

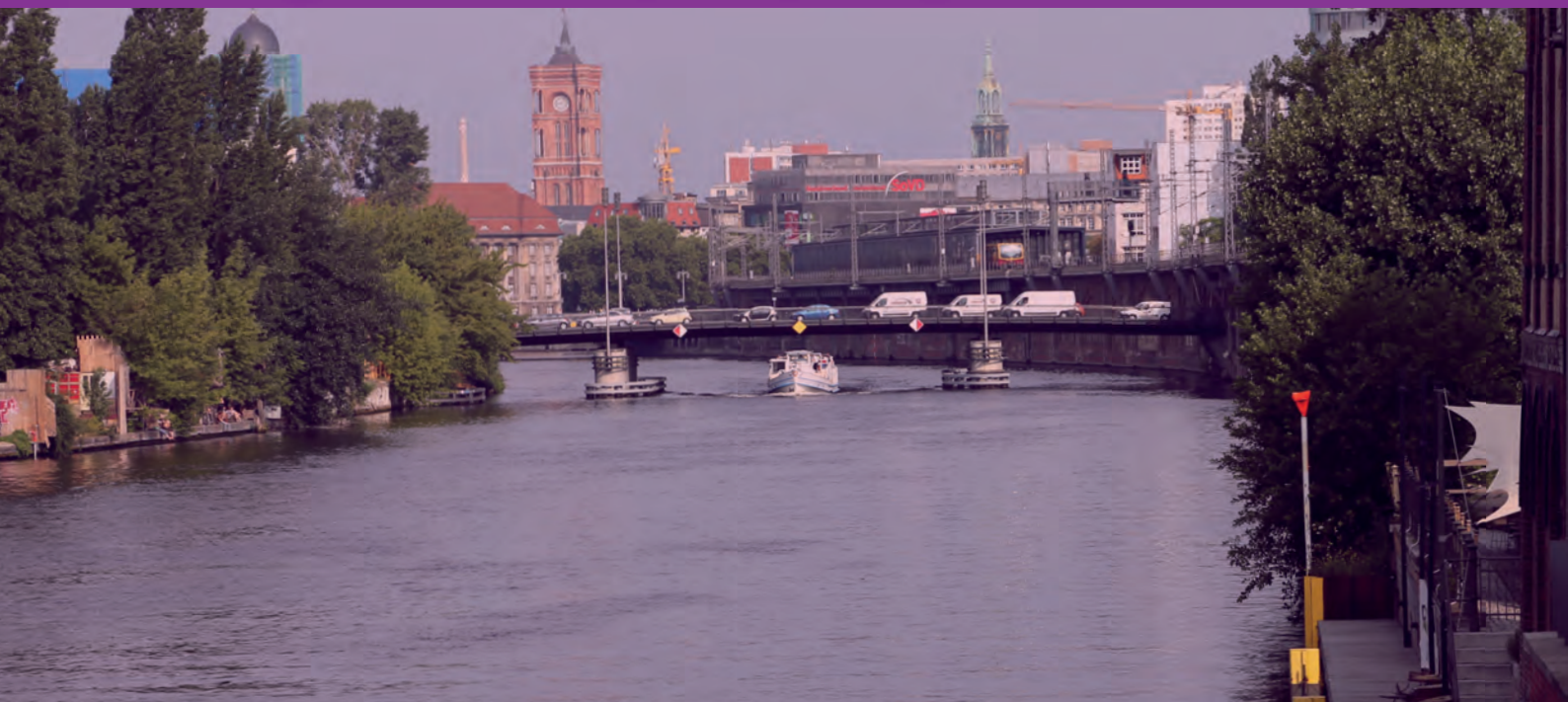
ISSN 2056-4856 (Print)
ISSN 2056-4864 (Online)

WATERLAT GOBACT

NETWORK

WORKING PAPERS

**Water politics and management:
findings from Africa, Asia, Europe and Latin America**



Vol. 4, N° 2

(In English, Portuguese and Spanish)

Newcastle upon Tyne and Buenos Aires, June 2017.

Cover picture: Spree River, flowing through Berlin, Germany, 7 May 2013.

Source: [WATERLAT-GOBACIT Flickr collection](#) (Attribution-NonCommercial Creative Commons)



ISSN 2056-4856 (Print)
ISSN 2056-4864 (Online)

WATERLAT-GOBACIT NETWORK WORKING PAPERS

Vol. 4, N° 2

Thematic Area Series

Thematic Area 3 - Urban Water Cycle and Essential Public Services

**“Water politics and management: findings from Africa, Asia,
Europe and Latin America”**

José Esteban Castro (Editor)
Newcastle upon Tyne and Buenos Aires
2017



WATERLAT-GOBACIT Research Network

5th Floor Claremont Bridge Building, NE1 7RU Newcastle upon Tyne, United Kingdom

E-mail: waterlat@ncl.ac.uk

Web page: www.waterlat.org

WATERLAT-GOBACIT NETWORK Working Papers

General Editor

Jose Esteban Castro

Emeritus Professor,
Newcastle University
Newcastle upon Tyne, United Kingdom
E-mail: esteban.castro@ncl.ac.uk

Editorial Commission: ([click here](#))



ISSN 2056-4856 (Impreso)

ISSN 2056-4864 (En línea)

Cuadernos de Trabajo de la Red WATERLAT-GOBACIT

Vol. 4, N° 2

Serie Áreas Temáticas
Área Temática 3 - El Ciclo Urbano del Agua y
los Servicios Públicos Esenciales

“Política y gestión del agua: resultados de investigación de
África, Asia, Europa y América Latina”

José Esteban Castro (Editor)
Newcastle upon Tyne y Buenos Aires
2017



Thematic Area Series

TA 3 - Urban Water Cycle and Essential Public Services

Title: Water politics and management:
findings from Africa, Asia, Europe and
Latin America

Corresponding Editor:

Jose Esteban Castro

Emeritus Professor,
Newcastle University
Newcastle upon Tyne,
United Kingdom
E-mail: esteban.castro@ncl.ac.uk

Corresponding authors:

For comments or queries about the
individual articles, contact the relevant
authors. Their email addresses are
provided in each of the articles.

Serie Áreas Temáticas

AT 3 - El Ciclo Urbano del Agua y los Servicios Públicos Esenciales

Título: Política y gestión del agua:
resultados de investigación de África,
Asia, Europa y América Latina

Editor Correspondiente:

Jose Esteban Castro

Profesor Emérito,
Newcastle University
Newcastle upon Tyne,
United Kingdom
E-mail: esteban.castro@ncl.ac.uk

Autores Correspondientes:

Para enviar comentarios o consultas
sobre los artículos individuales
incluidos, por favor contacte a los
autores relevantes, cuyos datos de
contacto son provistos en cada uno de
los artículos.

Table of Contents

	Page
Presentation of the Thematic Area and the Working Paper	1
Presentación del Área Temática y del Cuaderno de Trabajo	4
Article 1: "Providing Water in Wales: is there a Third Way? The Welsh experience with public and private utilities and the emergence of the not-for-profit mode"	7
<i>Mark Drakeford</i>	
Article 2: "The partial-privatisation of the Berlin Water Company in 1999 and urban development in 1990s Berlin"	27
<i>Ross Beveridge</i>	
Article 3: "The nexus of water and socio-spatial inequality in sub-Saharan Africa: legacies, strands and agenda for research"	41
<i>Emmanuel M. Akpabio, Eti-ido S. Udofia and Kaoru Takara</i>	
Article 4: "El auge de las re-estatizaciones en Argentina ¿Hacia un nuevo modelo público del agua?"	78
<i>Melina Tobias, Damiano Tagliavini and Melisa Orta</i>	
Article 5: "Antropología y agua(s). Cuestiones globales, aguas locales y flujo cultural"	119
<i>Barbara Casciarri and Mauro Van Aken</i>	
<i>Translated and commented by Luisa Arango and Jorge Rowlands</i>	
Article 6: "Administração de bens comuns: governança hídrica em disputa"	144
<i>Ladislau Dowbor and Arlindo M. Esteves Rodrigues</i>	

Presentation of the Thematic Area and the Working Paper

This Working Paper is part of the activities of the WATERLAT-GOBACIT Network's Thematic Area 3 (TA3), the Urban Water Cycle and Essential Public Services (<http://waterlat.org/thematic-areas/ta3/>). TA3 brings together academics, students, professionals working in the public sector, practitioners from Non-Governmental Organizations, activists and members of civil society groups, and representatives of communities and users of public services, among others. The remit of this TA is broad, as the name suggests, but it has a strong focus on the political ecology of urban water, with emphasis on the politics of essential water services. Key issues addressed within this framework have been the neoliberalization of water services, social struggles against privatization and mercantilization of these services, the politics of public policy and management in the sector, water inequality and injustice in urban areas, and the contradictions and conflicts surrounding the status of water and water services as a public good, as a common good, as a commodity, as a citizenship right, and more recently, as a human right.

This Working Paper includes six contributions. The first article, by Mark Drakeford, presents a historical analysis of the changing arrangements for the provision of essential water and sanitation services in Wales. This, previously unpublished paper, was originally presented at a special seminar organized in the University of Oxford in 2002 as part of the activities of the PRINWASS Project (<http://waterlat.org/projects/prinwass/>). Drakeford offers a critical assessment of the implications and impacts of the privatization of the Welsh Water Authority by the Conservative government of Prime Minister Margaret Thatcher in 1989, and discusses the process of partial de-privatization that took place in the year 2000. The article provides important insights about the negative impacts of privatization, particularly on the poorer sectors of the population. This is of the highest relevance, given the renewed push towards the privatization of water utilities that is taking place, for example in Latin America (notably in Brazil and Mexico) as we write this Introduction.

The second article, by Ross Beveridge, discusses the troubled process that characterized the privatization of Berlin's Water Company (BWB) in 1999, in the aftermath of the reunification of Germany. Beveridge shows how the privatization process was the result of political decisions largely unrelated with the situation of water and sanitation services, and rather determined by a broader political project seeking to make Berlin once again a powerful player in Europe. The article delves into some of the intricacies of the privatization process, characterized by top down decisions, lack of transparency, and secretive negotiations between politicians and multinational water companies. Beveridge's paper presents important lessons that can be derived from Berlin's troubled experience with water privatization, which eventually led to the remunicipalization of water and sanitation services in 2011-2013.

In the third article, Emmanuel Akpabio, Eti-ido Udofia, and Kaoru Takara discuss some aspects of the interrelations between people and water in the context of sub-Saharan Africa. They pay attention to the interface between social power and cultural and institutional dynamics behind the structural socio-spatial inequalities characterizing common people's access to water. The article shows the interweaving of colonial and post-colonial legacies with the influence exercised by global development institutions in shaping current water policies in the region. The authors emphasise the mechanisms that help to reproduce structural inequalities and discuss the challenges facing sub-Saharan countries to implement water policies informed by the principles of equality and equity.

The fourth article, by Melina Tobias, Damiano Tagliavini, and Melisa Orta, addresses the current global wave of re-publicization of formerly privatized water and sanitation companies, looking at the experiences of Buenos Aires and Santa Fe in Argentina. The paper examines the national context that led to the demise of neoliberal water policies in the country in the aftermath of the financial and political crisis that affected the country in 2001. The authors argue that re-publicization of previously privatized utilities does not mean a return to the old public model of utility management that existed prior privatization, and put forward several questions and proposals to elucidate the actual character of the "new public model" that seems to be emerging in the process.

In the fifth article, Barbara Casciarri and Mauro Van Aken discuss the significance and potentiality of "water" as an anthropological object of study. They place emphasis on the fact that, despite water's key role in social and cultural relations, it has been mainly studied by the natural sciences, while anthropology has failed so far to recognize the value of water as an object of study. They suggest newly emerging perspectives for research on the subject. This article was originally published in French as an Introduction to an special issue on the anthropology of water in the *Journal des Antropologues*. The article by Casciarri and Van Aken was translated by Luisa Arango and Jorge Rowlands, who also provide an introduction to meta-studies of water-related research carried out by French and British anthropologists. The introduction to the article by Arango and Rowlands aims to contribute towards enhancing the conversation between anthropological traditions that often remain oblivious to each other along the lines of national and cultural divides, and to foster greater interaction between European and Latin American authors.

The sixth and final article, by Ladislau Dowbor and Arlindo Esteves Rodrigues, focuses on the contradictions characterizing the conceptualization of water by different social actors, in particular the contradictions between market-driven notions of water as a commodity and civil-society understandings of water as a common good. The paper places emphasis on the implications and risks of treating water as a commodity, including the economic restrictions inherent to the "inelasticity" characterizing the demand for water, as water consumption is a constant need for all humans. This is a major factor enticing multinational corporations to tap into the "water market", which leads to inevitable social and political confrontation. The authors argue that as a result, organized civil society has a crucial role to play in helping to ensure both that access to water for dignified human reproduction is secured and that the existence of water itself is guaranteed for future generations.

The six articles composing this edition provide important contributions to current debates about the politics of essential water-related services. They also offer important insights about new avenues for research on water issues, aiming to enhance our knowledge of both empirical experiences and academic traditions that often remain isolated from each other whether because of geographical, national or cultural obstacles and distances. We are glad to present this issue, bringing together contributions from authors based in Asia, Africa, Europe and Latin America, and wish our readers a fruitful experience.

