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GEOPOLITICS OF TRANS-BOUNDARY WATER RESOURCES AND FOOD SECURITY

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ABSTRACT

This paper aims to investigate the control and access of water resources and related conflict among countries at various levels. As sovereignty and power over water bodies, represents a country's strategic position in international system. However, other environmental concern to the geopolitics of water resources rooted in the availability, utility and distribution among the countries into various purposes. The most important function constructed in this domain is food security to its citizen. Therefore, the paper deals with geopolitical contexts of the geographic distribution of water, its dimension of sovereignty, control and its implication for food security. For this particular assessment, a case of Nile Basin has been taken up. It is shared by 11 riparian countries, water management and access to water has been proved to be very difficult for riparian as Egypt has acquired hegemonic position in the basin by its historic and acquired rights. Therefore, the paper tries to assess the countries position and stand over distribution and utilization of Nile water to provide food security to its population. Since the conflict has historical background, the paper also observes into possibilities in the conflict reduction for just utilization of water resources and sharing the benefit.

Key Words: Geopolitics, Nile River Basin, Riparian, Water Resources, Food Security

Background

Geographic distribution, conditions and scarcity of resources have played major role in geopolitical analysis. Yet, influence of geography on country's crucial resources are under

acknowledged. Access to water resources can be seen in this context. Though, it has been pointed out from time to time that access to transboundary water is one of the fundamental rights for every individual and thus for a country for their living. There are many regions in the world, which are facing severe water crisis or scarcity. But the control over water and its development is strategically important that has been the impetus of conflict throughout history (*Friedman and Fedirka, 2017).*

Therefore, Access to water can cause conflict among countries through various means as control and access over water bodies provides a country's strategic stand at global platform. This strategic standing would be in form of strong military base, use of biotic and abiotic water resources, economic stability, providing Food Security and the most important leverage over other country. Having these benefits control and access of transboundary water resource in any region is vital for any country's competition over sharing of water resources sometimes leads towards geopolitical conflict among neighbouring countries.

According to the UN-Water (UN, 2008), approximately 45 percent of the world's population lives in river and lake basins that are transboundary in nature and perhaps even more significantly, over 90 percent of the world's population lives in countries that share basins. Transboundary water resources share more than 263 international river basins, which cover nearly half of the Earth's surface that provide an estimated 60 percent of global freshwater surface flows (Wolf *et al.*, 1999; UNESCO, 2009). Trans-boundary water resources are seen as a major water conflict zone throughout the world. Here, in this paper an attempt is made to understand the water geopolitics in terms of trans-boundary water resources with particular example of Nile River, as a conflict Zone due to uneven water distribution and water scarcity in the region vis-a-vis food security. Before proceeding further in this regard, it would be appropriate to give a brief introduction of the Nile River and its Geopolitical Situation in the basin.

Therefore, the trans-boundary rivers can lead to geopolitical power struggle among riparian states at inter-state relation perspective in Nile River Basin, where approximately 85 percent of total river flows to Egypt that originates in Ethiopia. With given river flow, Egypt a country of desert climate, more populous would be depends heavily on the river for drinking water and agriculture. Except Egypt, more irrigation and agricultural production are remaining fragile in other countries due to water scarcity. Though Egypt utilizes 86 percent of Nile water, during 2009-2011 food import was 37 percent of Egypt's imports and about 20

percent during 2014-2015 (FAO, 2015a). This geopolitical scenario has been seen for long back in history; e.g.

"The study of mathematics, like the Nile, begins in minuteness but ends in magnificence. (Charles Caleb. 1780-1832).

"He who controls the Nile controls Egypt." (Halford, 1936).

"Water flows towards the powerful and the rich. [Fradkin, P. L. 1981, (Quoted in Phillips *et al.,* 2006)].

Geopolitics examines the political, economic and strategic significance of geography, and it also focuses upon strategy induced by geographical factors, whereas hydro-politics refers to the study of conflict and cooperation among nations over shared water resources (Wolf, 2007). Although contemporary Western geopolitics favours the Horn of Africa for its geographic and strategic importance in counter terrorism and transportation of commodities, especially oil. For more than half a century, Egypt due to its location in the most unstable regions of the world has been viewed as a critical ally of the West. Consequently, the leading industrialised nations were unwilling to support anything upstream on the Nile that might disrupt the vital flow of water to Egypt and trigger instability there. Meanwhile, Ethiopia and the upper riparian states lacked funds to develop the badly needed broad irrigation and hydroelectric network.

