

Africa in Motion: Why the rush to build Grand Renaissance and Inga 3 Dams in Africa?

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Abstract: It is worthwhile to search that what really drives the two large dam's construction rush in Africa? To understand what has changed since the beginning of the 21st Century. When former Ethiopian Prime Minister Meles Zenawi gave an interview following the signing of the Entebbe Agreement in 2010, he had said, "some people in Egypt have old-fashioned ideas based on the assumption that the Nile water belongs to Egypt." But, "the circumstances have changed and changed forever." When he stressed this extraordinary changing in his speech, multinational driving forces has been in use to paradigm shift to solve some international disputes since the beginning of the 21st Century. Prime Minister Meles Zenawi was a visionary leader who brought real benefits on the table to share with. As the years go by Zenawi's statement come true. But mostly no attention has been given to what was "old fashion" and what is the circumstances that have changed forever in his statement. Rapidly developed and constructed water projects showed that it is time to remember these words to analyse new security paradigm as well as new driving forces in some African transboundary river basins. Some examples can be taken as Grand Renaissance Dam in Ethiopia and Grand Inga Dam in DR Congo that will be addressed in this article. First one has already completed as percent %60 and second one construction will start in very soon. Africa urgently needs energy to lift its people out of poverty and pursue sustainable development. The Nile and Congo River offers enormous opportunities for doing this. In this article, we aimed to highlight additional drivers being effective to develop transboundary waters faster than late 20th Century.

Keywords: Grand Renaissance Dam, New Hydropolitics, Land Grabbing.

I. INTRODUCTION

Africa is the darkest continent in the world. According to the International Renewable Energy Agency (IRENA), Africa continent currently has 147 000 MW of total installed capacity less than that only Canada has. In addition, average per capita electricity consumption in subSaharan Africa (when excluding South Africa) is just 153 kWh/year, which is roughly 6% that of the global average.

Furthermore, IRENA notes that the continent will need to add around 250 GW of capacity between now and 2030 to meet growing demand [17]. South Africa and Egypt, accounted for nearly 60% of the continent's total generation in 2012. In turn, the 27 countries with the worst generation figures on the continent, representing more than half the countries in Africa, only contribute around 1% of the continent's overall generation. [17].

There are large number of dams to enhance food security, increase hydropower generation, manage rainfall variability and promote economic growth in Africa.

But Grand Renaissance Dam in Ethiopia and Grand Inga Dam in DR Congo are spectacular projects among them in terms of new Nile hydro diplomacy, grabbed land protection resulting in rush to build.

The two large dams stated in this article has 10 800 MW total installed capacity that is more than 27 African Countries total installed capacity as of 2012 [20].

Total population of these 27 African Countries is about 229 million as of 2012 when Canada population only 35 million having same electricity generation capacity [20].

GRAND RENAISSANCE DAM IN ETHIOPIA

In 2011, Ethiopia began building the Grand Renaissance Dam Project on the Blue Nile River, which hold 74 billion cubic meters (BCM) storage capacity and about 60 BCM live storage which will produce 6000 MW electric generation [16].

Benefits of the Project

The main purpose of the project is to generate electricity. Annual energy production will be 15 130 GWH/year to cover the power supply demand in the country as well as in the East Africa region. The Grand Renaissance Dam will improve the electric availability in Ethiopia by 200% with full utilization of the power [16]. The benefits of the Project is not limited with power supply, it can also benefit the downstream countries mainly Sudan and Egypt by removing silt and sedimentation, by regulating the water flow.

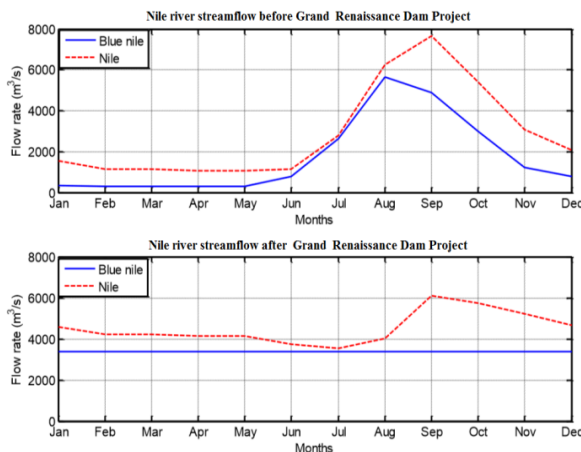


Figure 1. Blue Nile and Nile River flow pattern before and after Grand Renaissance Dam Project

Water Regulation and Flood Control for Sudan

The project will have a major impact on mitigation of drought and on flood management. A number of important studies indicated that semi-arid and arid countries to be more affected by climate change than temperate countries. It is very obvious that the Project will allow for regulated and sustainable minimum flow levels in the dry season. The Blue Nile flow trends has The Blue Nile River has a minim and maximum flow rate of 200m³/s and 6500m³/s measured at Roseires Dam in Sudan [18, 19].