Jose Esteban Castro

General Editor and Working Paper Editor

Newcastle upon Tyne and Buenos Aires, June 2017

Presentación del Área Temática y del Cuaderno de Trabajo

Este Cuaderno de Trabajo es parte de las actividades del Área Temática 3 de la Red WATERLAT-GOBACIT (AT3), el Ciclo Urbano del Agua y los Servicios Públicos Esenciales (<http://waterlat.org/es/areas-tematicas/at3/>). El AT3 reúne académicos, estudiantes, profesionales que trabajan en el sector público, especialistas de Organizaciones no Gubernamentales, activistas y miembros de grupos de la sociedad civil, y representantes de comunidades y de usuarios de los servicios públicos, entre otros. El alcance temático de esta AT es amplio, como lo sugiere el nombre, pero su foco central es la ecología política del agua urbana, con énfasis en la política de los servicios públicos esenciales. Algunos de los aspectos clave que abordamos en este marco han tenido que ver con temas como la neoliberalización de los servicios relacionados con el agua, las luchas sociales contra la privatización y la mercantilización de estos servicios, las políticas, las políticas públicas y la gestión en el sector, la desigualdad y la injusticia en relación al agua en las áreas urbanas, y las contradicciones y conflictos que rodean al agua y a los servicios relacionados con el agua considerados como bien público, como bien común, como mercancía, como un derecho de ciudadanía y, más recientemente, como un derecho humano.

Este Cuaderno de Trabajo incluye seis contribuciones. El primer artículo, a cargo de Mark Drakeford, presenta un análisis histórico de las formas cambiantes de provisión de servicios esenciales de agua y saneamiento en Gales. Este trabajo, no publicado anteriormente, fue presentado originalmente en un seminario organizado en la Universidad de Oxford en el año 2002 como parte de las actividades del Proyecto PRINWASS (<http://waterlat.org/projects/prinwass/>). Drakeford ofrece una evaluación crítica de las implicaciones e impactos de la privatización de la Autoridad del Agua de Gales por parte del gobierno Conservador de la Primera Ministra Margaret Thatcher en 1989, y discute el proceso de desprivatización parcial que tuvo lugar en el año 2000. El artículo provee elementos iluminadores acerca de los impactos negativos de la privatización, particularmente sobre los sectores más pobres de la población. Este tema reviste alta relevancia dado el renovado empuje hacia la privatización de empresas de agua y saneamiento que tiene lugar, por ejemplo en América Latina (notablemente en Brasil y México) al momento de escribir esta Introducción.

El segundo artículo, escrito por Ross Beveridge, discute el proceso problemático que caracterizó a la privatización de la Compañía de Agua y Saneamiento de Berlín (BWB) en 1999, en el período inmediato después de la reunificación de Alemania. Beveridge muestra cómo el proceso de privatización fue el resultado de decisiones políticas que en gran medida estaban desconectadas de la problemática específica de los servicios de agua y saneamiento y estuvo más bien determinado por un proyecto político más amplio dirigido a convertir a Berlín nuevamente en un actor poderoso en el contexto europeo. El artículo profundiza algunos de los detalles intrincados del proceso de

privatización, que estuvo caracterizado por decisiones verticalistas, falta de transparencia y negociaciones secretas entre los políticos y las empresas de agua multinacionales. El artículo de Beveridge presenta lecciones importantes que pueden derivarse de la problemática experiencia de Berlín con la privatización, que eventualmente culminó con la remunicipalización de los servicios de agua y saneamiento en el período 2011-2013.

En el tercer artículo, Emmanuel Akpabio, Eti-ido Udofia y Kaoru Takara discuten algunos aspectos de las interrelaciones entre los seres humanos y el agua en el contexto del África sub-Sahariana. Los autores prestan atención a la interface entre el poder social y las dinámicas culturales e institucionales detrás de las desigualdades socio-espaciales que caracterizan las formas de acceso al agua por parte de la población. El artículo muestra la relación entre el legado de los períodos colonial y poscolonial y la influencia que ejercen hoy las instituciones globales de desarrollo en la generación de las políticas del agua en la región. Los autores enfatizan los mecanismos que contribuyen a reproducir desigualdades estructurales y discuten los desafíos que confrontan los países del África sub-Sahariana para implementar políticas del agua fundadas en los principios de la igualdad y la equidad.

El cuarto artículo, a cargo de Melina Tobías, Damiano Tagliavini y Melisa Orta, discute la actual ola de republicización de empresas de agua y saneamiento que habían sido previamente privatizadas, analizando las experiencias de Buenos Aires y Santa Fe en Argentina. El trabajo examina el contexto nacional que llevó al abandono de las políticas neoliberales en el país, después de la crisis financiera y política que afectó al país en el año 2001. Los autores argumentan que la republicización de las empresas privatizadas no significa un retorno al modelo público de gestión de empresas de agua y saneamiento que existía antes de la privatización y proponen una serie de preguntas y propuestas para elucidar el carácter real del "nuevo modelo público" que pareciera estar surgiendo en el marco del proceso actual.

En el quinto artículo, Barbara Casciarri y Mauro Van discuten la importancia y potencialidad del "agua" como un objeto de estudio antropológico. Los autores colocan el énfasis sobre el hecho que, a pesar de la centralidad del agua para las relaciones sociales y culturales, la misma ha sido principalmente estudiada por las ciencias naturales, mientras que la antropología no ha reconocido todavía el valor del agua como objeto de estudio. Ellos sugieren perspectivas emergentes para la investigación sobre este tema. El artículo fue originalmente publicado en francés como Introducción a un número especial sobre la antropología del agua en el *Journal des Antropologues*. El artículo de Casciarri y Van Aken fue traducido por Luisa Arango y Jorge Rowlands, quienes también ofrecen una introducción a meta-estudios de investigaciones relacionadas con el agua realizadas por antropólogos franceses y británicos. La introducción del artículo a cargo de Arango y Rowlands intenta hacer una contribución al fortalecimiento del intercambio entre tradiciones antropológicas que frecuentemente tienden a ignorarse mutuamente, escindidas sobre la base de divisiones nacionales y culturales y generar una mayor interacción entre autores europeos y latinoamericanos.

El sexto y último artículo, escrito por Ladislau Dowbory y Arlindo Esteves Rodrigues, trata sobre las contradicciones que caracterizan la conceptualización del agua por diferentes actores sociales, en particular las contradicciones entre las nociones orientadas al mercado que tratan al agua como una mercancía y las formas de entender al agua como un bien común defendidas por sectores de la sociedad civil. El

trabajo coloca el énfasis sobre las implicaciones y riesgos de tratar al agua como una mercancía, incluyendo las restricciones económicas inherentes a la "inelasticidad" que caracteriza a la demanda de agua, cuyo consumo es una necesidad constante de todos los seres humanos. Este es un factor fundamental que atrae a las corporaciones multinacionales a intentar entrar en el "mercado del agua", lo cual deriva inevitablemente en confrontaciones sociales y políticas. Los autores argumentan que, como resultado, la sociedad civil organizada tiene un papel crucial en contribuir a lograr tanto que el acceso al agua para la reproducción humana en dignidad sea garantizado como en también asegurar la existencia del agua para beneficio de las futuras generaciones.

Los seis artículos que componen esta edición proveen contribuciones importantes para los debates actuales sobre la política de los servicios esenciales relacionados con el agua. Los trabajos también ofrecen sugerencias importantes en relación a nuevos enfoques de investigación sobre temas relacionados con el agua y procuran fortalecer nuestro conocimiento tanto de experiencias empíricas como de tradiciones académicas que frecuentemente permanecen aisladas entre sí debido a obstáculos y distancias geográficas, nacionales o culturales. Nos complace presentar este número, que incorpora contribuciones de autores basados en Asia, África, Europa y América Latina, y deseamos a nuestros lectores una provechosa experiencia.

José Esteban Castro

Editor General y del Cuaderno

Newcastle upon Tyne y Buenos Aires, junio de 2017

Article 3

The nexus of water and socio-spatial inequality in sub-Saharan Africa: legacies, strands and agenda for research

Emmanuel M. Akpabio - Department of Geography and Natural Resources Management, Faculty of Social Sciences, University of Uyo, Nigeria, and Disaster Prevention Research Institute (DPRI), Kyoto University, Gokasho, Uji, Kyoto, Japan¹

Eti-ido S. Udofia - Department of Geography and Natural Resources Management, Faculty of Social Sciences, University of Uyo, Nigeria

Kaoru Takara - Disaster Prevention Research Institute (DPRI), Kyoto University, Gokasho, Uji, Kyoto, Japan

Abstract

This article explores the dynamic relationship between society and access to water resources. It addresses the question of how the various mechanisms of power manifested through the cultural systems, institutional processes and social relations shape people's abilities to gain access to available water resources in sub-Saharan Africa. Through some theoretical discourses and literature reviews major issues and processes shaping the production and reproduction of socio-spatial inequality in the water sector have been highlighted. The central argument is that inequality in access to water and water services in sub-Saharan Africa is partly a natural phenomenon, but mostly depends on a social construction. The social perspectives have been emphasized as very critical and interrelated, and deeply touch on a range of issues. This includes the historical contexts of colonialism and post-colonialism, the socio-cultural circumstances of the people, and the wider impact of the global institutional norms and forces on some national water management policies. This places the family, society and the State as the main institutions at the center of water inequality through their everyday discourses, material practices and planning strategies. Several impacts and outcomes have been discussed, and could serve as a basis for targeted reforms aimed at guaranteeing equal and equitable access to water services in sub-Saharan Africa.

Keywords: Water, cultural systems, institutions, water inequality, sub-Saharan Africa

Received: October 2016.

Accepted: March 2017.

¹ E-mail: emakpabio@yahoo.com.

Resumen

Este artículo explora la relación dinámica entre la sociedad y el acceso a los recursos hídricos. Enfoca la cuestión de cómo los varios mecanismos de poder que se manifiestan a través de sistemas culturales, procesos institucionales y relaciones sociales dan forma a las habilidades de las personas para obtener acceso a los recursos hídricos disponibles en el África sub-Sahariana. El artículo examina algunos temas importantes concernientes con la producción y reproducción de desigualdades socio-espaciales en el sector del agua, con el apoyo de discursos teóricos y revisiones bibliográficas. El argumento central es que la desigualdad en el acceso al agua y a los servicios de agua en el África sub-Sahariana es en parte un fenómeno natural, pero principalmente es el resultado de una construcción social. Hemos enfatizado que los aspectos sociales son muy críticos y se encuentran interrelacionados, afectando profundamente un rango de temas. Esto incluye los contextos históricos de colonialismo y pos-colonialismo, las circunstancias socio-culturales de las personas y el impacto más amplio de las normas y las fuerzas institucionales globales sobre algunas de las políticas de gestión del agua nacionales. Estos procesos colocan a la familia, la sociedad y el Estado como las principales instituciones en relación a la desigualdad hídrica, a través de sus discursos cotidianos, prácticas materiales y estrategias de planificación. El artículo también discute algunos impactos y resultados de estos procesos y puede ser una contribución para la elaboración de reformas cuyo objetivo sea garantizar un acceso igualitario y equitativo a los servicios de agua en el África sub-Sahariana.

Palabras clave: Agua, sistemas culturales, instituciones, desigualdad hídrica, África sub-Sahariana

Recibido: octubre de 2016.

Aceptado: marzo de 2017.

Introduction

This paper explores the dynamic relationship between society and access to water resources by trying to address the question of how the various mechanisms of power manifested through the cultural systems, institutional processes and social relations shape people's abilities to gain access² to available water resources in sub-Saharan Africa.

Water remains an important resource for development given its potential to influence other aspects of social, economic and spatial transformation, yet its availability, distribution and access are not only governed by the natural factors; a range of cultural, institutional, normative, economic and social factors do intersect in the process of who gets what amount, where and why in most countries. Such interplay of forces underlies the question of relations of power, and can be useful for understanding the dynamics and fundamental factors shaping the geography of social and spatial inequalities³ in gaining access to water supply services in a specific setting.