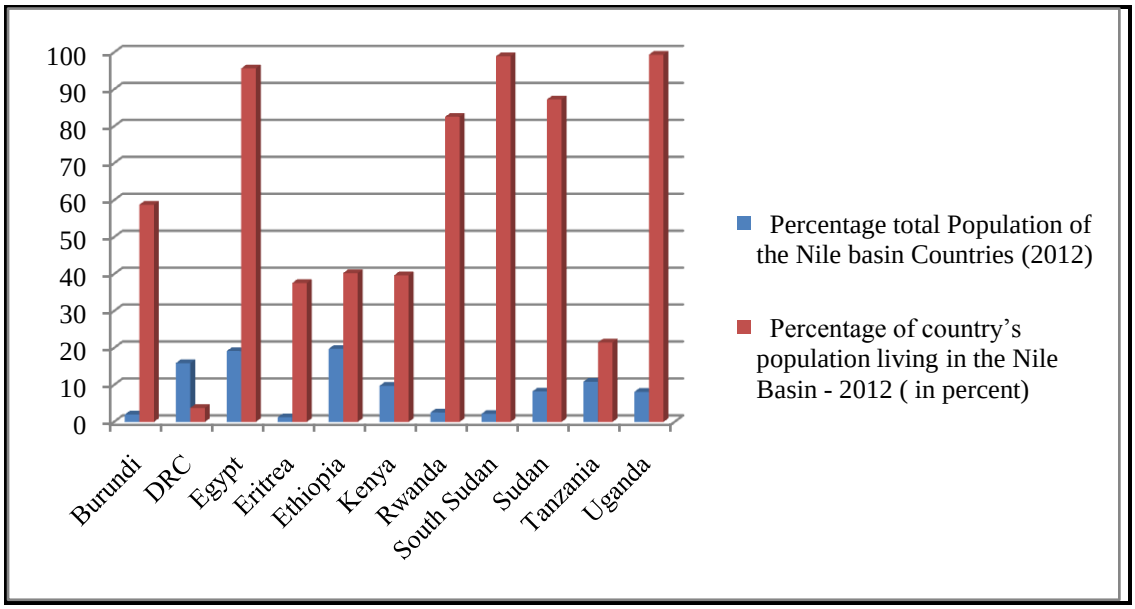
In the Nile River Basin, water management is the cause of concern for water scarcity and food security; the relationship between water and food security is fragile in the Nile basin region. The Nile is the most important river in the world and its basin covers 3,254,555 km^2 with a length of 6,853 km; thus Nile is considered the longest river in the world and its basin covers about one tenth of the African continent (Yohannes *et al*, 2017). The Nile Basin catchment area having 11 riparian states: Egypt, Eritrea, Burundi, Ethiopia, Sudan, South Sudan, Kenya, Tanzania, Uganda, Rwanda, and Democratic Republic of Congo (DRC) (see map 1). As the Nile Basin Initiative (2012) stated, that in 2010, the total population living in the basin states was 424 million, of that 232 million (about 54 per cent) lived in the basin region (diagram 1 and 2). It has been figured out that by the year 2025 around 600 million populations will be living in the Nile Basin countries and around more than 300 million people in the Nile basin area (NBI, 2012).

Map 1: Political Map of the Nile River Basin Countries

Source: Nile Basin Initiative, 2012.