Dam Construction

The tension arose since Ethiopian Prime Minister Meles Zenawi laid the foundation stone in April 2011 for the now almost-finished dam. Construction at the Renaissance Dam site has started in December 2010 (Fig.2).



Fig. 2. Grand Renaissance Dam and Inga Dam

In the case of Nile River Basin rapidly development progress, we can observe the importance of the external forces initiatives then internal intention, after recognizing that 60 percent of the Grand Renaissance Dam's

construction has already completed since 2011. This information was given by Dr. John Rao Nyaoro Nile Basin Initiative in the learning trip To Nile River initiative in Uganda in August 8 2016.

While Egypt, Sudan and Ethiopia are continuing technical and political negotiations on ways to reduce the potential negative impacts of the dam, construction at the site is continuing at a fast pace. Dr. John stated that however, water is not stored behind the dam yet but it is planned to start next year. Although Egypt rejected the proposal in the beginning, but the project became a reality that the Ethiopian government created to achieve development.

II. INGA 3 DAM IN DR CONGO

The U.N. Environment Programme described the plan to build the Grand Inga, or Inga 3, hydroelectric dam as the most important hydroelectric project in all of Africa.

The Inga 3 dam construction which is the first stage of the world's largest dam project in DR Congo is going to begin in soon (Fig.3). The \$14bn (£9.5bn) Inga 3 project, the first part of the mega-project, is being fast-tracked by the Democratic Republic of Congo government will span one channel of the vast river Congo at Inga Falls. It involves a large dam and a 4,800MW hydro-electric plant.



Fig 3. Inga 3 Project Location

South Africa and the DRC signed a co-operation Treaty to jointly develop the Inga 3 Dam, and the treaty was ratified by DRC in 2014. South Africa would purchase 2,500 MW of the total 4,800 MW generated, making it the principal buyer for Inga 3 electricity. Following the signing of the treaty, the DRC relaunched the process for the selection of a developer and established the first stage objective of the Inga dam – to lay the foundation stone in 2017.

Inga 3 BC will be the first of the seven development phases of Grand Inga Dam. Inga 3 would be constructed in two steps. About 6,000m³/s would be diverted for Inga 3 to a valley which runs parallel to the Congo riverbed. If completed, Inga 3 BC would have 4,800MW of installed capacity.

III. NEW DRIVING FORCES

Considering the fact that 91% of the population in DRC and %60 of the population in Ethiopia, Sudan, Uganda have no electricity and have no food and water security yet, these could be accepted as the most effective driving forces especially if they are threatened by climate change. These drivers put increasing pressures on basin countries to find solutions to provide these basic and vital needs. But all these drivers can be considered as internal forces.

External forces has also decided to play more effective role to promote peace and stability in the highly disputed transboundary river basins that prone to create instability. Beyond these very fundamental factors, there seems to be other reasons behind the rush to built these two Large Dams. In addition to internal needs and external forces competition in the region other driver could be related with the new food geopolitics of the 21st Century.

Development of Grand Renaissance Dam and Inga 3 dam will also significantly increase Africa's vulnerability to climate change and political instability. Climate change will bring risks to hydro-dependent economies and large scale agricultural land owner international cooperates through increases in the severity and frequency of both droughts and floods. Worsening droughts will reduce food production, while increased floods will threaten food production safety. Climate change will add to existing environmental stresses on riverine ecosystems and watersheds. In addition to other advantages of building Grand Renaissance Dam and Inga 3 dam, they will also protect the large scale agricultural grabbed land from the hydrological uncertainties of a warming world.

IV. WILL THE DAM'S PROTECT THE GRABBED LANDS?

The frequent occurrence of catastrophic flood events represents a major challenge for the River Nile riparian countries particularly those in the eastern region which include Ethiopia, Sudan, and Egypt where most of the floods occur (Abdo 2012).

In Sudan major floods events mainly occur along the main River Nile and its tributary the Blue Nile River. The causes of floods in Sudan can be attributed to high water level, or to torrential rain, or to a combination of both. However in most cases the rises of water level particularly in the Blue Nile River can lead to major flooding in this river and also in the main River Nile. Therefore a proper flood protection for the Blue Nile can be a viable tool to mitigate the River Nile flooding in Sudan (Abdo 2012).