Several estimations suggest that sub-Saharan Africa is the only region that has not been able to meet the MDG target of halving the proportion of the population without sustainable access to safe drinking water and basic sanitation. High intra-and inter-country disparities in water access reflect the wide spatial variability in the occurrence and distribution of rainfall and water resources as well as the growing inequalities in the distribution and access to social and economic opportunities. The dualities of urban/rural, urban/sub-urban, formal/informal settlements, and high/low socio-economic residential areas- all reflecting tendencies of improvements or non-improvements- provide an

2 According to Ribot and Peluso (2003), access is the ability to benefit from things including material objects, persons, institutions, and symbols. By focusing on ability, rather than right as in property theory, this formulation brings attention to a wider range of social relationships that can constrain or enable people to benefit from resources without focusing on property relations alone (pp. 153-154)

3 The concept of 'inequality' can be understood with reference to its direct opposite, 'equality'. 'Equality' itself is a multifaceted and complex construct. Rioux (1994) highlighted three general categories representing justifications for different claims about entitlements and the legitimating criteria for differentiating or distinguishing people. While the first category emphasizes equal-treatment (formal theory of equality); the second combines the ideas of equality of opportunity and special treatment (the liberal theory of equality). The third category focuses on the equality of outcome or equality-of-well-being. For specific emphasis, our notions of equality will draw on the second perspective-of equality of opportunity and special treatment (equality versus equity). The nature of water as fundamental for human existence and livelihoods both in itself and in the process of livelihood production warrants non-discrimination and equality in access. On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realization of all human rights. The Resolution calls upon States and international organizations to provide financial resources, help capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all (UN 2010). In November 2002, the Committee on Economic, Social and Cultural Rights adopted General Comment No. 15 on the right to water. Article 1.1 states that: 'The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights'. Comment No. 15 also defined the right to water as the right of everyone to sufficient, safe, acceptable and physically accessible and affordable water for personal and domestic uses (http://www.un.org/waterforlifedecade/human_right_to_water.shtml). The equality perspective of human rights to water does not automatically imply everyone must benefit from the same level of services; it rather demands that everyone benefits from adequate services, even if it implies differentiated tariff structure (for the purpose of addressing the equity concerns).

interesting basis for understanding the depth and breadth of socio-spatial inequality in access to water and related services. Today, a large number of the citizens (urban and rural) endure daily exposure to poor access to basic water and sanitation as well as associated diseases epidemics (Bartram and Cairncross 2010).

In our contribution, we highlight and categorize major structural and non-structural forces that tend to reproduce and sustain socio-spatial inequality in water access in sub-Saharan Africa. We draw on examples from specific reports from the literature in addition to our individual research experiences to illustrate specific facts. Three strands of factors including the geographical contexts, the cultural systems and institutional/normative frameworks have been captured, which also help to define possible scope for further research and intervention prospects.

Although this paper focuses on the sub-Saharan region of Africa, our discussions and some presentations, occasionally uses the whole continent of Africa basically to set comparative context and facilitate a better understanding of the issues under discussions. Moreover, this paper dominantly depends on theoretical and empirical reviews from selected issues, contexts and countries which may not adequately capture the diversities, realities, practices and experiences in the whole region of sub-Saharan Africa. Issues of inequality in access to water and sanitation have wide ranging dimensions depending on local situations and contexts. In this paper, we only touch on broad areas of cultural, physical, social and institutional challenges, which may not reflect some other specific challenges common in some countries. Despite these limitations, we believe discussions and issues addressed will set and open up many possibilities and agenda for further research.

The paper is segmented as follows: following the introductory section, the second segment discusses some theoretical relationship underlining water and socio-spatial inequality. The third segment focuses on sub-Saharan Africa. The segment is split into two to capture separately: i) the spatial distribution of water resources; and ii) water resource utilization capacities for the region. The fourth segment delves into the basis, pattern and manifestations of inequality in access to water services. This section is further split to understand the role of the colonial system, the impacts of cultural beliefs and the general spatial structure, modernity and institutional norms in the production of water services inequality across sub-Saharan African settlement spaces. This is followed by the general discussion and the concluding remarks.

Water, power and socio-spatial development: some theoretical discourses

What is water and how is it mobilized in the construction and representation of the social fabric of the society? Although this question has been addressed at diverse perspectives (Linton, 2010; Pflieger & Matthieussent, 2008; Sultana, 2009; Swyngedouw, Kaïka, & Castro, 2002, Strang 2004) there seems to be a general consensus mostly among social scientists that water is not only a material substance (H₂O), it reflects many social meanings, power and values deeply shaped by contextual circumstances. An important feature of the social aspect of water is its ability and potential value for deconstructing the realities of social and spatial relations, differentiations and development.

Linton (2010) had discussed how water has formed part of languages and social relations over the sequence of history and driven by geographical contexts:

...the ideas that people form of and with water are dependent on historical-geographical circumstances: people inhabiting deserts have tended to form ideas (and metaphors) that differ markedly from those formed by people living in humid regions. All ideas of water are hybrids in the sense that they are at once social and natural, internalizing the emergent-that is, historical and geographical properties of water along with historical and geographical circumstances of the thinker... (pp.38-39).

The basis in which the materiality of water transforms into a social construct (which is actualized through various knowledge and representations made possible by human experiences and material practices) has been captured differently by Swyngedouw (1993) and Smith (1984) in their presentation on the realities of the relationship between society and nature as follows:

humans encounter nature with its internal dynamics, principles and laws as a society with its own organizing principles. This encounter inflicts consequences on both. The dialectic between nature and society becomes an external one i.e., a conflicting relationship between two separate fields, nature and society, mediated by material, ideological and representational practices. The product then is the thing (object or subject) that is produced out of this dynamic encounter (pp.3).

For Smith (1984 and 1996), nature is an integral part of a process of production or, in other words that society and nature are integral to each other and in their unity produce permanencies (or thing-like moments) (cited in Swyngedouw ,1993).

Swyngedouw and Smith's assumptions theoretically imply that water as a natural substance has undergone some form of human production, discourses, representations and transformations suitable for a wide range of existential, identity, relational and utilitarian purposes. Several studies have cashed in on these perspectives to further explore the relationship between water, space, power, social inequality and other issues including cultural identity formation. Using south India, for instance, Weiz (2012) discussed how water and access to it have served to reinforce social differentiation and inequality. The author argues that different waters for different people and purposes reflect the depth of social inequality mediated by technology, financial power and social values. Drawing on some principles of economic theories, Graham and Marvin (2001) discussed how the management of urban public utility network has served to increase the socio-spatial splintering of modern cities especially when privatized and customized services tend to lead to social differentiation by widening the gap between the rich and poor areas (Pflieger & Matthieussent, 2008: 1908).

One of the greatest work on water and socio-spatial boundaries come from Sultana (2009) in a paper entitled 'fluid lives: subjectivities, gender and water in rural Bangladesh.' The paper not only delves into the spatial binaries and differentiation in access to water, it equally examines how gendered discourses on spatialities of access to water produce multiple 'knock-on effects' on women:

...the public-private and home-outside divides become problematic when safe water sources are increasingly in distinctly public spaces. The binary gendered constructions of public-masculine and private-feminine come into conflict with each other when women are forced to fetch water from public spaces where the only safe water source may be, whereby a domestic/feminine task is constructed by the spatiality of arsenic distribution and tubewell locations that necessitate crossing the boundaries from the private into the public in order to fulfill the private/domestic duties. As such, the private space activity of performing a gendered task (provisioning of household drinking water) spills out into the public space, when women may have to venture out into public roads, bazaars, mosques and schools to fulfill their domestic duties in procuring safe water (transgressing socio-spatial norms of purdah). Yet such bodies in public spaces and under the male gaze disrupt appropriate gendered behavior while fulfilling a distinctly gendered task of fetching domestic water. The private and public gendered spaces collide as a result of the need for water. In this respect, the distribution of arsenic and tubewells come to play a role in such spatial relations and spatialized construction of gender (pp. 431-432).

To better understand the dynamic relations of space and access to water, the works of feminist geographers on the co-production of spatial and social processes have fostered the understanding of how knowledge and socio-cultural construction of specific spaces have influenced who gains access to what quality of water. Social processes being the dynamic constituents of specific spaces also actively contribute in shaping the dynamic nature of such spaces/places (see the works of Besio 2006, Massey 1994, McDowell 1999 as cited in Sultana 2009: 431). Apart from the traditional/cultural notions of public spaces being masculine and private/domestic spaces being feminine, most spatial developmental practices in developing countries dichotomize the rural and urban spaces in manners that tend to privilege the urban space over its rural counterpart. In African countries, public water infrastructures and services provision not only reflect and simultaneously foster urban/rural segregation, there exists enormous inequality of access between the relatively poor and their relatively rich neighbours (Lipton and Litchfield 2002, FAO, 1995). The work of critical urban political ecology explains the level of social power relations focusing on exclusionary social services mostly sustained in favour of the rich over the poor citizens (Swyngedouw et al., 2002). In Truelove's (2011) classical observation in Delhi:

here, quality of life and urban citizenship are proclaimed as distinct rights of the middle and upper classes, at the expense (and even erasure) of the quality of life of the urban poor, who are often criminalized in the process of re-making Delhi (pp.147).

Meanings and material inscriptions and practices on water have been variously mobilized and appropriated to serve specific ideological, planning and socio-spatial goals and interests over mankind's history. Gandy (2002: 22) observed that "water is a multiple entity: it possesses its own biophysical laws and properties, but in its interaction with human societies, it is simultaneously shaped by political, cultural, and scientific factors." Similarly, Donahue and Johnston (1998) have argued for an investigation into

the relational linkages between water meanings and management in the following words:

what different cultural meanings does water have for the contending parties, and how do these meanings complicate mediation on among the various interests? How are some social actors able to impose their definition of water on other social actors with different but equally legitimate definition? In other words, how is power used in the service of one or another of the cultural definitions of water (pp.339).

Donahue and Johnston's points represent an aspect of a growing reaction against the overbearing perspectives espoused by the modern notions of water, which tends to ignore the existence of a plurality of other meanings and concepts. The wider debates on the different conceptions and meanings of water illustrate the complex nature of water itself. Put comprehensively, Cless and Hahn (2012: 12-13) summed up the complexities associated with water as follows:

in all societies worldwide, involvement, exchange, argument and discourse with water constitutes self-conception, the identity of humans and the universal order. Water is used as symbol, allegory, ritual, and metaphor of life, cooperation and social coexistence. This becomes obvious in manifold examples from all religions. Judaism, Christianity, Hinduism, indeed all myths, all religions, deal with water and use it as an expression and image for life and its course.

Although several studies focusing on the relations between water, management and socio-cultural norms have been undertaken for sub-Saharan Africa, none has comprehensively addressed the questions of how water has served in the propagation of socio-spatial inequality in the region as a way to understand the question of power, resource and development. This paper addresses that by highlighting critical strands of manifestations, which also serves as areas where future research could be most useful.

Sub-Saharan Africa and water resources distribution

Water constitutes an important element of human development and civilization. By implication a lack or insufficient supply of this vital resource can lead to various forms of developmental and livelihood problems within and between communities, states and regions. But availability of water itself does not only depends on the physical processes of the hydrological cycle; its circulation and flow could also be socially, technologically and politically mediated. This emphasizes the question and the role of power relations. Whether its supply is natural or human induced, the circulation and flow of water often produce inequitable outcomes-some areas or individuals gaining more access over others. Water availability, distribution and access have become so important that its studies have utilized a range of concepts and frameworks-from the hydrosocial, political ecology and political economy- in understanding its relationship with the society (see Linton 2010, Swyngedouw 2009 and Swyngedouw et.al 2002). Within these contexts,

how is the availability and access to water resources mediated in sub-Saharan Africa?

There is a great deal of spatial and temporal variation in the precipitation and distribution of water resources which implies diverse forms of development outcomes for sub-Sahara African countries. As a continent with about 20% of the land area of the earth, Africa has about 9% of renewable freshwater resources in the world (Shiklomanov 1999). Fresh water resources are unevenly distributed, with western and central Africa having higher rainfall than northern and southern Africa as well as the Horn of Africa (Table 1).

Table 1. Africa: Generalized Regional Climate Characteristics and Water Resources Distribution

Northern	Climate	Area (1000km ²)	Precipitation (km ³ /yr)	Internal renewable resources			
				(km ³ /yr)	mm/yr	As % of total	As % of precipitation
Northern	Arid	5753	411	50	8.7	1.2	12.2
Sudano-Sahelian	Arid	8591	2878	170	19.8	4.3	5.9
Western	Tropical climate	2106	2965	952	452.0	23.8	32.1
Central	Tropical climate	5329	7621	1946	365.2	48.8	25.5
Eastern	Equatorial	2916	2364	259	88.8	6.5	11.0
Islands (I.O)	Humid maritime	591	1005	340	575.3	8.5	33.8
Southern	Semi-arid	4739	2967	274	57.8	6.9	9.2
Total		30025	20211	3991	132.9	100.0	19.7

N/B: The regions are

1. Northern: Algeria, Egypt, Libya, Morocco, and Tunisia. Arid climate in this region is characterized by deserts
2. Sudano-Sahelian: Burkina Faso, Cape Verde, Chad, Djibouti, Eritrea, Gambia, Mali, Mauritania, Niger, Senegal, Somalia, and Sudan;
3. Western: Benin, Cote d' Ivoire, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Sierra Leone, and Togo;
4. Central: Angola, Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, São Tome and Principe, and Zaire. Tropical climate with high and predictable rainfall except the deserts of northern Chad and Sahelian parts of northern Cameroun and Central Chad
5. Eastern: Burundi, Ethiopia, Kenya, Rwanda, Tanzania, and Uganda. Typically equatorial climate but moderated by high altitudes;
6. Indian Ocean Islands: Comoros, Madagascar, Mauritius, and Seychelles;
7. Southern: Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe. Semi-arid climate with variation in rainfall over time and space

Sources: FAO (1995); Shiklomanov (1999) and UNDP et.al (2000)

The Democratic Republic of Congo (DRC) commands about 25% of average annual internal renewable water resources with 935km³/year, while Mauritania (the driest country) has about 0.4km³/year, or 0.01% of Africa's total (UNDP et.al 2000). It is estimated that some countries, including Gabon, Liberia and Zaire command over 20,000 cubic meters per capita of freshwater (Engelman and LeRoy 1995, cited in Rosegrant and Perez 1997: 3). According to Rosegrant and Perez (1997: 3), all north African countries are water-stressed. A breakdown indicates 540 cubic meters per capita is available for Tunisia; 690 cubic meters per capita for Algeria; 1017 cubic meters per capita for Libya; 1,151 cubic meters per capita for Morocco; and 1,056 cubic meters per capita for Egypt. The authors equally went on to list some countries in sub-Saharan Africa experiencing water scarcity to include Burundi and Kenya (654 and 635 cubic meters per capita respectively) while Malawi, Rwanda and Somalia all fall between 900 and 1000 cubic meters per capita. By Table 1, about 48% of the entire water resources in Africa is concentrated in Central Africa while the least of about 1% is in northern Africa.

