

Hydropower development indispensable to economic transformation: a case in Ethiopia

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Abstract

It is well recognized the economy of Ethiopia is growing at annual average rate of 11.3%. For a long period of time the backbone of the Ethiopian economy was the agricultural sector. Most scholars mentioned that Ethiopia has a large wealth of water resources. However, the utility of water resource of the country was at a stagnant stage for several reasons.

However, currently, the government of Ethiopia working day-and-night to transform the economy of the country from agricultural to industry based economy. In order to achieve the transformation set by the government of the country, the role of hydroelectric power generation is quite significant. The purpose of this study is to build econometric model that can show the significance and its imprecations on the country's economy of hydroelectric power generation.

In this study the analysis is made whether:

- *there exists true correlation between Ethiopia's GDP and the country's hydroelectric power consumption;*
- *the current explanation of hydroelectric power generation of by the government of Ethiopia respond and satisfy the demand of coming economic growth of the country;*
- *the current explanation of hydroelectric power generation of by the government of Ethiopia support the balance of payment of the country; and*
- *it provide a guideline to build trend equation of the hydroelectric power generation and the domestic hydroelectric power consumption of the country.*

The result of the econometric estimation suggests that there exist a strong and positive trend correlation between the country's GDP and the hydroelectric power consumption. This shows the hydroelectric power consumption of the country is economic derived consumption. Furthermore, the econometric analysis showed that the current explanation of hydroelectric power generation of by the government of the country unable to respond and satisfy the coming economic growth and support the balance of payment of the country.

From our deep econometric modelling and estimation, we recommend that it is a true and justifiable strategy by the government of Ethiopia to expand hydroelectric power generation such as the resistance dam on the Nile River. Further, the government, concerned bodies and investors work together and double their effort on hydroelectric power generation in order to support the country's sustainable economic growth of the country.

1. Introduction

Some three decades ago Ethiopia was in a dire situation where its people failed to get a daily bread to survive; millions passed away; a great number of youngsters displaced both internally and externally. Particularly, the 1984 draught was so devastating. The people were in dire situation dying of hunger despite the ample natural resources the country has endowed with. Among the country's diversified natural resources its water potential is remarkable of which the country manage to utilized only a small amount.

The famine and mass deaths catastrophe happened due to lack of political commitment, absence of appropriate developmental policies/strategies and lack of visionary leaders. The then regime was allotting a lot of money for artilleries and gun machines, while the people were dying of hunger. The economy had been deteriorating from time to time despite the ample resources the country has endowed with. The absence of visionary leaders who could devote for the betterment of the life of the people also aggravated the catastrophe. All these coupled with instability, violation of democratic and human rights put the people in a dire situation.

However, the socio-economic and political situation of the country was altogether altered with the overthrow of the military junta and the coming of Ethiopian People's Revolutionary Democratic Front (EPRDF) in to power in 1991, which was the basic turning point in the country's history.

Incredibly but truly, the economy of the country altered fast. It boosted in the past decade with a double digit economy, private and government sponsored industries like Textiles, leather factories, Medicos and pharmacies have expanded. Such developments necessitate the development of power. There should be electric power that could shoulder the fast growing economy, the boosting of investment and the expanding of social services that need a large amount of power consumption. When the living standard of the people improved, the consumption of electricity also increased. All these persuaded the country to develop its power every time, at least 25 per cent a year as it was stated by late PM Meles Zenawi.

Ethiopia is now one of the emerging economies in the world. However, it had deep rooted cultural and social retarding attitudes. Besides, there was no strong working culture. Replacing the backward culture and building positive attitude towards possibility of altering the country is not as such easy as it refers to changing the attitudes of people which is a crucial factor for any change. "Often our attitude is the only difference between success and failure," Maxwell J.C. (2003:11)

Moreover, the struggle to develop the economy was directly linked with ensuring an enduring peace and realizing democracy. These three: peace, democracy and development are intertwined. One couldn't exist without the existence of the other. In this regard, the Ethiopian government overtly wrote in its policy, "Poverty is Ethiopia's arch foe. However, in alleviating poverty, ensuring sustainable economy, realizing lasting peace and building strong democracy are indispensable elements. Ascertaining three of them as the same time is not only necessary but also mandatory". One of the key factor for sustainable economic development is electric power.

The purpose of this piece is; therefore, to indicate the indispensability of electric power development for Ethiopia's economic transformation. As the country's economy is growing fast and industries are boosting, developing electric power is mandatory. The country has ample hydropower potential and should concentrate on it to realize its transformation.

