



Food Versus Fuel: The Way Forward For Africa

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Abstract

The recent crisis in energy particularly from fossil fuel has necessitated the development of other alternatives such as bio-fuel. Unfortunately, the diversion of resources from food crops to bio-fuel has brought about high grain commodity prices. It is noted that about 14% of the world's total population lack adequate food, and majority of them come from China, India, Africa, and Latin America. Thus the need to pay attention to the production of non cash crops or non edible crops as a source of energy is inevitable. *Jatropha*, for example, has attracted a fair amount of attention in recent years. A hardy bush thought to be appropriate for cultivation in Africa, *Jatropha* thrives in arid areas and can be grown on desert and marginal lands without taking land out of cultivation for food production and without requiring expensive inputs like fertilizers and water. This paper therefore, examines the conflict arising from the use of scarce food crops to promote bio-fuel and its attendant consequence on food scarcity. The paper also recommends some policy measures that would deter farms from producing food crops for energy usage or using fertile lands for such energy crops.

Keywords: Energy, Fossil fuel, Bio-fuel, Food crops, Sime-arid.

1.0 Introduction

Energy is central to all human activities and it is needed to support development. Access to energy is inevitable for poverty alleviation and if we must achieve developmental targets and meet the millennium development goals (MDGs). There are apparently links between poverty and access to energy; the citizens of many poor nations of the world have extremely low access to energy and the richer countries consume far more energy than the poor countries, suggesting that access to energy is the dividing line between the rich and the poor countries of the world.

The diversion (or plan to divert) the agricultural resources to bio fuel will lead to shortage of food and high prices, especially those of grains. Now the question being asked by people is whether bio fuel promotion is better than food security?

The answer to this question is YES and NO.

YES, to the proponents of bio fuel promotion for the following reasons;

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1.1 Increasing Demand For Fossil Fuel Energy

Energy is the basis of industrial civilization; without energy modern life would be difficult to survive. The oil era began to replace coal energy after the second world war, and with subsequent development of internal combustion engines and automobiles, a vast new market for major oil products such as diesel & petrol expanded rapidly. It was during the 70's that the world began to witness painful adjustments of the vulnerability of energy supplies, partly because of the international politics. For instance, the Iran – Iraq war of 1981, the Iraq invasion of Kuwait in 1991 and of course the US invasion of Afghanistan and Iraq in 2003, were among the factors responsible for the up-shoot in oil prices and increasing demand. In recent years, new threats to energy security have emerged in the form of increased world competition for energy resources, and concern on climate change, plus other negative environmental impacts of excessive fossil fuel consumption.

One of the long-term solutions to this problem is to increase energy sources, through renewable energy supplies.

Below is a table of top 5 Oil Producers & Consumers in the World.

Table 1: 2004 Oil Productions by Country.

Oil production by country		
Ranking	Country	Barrels / day
1	S. Arabia	8,711,000
2	USA	8,054,000
3	Russia	7,286,000
4	Iran	3,804,000
5	Mexico	3,590,000
13	Nigeria	2,256,000

Source: 2004 world fact book

Table 2: 2004 Oil Consumption by Country.

Oil consumption by country		
Ranking	Country	Barrels / day
1	USA	19,650,000
2	Japan	5,290,000
3	China	4,570,000
4	Germany	2,831,000
5	Russia	2,595,000

Source: 2004 world fact book

The tables clearly show that, rate of fuel consumption does not match rate of production. For instance, there is a difference of about 11 million barrels between the highest producer and consumer i.e. S. Arabia and USA respectively.

Statistical data also show that, in 2005, about 400 Quadrillion (British thermal unit) of fossil fuel was consumed world wide (Encarta, 2009).

The ever increasing, highly unstable and fluctuating oil prices are what King Hubert predicted as signs of oil peak. The US Department of Energy Information Administration (EIA) estimated that, peak of oil production will be between 2026–2039 (Ronald, 2006)

2.0 Socio Economic Development

For socio economic development, especially of the rural populace (who form the majority of the African population) bio – fuel promotion at local level will give the people economic activity that will be geared towards poverty reduction: Even the expected high cost of grains can help to improve food supply... by providing economic boost and subsidies to farmers. Similarly, many Non-governmental Organizations (NGOs) will be willing to support farmers towards producing biofuel crops especially on non – agricultural lands. In Kenya, for instance, many NGO'S such as CDM are already helping the farmers to develop *jatropha curcas* plantation (Wachira, 2008).

A 100 Million Gallon of ethanol plant is estimated to create over 2,000 local jobs. Similarly the use of 11 million hectares of waste land for *jatropha* cultivation is expected to generate a minimum of 12 million jobs within the community (www.fao.org). This estimate will go a long way in reducing joblessness and improve human capacity building. The table below shows, World ethanol leading producers as at, 2004.

Table 3: World Ethanol Leading Producers as at 2004

Ranking	Country	Source	Billion gallons
1.	Brazil	Sugarcane	4.0
2.	USA	Corn	3.5
3.	China	Wheat & Corn Sugarcane	1.0
4.	India	Sugar beet & wheat	0.5
5.	France		0.2

Source: 2004 world fact Book.