High variability in rainfall implies that a large number of the African population depends on ground water as their primary source of freshwater. Statistics from the UNDP et.al (2000) shows that more than 60% of all water withdrawals in Algeria are from groundwater, while the figure rises to about 95% for Libya. Consequently, desalinated water has been important alternatives to complement available withdrawals, especially in countries such as Algeria, Egypt, Mauritius, Morocco, South Africa and Tunisia. Regional availability of freshwater in Africa has equally been complicated by the climate problem. Extremes of rainfall in forms of periodic flooding or drought have intensified over the past 30 years further raising concerns of climate change impacts. The NASA Global Earth Observing System (2001) reported continued declines in rainfall in the Sahelian zone compared to pre-1960s average, and lake Chad has shrunk to 5% of its size 35 years ago. The seasonal weather phenomenon has remained unpredictable as unfavorable seasons could take many seasonal episodes rather than single (Gichuki 2000). Van Koppen (2003) reported an example in Mozambique, Angola and Zambia, where prolonged droughts of over 30 years suddenly busted into a devastating flood in the year 2000.

The African Great lakes (which have a total volume of 30567km³, and spanning a surface area of 165581km²) have been important fresh water resources serving many purposes, including water flow regulation, flooding control and water storage with great impacts on human diverse water needs. Khroda (1996) observed that lake Tanganyika alone could supply water to 40 million people through the annual extraction of less than 1% of its volume. With the exception of lake Tana of Ethiopia, all African lakes are shared across international borders, which tend to pose allocation, management and governance challenges.

Water Resources Availability and Utilization Capacities

Water resource availability has been one of the core ingredients for socio-economic development due to its influence in domestic, industrial and agricultural use and productivity. Countries with high freshwater availability have a high potential for physical, social and economic development. However, such potential depends on available capacity (both human, knowledge, technology and finance) for harnessing the

resources. For Africa, inequality in access to and utilization of available water resources provides an important lesson of capacity measured in infrastructural investments, socio-economic improvement as well as the application of knowledge and technology in the sector. Given its largely agrarian nature, access to water for agricultural production holds great potential for the numerous small-holder African farmers scattered in the semi-arid and arid areas with limited access to rivers, streams, groundwater, rainwater, lakes and wetlands. The FAO (1995) statistics suggest that agriculture constitutes the highest water use sector followed by the municipal and industrial withdrawals and use (Table 2)

Table 2. Regional distribution of water withdrawals in Africa

Region	Withdrawals by sector					
	Agriculture	Municipal	Industries	Total	As % of total	As % of internal resources
	X10 ⁶ m ³ /yr					
Northern	65000 (85%)	5500 (7%)	5800 (8%)	76300 (100%)	50.9	152.6
Sudano-Sahelian	22600 (94%)	1200 (5%)	300 (1%)	24100 (100%)	16.1	14.2
Western	3800 (62%)	1600 (26%)	700 (12%)	6100 (100%)	4.1	0.6
Central	600 (43%)	600 (43%)	200 (14%)	1400 (100%)	0.9	0.1
Eastern	5400 (83%)	900 (14%)	200 (3%)	6500 (100%)	4.3	2.5
Islands (I.O)	16400 (99%)	200 (1%)	20 (-)	16620 (100%)	11.1	4.9
Southern	14100 (75%)	3000 (16%)	1800 (9%)	18900 (100%)	12.6	6.9
Total	127900 (85%)	13000 (9%)	9020 (6%)	149920 (100)	100.0	3.8

Source: FAO (1995)

The differences between regions in their water withdrawals and use have been linked to differences in technical, knowledge and investment capacities. Statistics from Lipton and Litchfield (2002) and Africa Water Taskforce (2002) indicate that about 1-5% of cultivable land is irrigated in other regions of Africa compared to 30-35% in North Africa. A breakdown of actual and potential irrigation by region shows that Central Africa with

about 48% of the total freshwater availability and a very high potential for irrigation only irrigates about 1% of its total arable land. The northern Africa with about 1% of the total freshwater availability irrigates about 48% of its total arable land (Table 3).

Table 3. Actual and potential irrigation in Africa

Region	Potential '000 ha	Irrigated '000 ha	Irrigated as % of arable	Irrigated as % of total	Irrigated as % of potential
Northern	8130	5915	24.8	48.6	72.8
Sudano-Sahelian	7716	2484	10.4	20.4	32.2
Western	8200	470	1.3	3.9	5.7
Central	13320	121	1.0	1.0	0.9
Eastern	5364	434	1.9	3.6	8.1
Southern and Islands (I.O)	7481	2750	10.7	22.6	36.8
Total	50211	12174	8.5	100.0	24.2

Source: FAO (1995)

Although agriculture commands the largest share of water withdrawals and use, domestic water withdrawals and use remain relatively very high in northern Africa (Table 2). It is estimated that 92% of the northern African's population have a reasonable access to improved water over sub-Saharan Africa whose access to improved water sources could be as low as 60% coverage. Differences in water resource utilization capacities have far deeper implication for social and economic development, especially in the areas of access to drinking water, sanitation services and hygiene practices. Looking at the global statistics, nearly 80% of the people still grappling with the challenges of accessing drinking water is concentrated in three regions, namely, sub-Sahara Africa, Eastern and southern Asia while the situation could be worse for sanitation (Table 4).

Table 4: Access to Drinking Water and Sanitation: High Priority Countries, FY 2009

Percentage of Population using improved				Percentage of population using improved					
Countries	% using improved Sanitation Facilities	Regional area	remarks	countries	% using improved Drinking water sources	Regional area	Remarks		
Jordan	98	50% of countries come from the Middle East; 33.3% (Eurasia); 17.7% (South east Asia)	75-100%	Lebanon	100	33.3% (Middle East); 25% (S. E. Asia); 17% each from Eurasia and Southeast Asia; 11% (S.S.Africa)	75-100%		
Lebanon	98			Georgia	98				
Georgia	95			Armenia	96				
Armenia	90			Jordan	96				
West Bank & Gaza	89			WestBank & Gaza	91				
Philippines	76			Phillipians	91				
Iraq	73	60% - S E. Asia; 20% (W. Asia); 20% (S.S.Africa)	50-74%	Pakistan	90			33.3% (Middle East); 25% (S. E. Asia); 17% each from Eurasia and Southeast Asia; 11% (S.S.Africa)	75-100%
Bangladesh	53			India	88				
Indonesia	52			Ghana	82				
Senegal	51			Bangladesh	80				
Timor-Leste	50			Indonesia	80				
Zambia	49	60% (S.S.Africa); 40% (Asia)	25-49%	Iraq	79	75% (S. S. Africa); 17% (S. E. Asia); 8% the Caribbean)	50-74%		
Uganda	48			Senegal	69				
Pakistan	45			Timor-Leste	69				
Afghanistan	37			Liberia	68				
Mali	36			Uganda	67				
Sudan	34			Haiti	63				
Nigeria	32			Cambodia	61				
India	31			Zambia	60				
Kenya	31			Kenya	59				
Cambodia	29			Nigeria	58				
Tanzania	24	90% (S. S. Africa); 10% (from the Caribbean)	0-24%	Sudan	57	83.3% (S.S. Africa); 17.7% (Asia)	25-49%		
Dem Rep of Congo	23			Mali	56				
Somalia	23			Tanzania	54				
Haiti	17			Afghanistan	48				
Liberia	17			Mozambique	47				
Mozambique	17			Dem Rep of Congo	46				
Ghana	13			Madagascar	41				
Ethiopia	12			Ethiopia	38				
Madagascar	11			Somalia	30				

Top Ten WASH Recipients, FY2009

1) West Bank- \$102.2 million; 2) Jordan-\$53.5 million; 3) Pakistan- \$49.0 million; 4) Sudan- \$33.9 million; 5) Afganistan- \$22.5 million; 6) Ethiopia- \$14.8 million; 7) Zambia- \$12.6 million; 8) Democratic Republic of Congo- \$13.4 million; 9) Iraq- \$13.0 million; 10) Indonesia- \$8.8 million

Source: Adapted from Salaam-Blyther (2012)

In the list of countries striving for improvement in access to drinking water sources, over 83% of such countries is concentrated in the sub-Saharan part of Africa. The figure is worse for sanitation category as 90% of countries in the least range of 0-24% are located in the same region. Relying on statistics in Table 4, few countries seem to perform relatively much better than others in some use sectors. For drinking water sources, only Ghana seems to achieve a wider coverage rate as it is listed in the 75-100% range. Senegal, Liberia, Uganda, Zambia, Kenya, Nigeria, Sudan, Mali and Tanzania fall between 50-74% coverage while countries such as Somalia, Ethiopia, Madagascar, Democratic Republic of Congo and Mozambique are at the lowest rung with an average range of between 25-49%. In terms of improvement in sanitation facilities, none of the countries in the sub-Saharan Africa has attained 75-100% coverage range. However, Senegal has managed to attain a coverage rate of 51%, while other countries fall below 50% with countries such as Madagascar (11%), Ethiopia (12%), Ghana (13%), Mozambique (17%), Liberia (17%), Somalia (23%), Democratic Republic of Congo (23%) and Tanzania (24%) recording very poor and worst performances (Table 4).

Within the context of the MDG progress evaluation, Africa (most especially the sub-Saharan region) is still captured as far from making significant progress as at the periods between 2000 and 2008 with the exception of Oceania (Table 5).

Table 5. Drinking water sources by MDG regions (percentage of population)

MDG region and the World	2000			2008		
	improved	piped	unimproved	improved	shared	unimproved
sub-Saharan Africa	55	15	58	60	16	40
North Africa	89	70	11	92	80	12
Eastern Asia	81	71	19	89	83	11
Southern Asia	81	22	19	87	23	13
South-eastern Asia	80	26	20	86	33	14
Western Asia	88	79	12	90	82	10
oceania	52	20	48	50	19	50
Latin America and the Caribbean	90	80	10	93	84	7
Commonwealth of Independent States	93	71	7	94	69	6
Developed regions	100	93	0	100	94	0
Developing regions	79	45	21	84	49	16
World	83	84	17	87	57	13

Source: UN-HABITAT 2011: 40

While it is estimated that about 884 million people in the world do not presently get their drinking water from improved sources (almost all of the affected people live in developing countries), available statistics confirm that sub-Saharan Africa account for 330 million or 39% followed by a commonwealth of Independent states (26%) and Eastern Asia (18%) (WHO/UNICEF 2010).

Very high variation and disparities in rural-urban coverage has also been raised as another important challenge in attaining improved drinking water supply and sanitation facilities in Africa (Tables 6 & 7).

Table 6. Urban/rural coverage of drinking water in Africa

	1990	2000	2008
Population ('000')	517,681	674,693	822,436
Percentage population	28	33	37
Urban			
Improved	82	83	82
Piped	43	38	35
unimproved	17	18	17
Rural			
Improved	36	42	47
Piped	4	4	5
unimproved	64	68	63

Source: UN-HABITAT 2011: 42

Over the periods of between 1990 and 2008, public investments in drinking water and sanitation coverage for sub-Sahara Africa has largely been concentrated in urban areas while the rural areas (with a very large concentration of population) tend to receive marginal attention. Between 1990 and 2008, urban drinking water and sanitation coverage have consistently been more than doubled the general coverage for the rural population. For instance, while improved sources of water supplies for the urban dwellers went as high as 82% (1990); 83% (2000) and 82% (2008), the rural dwellers were left at a coverage rate of 36% (1990); 42% (2000) and 47% (2008) (Table 6). The coverage trend for drinking water was not significantly different from its sanitation counterparts (Table 7).

Table 7. Urban/Rural Sanitation coverage in Africa

	1990	2000	2008
Population ('000')	517,681	674,693	822,436
Percentage population	28	33	37
Urban			
Improved sanitation	43	43	44
Shared sanitation	29	30	31
Unimproved facilities	17	17	17
Rural			
Improved sanitation	21	23	24
Shared sanitation	10	11	13
Unimproved facilities	22	23	25
Open defecation	47	43	38
Total			
Improved sanitation	28	29	31
Shared sanitation	16	18	20
Unimproved facilities	20	21	22
Open defecation	36	32	27

Source: UN-HABITAT 2011: 45

The UN-HABITAT (2011) reports that about 63% of the urban population have access to an improved water source, compared with about 14% of the rural population. Similarly, about 42% of the urban population have access to improved sanitation compared to about 7% of the rural population.