Diagram: 1

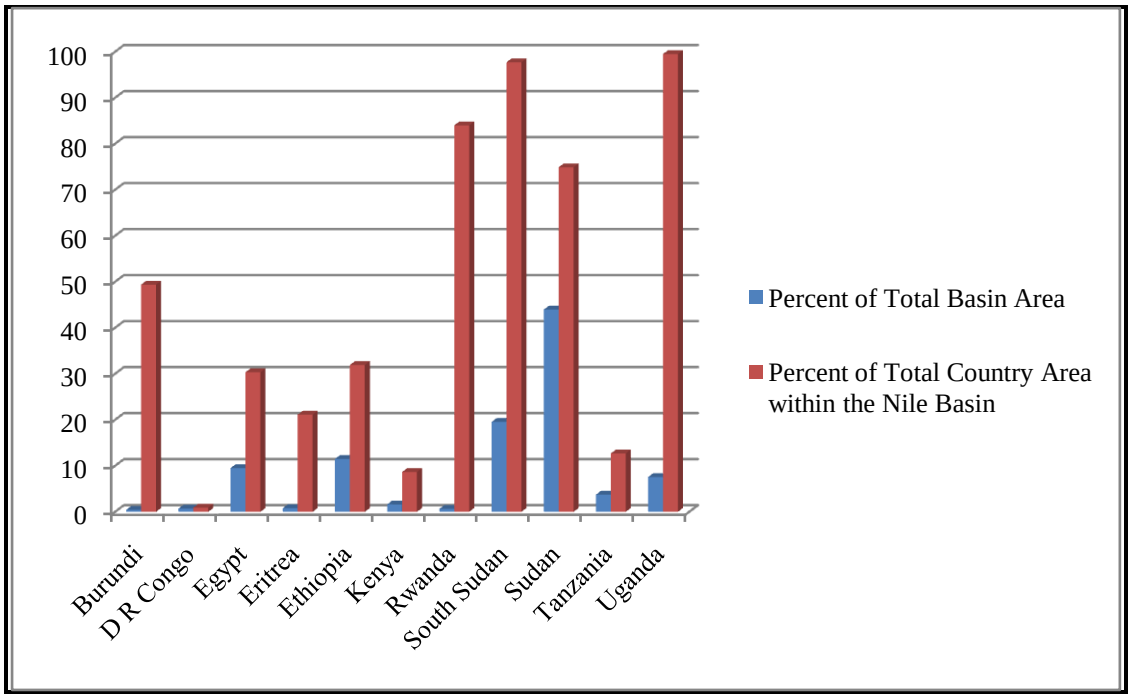
Population Indicators in the Nile Basin Countries



Source: NBI (2013).

Diagram: 2

Area Indicators in the Nile Basin Countries (Expand in the Text)



Source: NBI (2012).

Geopolitical claim of River Nile: Perspective from Riparian States

To date, Egypt claims that it has natural, acquired and historical rights on the Nile, and will be governed by the hydro-political doctrines of ‘‘prior use’, ‘primary need’ and ‘acquired rights[1]’’. These principles have been regarded by the Egyptians as the crux of any talks or negotiations with upstream states. Moreover, these water rights are often referred to as an Egyptian foreign policy benchmark which calls for the safeguarding of the uninterrupted flow of the Nile water. Egypt is almost completely dependent on the Nile's water and claims that prior usage entitles it to a disproportionate share of the water resource; over ninety-five percent of agricultural production comes from Nile irrigated land. Egypt needs to expand its agricultural land and reduce saltwater intrusion from the Mediterranean Sea to the Nile delta.

However, Ethiopia has even more ‘logically plausible’ and ‘legally defensible’ claims to reserve the possibility of a massive unilateral water development Programme for the Blue Nile Basin and other water resources. The development of irrigation schemes in Ethiopia has

[1] Report of Egypt Government…. Elhance, A. P. (1999),

been minimal. The combination of land degradation and lack of adequate rainfall has often caused crop failures. To stabilize and boost agricultural production, it has become necessary to expand irrigated agriculture. The lowlands, with their extensive flat and fertile land, hold great potential for the development of large-scale irrigation based agricultural production. The potential gross irrigable area is estimated to be 3.5 million hectares. Till date, only 5 percent of the total potential is utilised (Ethiopian Investment Authority, 1999).

The geopolitical relationship between Egypt and Ethiopia is constructed on the sharing of water of River Nile. Egypt is much concerned about its relationship with Ethiopia since roughly 85 percent of the Nile River's flow in Egypt originates with the Blue Nile in Ethiopia. Egypt has frequently warned Ethiopia not to take any steps that would affect the Blue Nile's discharge. Ethiopia has responded on numerous occasions that it reserves sovereign right to use the Blue Nile for the benefit of its own population (The Conversation, 2016). Ethiopia has broad plans to develop fifty irrigation and hydroelectric generation projects. As Ethiopia claims a larger share of the Nile headwaters, Egypt will likely experience a slight reduction in Nile water.

Egypt is also apprehensive about Sudan. Incapable of expanding its water utilization at the present, this situation could change in the future. With increased use of Nile water for agricultural irrigation, Sudan could become the breadbasket of the Middle East. The Nile Waters Agreement of 1929 is one of the most important agreements between the two countries allocating the Nile's water. The Sudano-Egyptian Agreement of 1959, adjusted the 1929 allocation, reducing Egypt's share. Regional economic improvements will require cooperative management of the Nile River and its tributaries. Egypt has protection of its Nile water resources as one of its key strategic objectives (Metawie, 2004).

