

ETHIOPIA'S HOUSEHOLD ENERGY SECTOR

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ABSTRACT

This review deals with the energy situation in the household sector of the Ethiopian economy. Ethiopia has inadequate energy supply and utilization. There is the need to transform from traditional to modern energy sources to support the development requirement of the country. The continued destruction of forestry resources for firewood has resulted in environmental problems, loss of productivity and ecological imbalance. Recognizing that formulation of sound economic development and environmental sustainability policy needs knowing the relationship among energy use, economic growth and environmental quality. This paper provides a mini review of "Ethiopia's household energy sector". Finally, this paper helps the researchers as well as the government officials to find pin point unforeseen issues that need to be considered while planning development policy regarding energy along with proposing recommendations.

INTRODUCTION

Ethiopia's energy consumption is predominately based on traditional Energy Sources (Fuel wood, Charcoal, dung cakes) which consists about 94%. Modern Energy source (mainly products of petroleum and Electricity) which is about 6%. The Per capita electricity consumption of the country is 28kWh.

In Ethiopia within the traditional biomass fuels fire wood and charcoal contribute for about 87% while agricultural residues such as dung and crop residues met an estimated amount of about 11% (MoWE, 2011). As far as the sectoral energy consumption in the country is concerned, the largest share, over 90%, is attributed to household consumption, followed by the transport sector amounting to 6% and the industrial and service sectors respectively consuming about 1% each (Gebreegziabher & Van Kooten, 2013). Though agriculture is the main stay and the dominant sector for the Ethiopian economy, it consumes the lowest energy proportion amounting to 0.1% of the total energy consumption.

The causality relationship between energy consumption and economic growth has attracted the interest of many economists. Some of the findings indicate that there is a strong relationship between energy consumption and economic growth. For instance, a unidirectional Granger causality running from energy consumption to economic growth entails that the country's economy is energy dependent and, hence, more energy consumption is compulsory for sustained economic growth (Jumbe, 2004). Despite the growing volume of literature on the causal relationship between energy consumption and economic growth including for Sub-Saharan African countries, the evidences are mixed and there is no consensus yet. The review will add in various ways to the body of knowledge on the important subject of the work done

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on the interaction among energy consumption, economic growth, and environment in Ethiopia.

INTERACTION BETWEEN ENERGY CONSUMPTION, ECONOMIC GROWTH AND ENVIRONMENT

Economic growth and environmental pollution

There have been two parallel literatures on the relationship between economic growth and environmental pollution. The first set of studies have focused on the economic growth-environmental pollutants nexus and closely allied to testing the Environmental Kuznets Curve (EKC) hypothesis. The EKC hypothesis states that as income increases, emissions increase as well until some threshold level of income is reached after which emissions begin to decline. The EKC hypothesis specifies emissions as a function of income, which presumes that unidirectional causality runs from economic growth to emissions. However, it is conceivable that causation could run from emissions to economic growth whereby emissions occur in the production process and, as a consequence, income increases.

A second set of studies on the relationship between economic growth and environmental pollution have focused on the economic growth-energy consumption nexus, as emissions are primarily generated by burning fossil fuels. Since the seminal work of Kraft and Kraft (1978), many studies have investigated the causal relationship between energy consumption and economic growth (Griffin & Gregory, 1976; Berndt & Wood, 1979) have emphasized on the substitutability or complementarity between energy and factors of production and its interplay with technical progress and productivity within the neoclassical theory of economic growth.

Energy consumption and economic growth

Increasing scarcity and cost of household fuels, particularly firewood; increased stress on women and children who usually are supposed to collect fuel. Traditional energy consumption in Ethiopia is associated mainly with environmental problems. The impact of rising price of petroleum imports on trade and foreign exchange availability. Recent growth in investment has shown that energy supply is not in pace fast growing demand.

A study which incorporates more than hundred counties by (Chontanawat, et al., 2008), found that the causal relationship between energy consumption and economic growth is more likely marked in developed than in developing countries. In his study, he obtained that causality running from energy consumption to economic growth was found in only 35%, 42% and 69% of the poorest nations, of the middle-income nations and of the high-income countries respectively. (Wolde Rufael, 2006) in his bivariate relationship between energy consumption and economic growth in African countries also found evidence which is conflicting with the neutrality hypothesis in a substantial number of countries and gave support for the hypothesis that energy causes economic growth. (Mahadeven & Asefu Adjaye, 2007) found for some countries a bi-directional causality while a uni-directional causality running from energy consumption to economic growth was found in other countries (Lee & Chang, 2007). Also found a long run causality of 16 Asian countries running from energy consumption to economic growth. Evidence from 11 sub-Sahara African countries on energy consumption and economic growth by

(Akinlo, 2008) using the Autoregressive Distributed Lag (ARDL) bounds test found that energy consumption is co-integrated with economic growth in Cameroon, Cote D'Ivoire, Gambia, Ghana, Senegal, Sudan and Zimbabwe. Moreover, this test suggests that energy consumption has a significant positive long run impact on economic growth in Ghana, Kenya, Senegal and the Sudan. Bi-directional relationship between energy consumption and economic growth for Gambia, Ghana and Senegal was observed with the help of Granger causality test based on vector error correction model (VECM). The results of the study conducted by (Akinlo, 2008) revealed that a high level of economic growth leads to high level of energy demand and vice versa.

According to (Gebereegziabeher, Z., et al., 2013) to The Johansen test for co-integration test is employed and found that energy consumption and economic growth are co-integrated series (process). The causality or direction of causality between them is also identified using the Engle-Granger causality test within the vector error correction model framework. The Granger causality test between energy consumption and economic growth shows a uni-directional relationship running from energy consumption to economic growth in Ethiopia.

A combination of these two literatures whereby the relationship between economic growth, energy consumption and pollution emissions are considered by examining Granger-causality within a multivariate framework is relatively new area of research. There are a limited number of studies in this direction either for developed countries, such as (Ang, 2007) for (France & Soytas, et al., 2007) for United States, or for developing countries, such as (Zhang & Cheng, 2009) for China, (Ang, 2008) for Malaysia.

It is important to note that most of the studies have found either unidirectional or bidirectional Granger-causality among electricity or energy consumption, CO₂ emissions and economic growth for developing countries and no Granger-causality in case of developed countries. This implies that the unidirectional Granger-causality between electricity consumption and economic growth seems to be more consistent for developing countries. It can be concluded that increasing electricity supply is required to meet growing electricity consumption, to sustain economic growth.

CONCLUSION

Literatures on the area witnessed, Ethiopia is planning to liberalize its energy industry to overcome power shortage and stabilize energy supply. One of the justifications for encouraging the expansion renewable energy supply in Ethiopia is the possibility of saving scarce foreign currency that is used to import fossil fuels and shifting from high-cost fossil oil to cost-effective energy sources. The value of the country's oil imports has increased substantially over time. For instance, the value of oil imports relative to export earnings of the country has increased from 52.7% in 2000/1 to 66.9% in 2010/11. The high cost of oil imports has aggravated the country's balance of payments problem, and has serious repercussions on the macroeconomic stability of the country. Besides, effective implementation of energy conservation and demand-side management measures as well as strengthening research and development will also be carried out to ensure the continued energy growth is compatible with environmental objectives. However, even with the above-mentioned efforts, the country's contribution to global warming will still increase

mainly due to its greater energy need even though it low enough as compared to with that of the industrialized nation.

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