It is hardly a surprise that available statistics always reflect higher concerns for drinking water supplies over its sanitation counterpart. The experience of Ghana with improved drinking water and very poor sanitation coverage shows that drinking water and sanitation programs in Africa are hardly planned from holistic and integrated perspectives. Drinking water often attracts very disproportionately higher priority policy attention than sanitation. The UN MDGs (2012) observed that while the target of halving the proportion of population without access to improved sources of water supply had been attained five years ahead of 2015 dateline, sub-Saharan Africa is still less likely to attain the MDGs target by a substantial margin (UN 2012: 3). The integrity of official statistics on water and sanitation coverage for Africa has always been undermined by major findings and reports that tend to imply that water distribution systems in many cities are inadequate and only serving the city's upper-and middle-class population while low class settlements and slums are hardly covered. Udom's (2011) observation that public water and sanitation services in Nigeria are only linked to high quality urban residential areas only validates the UN-HABITAT (2003) earlier reports on the weakness,

irregularity and unrealistic nature of most international statistics regarding access to water and sanitation services in Africa.

Poor utilization of available water resources for socio-economic development reflects a far deeper fundamental problem of investment and governance deficits. For water and sanitation services (WSS), statistics from the 2009 World development indicators show Sub-Saharan African governments' commitment to public drinking water and sanitation facilities remain very low relative to other regions of the world, indeed the lowest in the world (Table 8).

Table 8. Africa's water and sanitation infrastructure endowment relative to other regions

Water & sanitation	Sub-Saharan Africa	South Asia	East & Asia Pacific	Europe & Central Asia	Latin America & Caribbean	Middle east & North Africa
% of population with improved water source, 2006	58	87	87	95	91	89
% of population with access to improved sanitation facilities, 2006	31	33	66	89	78	77

Source: 2009 World Development Indicators, World Bank, April 20,2009

While other regions of the world (except south Asia) commit a substantial amount of public resources towards improving access to water and sanitation for the population, Africa's water and sanitation infrastructural base remain abysmally poor. Current public spending on water and sanitation infrastructures (both capital and recurrent) remain very poor and highly insignificant relative to the actual spending needs (Table 9).

Table 9. Sub-Sahara Africa's annual WSS infrastructure current spending and needs US\$ billion

	Spending Needs	Current Spending
O & M	7	3.1
Capital expenditure	14.9	2.8
Total	21.9	5.9
Spending gap	16.0	
Percentage spending gap	271.2%	

Source: Brinceno-Garmendia et al (2008).

According to figures quoted by Brinceno-Garmendia et al (2008) (Table 9), sub-Saharan Africa has an annual spending gap of over 271%. A breakdown shows that of the US\$ 14.9 billion annual capital spending needs for water and sanitation infrastructure, only US\$ 2.8 billion is currently spent, while US\$ 3.1 billion is currently spent of the US\$ 7 billion needed for operation and maintenance (O & M). Based on the estimates from Table 9, sub-Saharan Africa really has to double their current annual infrastructure spending to be able to meet the growing demand in the water and sanitation sector. In another perspective, although the water and sanitation sector do receive the lowest allocation of public resources and funding, it has also been raised as important concern that in most cases only a tiny fraction of the allocated public resources ends up being spent in the sector due to corruption and a lack of policy prioritization (Chitonge, 2011).

Sub-Saharan Africa's human spatial settlement characteristics pose one obstacle to successful implementation and coverage of some aspects of water and sanitation programs. Over the years, Africa's population has not only experienced rapid growth, it is also rapidly urbanized. Cohen (2006) argued that although African fertility has started to fall, simple population momentum ensures that its total population will continue to increase: from 794 million in 2000 to 1.489 billion in 2030. Consequently, 70% of this growth will be witnessed in the cities and towns, and by 2025, African society will become predominantly urbanized (the author also cited the UN 2004). From a largely rural occupation at the beginning of the 18th Century, Africa's population was estimated to be rapidly urbanized at 43% by 2010 (Boadi et.al, 2005). This burgeoning growth has been experienced without corresponding and commensurate spatial planning adaptation. This has led to the emergence of peculiar and unplanned spatial patterns of settlement in urban and peri-urban areas, on the one hand, and largely scattered settlement structures in the rural areas.

Complicating this dualistic and multifarious spatial growth phenomenon is the level and rate of urbanization over the greater part of the last century. In 1950, about 14.5% of the population of sub-Saharan African countries was urbanized; by 2007, the level increased to 38.7%. This, coupled with the growth of urban population (at an average of 4.8% between 1950 and 1975) led to some consequences manifesting in rural-urban migration and the attendant phenomenon of urban poverty (UN 2008). Chen and Ravallion (2007) have recorded that while the level of urbanization in Africa increased from 29.8% in 1993 to 35.2% in 2002, the urban share of poverty increased from 24.3% to 30.2% within the same time period. The evolving human spatial and settlement patterns were also accompanied by their water and sanitation practices that were consistent with evolving settlement characteristics. Letema et al (2014) has identified and classified different sanitation systems corresponding with cost-effectiveness, funding capabilities, technological requirements as well as settlements and population classes. Choices outlined ranged from traditional pit, VIP latrine, lined VIP latrine, septic tank, Ecosan, biogas latrine, satellite sewerage, urban sewerage.

Water, Socio-spatial relations and the production of inequality in sub-Saharan Africa

Everyday struggles associated with water access and use in sub-Saharan Africa can be understood in Sen's (1982) thesis on the social basis of resource entitlement:

the distribution of resources in any society occurs through a complex systems of claims, which are in turn embedded within the social relations and practices that govern possessions, distribution and use in that society (see Roy and Crow 2004: 3).

In this section, we examine the structures and regimes of social relations that have shaped and influence the basis and mechanisms of water service production, distribution and access in sub-Saharan Africa. Our discussions are structured and organized on specific thematic areas with emphasis on the colonial legacies, the cultural and gender perspectives, and the implication of modern use of water on socio-spatial inequality.

Colonialism, post-colonialism and the legacies of water services inequality

The history of modern water service inequality in Africa can be traced as far back to the colonial era. It all started with the colonial interest in urban public health management through the provision of safe and improved sources of water supply and sanitation system for the colonial masters and the African elites. Government bylaws, regulations, and infrastructure provisions were the cardinal tools available to pursue these goals, with high priority attention given to urban and other public spaces. In Nigeria, for instance, public sanitary inspection team dominated mostly the sanitary enforcements of residential and public places with regular inspection exercises. Jenkins et al (2010) has also reported almost a similar trend of colonial sanitation legacies in Kenya, Uganda and Ghana. Major public infrastructure investments were mostly in the areas of public water supplies in urban dwellings. Colonial and post-colonial primary schools constituted important platforms for engaging young people in knowledge, awareness and promotion of sanitation behaviors. Whatever efforts were made to secure good sanitary practices were mostly centered on the urban areas where public health protection was the priority especially for the safety of the colonial masters. Rural areas were left behind, especially in public sanitary infrastructure investments.

While the colonial masters generally pursued policies of segregation by concentrating basic and essential public services in selected zones within urban areas, post colonial governments, though were committed to development plans of equality in basic public services, found such policies increasingly unattainable. The rising and haphazard expansion and growth of post colonial urban centres constrained the financial and planning capacities of their respective governments. Lugalla (1995, cited in Dill and Crow 2014: 192) reported the growth of urban centres in Dar es Salaam at a rate of 14% per year between 1948 and 1967 accompanied by the rise in uncontrolled and unplanned residential areas. This was made possible by the abolition of the colonial segregated urban laws (which severely restricted the flows of Africans into urban areas) in 1961 following independence. In south Africa, a large and sudden rise in rural-urban migration

in the early 1990s following the collapse of the apartheid system (and its stringent policy of restricting people to their 'homeland' areas) led to enormous pressure on urban public infrastructures including water and sanitation (see Dyson 2003). The apartheid system has been widely blamed as the root cause of some problems and inequalities in public utility services. President Jacob Zuma was recently widely quoted when he used the failure in the energy sector as illustrative example: 'the problem is that energy was structured racially to serve a particular race, not the majority.' (The Economist 2015). The implication is that while old settlements had network of urban public water and sanitation, this was absolutely not the case with the new informal settlements whose occupants were poor and lacked the necessary capacity to influence the extension of public water and sanitation infrastructures to their settlement domains.

For Nairobi, the colonial land redistribution and city planning system spatially segregated urban public services on the basis of socio-economic groups. This policy was carried over and sustained in the post-colonial era. For instance, Syagga and Mwenda (2010: cited in Dill and Crow 2014: 193) observed as follows:

the post-colonial governments of Kenyatta and Moi sustained the colonial land policies and did not reverse the huge land inequalities that were created by the colonial government. Instead the post-colonial governments allocated land in favour of a new emerging group of political and economic elites.

The lessons here demonstrate that different countries followed different trajectories in water service provision over the colonial period depending on some determining contexts. Consequently, a legacy of segregated spatial planning has left behind some dualistic spatial structures as urban/rural, urban/sub-urban and slums distinguishable on the basis of the availability of public service infrastructures including water supply. The post-colonial governments reproduced and sustained such inequalities either as a response to inadequate financial capacity to fully serve the urban citizens or poor planning, corruption or through the influences of global neoliberal and capitalist forces of privatization, commercialization and marketization.

Diverse planning and visions of urban development at the post-colonial level hardly close the inequality gap in water supply services across spaces. Such visions depend on practices of inclusion/exclusion sustained through specific discourses to justify where public attention should be focused on the provision of water services. For instance, discourses of 'illegal settlements', 'unapproved settlements', 'slums', etc have come to be popular planning discourses which ensure some segments of the urban dwellers, for instance, are denied access to basic public water services. Dill and Crow (2014) have outlined three main approaches in which most national governments in sub-Saharan Africa have employed to sustain existing inequality in access to basic public water and sanitation services as follows:

- a. demolition and eviction, and the long continuing shadow of demolition and illegality in which water and other services are rarely provided.
- b. reluctant recognition of the needs of informal settlements, eventhough they are excluded by the insecurity of land tenure, informality of institutions, and inattention

by city government;

- c. current attempts to upgrade and improve slums.

These three phases have guided contemporary urban development strategy in post-colonial sub-Saharan Africa through a wider process of urban 'gentrification'⁴, where the powerful segments of the urban dwellers are continuously marginalized and pushed further outskirt to create spaces for the urban elites and the rich.

One important legacy of the colonial water services system was its modernizing characteristics, which was possible as a mechanism of coping with the evolving urban structures in sub-Saharan Africa. The emergence of modern development reflected in high urban growth and the development of modern public water supply and sewerage systems have served to widen the social and spatial segregation between the poor and rich, rural and urban and urban and suburb dwellers in sub-Saharan Africa with specific reference to water access. Modernity partly represents a polarization between the affluence of the few and the increasing misery of the many. The modern abstraction and management of water resources in sub-Saharan Africa is better understood by looking at the historical aspect of its urban evolution pattern and trajectory.

Sub-Saharan African countries generally maintain a hierarchical urban system characterized by extreme cases of spatial imbalances. The UN (1991: 10-16) distinguished such hierarchical imbalances with a number of characteristics, including: a) the domination of national urban systems by one or a few large primate cities; b) the existence of middle-order cities; and c) the existence of many insufficiently developed low-order urban centres. These imbalances were linked with historical trajectories conforming to the natural locational and previous indigenous organizational advantages enjoyed by certain settlement spaces. Such advantages as trade and transport routes, colonial and administrative development plans were particularly relevant.

O' Connor's (1983) typology of African cities recognized some urban systems based on their largely colonial influence (Kenyan and Zimbabwean city examples); largely indigenous cultures (some urban centres in Nigeria); or urban centres that reflect an amalgam of the attributes of the colonial heritage and pre-colonial ethnic characteristics (Cote d'Ivoire and Zaire). However, shared features of primacy and imbalances in the geographical distribution are common among all the urban systems in sub-Saharan Africa.

Settlement types and distribution equally reflect service quality and availability. Most spatial policies in African countries sustain a dual pattern development heritage of the colonial system, producing not only rural and urban dichotomies, but also development disparities within urban structures. In colonial periods, the immigrant areas in cities were distinguished from the native Africans in peri-urban areas. Reflecting on the situation during the colonial period in Kenya and Uganda, Latema et al (2014) described such duality by their differences in administration, planning and service provision. Moving beyond the colonial period, the authors argued that public

4 Wyly and Hammel (2005: 35) observed as follows: 'more than ever before, gentrification is incorporated into public policy-used either as a justification to obey market forces and private sector entrepreneurialism, or as a tool to direct market processes in the hopes of restructuring urban landscapes in a slightly more benevolent fashion.'

service provisions (sewerage system in particular) in the East African cities hardly cover unplanned peri-urban settlements, which houses about 60% of the population, although urban sewer lines pass through such settlements in some areas. Across sub-Saharan Africa, the rural population obtains their daily water supplies either from the natural sources (rivers/streams, ponds, rain, and hand-dug wells) or modern supply sources (public sector and private or commercial supplies). The urban areas do not fare better given their inherent hierarchical structures. According to Nigeria's Water Supply and Sanitation Interim note (FGN 2000), for instance, no urban community in Nigeria has a sewerage system except for Abuja and limited areas of Lagos. This means that sewerage and sullage in urban areas either lie stagnant or are disposed through the storm water drainage.

