buildings which are already strained with old water and sanitation systems. An observation during assessment of water and sanitation at the two universities indicate that new infrastructural developments and modifications of water and sanitary facilities were not addressing the varied needs and interests of student with special needs.

ii. *Gender Inequalities and Political Choices of Distribution of Financial Resources in Higher Education*

Financing and cost recovery are key issues for sustainable water and sanitation schemes (Osumanu, 2010). The impact of better and gender responsive university financial systems on improving the provision for water and sanitation at universities may have direct implication on improving the health wellbeing of male and female students or indirect for example on improving male and female student performance due to reduced water and sanitation related illnesses especially among female students who use more water than their male counterparts.

The study found out that capital and operating budgets at the two universities were reported to be insufficient due to the declaiming role of governments to fund higher institutions of learning. These findings support those of (Moody's 2012; sawyer 2004; Teferra and Altbach 2004) who indicated that the myriad of social economic challenges that plagued Africa, beginning from the 1980s and the subsequent structural adjustment reforms undertaken by many African Governments led to the gross underfunding of higher education, which had been mainly supported by public funds. Another study done by Telmo (2002) mentioned that in Mali the lack of 34 financial means by government was identified to be the main obstacle to the improvement of water supply and sanitation. Several authors (Moody's 2014; Teferra & Altbach, 2004) also report that similar fiscal problems are also experienced by wealthy industrialized nations, although the magnitude of fiscal problems is greater in Africa than anywhere else in the world. This situation is also coupled with pressure from the International Monetary Fund (IMF) and the World Bank to restructure its economy.

Key informants at the two universities concurred with the above scholars and revealed that the costs for operation and maintenance of higher education infrastructure face fiscal problems. The informants further reported that universities were constrained with teaching and learning financial demands with small budgets to address water and sanitation emergencies at universities.

iii. *Lack of Gender Disaggregated Data or Information on Water and Sanitation in universities*

The importance of accurate and reliable statistical data for proper planning and development of water and sanitation in universities cannot be

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overemphasized. The objective of statistical data is to build a reliable and accurate water and sanitation profile in universities, which is used to negotiate with government and development partners. It also guides the planning and design of intervention programmes. Key informants and survey with students at both universities were in tandem that University duty bearers responsible for the provision of water and sanitation have not engaged in data collection, analysis to define water and sanitation needs for male and female students as priorities.

According to NETSSAF (2008), the purpose of the baseline data collection within the planning procedure is to collect background information that is essential to determine the requirements for an adequate water and sanitation in an institution, both from a technical point of view, and from the user's perspective. Water and sanitation baselines need to be conducted through a comprehensive, participatory evaluation of the current level of services and the perceptions of the users towards sanitation and water within an institution. The objective of this approach is not only to facilitate participatory decision making in the planning process, but also to improve further designs to meet male and female student user needs and to address the water and sanitation operation and maintenance challenges of day-to-day service delivery.

This challenge is due to lack of an institutional water and sanitation monitoring framework. The lack of gender focused has led to very little effort to upgrade or monitor water and sanitation infrastructure. Yet water and sanitation prioritization and monitoring indicators would be useful on focusing on the hardware or software (systems) to deliver water and sanitation, quantity of water and sanitation of a given quality accessible by users (Moriarty *et al.*, 2011), or the safety of a facility that is easily accessible and sustainably operated at the user unit level (Potter *et al.*, 2011).

iv. *Increased Demand for Higher Education*

A study done by Gleick (1998) mentioned that water availability was affected by anthropogenic factor which was the population growth. For example a research done by Vairavamoorthy et al. (2007) showed that the availability water sources throughout the world were becoming depleted and this was aggravated by the rate at which populations were increasing, especially in developing countries.

The major implication for the growth of a young population lead to an increase in demand for social services like University education and water and sanitation facilities, which are not keeping pace with the growth. The unlimited population growth has ultimately outstrips the ability of the economy and institutions of higher education to meet the demand for water resource availability as is the case at Makerere University and university of Dar es Salaam. The findings support those of Panayotou (2000) and Madulu (2004) who highlighted serious concerns as to the effect of population growth on local resources such as water and sanitation. The lack of these services threatens not only the health and the environment of University communities but also that of people living in formal urban areas (McGranahan, (2007).