Egypt and Sudan hold absolute rights to utilize 100 percent of the river’s water under agreements reached in 1929 between Egypt and Britain (which was then the colonial power in Kenya, Sudan, Tanzania, and Uganda) and in 1959 between Egypt and Sudan. Since Egypt must consent to other nation’s uses of the Nile’s water, most of the other basin countries have not developed projects through which it can be used extensively. However, the say of other riparian states are not represented in these treaties. Not surprisingly, over the years other basin countries have contested the validity of these treaties and demanded their revocation to make way for a more equitable system of management. The current development of Grand Ethiopian Renaissance Dam is one of the prominent challenge to the lower riparian.

Growing water demands stemming from population and economic growth in all riparian countries have increased the pressure on water resources. This enhanced the potential for conflicts over how to share water resources in the future. However, the need to share the Nile's waters also offers the potential for cooperation. In fact, in recent years the riparian countries moved closer towards cooperation and joint development of the river basin. Thus, in the late 1990s, the Nile Basin Initiative (NBI) was launched for bringing together the riparian countries at one table. The challenge ahead is to jointly develop the Nile River Basin and to allocate water to its optimum uses while sharing the benefits.

However, the Nile River supplies 55.5 million cubic meters of water. This accounts of 86 percent of the water used in Egypt annually. The Nile River's importance to Egypt is not in its water alone, but also the flow of the river's water. 28 percent of the country's power is produced from hydroelectric plants on the river. Flood irrigation from the Nile River supplies water for almost all of Egypt's food production. Already Egypt imports 20 percent of its food requirements. Despite these factors, Egypt's water needs will continue to increase. At present Egypt's population is about 94 million, increasing with the growth rate of more than 2.1 percent per year (as on 2017). Egypt and Sudan are likely to face water deficits within the next 10 years due to climatic factors and unilateral or bilateral water development in the upper riparian. Both Egypt and Sudan currently require about 5 billion cubic meters of water per year (Lorey , 2003).

As stated above, the Nile is Egypt's primary source of water for meeting consumption demand so Egypt's reliance on the river's water is absolute. Coupled with the striking seasonal variation in river flow, Egypt suffers from insufficient water during the long, dry summer months. The storage capacity of the Aswan High Dam is essential for coping with periods of low flow levels. Settlement in the Nile basin is intimately associated with the river. In Egypt, most of its population is crowded in a habitable, 30 thousand square kilometres, narrow corridor of arable land along the Nile River and in the Nile Delta. Moreover; Egypt is the farthest downstream state in the Nile River Basin.

However, the principal causes of concern in the Nile River Basin are environmental and economic. Lack of common agreements among all the users of Nile water is largely a result of Egypt's insistence on its overriding needs. Rapid population growth in the states of the Nile River Basin means that demand for water will increase. Existing water resources will have to be used and allocated more efficiently to meet demand. Otherwise, the consumption and development requirements of some states will not be met. The combination of high

population growth and a scare resource is not be sustainable and may prove to be highly unstable without cooperation. Consequently, after 25 years, when the population would be doubled as well as lack of water resource cooperation, there could be conflict over control of the waters of the Nile River Basin.

As the Nile riparian's gained independence from Colonial powers, riparian disputes became international and consequently more contentious, particularly between Egypt and Sudan. The core question of historic versus sovereign water rights is complicated by the technical question of where the river ought to be best controlled-upstream or down.

Ancient Egypt, however utilize Nile River water historically; it claim its principles of acquired rights have been a focal point of negotiations with other upstream states. The fact that this right exist means that any perceived reduction of the Nile water supply to Egypt is tampering with its national security and thus could trigger potential conflict. There have been occasions when Egypt has threatened to go to war over Nile water. This has been because of a threat to Egypt's water supply by neighbouring states. Sudan also has hydraulic potential and has created some dams in the last century. This has resulted in the development so far of 18,000 km² of irrigated land, making Sudan the second most extensive user of the Nile, after Egypt. More recently, Ethiopia is developing Grand Ethiopian Renaissance Dam on the Blue Nile since 2011 with a capacity of 74 BCM that is expected to be completed in the end of 2017.