Successive policies and programs on water and sanitation in Africa nowadays have been understood in the contexts of public, market and voluntary actors with urban, rural and peri-urban settlements as operational fields. Gaining access to water has consequently been shaped and defined by various positions of rights and mechanisms of technology, status, financial capability, markets and institutional arrangements. The highly dispersed nature of rural settlements, the very high incidence of urban and peri-urban poverty, and a lack of locally evolved water services planning system in sub-Saharan Africa imply not only a huge cost/financial prospects of delivering wider and efficient water infrastructure coverage, there is equally a strong need for political commitment and institutional innovation to deliver the needed infrastructures and services to address the needs of the diverse population. This is one of the greatest problems accounting for water services inequality in the region. Drawing on a specific case study in Nigeria, Udom (2011) demonstrated how modern norms of water privatization, the use of technology of supplies and demand responsive services have shaped access and service spatialization, generating advantages for certain classes of citizens and urban dwellers over others.

Water, cultural beliefs and socio-spatial inequalities

For many years cultural meanings, symbols and customary norms associated with water or bodies of water have served to mirror the depth and breadth of socio-cultural influences that enable or disable different actors from sustaining full benefits accruing from its use in sub-Saharan Africa. This is so because in most parts of the region, real life or wellbeing and mechanisms of governance are anchored on the three worlds of social, material and the spiritual (Millar and Hiemstra 2008). This broad cosmivision provide justifications for beliefs and spiritual discourses to regulate and enforce access, utilization, interaction and traditional management practices. Theoretically, the framework of the feminist school has provided enormous basis for understanding specific implications of the dynamics of specific cosmivision related to cultural knowledge of water on social and spatial inequalities specifically on women (Truelove 2011, Sultana 2009).

In most of sub-Saharan Africa's traditions, discourses on water and bodies of water hardly get detached from religion, deities and social histories all encoded with existential and behavioral underpinnings. Specific reports in Congo (Tshimanga 2009), Ethiopia and Mali (Finneran 2009), Nigeria (Akpabio 2011, 2006), Ghana and

Togo (Drewal 1988), among several others, suggest a transcultural phenomenon that actively explains the complex role of water as avenues of beliefs, religious and ancestral worships and symbols for traditional governance. Different versions of such roles and practices have been reported. Drewal (1988: 160) captured the shared experiences of 'mami wata' for instance as follows:

mami wata, pidgin English for 'mother of water' refers to an African water spirit whom Africans regard as foreign in origin. Africans use the pidgin term to acknowledge the spirit's otherness as well as to indicate its incorporation into the African world. The term mediates between Africans and those from overseas and represents Africans' attempts at understanding or constructing meaning from their encounters with overseas strangers. Pidgin English also serves as a lingua franca among Africans. Sharing similar kinds of experiences with foreigners and foreign material culture, Africans spread mami wata lore throughout west and central Africa and filter it through many cultural lenses to make it a transcultural phenomenon of remarkable proportions.

Throughout Drewal's presentation, mami wata (in all variant forms) is mostly gendered into feminine sexuality, although its influences could extend to the masculine sexuality. Popular narratives of mami wata convey the image of a woman with fair complexion and curly hairs in some contexts.

Visibly projecting and associating the feminine sexuality with the water deities serve to reproduce some exclusionary practices against a specific class of women believed to be linked to such spirit. Similar treatments occur in equal measure (though in rare cases) involving men. In most reports, the victims are likely labeled as 'possessed' and 'married in the water', and are often perceived as targets for 'deliverance rituals.' Local communities believe individuals in such circumstance are hardly contacted for marital relationship. Akpabio (2012b) reported a man in his late 40s who was able to report their local belief in the relationship between the spirit deity (*Atakpo Ndem Uruan* which lives in *Iboko Inyang Itiaba*) and the physical woman in Uruan: '*Atakpo Ndem Uruan* is believed to live in *Iboko Inyang Itiaba*...and is believed to be the default husband to every woman...and before a woman is married sacrifices must be performed to separate her from the *Atakpo*...I do not think most people still believe in it...but some do' (pp 810).

Individuals who are believed to be possessed with the water deity are subject to physical and spatial restrictions. Their visits and engagements with water bodies are strictly under guidance in terms of the spatial and temporal extents of engagements. Night hours are dangerous while day hours engagements are strictly guided. In one of the fieldwork activities, a lady in her early 30s reported her experience with her parents who believed she is spiritually possessed with the water deity as follows: "my parents hardly allow my visit to the river...they don't even allow anybody to carry me near a river because of their fears of likely disappearance...they say am possessed...but when I get nearer the river I feel very relaxed..." The man's situations are always tolerated largely given the perception of their social and cultural positions as symbols of authorities and power.' Ellis and Ter Haar's (2004: 125-126) discussions on the ambivalence of the 'mami wata' spirit in southern Nigeria focus on the powers of fortunes and misfortunes sometimes credited to such marine agency.

The wider African cosmology which is largely dominated with spiritual idioms and beliefs in supernatural powers is widely articulated within the contexts of the multiplicity of ritual practices, norms, values and taboos reserved for water and bodies of water to satisfy specific needs and purposes. Finneran (2009: 179) had this to say of the Bambara peoples in relation to their water deities:

the Niger river, for instance, is identified by Bambara peoples with the body of their deity Faro and the waters-as well as having general healing powers- are specifically linked to conferring fertility. A similar trait may be noted amongst the Yoruba of Nigeria, where the deity Yemonja gave birth to all rivers and is explicitly associated with fertility...in Nigerian Igbo cosmology, the water goddess Nne Mmiri fulfills a similar function (cited in Akpabio and Takara 2014: 5).

There are a growing ambivalence depicting bodies of water as carrying the benign spirit in one form, with another perception imputing malevolent spirit. When communities and individuals perform certain rituals on bodies of water for fertility, spiritual deliverance, resource productivity, etc., and in turn credit such bodies of water as dangerous for a certain class of people or development activities. The fertility, productivity and security values of water have been reported in many forms across sub-Saharan Africa, just as their anti-development attributes. Rivers as places of fortunes, misfortunes and economic opportunities have been reported across sub-Saharan Africa in Zimbabwe (McGregor 2007); Tanzania (Walley 2004; Nigeria (Akpabio 2012a, 2012b); in Congo (Tshimanga, 2009), etc.

For sub-Saharan Africa, the sacredness of water is rooted in religion and the supernatural. The starting point is the knowledge of a) water and bodies of water as a free gift from God/gods/goddesses and; b) bodies of water as depositories of ancestral spirits and souls. These ideas and concepts not only traditionally emphasize universal rights of access, they offer a remarkable platform for connecting humans with the supernatural through worship and ritual practices. In north-eastern Congo, Tshimanga (2009) had documented a ritual whereby someone crossing a river for the first time has to give an offering to the river as a sign of being blessed by the spirits. Other religious observances and practices associated with water and bodies of water have been reported in other countries, including Ethiopia, Nieria, Ghana (see Finneran 2009, Akpabio 2012, Ellis and Ter Haar 2004).

Water, gender and socio-spatial inequality

Central to Sen's arguments on resource entitlements is the consensus in the literature demonstrating a great deal of power differences relating to access to water resources which in most cases are gendered in favour of the male gender (Sen, 1982). While men have absolute control and entitlements to all productive resources of nature, including land and water; women's rights to such resources, on the other hand, are subsumed in the broader web of their roles as wives, which entitles them to the collection, use and domestic management of water. The scope for understanding gender inequality and power differences in water access largely depends on two fundamental framework

relating to: a) the gender division of labour and; b) basic societal rights of ownership and entitlements to productive resources. The major questions most studies seek to address around these themes border on the broader gender question of who controls and manage available water resources at community and household levels: what roles do women, girls, boys and men play in collecting, handling, managing, storing, treating water? Are decision-making processes and responsibilities in water management shared equally for men and women? What implications are likely to be produced in the context of gender inequality in access and control over water resources?

Access and management of water resources in sub-Saharan Africa is intertwined with religion and cultural norms which, in most cases, throw up issues of gender and power relations at domestic and public spaces. Studies have shown that the prospects of achieving greater integration of women in water management programs, and decision making remain very low because of some cultural and socio-economic reasons (Michael 1998, Archer 2005, Akpabio 2012; Akpabio and Subramanian 2012). The development structures of most African countries are highly culturally gendered. In the domain of water management, the cultural norm still privilege men over women. Women are known to be traditionally and exclusively involved in the cycles of collecting and managing domestic water while participation in governance and decision-making processes were entirely in the exclusive domain of men.

The perception that women are subordinate to men automatically consigns them to the domestic spaces. Social perception and consignments of women in the domestic spaces assume more complicated as it intersects with cultural beliefs and taboos which serve to limit women's access to public water sources on certain conditions. As religious and cultural perception shapes access and use of water and bodies of water in some contexts, studies have demonstrated that women are the most victimized. In southern Nigeria, Akpabio (2011) had reported how certain streams were regarded as unfriendly to women in their menstrual periods as follows: *'in our land, tradition forbids a woman in her menstrual period from going to stream or river to have her bath...'* This attitude is tied to the cultural belief of linking menstruation as the embodiment of evil spirits and curses. Similar and related reports are documented for Zimbabwe, Rwanda, Congo (Hickling and Hutton 2014, Sustainable Health Enterprise 2012).

Restricting women full access to water limits their capacity to address their biological needs of menstrual, domestic and child hygiene and sanitation needs. Domestic water, sanitation and hygiene issues are mostly within the exclusive domains of women at many fronts. As earlier observed, women are traditionally and culturally the pillars of domestic water, sanitation and hygiene management. Their biological nature and reproductive characteristics regularly trigger natural processes of menstrual discharges. At their productive ages, women and girls do menstruate every month and would require information and facilities for proper disposal of the hygiene products. Menstrual hygiene management requires gaining access to water for washing hands, body and usable menstrual cloths; gaining access to private and hygienic sanitation facilities for changing and disposing sanitary protection materials, and for bathing; gaining access to necessary and relevant hygiene information as well as the availability of adequate solid waste management system for disposal of cloths and pads.

The cultural division of roles and responsibilities between men and women has been a long standing developmental issues rooted in the ideology of privileging men over

women as well as the tendency to see every role of women as naturally conforming to their biological destiny. Patriarchal social relations in sub-Saharan Africa explains why every act of daily struggles relating to collecting, storing, using and disposing of waste water are exclusively in the domains of the women and girl child, leaving the men in the exclusive spheres of ownership, control and decision-making. Nyong and Kanaroglou (2001) discussed the practices and burden involved in the daily struggles for water by women in Nigeria. Women have to make careful choices on where to collect water, taking into consideration distance, risk and safety, which ultimately affect the amount of time available for other productive engagements, in addition to enormous pressure on the health system (see also Crow 2002). For the men, the full right of control or entitlements to water and related resources place them far more privileged and economically and socially powerful. Studies on the gendered aspect of irrigation systems have demonstrated how women must depend on their husbands (as household heads or as farmers) or in the context of being mothers to gain access to water from the system (see Koppen 1998, Cleaver and Elson 1995, Roy and Crow 2004).

Entrenched gender relations in access, control and management of water produce different forms of unequal outcomes, mostly to the disadvantages of the female gender. Apart from a lack of full entitlement of water for economic productivity, the daily routine of collecting and managing water for the household produces considerable burden and deprivation. In the context of water scarcity and poor sanitation coverage, for instance, the women and girl children are the most vulnerable. Within this context, the gender balance in domestic water management remains poor. Women face a greater burden than men. Going down the age ladder, the girl child has the natural responsibility for supplying water for domestic needs, and in most cases this comes at a cost to her education and other forms of social engagements. As wives, every aspect of domestic water management—food production and preparation, care of domestic animals, household hygiene, washing and disposal—depends on them and in most cases this comes at a cost to other socio-economic engagements. Women are involved in child birth and child rearing which carry an enormous implication for water, sanitation and hygiene both in practice and generational habit transfer. They must walk long distances to look for water. They are the first to be exposed to sources of polluted water and water-borne diseases as they move from one point to another in search of water for domestic needs. For school girls, GWA (2003) noted that the absence of clean and private sanitation facilities rendered 10% of school-age girls in Africa drop-out at puberty or absence from school during menstruation.

Discussions and concluding remarks

Clearly, four critical and interrelated themes have shaped the pattern and trend of socio-spatial inequality in the distribution and access to water resources in sub-Saharan Africa, namely, the geographical aspects of resource availability and distribution; the historical contexts of colonialism and post-colonialism; the socio-cultural circumstances of the people and; the wider impact of the global institutional forces on some national water management policies. As we have seen in the various reports, these factors do not operate independently on their own; they display some interrelationships and are shaped by prevailing local contexts, which act together to influence local practices in the distribution and access to water and water services. In

short, what we see as inequalities in access to water and water services in sub-Saharan Africa is partly a natural phenomenon and partly a social construction.