The dam will regulate the steady water flow throughout the year and it will avoid un-expected flooding to downstream countries. In other words Grand Renaissance Dam will help to control the floods and protect the agricultural land including large scale land grabbed by international cooperates in Sudan.



Fig.4 .Blu Nile and Agricultural Land in Sudan

D'Odorico's study points to Sudan where land is usually grabbed on the banks of the Blue Nile – heavily sought after spots in an otherwise dry place (Rulli, D'Odorico 2013).

V. EASTERN AFRICA AND SOUTHERN ASIA LANDS

Africa and Asia have accounted for 44 and 37 percent, respectively, of the total land grabbed since 2000. Nearly two-thirds of those lands are in Eastern Africa and Southeast Asia. The top five countries by amount of land purchased since 2000 were the United States, Malaysia, the United Kingdom, China and the United Arab Emirates, according to Land Matrix data (Bienkowski 2013).

U.S. Companies have grabbed about 3,15 million hectares since 2000. The largest acquisition by a U.S. company was a highly publicized 600 000 hectare purchase in Sudan by Texas-based Company (Bienkowski 2013).

In fact, ultimately, large scale land deals can generate real development, secure access to natural resources for all. It can also improve food security. But all these will depend on large scale land deals terms and conditions. In addition to that because of lack of information on the deals and their water usage, the full impact of the global land grabbing is not clear yet.

VI. LARGE-SCALE LAND ACQUISITIONS IN AFRICA

Following the global food crisis of 2007 and 2008, food insecure nations with surplus capital began to look towards Africa, and its rare surfeit of unfarmed, arable land, in order to ensure a steady food supply for their citizens, rather than trust to volatile food markets. The result is a dangerous trend towards large-scale land acquisitions in the developing world.

Land Matrix Partnership research indicates that as many as 227 million hectares have been sold, leased, licensed, or are under negotiation in large-scale land deals since 2001. This large scale land deals are mostly to international cooperates and mostly since 2008.

According to The Online Public Database on Land Deals of the Land Matrix Initiative (LMI) :as of August 2016

number of international contract signed has been more than 1250. About 44 million hectare agricultural land agreement has already been concluded (%64) and main drivers of international land acquisitions are food crops, agrifuels and unspecified agricultural respectively.

In recent years, Africa has experienced increased large-scale foreign investments in agriculture. A recent study estimates that more than half of the 56 million hectares of land sought after by foreign investors globally is located in sub-Saharan Africa (ADGB 2012). The Democratic Republic of Congo and Mozambique have the highest share of foreign investor driven land deals relative to total arable land of close to 50% and 21%, respectively. In the Democratic Republic of Congo, close to 50% of arable land is either leased to foreign companies or is under negotiation for leasing, without a clearly defined framework governing these transactions (ADGB 2012).

The Sudan – is already being eyed by the foreign investors due to its enormous potential for large-scale agriculture. In fact, several deals have already been signed.

This could potentially change, however, as Ethiopia and Sudan, the upstream and midstream riparian’s in the Eastern Nile River Basin, have now leased millions of hectares of land to big investors in the last couple of years. It seems that none of these cooperative processes in the Nile River Basin is looking at the current and future water impacts of the new land acquisitions. In fact, agriculture as a sector has largely been left out of the cooperative projects and negotiations. The deals on land acquisitions in upstream riparian’s bring new aspects to the hydropolitical relations.

South Sudan has the largest area under contract, but only 7 per cent of it is currently in use, and only 3 per cent is currently productive.

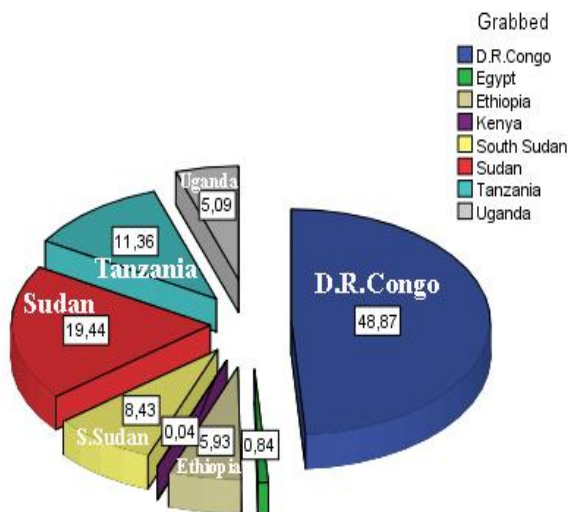


Fig. 4. Large scale agricultural lands grabbing as percentage of agricultural area in some of the Nile Basin Countries and DR Congo (it was compiled with GRAIN and Land Matrix database)

Indonesia and the DR Congo have the largest area where implementation has begun or is ongoing and large parts of these areas are currently productive. It is worth noting that deals in the DR Congo tend to be rather large: six active deals amount to 2.41 million hectares. Conversely, deals in Indonesia tend to be small: a similar area as that in the DR Congo is divided among 69 projects. Most of the area under production in Indonesia is used for oil palm cultivation.