The situation has been exacerbated by the growth of housing infrastructure of towns and cities in Kampala and Dar es Salaam who have been connected to the old water supply and sewerage systems. An observation was made in the studied universities that although there were direct connections to water or sewage service, majority of these facilities were not adequately functioning due to system overload (Asoka *et al.*, 2013).

In an attempt to address the water and sanitation challenge, the universities have taken decisions to ration water. For example, at the University of Dar es Salaam approximately 10.000 liters of water is pumped in the morning at 5:30 and 7:00 in the morning and evening in lecture theaters and halls of residence leaving most of entire day and night without water (KI, UDSM). Higher population densities, combined with unequal access to adequate piped water, sanitation and refuse collection, mean that a large proportion of less affluent urban populations are at risk from faecal contamination and other environmental hazards.

v. *Absence of Gender Responsive Sanitary Materials and Student's Practices*

This section discusses anal sanitary materials used after defecation, sanitary for menstruation and students practices.

a. *Anal Cleansing Materials and Hand Washing Practices*

Anal cleansing is an essential part of overall personal hygiene. Not cleaning after defecation can lead to irritation of the surrounding skin, cystitis (mainly for girls and women), it is also an embarrassment because of odor. In the perspective of human rights to water and sanitation, University male and female students need to be availed with anal cleansing facilities and materials, taught and motivated to follow hygienic anal cleansing practices. However, findings from this study reveal that majority students (70.90%) males (81.90%) and (90%) female at University of Dar es Salaam and (77.7%) male and (82.9%) female at Makerere University were not provided with toilet paper for anal cleansing after defecation. Students in FGD at University of Dar es Salaam reported that it is a Tanzania custom for a male or female to use water with or without soap for cleansing the anal area after defecation. This assertion supports an observation made that toilet paper and soap are not being provided in all student toilets. Instead, buckets, and mugs were available in toilets or in the toilet area for collecting water for anal cleaning after defecation. The

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fact that the University is highly water deficient which violets the custom of students at University of Dar es Salaam majority of whom are Muslims. Majority students at both universities used newspaper or any hard paper material as toilet paper, stone, stockings, handkerchiefs, stockings, underpants which eventually caused toilet blockages to sewerage systems. Both male and female students carried their own toilet paper while others defecated without cleaning because they could not afford buying toilet paper. Students at the two universities had reservations on the practice of carrying own toilets paper as stated:

> *When a student is seen with toilet paper, physiologically his or her friends think that he/she will soon be going to the toilet. We also fear that carrying toilet paper in our book bags or pockets has health implications associated with fungal infections.*

(Female FGD, University of Dar es Salaam &Makerere University)

Although this argument seems convincing, the scope of the study did not carry out a deep analysis to prove the assertion. However, given the unsanitary conditions in the university toilets, a further study need to be conducted to investigate whether toilet paper in toilets is more prone to be contaminated with diseases compared to that carried by students in their bags or pockets.

Literature exists on anal cleansing practices Pre University institutions. However, the scope of this scholarship has not been extended to Higher Institutions of learning including UDSM and Mak. The universities themselves have not conducted awareness creation on student's use of sanitary facilities and practices are ignored as stated by a key informant:

> "*I believe that everyone is a grown up person and think that there is no need for training grownups how to use the toilet and how to clean their bottom. Toilet manners are taught at home because culture begins at home. In my culture, talking about toilet issues is taboo. Teaching a grown up person on how to use the toilet and how to clean his/her bottom is taboo plus. As an old educated man, people might think that I have run out of ideas"*
>
> *(Key Informant University of Dar es Salaam)*