The regional climate and water resources distribution systems provided the natural basis determining where water flows in space and time. Our analyses have shown that the central and western (tropical climatic regions) parts of sub-Saharan Africa are the wettest regions relative to the arid and semi-arid regions. However, water utilization indices for these regions remain very low and mostly restricted to rain-fed agriculture and domestic uses in sharp contrast to some of their arid and semi-arid neighbours, particularly the northern and southern Africa. Although Hanjra et.al (2009) recorded very low withdrawal level (less than 4%) of renewable water resources for Africa, the incentives for water resources development is comparatively most higher in the arid and semi-arid regions over the tropical and wetter regions. This probably relates to the scarcity values which in turn influence the incentives to develop available water resources. Drawing on Ghosh and Bandyopadhyay's (2005) notion of 'water scarcity value', we argue that renewable resources like water command a value when being constrained in terms of supply for a specific time and space. The scarcity of renewable water resources probably drives a sense of incentive in the arid and semi-arid regions for its development in sharp contrast to countries in the tropical and wetter regions who are yet to realize such value and incentives for development.

The impact of colonial administration in sub-Saharan Africa has been one of the important explanatory factors for inequalities in access to water services through various intra-country specific water service differentiation schemes and practices. Although different countries experienced some differences in water services provision under the colonial system, the general feature was the practices whereby water services were tailored and customized to administrative and residential areas in line with the public health interest needs of the colonial masters. Invariably, the colonial masters, few African elites and the urban areas had the highest priority. The urban areas were prioritized given their positions as important centres of the colonial administration, and as a way of guaranteeing the public health needs of the colonial elites. The colonial experiences of differentiated water services effectively implied that certain sections of the urban areas had historically enjoyed an unequal advantage over other spatial areas. By all standard, such practice was to lay the foundation for the huge gap and dichotomies between the urban and rural, urban and sub-urban and between socio-economic groups in relation to access to water services. Post-colonial water services system across sub-Saharan Africa have reproduced and perpetuated the pattern of colonial water services differentiation in complex ways where class, wealth, power and political connections become the focus of where and to whom the flow of water services should be channeled.

Although some countries had attempted some egalitarian services and equalization at the urban scale, our review of literatures has demonstrated this was not possible due to a number of challenges. For instance, post-colonial urban areas in sub-Saharan Africa is still notably characterized by a steady rise in the phenomenon of rural-urban migration with consequent demographic challenges on housing, employment and access to other basic and liveable services. The rise in sub-urban settlement and urban slum formation is a glaring manifestation of structural inequality. The cost of accessing urban water and related services remains excessively high for the low income earners and the unemployed who exclusively constitute urban slum dwellers. In most

countries, for instance, the important infrastructures and energy for gaining access to urban water supplies including pipes, pumps, mains and other technologies of water services production and distribution are spatially structured to privilege the high income residential areas. In a study in Nigeria, Udom (2011) observed that urban public water services are mostly channeled to high quality residential houses corresponding to government and private residential quarters/estates and major streets occupied by the rich and upper class citizens. Focusing on the very high cost of paying for connecting the public water infrastructures, the author argues that in a country where the monthly public minimum wage is relatively very low, the initial cost of attracting public water infrastructures to a private residence only serves to further alienate the poor from accessing the public water services.

Over the years, the various post-colonial sub-Saharan African governments do embark on schemes to provide full coverage (in principle) of water services to their urban citizens. However, guaranteeing the provision of a uniform water service for highly polarized urban structures as currently discussed seems highly impossible within the present technical, economic and infrastructural constraints which are the lots of sub-Saharan African countries. In South Africa, for instance, Jaglin (2008) while acknowledging the rising service inequality, argued that the fabric of cities (using the Cape Town as a case) is such that standard, universal and uniform service package for everyone can hardly be possible given the prospect of enormous financial difficulties for the State.

Neoliberal capitalist policies and norms in the water services sector have equally added some complex and difficult challenges that serve to exacerbate and sustain the existing pattern of inequality in access to water services in sub-Saharan Africa, with water services being increasingly privatized, commercialized and subjected to the market forces of demand and supplies. At the instance of the pressure from the International Monetary Fund (IMF) and the World Bank, urban public water corporations and infrastructures are systematically handed over to the private sector through different forms of agreements and MoUs.

Reports across eastern, western and southern Africa (Crow and Brian 2014, Akpabio 2012c, Udom 2011 and Jaglin 2008) noted the various levels of complexities associated with such trend as well as the dilemma and hard choices governments and communities face in either supporting full liberalization in the water services sector or outrightly rejecting it. Clearly, most urban water services opt for the former even with clearly disruptive socio-spatial implications. The consequences are clear and further deepen the existing inequality in access to water services, given that: the vast majority of urban households have no water connection due to high cost; public taps are increasingly disappearing in urban streets to make ways for commercial water entrepreneurs; urban households and citizens massively depend on the private or commercial water services-private boreholes and wells, buying water from governments, kiosks, water vendors or their residential neighbours. Given a very high income inequality among the urban citizens, the burden of paying a higher price for water falls disproportionately on the poorest households.

In urban areas, differentiated access to water was linked to economic inequality, institutional arrangements as well as some material and spatial practices. Here, public policies over water provision tend to privilege the neoliberal agenda over values of universal access and human rights imperative. As water has become increasingly

commodified, its services have been differentiated on the basis of cost recovery possibilities. Gaining access to water then becomes the exclusive privilege of the high income and upper class, with the result that water services are targeted at high quality public and private residential areas. The urban slums and outskirts are left with artificial water scarcity which creates further incentive for commercial investments. By producing an image of areas as 'water needs' or 'water scarce', some residential areas (especially the low income sections) are becoming increasingly attractive for commercial water services which has become the means of fostering capital accumulation by the high income and wealthy class. Through some strategic alliances, prices for urban water services were arbitrarily fixed while hours of services became increasingly regulated and rationalized to create artificial scarcity. Rather than serve the interest of the poor and low income class, these practices were observed to propagate and deepen social inequality, economic marginalization and coping problems.

The situation in Nigeria's urban spaces is a classic example of manifest water inequality sustained by exploitation, social distancing, hierarchization and exclusion (Therborn 2013). Between 1970s and 1980s, public water taps used to be the norm which contributed in servicing the urban population in the low residential streets. However, public taps systematically disappeared from the urban streets about two decades ago when Nigeria was swinging between policies of integrated water management, demand responsive water management and water privatization. While the low income earners readjusted to these policy and service changes by exploring options of natural supplies, this, however, provided an opening and economic opportunities for capital accumulation by the rich and wealthy class leading to the emergence of private and commercial water supply services through the drilling of boreholes in private homes. Politicians, public officials and the state are also involved in 'borehole drilling race' to compensate groups and loyal individuals in a manner that encourages and consolidates patronage relationships. At political campaigns, access to water has always been at the center of endless political promises and cycle of expectation from the citizenry in the name of 'dividends of democracy.' The upper class has also used the desperation for water services to sustain their accumulation drive through heavy commercial investments. The Nation Newspaper Editorial of May 8 (2013), while reacting to the alarm raised by the Minister of Water resources over indiscriminate drilling of borehole in the country, captured this scenario as follows:

...in official and household circles, borehole drilling has become rampantly disturbing, Governments at all levels shamefully join the bandwagon of borehole diggers even when an institution, usually the water corporations of states-primarily established to provide water for the citizenry, have failed to satisfactorily discharge their responsibilities. The sad trend will in the long run result in environmental hazards such as over-abstraction of ground water, salt intrusion, aquifer depletion and water quality degradation, among others. But, of what significance is the Minister's alarm, in view of the debilitating state of public water supply in the country? The rural areas across the land have been subjected to a perpetual state of lack of potable water. They rely on river and stream water for drinking, with attendant vulnerability to avoidable water-borne diseases. Even in most towns and cities that once boasted of the effective public water system, the situation on the ground is very pathetic...

The challenges often characterizing access to urban water supplies in sub-Saharan Africa carry some health and socio-economic implications. High cost of access means low income families are forced to depend on available natural sources with unimproved qualities. At home inadequate supply of water compromises domestic sanitation and hygiene. In homes with an in-house sanitation system, toilet is likely flushed once or twice in a day after everybody would have used it. A personal discussion with one of the author's immediate neighbor (which is a common experience across urban areas) is shared as follows: '...if we are able to spend #100 for water [in a household of seven persons-four children, one domestic help and the parents] in a day...some for washing clothing materials...some for bath...some for domestic cooking and washing dishes... but the waste waters are reserved for the toilets...' Some households may be worse. In most cases, children have the burden of fetching water, and for school age, this task runs prior and after school hours into the night depending on the financial capacity to sustain purchase.

The cultural aspect of water meanings and perception have perpetuated inequality through various influences on access in space and across socio-economic boundaries. In the review, knowledge of water is not only shaped by beliefs and symbolic values; gaining access into specific bodies of water (for some individuals and communities) sometimes depends on strict adherence to certain cultural and religious norms. Empirical reports across-sub-Saharan Africa, mostly conclude that the traditional institutions are still actively but subtly involved in water management (Derman 2003, Akpabio and Takara 2014). There is equally the implicit and explicit tension between the neo-liberal norms focusing on water as economic good and the cultural values of water often espoused by users in sub-Saharan Africa.

Across sub-Saharan Africa, modern norms of commoditizing and individualizing water are practically not in line with local values of water as 'free gift' from nature (which implies equal rights of access) and as homes to spirit deities (which emphasizes some existential links with bodies of water). This belief is most stronger among the rural dwellers whose livelihoods are structured on a reciprocal relationship with nature, mediated by some religious norms and cultural values. Such contradictions have been responsible for mass resistance and 'freebie' attitudes to modern water schemes with a prospect of widening access inequality through some cost-recovery practices (Akpabio 2012b). Vandana Shiva (2002) has rightly argued that the way water is conceptualized and represented is instrumental in determining who gains access and on what terms. Tension and conflicts over contestations of meanings and values are inevitable, given that the social power equations are often weighted significantly towards the advantages and privileges of a select group bent on foisting certain attitudes and orientations on the socially disadvantaged.

In conclusion, this paper has established the basis for understanding the spatial and social aspects of inequality produced through water resources distribution and transformation. Various cases and statistics reviewed demonstrate that water and access to it are first produced through the natural processes and subsequently transformed through some mechanisms of social processes which yield certain distributive outcomes. Power and power relations become very important in who gets what amount and what quality of water, and at what specific time and place. While the natural processes are important in explaining the differences between countries in the amount of water availability, our various discussions have shown that 'distributive

actions and mechanisms' have been very critical in the production and sustenance of specific cases of inequalities. The family, society and the State constitute the main institutions that serve to reproduce such inequality through various discourses, material practices and planning strategies. Several impacts and outcomes have been discussed, and could serve as a basis for targeted reforms aimed at guaranteeing equal and equitable access to water services in sub-Saharan Africa. Within the social action perspectives, Therborn's (2013: 62) mechanisms⁵ for reproducing inequality becomes a useful framework for further analyses.

Acknowledgements

The Japanese Society for the Promotion of Science (JSPS) has been the source of funding for this research..

5 Such mechanisms have been discussed to include distancing, exclusion, hierarchization and exploitation.

References

- Africa Water Task Force (2002). Water and sustainable development in Africa: a position Paper. International Water Management Institute, Pretoria, South Africa
- Akpabio, E. M. and K. Takara (2014). Understanding and confronting cultural complexities characterizing water, sanitation and hygiene in sub-Saharan Africa. *Water International*. DOI: 10.1080/02508060.2015.981782
- Akpabio E. M. (2012a). Water meanings, sanitation practices and hygiene behaviors in the cultural mirror: a perspective from Nigeria. *Journal of Water, Sanitation and Hygiene for Development* 02(3): pp. 168-181.
- Akpabio, E. M. (2012c). Water supply and sanitation services sector in Nigeria: the policy trend and practice constraints. ZEF Working Paper Series 96. Center for Development Research, University of Bonn, Germany.
- Akpabio, E. M., (2012b) Water in the village: prevailing notions and conflicting messages in Akwa Ibom state, Nigeria. *Water International* 37 (7) pp. 805-817.
- Akpabio E. M. and S. V. Subramanian (2012). Water supply and sanitation practices in Nigeria: applying local ecological knowledge to understand complexity. Working Paper Series 94. Zentrum für Entwicklungsforschung (ZEF). University of Bonn, Germany.
- Akpabio, E. M. (2011). Water and People: Perception and Management Practices in Akwa Ibom State, Nigeria. *Society and Natural Resources*, 24 (6): pp. 584-596.
- Akpabio, E. M. (2006) "Notions of environment and environmental management in Akwa Ibom State, Southeastern Nigeria". *Environmentalist* 26, 227-236. Springer Press.
- Archer E. (2005). The Wells are drying up: water and women in Ghana. *Off our Backs* 35 (3/4): pp. 23-27.
- Bartram J. and Cairncross, S. (2010). "Hygiene, sanitation, and water: forgotten foundations of health". *PLoS Medicine* 7 (11), e1000367. doi:10.1371/journal.pmed.1000367.
- Besio, K. (2006). "Chutes and ladders: negotiating gender and privilege in a village in northern Pakistan". *ACME: an International E-Journal for Critical Geographies* 5, no. 2: pp. 258-78.
- Boadi, K., Kuitunen, M., Raheem, K., & Hanninen, K. (2005). "Urbanization without development: Environmental and health implications in African cities". *Environment, Development and Sustainability*. doi:10.1007/s10668-004-5410-3
- Briceño-Garmendia, Cecilia, Karlis Smits, and Vivien Foster. 2008. "Fiscal Costs of Infrastructure in sub-Saharan Africa." *Africa Infrastructure Country Diagnostic*. Washington, DC: World Bank.

