

## **ABSTRACT**

Let us presume the emergence of a new country with the size and energy demands of either the United States or China onto the planet every five years. What do we think might happen to the world's food and energy needs and the environment? This is the question my essay begins with, with the aim of drawing our minds to the potential abyss we may find ourselves in if we do not take hard and fast decisions to solve the crisis now.

This kind of conceptual analysis using examples from a global context continues into the next three paragraphs and considers major themes like the macrostructure and microstructure of the food and energy crisis. In developing possible solutions to the crisis, I also bring out the point that building a secure future for ourselves requires both reforms at the institutional level and a transformation at the social level which should be focused on the long-term stakeholders of the future world economy. The present moment is both the worst and best in history to live in. It is the worst time due to the adversely negative socio-economic forces worldwide but it is also the best time since the situation presents an opportunity to all of us in whatever capacity we find ourselves to contribute to solving the problem and avoid related ones.

The approaches to achieving this food and energy security as contained in this essay are practical-based and result-oriented and require collective action and a spirit of stewardship, attitudinal changes, changes in consumption patterns among individuals, gender reconsiderations, increased political will and improvements in civic education among others.

In my submission also, I try not to prescribe any of the GM crops and alternative power mechanisms that are being postulated around to solve the food and energy crisis since I believe each country has the sole prerogative to accept and put into action the mechanisms(s) most suitable to meet it's overall development goals and that will also be environmentally and economically viable without bringing adverse effects.

My final note airs the massive scope of challenging the status quo and ensuring food and energy security and that despite the immense task ahead, a small step in the appropriate direction is infinitely more desirable than inaction and passiveness. History has ushered us into a crisis and the policies required to deal with these economic strains may be a difficult brew to swallow more especially in the presence of the global financial crisis, but we should accept them and also accept the fact that the sacrifices we make today will create greater future happiness for us and generations to come.

## **THE FOOD AND ENERGY CRISIS: ANALYSING THE EFFECTS AND CHARTING A SUSTAINABLE FUTURE**

Let us assume the emergence of a new country with the size and energy demands of either the United States or China onto the planet every five years. What do we think might happen to the world's food and energy needs and the environment? The world's population today is even growing at a higher rate, and it is estimated to grow much further with the potential of greatly increasing its energy demands from the current 400 exajoules per year of energy.

In analyzing food and energy security, we should try to make the contrast between availability and accessibility. Food and energy may be on sale in markets- that is, available- but this provides little repose to humanity if their prices and distribution go contrary. Presently, only a small proportion of the world's population consumes a significantly large part of its resources, with the U.S. for example and its population of 300 million people consuming far more energy than China with a population of about 1.3 billion people. The food available worldwide would be enough to satisfy earth's dietary needs – if it were evenly distributed and solely according to needs. However, nightly, some 830 million people go to bed hungry or undernourished. Getting food into people's shopping baskets and onto people's tables and enough energy for the world's growing economies with voracious appetites is a matter of utmost concern. So just how secure are our food and energy supply systems? Why are experts worried that they are being stretched to the limit? And will there ever be a time when no one will have to worry about where his next meal is coming from and whether there will be a blackout? A few facets of the joint food and energy problem include the under listed:

- As a consequence of government's discontinuation of food subsidies in one economically troubled country in North Arica, the price of bread doubled overnight. Protesting angry and hungry mobs stormed the streets smashing shop windows and attacking banks and post offices. Agitation spread throughout that country, and a state of emergency was declared. In an effort to suppress the riots, security forces opened fire on the crowds resulting in the reported death of 120 people and injury of many more.
- Protesters against high fuel prices in Ecuador in 1999 and in Britain in September 2000 (combined with already relatively high taxation on road fuel in the UK) blockaded oil refinery exits and prevented deliveries from leaving them causing acute impediments to the food supply. Within days, gas stations ran dry, vehicles had no fuel, and the food distribution system destabilized. Countrywide, stores and supermarkets, which usually depend on expedient delivery schedules, had empty shelves.
- Hurricanes Georges and Mitch that hit the Caribbean area and Central America in 1999, caused widespread destruction, disrupted the normal activities and caused severe starvation.