As shown in Fig 4. Democratic Republic of Congo has leased to 8,2 million hectares of land, the most on the Africa Continent . In the Nile Basin Countries Sudan has transferred closed to 3,3 million hectares to foreign entities. Sudan is the most prolific large-scale land transfer country among the Nile Basin states.

DR Congo and Sudan are the most prolific large-scale land transfer countries on the Africa Continent. Transboundary rivers, Nile and Congo are the main water sources to these countries. Due to the largest number of hectares already leased and their transboundary rivers, these two countries will meet land and water diplomacy interrelations much earlier than other grabbed countries in Africa.

According to the Online Public Database on Land Deals of the Land Matrix Initiative (LMI): as of August 2016 number of international contract signed has been more than 1250. About 44 million hectare agricultural land agreement has already been concluded(%64) and main drivers of international land acquisitions are food crops, agrifuels and unspecified agricultural respectively.

VII. WHAT’S HAS BEEN MAJOR CHANGES SINCE 2000

Security concept has changed (Water, Food Energy, Environment Security), Climate has changed, Food geopolitics has changed, World demographical structure has changed, social, economic threats have changed, and war concept has also changed bringing new paradigms and new actors to 21st Century.

For instance; corporates and investors in developed countries are buying up foreign farmland and the freshwater perks that come with it. The first driver is food security second one is biofuels and new biofuel policy. They have increased the demand for agricultural lands and activated large scale land grabbing in Africa and Asia continents. This will bring a new actors that may involve New Nile Hydro politics.

As Emil Sandström suggests that the hydropolitical landscape of the Nile River Basin is about to shift from a hydropolitical landscape dominated by an “Egyptian “military discourse” towards a “ business discourse”, in which new assemblages of actors become shareholders of the Nile water(Sandstrom, at all 2016). Considering the enormous size of some of these land and water deals, external actors may become important “hydropolitical players”, involved in the future negotiations of the Nile.

There will be a new group of actors involved in land and water development, namely from the private sector, that are not at all (or at least not until now) included in the transboundary decision-making process or negotiations.

VIII. CONCLUSION

Africa in motion in terms of building dams and agricultural land transfer to international entities in some certain river basins. During the second half of the 20th Century, especially Upper Nile Basin Countries attempted to build dams for irrigation and hydroelectricity purposes. But they could not achieved this goal as they like till the beginning of the 21st Century.

21st Century has begun with new paradigms on water, food energy, environment security. Climate change has also effected to this paradigm shift.

This paradigm shift has brought a new international approach to Nile River Hydropolitics as well as taking into account Africa's development needs more seriously. Among the changing issues, the new food geopolitics in relation with 21st Centuries food security concept has also accelerated large-scale land acquisitions in developing countries. It has increased since last ten years creating a potential regional and local conflicts.

The research conducted by different researchers showed that (Keirstead 2012) the world's population will continue to rapidly increase, more people will move into the middle class, and climate change will strain the environment. Global agriculture will be hard pressed to meet demand. As a result, the upward trend of large-scale land acquisitions in the developing world will continue into the foreseeable future. Therefore the potentially destabilizing effect of large-scale land acquisitions will be an emerging issue in coming decades.

In the 21st Century, high percentage of population without access electricity and clean water in African countries is considered as an increasing threat to local and regional stability and developed World's interest in the dark continent.

This emerging situation has forced developed world to promote the projects that can be facilitated accessing to basic needs of the millions of people live in Africa like dams and irrigation schemes. As such, we should broaden our understanding of new threats, climate change, large-scale land acquisitions attempts in order to analyses new hydropolitics in Africa.

If we want to define why the rush to built the two Large Dams in Africa, in addition to supply basic needs to population in region, it is worthwhile to consider paradigm shift in Nile hydro politics, new food geopolitics, large-scale land acquisitions attempts as well as increasing mass migration waves threats to developed world.