While Egypt is highly dependent on the Nile, there are factors that prevent the necessity of conflict over the distribution of the Nile's water supply. For example, Egypt no longer has such an agriculturally-dependent economy. Further, Egypt is already dependent on 'virtual water'[2] imports, and it can be observed that pursuing this as an alternative may prove an efficient way of avoiding water conflict. On the other hand, consider the riparian state of Ethiopia, whose tributaries supply about 86 percent of the waters of the Nile, conflict could arise from the fact that Ethiopia has limited hydraulic power and only uses about one percent of the Nile. With this in mind, some academics argue that it is the fact that other riparian states simply do not have the resources to enter into conflict that conflict has not yet occurred. However, this is not the only reason that conflict has not occurred. Governments,

[2]Virtual water (also known as embedded water, embodied water, or hidden water) refers, in the context of trade, to the water used in the production of a good or service.

over the years, have put agreements and treaties into place so that conflict can be controlled and cooperation can be maintained.

Trans-boundary Water Resource Development and Food Security

Agriculture, accounts for more than 80 percent water uses of the Nile River in the basin countries. With high population growth rate in the region, it is obvious that food requirement will increase accordingly. Food security is a vital and challenging issue for policy makers. A large portion of the Nile Basin's population is agrarian and rural, which relies heavily on rain fed subsistence farming, but is in fact isolated from global market. Increasing food productions will considerably boost pressure on water resources and land to maintain food security. A vivid appraisal for future food demands is essential for Nile Basin counties government to consider and modifies decision and plans related to agricultural activities and allocation of water resource in the Basin (Hilhorst *et al*., 2011).

The hydropower generation in the Nile basin states provides possibilities for developing hydropower sites. It though, there are many challenges and implications of these projects and potential environmental and social impacts, and possibilities for enhanced national energy security by regional power interconnection. The areal context of any discussion summarizes the Nile basin countries (see diagram 2). For each country, the percentage area of a country actually lying within the Nile basin differ and as statistics are usually country - based, applying whole - country data to a small area disturbs the whole picture. This is especially true of data in percentage of basin area for Democratic Republic of Congo, Kenya, and Tanzania.

Presently Ethiopia utilizes limited amount of the river Nile partly due to its inaccessibility towards resources because of major centres of its population lies outside the Nile basin. Also there has been confined development of hydraulic infrastructure on the Nile river (Oakland Institute, 2011). In Ethiopia, around 85 percent of the total population is rural. Ethiopia is one of the poorest nations in the world, with merely five percent of the land is suitable for agriculture and irrigation development. Therefore, this led Ethiopia to be one of the least developed country of the world and it ranks 174th out of 188 countries in the Human Development Index [United Nations Development Programme (UNDP, 2015)], 'with rain-fed cultivation as the basis of the economy which employs 80 percent the Ethiopia's 82 million population (UNDP, 2013)'.

However contemporary period food insecurity is one of the prominent global concerns, as approximately one billion populations are facing severe problem of starvation, under and mal-nutrition (Sasson, 2012). FAO reported that we are still far to accomplish Millennium Development Goal (MDG) "to halve extreme poverty and hunger by 2015" (MDG, No. One). In Sub Saharan African region, the population facing hunger is approximated at 239 million people, and the proposed estimation could increase in the coming future. In Ethiopia 12 million people are food insecure [(the Consultative Group on International Agricultural Research) is an International Organization (CGIAR, 2011)]. Ethiopia has been confronted with chronic food insecurity over last decades and in 2009 around 7.8 million people (about 10 percent of the total population) were in the severe hungry situation (FAO, 2015). According to the African Development Bank, agriculture represents almost half of the Ethiopia's GDP (Gross Domestic Product) and 90 percent of its exports, and accounts for 75-85 percent of the labor force. At present, Ethiopia gets the most food aid in the world. When food prices have increased in 2008, an additional 6.4 million population turned reliant on emergency food aid. According to the Food Security Risk Index (2010), Ethiopia was considered to be among the top 10 countries at extreme risk (Oakland Institute, 2011). To meet Ethiopia's growing food requirements; Ethiopia needs more water resources for its own use. Therefore, 'Ethiopia's pursuant status has been that it must consume its water resource in general and the Blue Nile River water in particular to develop the poor economy and country, for its rapidly expanding population and to develop its economy. In recent time, Ethiopia stated its position considering the consumption of the Nile Water (Arsano, 2010) and consequently developing infrastructure on the River such as GERD.

The most important and debated bilateral agreement of 1959 on sharing of the Nile River which provides; out of the total 84 billion cubic meters (bcm) discharge measurement at Aswan; Egypt obtained to get 55.5 bcm of water share of the Nile and Sudan allocated 18.5 bcm of water share and the rest account 10 bcm of annual evaporation. However, since about 85 percent of the Nile water at Aswan comes from Ethiopia; but Egypt and Sudan are the main users of the Nile water (Metawie, 2004).