2. Statement of Problem

According to Ethiopia Ministry of Water, Irrigation and Energy, Ethiopia has 12 river basins with an annual runoff volume of 122 billion m³ of water and an estimated 2.6 - 6.5 billion m³ of ground water potential. This corresponds to an average of 1,575 m³ of physically available water per person per year. However, only about 3 per cent of water resources are used so far and only 2 per cent have access to electricity in the rural areas. Recognizant of that, the incumbent government has been investing on it particularly since the past decade. However, various international organizations open a strong propaganda against this development effort to influence donors from financing the country. "The use of renewable resources has made limited headway in Ethiopia, primarily because of financial constraints," Assefa Abreha, et al (2002:38)

Human Rights Watch, Amnesty International, International Rivers and other organizations sponsored by some irresponsible states have been attempting to hinder the efforts for hydropower development. They raise irrelevance justification to impose donors to jeopardize Ethiopia's efforts to alleviate poverty, ascertain sustainable economic growth and guarantee the respect of the democratic and fundamental rights of the people; fulfilling the right of the people to have access to education, health and other facilities. This blackmailing has a significant impact on the country's move to alleviate poverty as its economy is an emerging one though the justifications are irrelevance and baseless.

3. Economic Development

Ethiopian is an agrarian economy where the agriculture, according to recent data from Ministry of Finance and Economic Development (MoFED), accounts for 45.9% share of the Gross Domestic Product (GDP) in the 2006/07 fiscal year. About 45 per cent of Ethiopia's land mass is arable. The manufacturing sector accounted for merely 13.3% of GDP in 2006/07, is dominated by food, beverage, textiles, hides & skins, and leather industries.

From 2007-2010, in five years, the country had registered an annual average growth of 11.6%, 10.2%, 11.3% and 13.7% respectively. Comparing it with 2014/2015, there is a significant change. In 2012/2013, Ethiopia was the twelfth fastest growing economy in the world. Average annual real GDP growth rate for the last decade was 10.9%. Agriculture, which accounts for 42.7% of GDP, grew by 7.1%, while industry, accounting for 12.3% of GDP, rose by 18.5% and services, with 45% of GDP, increased by 9.9% in 2012/13. Ethiopia has made great strides to become one of Africa's fastest growing economies that this economy needs huge amount of power to sustain but it is not such an easy way to move forward. There are various challenges the country has been facing in developing its electric power and other mega projects. According to African Outlook, The Ethiopian economy has experienced strong and broad based growth over the past decade, averaging 10.9% per year in 2004/05 - 2012/13 compared to the regional average of 5.3%. Expansion of the services and agricultural sectors account for most of this growth, while manufacturing sector performance was relatively modest. Economic growth brought with it positive trends in reducing poverty, in both urban and rural areas. While 38.7% of Ethiopians lived in extreme poverty in 2004-2005, five years later this was 29.6%, which is a decrease of 9.1 percentage points as measured by the national poverty line, of less than \$0.6 per day. Using the Growth and Transformation Plan (GTP), the target is to reduce this further to 22.2% by 2014-2015.

4. Challenges to power development

Financial constraints are one of the challenges. Due to lack of finance, the country couldn't use its water resources that could contribute to the economic transformation of the country. However, the government is already devoting a very high share of its budget to programs benefiting the majority like schools and health center. Besides, it allotted a lot of money on infrastructure and investments. As the same time, large scale donor support will continue to provide a vital contribution in the near-term to finance the levels of spending needed to meet these challenges. However, even if donor support is increased, using aid effectively will require Ethiopia to improve governance, empower local authorities, and become more accountable to its citizens. Of course, there has been significant progress in various areas: primary school enrollments have already registered more than 98 per cent, child mortality has been cut in half, and the number of people with access to clean water has scored more than 65 per cent.

The five-year (2010/11-2014/15) Growth and Transformation Plan (GTP) incorporated broad-based development in a sustainable manner to achieve the MDGs. Rapid economic growth, targeted for 11% per year at worst and, 14.5 per cent at best, to double the size of the economy by 2015, with GDP per capita expected to reach \$698 by the end of 2015.

It has been also ensuring an increased contribution from the industrial sector, particularly focused on increased production in sugar, textiles, leather products and cement. The power generation capacity will increase from the current 2,000 MW to 8,000 MW, and the number of customers from the current two million to four million by 2015 Construction of 2,395 km of railway line. Having exerting all efforts in a consolidated way could pave the ground for the country to alleviate poverty and ensure sustainable economic development.

“Energy is fundamental to all human activity. To a large degree, they type and amount of energy resources at our disposal largely determine the way in which we live our lives. Indeed, the quest for adequate energy resources to meet needs remains forever pegged to the whole question of human survival and development,” Assefa Abreha, et al (2002:37).

Ethiopia’s fast economic growth and its boosting investment need huge electricity. Developing its power is a matter of living under poverty or sustaining the fast economy. In other words, one of the most fundamental measures that the country has to take to reduce poverty and ensure fast and sustainable economic growth is parallel development of its energy having utilized its huge water potential.

The past two decades, the electric power development policy and activities began to underway in the country, which aimed to play pivotal role towards economic growth and prosperity of the nation, with ultimate goal of regional economic cooperation and integration through additional mission of interconnecting neighboring countries with electricity.