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REFERENCES

- [1] Abdo, G. and Nasr, A. E. An Improved Flood Forecasting Model of the Blue Nile River in Sudan. University of Khartoum engineering journal, Vol. 2 issue 1, Pgs. 27-30, Feb. 2012.
- [2] Bienkowski. B, 2013 "Corporations Grabbing Land and Water Overseas" Environmental Health News on February 12, 2013.
- [3] Bertram Zagema, Land and Power: The Growing Scandal Surrounding the New Wave of Investments in Land. (Oxford, UK: Oxfam, 2011).
- [4] Rabah Arezki, Klaus Deininger and Harris Selod (2011) "What drives the global land rush?" IMF Working Paper. WP/11/251.
- [5] Steinbrück, E, Foreign Land – Acquisitions In Africa Opportuniy Or Land Grabbing? The Case Of The Democratic Republic Of Congo, 2013.
- [6] S. Kay and J. Franco, Tni.org, (2012) "The global water grab", http://www.tni.org/sites/www.tni.org/files/download/landgrabbingp_rimer_0.pdf
- [7] W. Anseeuw, L. A. Wily, L. Cotula, M. Taylor, Landcoalition.org, "Land Rights and the Rush for Land", 2012.
- [8] Economist.com, "Rich food importers are acquiring vast tracts of poor countries' farmland. Is this beneficial foreign investment or neocolonialism?", 2009.
- [9] Jägerskog, A., Cascão, A., Hårsmar, M. and Kim, K., Land Acquisitions: How will they Impact Transboundary Waters? Report Nr 30. SIWI, Stockholm, 2012.
- [10] Keirstead, Michael D. (2012) "Large-Scale Land Acquisitions in Sub-Saharan Africa: The Intersection of American Strategic Interests, Economics, Security, and Politics" . REPORT TYPE Master of Military Studies Research Paper.USMC Command and Staff College Marine Corps University USA.
- [11] Sandstrom E., Jagerskog A., Oestigaard T., Land and Hydropolitics in the Nile River Basin: Challenges and new investments (Earthscan Studies in Water Resource Management) Routledge (August 8, 2016).
- [12] ADBG(African Development Bank Group) 2012 "A Global Rush for Africa's Land: Risks and Opportunities" 17 Oct.2012
- [13] LAND MATRIX <http://www.landmatrix.org/en/accesed> 21 August 2016.
- [14] Mohamed S. M. Yassin Ting Fa Margherita Chang Luca Iseppi (2014) RESOURCES GRABBING IN THE NILE BASIN: MISUSE, MISMANGEMENT AND MISINVESTMENTS Proceedings of the XVII - IPSAPA Interdisciplinary Scientific Conference. Volume IV. 201.
- [15] Rulli, M. C., A. Savioli, and P. D'Odorico (2013), Global land and water grabbing, Proc. Natl. Acad. Sci. U.S.A., 110(3), 892–897.
- [16] Tesfa C. B., 2013 "Benefit of Grand Ethiopian Renaissance Dam Project (GERDP) for Sudan and Egypt" EIPSA Communicating Article Volume 1; Issue 1; Dec 2013, Pages 1-12
- [17] Sector Report 2015 Power in Africa kpmg.com/Africa
- [18] G. Mary, "River Nile, History, Present and Future Prosperity."
- [19] P. Billi and O. el Badri Ali, "Sediment transport of the Blue Nile at Khartoum," Quaternary International, vol. 226, no. 1–2, pp. 12–22, Oct. 2010.
- [20] https://www.cia.gov/library/publications/the-world-factbook/rank_order/2236rank.html

BIOGRAPHIES

Dursun Yıldız is a hydro politics expert and Director of the Hydro politics Academy Association located in Ankara-Turkey. He is a civil engineer and used to be Deputy Director at State Hydraulic Works in Turkey; completed hydroinformatics post graduate course at the IHE in Delft, Technical training programme in USBR-USA and a master degree in Hydro politics at the Hacettepe University-Turkey. He has over 5 years of teaching experiences in some Turkish Universities and now works as head of his own Hydro Energy & Strategy consulting company located in Ankara. He has published several international articles and 11 Books. He received Most Successful Reseracher Award on International Water Issues from Turkish Agricultural Association in 2008.



Dogan Yildiz was graduated from the Department of Econometrics in the Faculty of Economy of Istanbul University in 1984. He completed his graduate and doctorate education in Economics and Statistics Programs of Social Sciences Institute of Istanbul University, respectively. Between 1986 and 1995, he, initially, worked as research assistant and later as assistant prof. dr. in Operations Research Program of the Department of Econometrics in the Faculty of Economics of Istanbul University. Since, September 2001, he has been working as faculty member and deputy head of the Department of Statistics in the Faculty of Sciences and Literature of Yildiz Technical University. His lectures are on probability and statistics, Statistical Package programs, Multivariate Statistics and Marketing Researach regression analysis, and operations research. His interests are on Appied Multivariate Statistical analysis and Statistics Education.



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