The 2008 Central Asia energy crisis, the South African electrical crisis and a general oil price increase since 2003 caused by continued global increases in petroleum demand coupled with production stagnation, the falling value of the US dollar, and a myriad of other secondary causes like ageing infrastructure, choke point disruption or bottlenecks at oil refineries, port facilities that restrict fuel supply, bad weather, terrorist attacks on important infrastructure and pipeline failures are common phenomena.

The macroeconomic implications of a supply-shock-induced food and energy crisis are enormous, since energy is the primary resource used to exploit all other resources including food sources and if current trends continue, global food and energy security could well become the two greatest humanitarian problems of the 21<sup>st</sup> century. Conclusions that the world is heading towards an unprecedented enormous and potentially devastating global food and energy crisis due to a decline in the availability of cheap food and energy calls for urgent attention. The task of ensuring food and

energy security for an exploding world population adequately constitutes an increasingly pressing and mammoth challenge requiring the synchronized efforts and coordinated interaction of producers, transporters and market operators. This is especially significant in the developing world where services such as transportation and structures such as storage buildings, markets and energy generators are already overextended.

Because food production is dependent on water, irrigation development is key to feeding the world's burgeoning population. It takes one cubic metre (1000 litres) of water to produce one kilogram of wheat and 3000 litres of water to produce one kilogram of rice. Irrigation can ensure adequate and reliable supply of water which increases yields of most crops by 100% to 400%. Although only 17% of global cropland is irrigated, that 17% produces 40% of the world's food. Increasing irrigation efficiency and limiting environmental damage are vital for food availability. In adverse situations where water is extremely scarce and the environment fragile, achieving food security may depend on what has now been termed 'Virtual Water', which is, importing food from countries with abundant water. This may be a cheaper and more efficient use of a scarce resource. It is also important that we revive both ancient and modern methods of rainwater harvesting to supplement existing water supplies some of which include constructing;

- Roof water that funnels rainwater into underground sumps or above-ground tanks
- Naulas, that is, stone walls built across a stream to dam the rainwater
- Percolation tanks or 'rapats'(small tanks built on sandy or rocky soil to store rainwater for use and the remainder percolates through to aquifers, which replenish wells)
- Bhandaras (underground tanks built to intercept water from springs, channeling it to storage tanks for city use)
- Qanats (vertical shafts in hilly areas to catch rainwater that is carried by gravity over long distances to storage wells) and
- Integrated tanks that overflow into a series of lower tanks to catch the rainwater that is funneled through gutters.

We should remember that available water is limited and unlike a bank account there can be no overdraft when no water is available.

In seeking solutions to the food and energy crisis, emphasis should be placed on gender equity in the form of recognizing the role of women. Women play an essential role in the provision of food and nutrition through their roles as food producers, processors and market operators. Nevertheless women's lower socio-economic status limit their access to education, training, land ownership, decision making and credit and consequently their ability to improve their access to and use of food. Expanding women's participation in decision-making and their secure access to land and credit will in turn improve food security as women invest in fertilizers and better seeds, labour-saving tools, irrigation and land care. By ensuring the security of land tenure, property rights and access to finance, women will be able to play a more vital role in food security development.

Addressing the prolonged lack of investment in rural economies is another method I recommend. Food and energy sourced locally rather than internationally minimizes the costs and disruption to local markets. Therefore rural development should target sustainable agricultural, fishery and forestry production and management of rural natural resources. Such a strategy should include the subsidization of rural farming activity where possible since rural communities produce staples more cheaply than rich urban societies. Rural investment should as much as possible attempt to eliminate trade imbalances and barriers to trade such as distance from markets and tariffs. Policies and programmes that address local ownership and control of the full chain of resources, soil degradation, chronic water shortages, inappropriate agricultural practices and population growth, and that accept small farms

for what they are while encouraging their sustainability through subsidized imports and credit should be adopted as for example has been followed successfully in Malawi's recent transformation from shortage to surplus. There should also be a better integration of traditional knowledge with research so that these rural economies could perform their prospective functions as fully fledged Land Banks or Unique Agricultural Zones if agricultural productivity is to rise.