It was known that the total electric power generating capacity of nation was only 370 mega watt before 1991, the incumbent government realizes the need to accomplish various activities to develop the electric power of the country. The gradual construction of small and medium size electric dam projects across the country had increased the electric generation capacity of the nation from 370 mega watt in 1991 to 2, 268 mega watt up to date. This is about six fold rise in developing power generating capacity in accordance to the fast economic development of the nation, which extremely raised the demand of electric power supply in the country apart with fulfilling the demand of the people for daily consumption.

As aforementioned, accessibility of funds from major financial institutions for the construction of hydro electric power dams remains a challenge. The donor countries were helping Ethiopians to eat but not how to get food fitting to the saying that goes like, “If you give me a fish I eat a day, if you show me how to fish I eat life time” fits. Before two decades, Ethiopians were helped by the international community but the help was food, daily bread. They haven’t financed particularly the Ethiopian hydro power projects. No matter what the reason behind it might be, the international communities’ lack of courage to finance particularly to dams on the Nile River is none.

However, it is imminent for Ethiopia to construct larger hydro electric dams such as the Ethiopian Grand Renaissance Dam (GRD) and the Gilgel Gibe III allotting huge money from the nation’s limited financial resources so as to attain the aspired goal of the power development. The Ethiopian Electric Power Corporation reported that as a result of this commitment over 6,000 urban and rural areas get access to electricity currently. Only 320 urban and rural areas were accessing electricity before 1991. However, the coverage of electricity in 1995 was 54 percent, which later developed to more than 2000 MW.

According to the GTP, the plan was to stretch the 2,000 MW to 10,000MW that in the past four and half years, the country has been carrying out its hydro electric power dam constructions day in and day out, registering encouraging results with a great government initiation and popular support of the public.

Among the major projects currently under construction is the Ethiopian Grand Renaissance Dam (GRD) with a generation capacity of 6,000 MW 45 percents of its work is completed. The other magnificent Hydro electric power dam constructing on Gibe River is Gibe III hydro power project which has the capacity of 1870 MW is nearing to start its work. The other major hydro electric project is the Genale Dawa III hydro power expected to generate 254 MW, launched in February 2011, nearing completion.

In line with the expansion of electric power generation plants the government also give emphasis for the extension of electric power transmission lines and establishment of electric power distribution stations, so far 10,000 kilometers long electric power transmission lines is carried out with exerted efforts to reach the goal of 17,00887 kilometers of line in the GTP final year.

Stations	Capacity (in MW)
Koka	42.00
Awash II	32.00
Awash III	32.00
Finch	134.00
Melka Wakena	153.00
Tis Abay I	11.40
Tis Abay II	73.00
Gilgel Gibe I	210.00
Gilgel Gibe II	420.00
Dire Dawa	40.00
Awash 7 killo	35.00
Tekeze	300.00
Beles	460
Fincha Amerit Neshe	97.00
Tis Abay II	73.00
Total	2112.40

Source: EEPKO

Ethiopian government is primarily striving to fulfill the yearly 25 percent growing local demand of electric power, further development activities on the sector and exporting electric power to neighboring countries and integrating the region. It signed an agreement with the governments of Kenya, Uganda, Sudan and Djibouti for electric sale and it is selling electricity to Djibouti and Sudan. World bank had provided 41 million USD loan for the Ethio-Sudan electric transmission line project to support the electric power exporting systems between two countries. (EPCo)

Kenya has also signed Memorandum of Understanding (MOU) to purchase 400 MW electricity from Ethiopia, Ethio-Kenya electric transmission line project is under construction with 1.26 billion USD loan obtained from African Development Bank. The Ethio-Kenya Electricity Highway Project workshop, which is the first phase of the east African Power Integration Regional Program, was officially launched in Addis Ababa on May 14, 2013. AlemaYehu Tegenu, Minister of Water and Energy addressing the launching program stated that the project is an important move towards the development of the regional power pool. In

due course of time also, Miheret Debebe, CEO of the Ethiopian Electric Power Corporation (EPPCO) pointed out that construction of the 500KV transmission line links the national grids of the two countries. He went on to say that the program would alleviate the bottleneck problem for the exchange of electric power between the two countries.

5. Conclusion

Ethiopia is working hard to alleviate poverty and ensure sustainable economic development. The economic development plan focuses on exhaustively developing the agriculture sector on which more than 85 percent of the population depends on.

The country has been exploring and developing the available sources of the country and then developing transforming to industrial development through integrating the agriculture with industry. This will be possible if and only if the country develops its power energy as the same time. "The availability of affordable and convenient energy services is a necessary condition for improving lives and livelihoods..." Assefa Abreha et al (2002:49). Therefore, Ethiopia needs extensive electric power that could shoulder the fast growing economy. This is not a matter of choice but a matter of survival and sustaining the economic development to realize its vision of becoming middle income country in the near future. As its potential is hydropower, developing it with any cost is indispensable for its economic transformation.

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