Ethiopia was considered as 'silent partner' for the Nile River hydro-politics (Waterbury, 2002). In spite of its contribution of 85 percent water in the Nile system, Ethiopia has a very less quantity of the Nile River water resource which can be used in its country, and so only few water operator and check infrastructures have been built in Ethiopia (Arsano and Tamrat, 2005). Many elements explain Ethiopia's neutrality from the competition for utilization of the

Nile River water and its resources. There have been lengthy internal disputes, weak institutions, lack of financial resource, lack of priorities and appropriate strategies for the water management sectors and dependency on rain for agriculture has weaken the requirement for irrigation as well (Shapland, 1997).The Ethiopian government has always underlined their wish to develop and enhance such resources for both irrigation and hydro-power purpose, no matter of the resistance from down-stream riparian states. Till 90s, few improvements had come out in the Nile River basin especially in Ethiopia, but in the past decade Ethiopia's political scene has been modifies and changed that might have hydro-political consequence for the whole Nile basin region. Since then Ethiopia has started contending and challenging Egyptian hydro-hegemony in this region (Cascao, 2008).

The growth and development of the Ethiopian positions in Nile basin's hydro-politics intimates that power relations also are certainly modifying and not only in informal aspects, but considerable changes are taking place in terms of bargaining of power. Ethiopia is now no longer silent and is settled to progressively exercise its impact on regional hydro-political relations and to lead a change in the regions regimen. Ethiopia is applying such bargaining power which is gained by its positions as the up-stream riparian state and supplier of more than 80 percent of water to put pressure on two major riparian states Egypt and Sudan. However the alternatives, absolutely provided by Ethiopian government to the down-stream states look to be: "(a) the achievement of a multilateral agreement which would grant Ethiopia specific volumetric allocations; or (b) the development of unilateral infrastructures with or without downstream consent"(Cascao, 2009:256).

Therefore, the prosperity and success of Ethiopia depends on consuming water resources to a greater extent, including the Blue Nile as well as its tributaries, Atbara and Sobat River. Significantly, the growing population size is a major concern and challenge for food security in the country. In Ethiopia, the population birth rate and growth rate in 2012 was 34 (per 1000 people) and 2.1 percent (annually) respectively [World Bank, (WB, 2014)]. There will be a striking population increase in near future in all Nile Basin states. Consequently, there will be a more and more requirement for water and food productions both.

Food Security Situation Exploration in the Nile River Basin Countries

Many countries in the Nile Basin Region are food insecure having poor infrastructure, hunger, malnutrition, chronic poverty and political instability (Pingali *et al.,* 2006; NBI, 1998). These issues are interrelated; food security plays an important role at national as well

as at regional level. Statistics from the World Bank, IFPRI (International Food Policy Research Institute), FAOSTAT (Food and Agriculture Organization Statistical Database), FAO/AGL-TERRASTAT show that most countries in the Nile Basin Region are unable to produce enough food for their population, which have led to hunger, malnutrition, high child mortality and low energy (calorie) intake (Omiti *et al.*, 2011).

Global food prices make the food security in the Nile basin even grimmer (IFPRI, 2002, 2010). With perhaps the exception of Egypt, the Nile Basin Countries have a predominant common problem of food insecurity which is mainly due to low and stagnating agricultural productivity, diverse and complex farming systems (Barret *et al.*, 2005, NBI 1998). Other factor which has affected food availability in the Nile River basin is the increase in population. The total population in the Nile basin is expected to grow from 210 million in 2005 to 336 million in 2030 (FAONILE, 2005). This has serious implications for national planning and socio economic development including food security in the Nile riparian states. With an exception of Egypt other Nile basin countries are net food buyers which especially affect the poor countries who spend 60 to 80 percent of their income on food (Yu *et al.*, 2010).

Food security is thus one of the key challenges in the Nile Basin countries. Food security is a multidimensional conceptualization of food availability, accessibility and utilization to sustain a healthy and productive life at an individual, household, national and regional levels, at all times (Omiti *et al.*, 2011). The major challenge for a sustainable use of water resource is to maintain social and environmental aspiration of the community and to ensure that food and fiber crops are produced to feed its population. Water is seen as a main factor in food security programme as the water, food and trade in food items is estimating in the cognizance of policy and decision makers in the Nile River Region (Adly and Ahmad, 2009).