- Cassel C., Giuseppe de Candia and A. Liberatore (2010). Building African Infrastructure with Chinese Money.
- Chen S. and M. Ravallion (2007). Absolute poverty measures for the developing world, 1981-2004. In proceedings of the National Academy of Sciences. www.pnas.org/content/104/43/16757.full.pdf+html
- Chitonge, H. (2011). A Decade of Implementing Water Services Reform in Zambia : Review of Outcomes , Challenges and Opportunities, 4(3), pp. 1–22.
- Cleaver, F. (1998). "Choice, complexity and change: gendered livelihoods and the management of water" *Agriculture and Human values*. Special Issue 15 (4).
- Cleaver F. and D. Elson (1995). "Women and water resources: continued marginalization and new policies". Gatekeepers Series, No. 49. International Institute for Environment and Development.
- Cless, K. and H. P. Hahns (2012). Introduction (pp 9-22). In: Hahns, P. H., K. Cless and J. Soentgen (eds). *People at the well: kinds, usages and meanings of water in a global perspective*. Frankfurt/New York: Campus Verlag.
- Cohen, B. (2006). "Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability". *Technology in Society*. doi:10.1016/j.techsoc.2005.10.005
- Coutard O. (2008). "Placing splintering urbanism: introduction". *Geoforum* 39, pp. 1815-1820.
- Crow B. and B. Dill (2014). "The colonial roots of inequality: access to water in urban east Africa". *Water International* 39 (2):187-200. DOI:10.1080/02508060.2014.894212.
- Crow, B. (2002). Water: gender and material inequalities in the global south. In Sustainability. the Open University. Milton Keynes, UK.
- Davidoff, L. and Hall, C. (1987). Family fortunes: men and women of English middle class 1750-1850, Hutchinson, London. Cited in Valentine, G. (2001). *Social geographies: space and society*. New York: Pearson Education.
- Derman, B. (2003). "Cultures of development and indigenous knowledge: the erosion of traditional boundaries". *Africa Today* 50 (2).
- Donahue, J. & Barbara, R. J. (1998). "Water, Culture and Power: Local struggle in global contexts". Washington, DC.: Island Press. Cited in Linton, J. (2010).
- Drewal, H. J. (1988). "Performing the other: mami wata worship in Africa". *The Drama Review* 32 (2): pp. 160-185.
- Dyson T. (2003). "HIV/AIDS and urbanization". *Population and Development Review* 29 (3) pp. 427-442

- Ellis, S. and G. Ter Haar (2004). *Worlds of Power: Religious Thought and Political Practice in Africa*. New York: Oxford University Press.
- Engleman R. and P. LeRoy (1993). *sustaining water: population and the future of renewable water suppliess*. Washington, DC: Population Action International.
- FAO (1995). *Irrigation in Africa in figures*. Water Report No. 7. Rome. Food and Agriculture Organization.
- FGN (2000). *National Water Supply and Sanitation Policy*. Department of Water Supply and Quality Control, Federal Ministry of Water Resources. Federal Republic of Nigeria.
- Fontein J (2008). *the power of water: landscape, water and the state in southern and Eastern Africa; an introduction*. *Journal of Southern African Studies* 34 (4): pp. 737-756.
- Gandy M. (2002). *Concrete and clay: reworking nature in New York City*. Cambridge: MIT Press.
- Ghosh, N. and Bandyopadhyay J. (2005). *scarcity value based explanations of transboundary water conflicts in water scarce economies: cases of Cauvery and Colorado river basins*. In: Mathur GN and AS Chawla (eds). *Proceedings of the XIIth World Water Congress (Water for sustainable development-towards innovative solutions*. Vol. 3: 41-60.
- Graham S., and S. Marvin (2001). *Splintering Urbanism*. Routledge, London
- Gichuki FN (2000). *Makueni district profile: rainfall variability, 1950-1997*. Dryland Research Working Paper No. 2. Somerset, Drylands Research, England.
- GWA (2003). *The Gender and Water Development Reports 2003: Gender perspectives on policies in the water sector*. Gender and Water Alliance. <http://www.genderandwateralliance.org>
- Hanjra, M. A., Ferede T. and D. G. Gutta (2009). "Reducing poverty in sub-Saharan Africa through investments in water and other priorities". *Agricultural Water Management*, 96: pp. 1062-1070.
- Hickling S. and G. Hutton (2014). *Economics of inadequate sanitation in Africa*. Chapter 4. In: In: P. Cross and Y. Coombes (eds). *Sanitation and Hygiene in Africa, where do we stand? Analysis from the AfricaSan Conference, Kigali, Rwanda*. IWA Publishing, London.
- Jackson, C. (1993). "Doing what comes naturally? Women and environment in development". *World Development* 21 (12): pp. 1947-63
- Jaglin, S. (2007). "Differentiating networked services in Cape Town: Echoes of Splintering urbanism?" *Geoforum* 39: pp. 1897-1906.

- Koppen, B. v. (1998). water rights, gender and poverty alleviation. inclusion and exclusion of women and men smallholders in public irrigation infrastructure development. *Agriculture and Human Values* 15: 361-374.
- Letema S., B. V. Vliet and J. B. van Lier (2014). Sanitation policy and spatial planning in urban East Africa: Diverging sanitation spaces and actor arrangements in Kampala and Kisumu. *Cities* 36:1-9.
- Linton, J. (2010). *What is Water? The History of a Modern Abstraction. Nature/History/Society* (p. 333). doi:10.1080/14649365.2012.757036
- Lipton M and Litchfield J (2002). The impact of irrigation and poverty. A report for the FAO by the Research Unit, University of Sussex.
- Lugalla J (1995). crisis, urbanization and urban poverty in Tanzania: a study of urban poverty and survival politics. Lanham, MD: University Press of America.
- Mango (2002). Cited in Gerke, S. and J. Ehlert (2009). Local Knowledge as strategic Resource: Fishery in the seasonal floodplains of the Mekong Delta, Vietnam. ZEF Working Paper Series 50. University of Bonn, Germany
- McGregor, J. (2007). living with the river: landscape and memory in the Zambezi valley, northwest Zimbabwe. In: Fontein J (2008: 746). the power of water: landscape, water and the state in southern and Eastern Africa; an introduction. *Journal of Southern African Studies* 34 (4): pp. 737-756.
- Michael B. P. (1998). The role of women in water resources management. The Tanzania case. *International Journal of Water Resources Development* 14 (4): 499-504.
- Millar, D. and W. Hiemstra (2008). An Evolving Framework for Endogenous Development in Africa: Walking the COMPAS 'Bushpath'. In Millar, D., A. A. Apusigah, C. Boonzaaijer (eds). *Endogenous Development in Africa-Towards a Systematization of Experiences*. COMPAS/UDS. EDU, Barneveld, the Netherlands.
- NASA Global Earth Observing System (2001). A shadow of a lake: Africa's disappearing Lake Chad. GSFC online News. <http://www.gsfc.nasa.gov/gsfc/earth/environ/lakechad/chad.htm>
- Nyong, A. O. and P. S. Kanaroglou (2001). "A survey of household domestic water use patterns in rural semi-arid Nigeria". *Journal of Arid Environments* 49: pp. 387-400.
- O' Connor, A. (1983). *The African city*. London: Hutchinson.
- Pflieger, G., & Matthieussent, S. (2008). Water and power in Santiago de Chile: Socio-spatial segregation through network integration. *Geoforum*, 39, 1907–1921. doi:10.1016/j.geoforum.2008.09.001
- Rathgeber E. (1996). women, men and water-resource management in Africa. In: *Water management in Africa and the middle east: challenges and opportunities*. Rached, Egal and Eva Rathgeber and David Brooks, eds. the International Development

Research Center.

- Ribot J. C. and N. L. Peluso (2003). a theory of access. *Rural Sociology* 68 (2): 153-181.
- Rioux, M. H. (1994). Towards a concept of equality of wellbeing: overcoming the social and legal construction of inequality. *Canadian Journal of Law and Jurisprudence*, vol. VII, No. 1: pp. 127-147
- Rosegrant M. W. and N. D. Perez (1997). Water resources development in Africa: a review and synthesis of issues, potentials, and strategies for the future. EPTD Discussion Paper No. 28. Environmental and Production Technology Division. International Food Policy Research Institute, Washington, DC, USA.
- Roy, J. and B. Crow (2004). gender relations and access to water: what we want to know about social relations and women's time allocation. Working Paper. Center for Global, International and Regional Studies UC Santa Cruz. <http://escholarship.org/uc/item/om5033gv>
- Sen, A. (1982). cited in Roy, J. and B. Crow (2004). gender relations and access to water: what we want to know about social relations and women's time allocation. Working Paper. Center for Global, International and Regional Studies UC Santa Cruz. <http://escholarship.org/uc/item/om5033gv>
- Shiklomanov, I.A. (1999). World Water Resources: Modern Assessment and Outlook for the 21st Century. Federal Service of Russia for Hydrometeorology and Environment Monitoring, State Hydrological Institute, St Petersburg
- Shiva, S. (2002). *Water wars: privatization, pollution and profit*. Cambridge: South End Press.
- Sultana, F. (2009). Fluid lives: subjectivities, gender and water in rural Bangladesh. *Gender, Place & Culture*. doi:10.1080/09663690903003942
- Sustainable Health Enterprises (2012). Available at <http://www.sheinnovates.com/> (accessed 02-02-2014)
- Swyngedouw, E. (2009). "The political economy and political ecology of the hydrosocial cycle". *Journal of Contemporary Water Research and Education* 142: pp. 56-60
- Swyngedouw E (2006). circulations and metabolisms: (hybrid) nature and (cyborg) cities. *Science as Culture* 15 (2): 105-122.
- Swyngedouw, E., Kaïka, M., & Castro, E. (2002). "Urban water: A political-ecology perspective". *Built Environment*, 28, pp. 124-137.
- Syagga, P. M. and Mwenda, A. K. (2010). political economy and governance issues surrounding policy interventions in the land sector in Kenya. Final Report prepared for the World Bank. cited in Crow B. and B. Dill (2014). the colonial roots of inequality: access to water in urban east Africa. *Water International* 39 (2): 187-200. DOI: 10.1080/02508060.2014.894212.

- The Economist (2015). South Africa's electricity crisis: rolling power cuts are fraying tempers. 3rd January. <http://www.economist.com/news/middle-east-and-africa/21637396-rolling-power-cuts-are-fraying-tempers-unplugged?fsrc=scn%2Ftw%2Fte%2Fed%2Fpe>. Accessed on 7th January 2015, Japan.
- Therborn, G. (2013). *the killing fields of inequality*. Polity Press, Cambridge, UK.
- Truelove, Y. (2011). (Re-)Conceptualizing water inequality in Delhi, India through a feminist political ecology framework. *Geoforum*, 42, 143–152. doi:10.1016/j.geoforum.2011.01.004
- Udom, E. S. (2011). *Accessibility to potable water supply in Akwa Ibom State*. Unpublished PhD thesis. Department of Geography and Regional Planning, University of Uyo, Nigeria.
- UN (2010). Resolution A/RES/64/292. United Nations General Assembly, July 2010. http://www.un.org/waterforlifedecade/human_right_to_water.shtml
- UN (2012). *The Millennium Development Goals. Report 2012*. United Nations, New York
- UN (1991). *The management of secondary cities in sub-Saharan Africa: Traditional and modern institutional arrangements*. United Nations Centre for Human Settlements (Habitat). Nairobi, Kenya.
- UN (2008). *World urbanization prospects. The 2007 revision, population division, Department of Economic and Social Affairs, New York*. www.un.org/esa/population/publications/wup2007/2007WUP_Highlights_web.pdf
- UN (2004). *World urbanization prospects: the 2003 revision data tables and highlights*. New York: United Nations.
- UNDP, UNEP, World Bank and WRI (2000). *World Resources 2000–2001: People & Ecosystems: The Fraying Web of Life*. World Resources Institute, Washington D.C.
- UN-HABITAT (2011). *Infrastructure for economic development and poverty reduction in Africa*. United Nations Human Settlements Program (UN-HABITAT), Nairobi, Kenya.
- UN-HABITAT (2003). *Water and sanitation in the world's cities: local action for global goals*. London: Earthscan.
- Van Koppen B. (2003). *Water reform in sub-saharan Africa: what is the difference?* *Physics and Chemistry of the Earth* 28: 1047-1053
- Walley C. J. (2004). *rough waters; nature and development in an east African marine park*. Oxford, Princeton University Press. P. 17
- WHO/UNICEF (2010). *Joint monitoring programme for water supply and sanitation. Meeting the MDG drinking water and sanitation target: mid-term assessment of progress*. WHO; Geneva: UNICEF, New York.

Wyly, E. and Hammel, D. (2005). "Mapping neoliberal American urbanism". In: R. Atkinson and G. Bridge (eds). *Gentrification in a global context: the new urban colonialism*, pp. 18-38. London: Routledge.



WATERLATGOBACIT