A basic solution of the two-prong crisis lies in administrative policy and decision making. As much as possible political administrations should be made to include in their development policies and programmes mainstream development goals that seek to improve household food and energy security and prevent and control specific micronutrient deficiencies for example by food fortification with minerals and vitamins that are most susceptible to shortage. The potentially massive impact on global economies of the energy crisis can be avoided if governments strive for a portfolio of energy systems, and in acquiring funds for the development of these energy systems care should be taken so as not to negatively affect the economy's budget. Another mitigation measure that requires government assistance is in the global setup of a cache of secure fuel reserves like the "Strategic Petroleum Reserve" adopted by the United States of America, in case of a national emergency, or a joint venture capital instrument of some sort that will be used in the research and development of both existing and potential energy resources. The Hirsch report has also made it clear that an energy crisis is best averted by preparation and so to avoid an even more serious energy crisis in the near future, governments should also seek to come to an international agreement on a persistent, orderly, predictable, and steepening series of price hikes in energy resources over the next two decades. Conflict prevention and resolution mechanisms and democracy and governance based on principles of accountability and transparency in public institutions and the rule of law are basic to assisting vulnerable members of society.

The world could also be much better if we simply adopted categorical changes in our pattern of energy consumption and shunned energy intensive lifestyles. The current energy consumption trends all over the world are extremely inefficient, whether it be in the domestic, industrial, trade or commercial sectors. With minimal effort, a greater proportion of each nation's energy can be saved by applying only the first level of energy conservation, that is, a change in attitude. It is common to see in most household lights and home appliances on even when they are not being used. Similarly, many businesses are usually extravagantly lit when they could do with a few energy-saving tube lights to meet a desired level of luminescence. The transportation sector could be made much more efficient and add to multi-gigawatt capacity if we all accept to as much as possible use public transport, trains and ships, and innovations like the 'Dahon' (a foldable bicycle), instead of airplanes and energy-sapping Sports Utility Vehicles. Building construction techniques that incorporate changes to reduce heating costs, potentially through increased insulation should be prioritized. Public education, information and participation in this case are essential in the form of effective electronic and print media campaigns.

To further not compound the existing energy crisis; I propose three institutional arrangements that are vital to capturing the blessings of any newly-found energy resource and having them function effectively especially for countries like my own Ghana that has just discovered oil in commercial quantities and these include:

- Institutional mechanisms that will ensure transparency and accountability in all issues relating to the energy resource cycle in the areas of revenues received, expenditures undertaken and contract negotiations.
- Another mechanism to establish a Fiscal Stabilization Fund of some sort to stabilize volatile revenues, and a more permanent fund to invest long term savings according to agreed principles.

- Institutions to implement a Public investment or Human Development program based on transparent cost-benefit analysis to avoid the 'Resource Curse' problem of most energy resourced nations.

It can be noticed that in my submission so far, I have not prescribed any of the GM crops and alternative power mechanisms that are being postulated around to solve the food and energy crisis since I believe each country has the sole prerogative to accept and put into action the method(s) most suitable to meet it's overall development goals and that will also be environmentally and economically viable without bringing adverse effects.

Finally, a closing thought: History shows us that reforms are embarked on more in times of crisis than in periods of benign growth. This same history has ushered us into a crisis and the policies required to deal with these economic difficulties may be a difficult brew to swallow more especially in the presence of the global financial crisis but we should accept them and also accept the fact that the sacrifices we make today will create greater future happiness for us and generations to come.