Conclusion

Hence, Emergent grounds suggest that water resources variance might be a deciding factor of economic growth, development and poverty relief in almost all African states, including Ethiopia. The Nile water utilization has been the root cause of political tensions among of its three major riparian states in the basin. So here the emphasis is on the three major Nile riparian, which are; Ethiopia, Sudan and Egypt in terms of their geopolitical relation and maintaining food security by Nile, in the basin states particularly Ethiopia. Even a new state South Sudan is a new actor in the Nile basin states that can change the chemistry for Sudan

and Egypt. As the entire basin countries are trying to feed their increasing population by growing its own food for their subsistence. So, all the basin countries are trying to harness more water from Nile River and its tributaries to feed its already vulnerable population. The future development of all countries is dependent on using more water. So water management is the main cause of concern for water scarcity and food security in the Nile River Basin countries. Nevertheless existing complexity of each country's development and the limits of space and water utilization, an apparent statement would not be appropriate.

Agriculture in the Nile River basin countries accounts for approximately 85 percent of all water consumption. The irrigation potential of the Nile Basin countries is extensive and countries are interested in exploiting this potential. However, due to the inefficient use of water in agriculture, loss of water is more. Improvement of irrigation technique is needed to avoid wasting water. Cultivation of crops that require large amount of water, like the growing of rice and sugarcane particularly in the down riparian states should be discussed. There is more evaporation of water in arid and semi-arid countries. Here flooding of field is done in which about 50 percent of the water is lost. Alternatives like the sprinkler irrigation and drip irrigation can be opted which can attain efficiency up to 90 percent, if properly managed.

Food Security is closely linked with the proper management of water resources, because water is in abundance but its management is poor. So, it is a need of hour to manage the trans-boundary water to manage food and to provide food security in all the Nile Riparian countries. The integrated approach in terms of land and water resources, management must be in cohesive manner. The Nile riparian countries need to co-operate in their respective plans for agriculture, structural development, policy making e.g. through different crops distribution to the areas of the Nile basin where they would be adopted. Long seasoned crops or water intensive crops can be grown in the upper Nile Riparian's while the short-seasoned crops or which require less water can be grown in the lower Nile Riparian States.

References

***Indicates Primary Sources**

- Adly, E. and Ahmad, T. (2009), "Water and Food Security in the River Nile Basin: Perspectives of the Government and NGOs in Egypt", in Hans Gunter *et al.* (eds.) Hexagon series on *Human & Environmental Security & Peace, facing Global*

Challenge/ Environmental, Human, Energy, Food Health and Water Security Concept (4), New York: Springer-Verlag.

- Arsano, Y. and Tamrat, I. (2005), "Ethiopia and the Eastern Nile Basin", *Aquatic Sciences*, 67(1): 15-27.
- Arsano, Y. (2010), "Institutional Development and Water Management in the Ethiopian Nile Basin", in T. Tvedt (eds.), *The River Nile in the Post-Colonial Age*, I.B. Tauris, London: 161-78.
- Barrett, C. B. *et al*., (2005), "Heterogeneous Constraints, Incentives, and Income Diversification Strategies in Rural Africa", *Quarterly Journal of International Agriculture,* 44(1): 37-60.
- *Consultative Group on International Agricultural Research (CGIAR) (2011), *Annual Report: Challenge Program on Water and Food*, [Online: web] accessed on 09 April, 2017, URL:http://waterandfood.org/2012/10/29/2011-cpwf-annual-report-working-together-for-impact/.
- Cascao, A. E. (2009), "Changing Power Relations in the Nile River Basin: Unilateralism vs. Cooperation", *Water Alternatives* 2(2): 245-268.
- Elhance, A. P. (1999), *Hydro-politics in the Third World: Conflict and Cooperation in International River Basins*, Washington D. C.: United States Institute of Peace Press.
- Ethiopian Investment Authority, (1999), Ethiopia-- the way forward, Ethiopian Investment Authority.
- FAO, (2015), The State of Food Insecurity in the World, Meeting the 2015 international hunger targets: taking stock of uneven progress.
- FAO. (2015a). *FAOSTAT database.* Food and Agriculture Organization of the United Nations. Rome.
- *FAONILE, (2005), "Information Products for Nile Basin Water Resources Management", [Online: web] accessed on 08 January, 2017, URL:http://info@www.faonile.org.
- Friedman and Fedirka (2017) "Water and Geopolitical Imperatives accessed on 27th Feb 2017 http://www.mauldineconomics.com/this-week-in-geopolitics/water-and-geopolitical-imperatives#.
- Halford, L. H. (1936), "The Suez Canal in Time of War", *Foreign Affairs,* 14:101.