Some studies also highlight that anal cleansing is often ignored in presentations on hygiene and sanitation. The reason for this is that, in almost all cultures, dealing with or touching human feces is surrounded by many taboos. Because of these taboos, it sometimes seems easier to "just forget" about the subject (http://www.wsp.org/Hygiene-Sanitation-Water-Toolkit/BasicPrinciples/AnalCleansing.html (accessed 11/06/2014)

An assumption that UDMS and Mak students as grownups with adequate knowledge on the use of toilets without considering their cultural, social and economic backgrounds, does not promote health and cut down the costs of ill health treatments and repairs of University sanitary facilities. The presence of policy with an all inclusive frame work on proper water and sanitation practices of toileting and hand washing with soap after anal cleansing and convenient materials for disposal would yield health benefits. Cultures promoting say the use of soil, ash or sand to clean the hands after defecation in the absence of water and soap are prone to contracting and transmitting diseases like diarrhea and helminth infections because hands carry microbes and other pathogens if not properly washed (GWP 2008).

b. Sanitation for Menstruation Management

Sanitary bins to dispose of female used sanitary towels though few to match with the number of female student users were available in all toilets at both universities. The challenge was that whenever sanitary bins filled up, female students resorted to throwing them on the floor or placing them on the water cistern. This practice was observed at both universities in halls of residence and lecture theatres. Such situation led to littering of the place which attracted flies. A few female students reported continuous menstrual periods by mere look at used sanitary towels as state by a female student:

> "*Whenever I see used sanitary towels littered on the toilet floor, I straight away start menstruating regardless of my menstrual cycle. I menstruate throughout the University semester period. This has not only been affected my economic status due to money I spend on buying sanitary towels, but it has also limited my social interaction with fellow students because I feel like smelling blood all the time. Psychologically I feel that my reproductive health function has been affected and maybe I never have children when I get married. Sometimes I feel like dropping out of University but my parents will not understand my problem"*

(Female student at University of Dar es Salaam, Nyombo lecture 4&5)

The locations of sanitary bins was also said to be a challenge. Through observation, sanitary bins were placed outside the toilet, close to the hand wash basins. Students reported that they felt uncomfortable carrying used sanitary towels from the toilet to an open area where everyone else waiting in the queue to use the toilet would see them dropping them in the bin. Due to this fear, students instead resorted to leaving them on the toilet floor, place them on toilet water cistern or drop them in toilet causing blockages. The cleaners were being tasked to place them in the right facility. Furthermore, Universities did not have incinerators instead outsourced companies for safely disposal.

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According to records at University of Dar es Salaam, the companies' collection was limited to once a week

V. Conclusions and Recommendations

The selected East African Universities exhibit severe water and sanitation deficiencies. This status has perpetuated gender inequalities in availability, acceptability and accessibility of water and sanitation facilities. The link between natural resource management and their interactions with management systems which affect water provision, access and utilization has not been understood by EAUs as political process based on water control. The questions in feminism of water and sanitary facilities allocation claim to how much water and sanitary facilities are provided and distributional dimensions on how to get a certain volume to a certain location at a particular time are hidden and limit political choices of male and female who are the main users of water and sanitation facilities in EAUs.

Major contributing factors of the observed deficiencies in water and sanitation facilities were lack of gender needs and interests prioritization of water and sanitation; gender neutral culture of infrastructural maintenance; non existence of gender specific water and sanitation policies and legal frameworks in higher education; gender neutral expansion of higher education institutions; naturalizing and universalizing of higher education; gender inequalities and political choices of distribution of financial resources in higher education; lack of gender disaggregated data or information on water and sanitation in universities; increased demand for higher education and lack of gender responsive sanitary materials and student practices.

There is need to improve the current water and sanitation infrastructure, abstraction and storage (water harvesting) to accommodate the increasing number of students, need to formulate, gender mainstreaming water and sanitation policies into national frameworks, students behavior change, sensitization campaigns, need for a study to be carried out to determine the most appropriate design and distribution of water and sanitation facilities to cater for the high numbers of students. There is also need to assess student's perceptions and adaptive measures to the current water and sanitation status in East African Universities.

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