3.0 Biofuels Are Cleaner Compared With Conventional Fossil Fuel.

One of the environmental benefits from the use of energy production is decrease in green house gas (GHG) emissions.

Unlike fossil fuels, plants grown for energy absorbs the amount of CO₂ released in to the environment, thereby making no net CO₂ generation in into the environment. The table below shows a comparison between carbon emission and energy source.

Table 4: Sources of carbon emission

	Energy Source	Carbon emission gram/Kwh
1	Popular	3961
2	Switch grass	6841
3	Natural gas	49618
4	Petroleum	80260
5	Coal	88758

Source: Report of Michigan Biomas Energy program 2008.

The concentration of CO₂ is close to 400ppm by volume and scientists estimate that, at 500 ppm volume, there will be significant warming and perhaps catastrophic and irreversible climate change (Stanley, 2007).

To the proponents of food security, that is, those of the opinion that, for food security reasons biofuel promotion should not be encouraged, there are reasons given; some of these reasons include:

3.1 Increase in Food Price.

It is very clear that, biofuel promotion will eventually affect the prices of food already in the US it is affecting the price of maize. Even here in Nigeria, the escalating prices of food stuff may not be unconnected with the rising cost of importation, particularly rice. The world demand for grain expanded an average of 40 million tons per year between 2007 and 2008, and this rise is associated with ethanol production in the US (Lester, 2008). The increasing demand for grains is attributable to the additional grain going into ethanol production especially in the US.

3.2 Demand and Supply

The Demand for biofuel especially for automotive purpose, far outweigh the agricultural resources available. For instance it has been estimated that, the grain required to fill a 25 – gallon tank with ethanol will feed one person for a year. On a whole, if for example, the entire US grain harvest is converted to ethanol it will satisfy only about 18% of entire US automotive fuel needs.

3.3 Ecological and Environmental Consequences

The replacement of deciduous forest reserves with perennial crops will have serious negative ecological and environmental consequences. Many African countries are living witness to the disaster of

desertification brought about by cutting trees. Similarly the environmental consequences of global warming are also associated with cutting forests, thereby limiting CO₂ absorption and consequently increase in Green House Gas in the globe.

Even some developed countries are still skeptical about biofuels promotion, for ecological reasons. For example, John Beddington, the UK Chief scientific adviser said “it is profoundly stupid to cut down rain forests to grow biofuel crops (www.guardian.co.uk/envirom/2008).

3.4 Shift on Emphasis.

The opponents of biofuels promotion for sake of food security feel that, for economic gains, farmers are likely to shift emphasis to growing non–food crops for bio–fuels. Research shows that, the cultivation of *jatropha* and sun flower plants do not require much input from the farmers, therefore they are likely to grow more *jatropha* and Sun flower in their farms rather than corn. At the end of the day, there will be more biodiesel, without much food to eat.

4.0 The Way Out For African Countries

Growing crops for food or growing them for conversion to fuel, are both needed the society; and eventually the equation may be one – sided, in that, the rich countries will have both the food and the energy, while the poor ones may not have either, unless perhaps they strive hard and come up with alternatives to reflect their socio economic standing. The African countries therefore, have a daunting task of coming up with such alternatives, so as to meet up with the world energy challenges. It is no longer a celebration for a nation to discover oil in its territory, but it is rather, spectacular for a Nation to come up with a clean technology on renewable source of energy.

The African countries are endowed with favorable climatic conditions, suitable for the growth and development of both food – based and non – food based crops. The following recommendations are proposed:

i. Promotion of non – food crops production such as *jatropha carcus*. This plant has been identified to grow & thrive favourably in both arid and semi arid regions. Its prospects for biodiesel production

has also been fully investigated and found to be cost effective.

ii. Promotion of specific food – based crops that, could serve both energy and food purposes. These include, sun flower, palm oil, castor oil (for biodiesel production) and sugarcane (for bio ethanol production). This will further improve employment and income opportunities.

iii. Establishment of stringent policies by the Africa Union that will restrict the cultivation of non – food crops to only designated areas particularly marginal lands. This will be the only way to curtail the fear of diversion by farmers from food – based crops to non – food based crops for economic gains.

iv. Generally also, there is need for interdisciplinary research and exchange of ideas (via conferences like this) to better understand the environmental risks related to land use change resulting from biofuels expansion and understand the relationship between economic and environmental effects.

v. Research and development should not be limited to biofuels alone, but to other renewable energy technologies such as solar energy, hydrogen fuel cells and others. This forms part of the reason for our being here, as representatives of Renewable Energy Research Group (RERG) Umaru Musa Yar'adua University, Katsina, Katsina State, Nigeria.

5.0 Conclusion

In this paper, the good and bad aspects of bio fuel promotion have been discussed, and pertinent solutions have been suggested, for especially the

African countries, whose economy is staggering and dependent. The economic melt down being witnessed in the world today, is a testimony to the fact that, Africans need to evolve strategies that will make them ever strong, independent, and reliable.

Fossil fuel is no longer seen as a future prospect of a Nation. Today, the development of new technology in bio fuel is much better than discovering new oil Wells.

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