- Hilhorst, B. *et al*., (2011), *Demand for Agricultural Produce in the Nile Basin for 2030: Four Scenarios*, Rome: Food and Agriculture Organization of the United Nations. http://hdr.undp.org/en/composite/IHDI.
- *IFPRI, (2002) (International Food Policy Research Institute) "Green Revolution Curse or Blessing", *IFPRI Brief*, [Online: web] accessed on 16 April, 2017, URL:http://chapters.ewb.ca/pages/memberlearning/africa%28culture_history_livelihoods%29/greenrevreading1.pdf.
- *IFPRI, (2010), Global Hunger Index: Facts, Determinants and Trends, Washington D. C.: International Food Policy Research Institute.
- Lorey , David E. (2003), Global Environmental Challenges of the Twenty-first Century: Resources, Rowman & Littlefield, 2003 - Social Science - 312 pages.
- Metawie, A. F. (2004), "History of Co-operation in the Nile Basin", *Water Resources Development*, 20 (1): 47-63.
- *NBI, (2012), "State of the Nile River Basin Report-2012", Uganda, [Online: Web] accessed on 7 December 2016, URL:http://www.nilebasin.org.
- *Nile Basin Initiative (1998), *Nile River Basin Action Plan Review: Towards a Priority Action Plan*, Uganda: NBI, Entebbe.
- *Oakland Institute, (2011), *Understanding land investment deals in Africa-Country Report: Ethiopia*, Oakland Institute, Oakland, California.
- Omiti, J. M. *et al.*, (2011), "Exploration of Food Security Situation in the Nile Basin Region", *Journal of Development and Agricultural Economics*, 3 (7): 274-285.
- Phillips D. *et al*., (2006), *Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing*, Report-Global Development Studies No-4, Prepared for the Ministry for Foreign Affairs: Sweden.
- Pingali, P. *et al.*, (2006), "Eradicating Extreme Poverty and Hunger: Towards a Coherent Policy Agenda", ESA Working Paper No, 06-01, FAO: Rome, [Online: web] accessed on 16 June, 2017, URL: http://www.fao.org/docrep/008/af839e/af839e00.HTM.
- Sasson, A, (2012), Food security for Africa: an urgent global challenge, Agric. Food Security, 1 (1).
- Shapland, G. (1997), Rivers of Discord: International Water Disputes in the Middle East, London: Hurst and Company.

- The Conversation, (2016), Academic rigour, journalistic flair, The most important dam you probably haven't heard of, August 30, 2016.
- *UNDP, (2013), *The Rise of the South: Human Progress in a Diverse World: Explanatory note on 2013 HDR Composite Indices Ethiopia*, Human Development Report 2013.
- UNDP, (2015), Table 3: Inequality-adjusted Human Development Index.
- *UNESCO, (2009), *Atlas of Trans-boundary Aquifers: Global Maps, Regional Cooperation, and Local Inventories*, International Hydrological Programme, France: Paris.
- UN-Water. (2008), "Transboundary Waters: Sharing Benefits, Sharing Responsibilities", Zaragoza, Spain, UN-IDFA.
- Wolf, A.T, (2007), Shared Waters: Conflict and Cooperation, Annual Review Environmental Resources, 32:3.1–3.29
- Wolf, *et al*., (1999), "International River Basins of the World", *International Journal of Water Resources Development*, 15 (4): 387-427.
- *World Bank, (2014), "For Different Countries", [Online: web] accessed on 15 June, 2017, URL:http://data.worldbank.org/topic/economy-and-growth.

Yohannes Yihdego, Alamgir Khalil & Hilmi S. Salem (2017), "Nile River's Basin Dispute: Perspectives of the Grand Ethiopian Renaissance Dam (GERD)", *Global Journal of HUMAN-SOCIAL SCIENCE: B Geography, Geo-Sciences, Environmental Science & Disaster Management,* Volume 17 Issue 2 Version 1.0 PP: 1-21.

Yu, *et al*., (2010), *Towards A Typology of Food Security in Developing Countries*, Development Strategy and Governance Division, Discussion Paper 00945, International Food Policy Research Institute (IFPRI), Washington D.C. [Online: web] accessed on 23 May 2017, URL:http://www.reliefweb.int/rw/lib.nsf/db900sid/VVOS7ZMSBX/$file/ifpri_jan2010.pdf?openelement.