
Authentic Agriculture for Sustainable Food Security in the Global Food System

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ABSTRACT

This review on Authentic Agriculture for Sustainable Food Security in the Global Food System is presented at the International Conference on Authentic Agriculture for Sustainable Food Security in the Global Food System, organised by the International Centre for Integrated Development Research in collaboration with Copperstone University. Obviously, the issue of food security is a necessity to life through sustainable agricultural development. The global food system today faces the significant challenges of feeding more people amid dwindling national resources and agriculture is the foundation of the global food supply system. However, global food production methods must change to minimize the impact on the environment. For effective and successful effort towards achievement of sustainable agriculture for food security and nutrition, the paper advocates among others that the investment in agricultural research should receive high priority and there is need for long term strategic plans for research and development as this will have significant impact on productivity growth.

Keywords: *Authentic Agriculture, Global Food System, Sustainable Food Security.*

INTRODUCTION

It gives me great pleasure to deliver the keynote address to this distinguished gathering of eminent personalities, professional scientists, highly respected farmers and National policy makers. This conference whose theme is Authentic Agriculture for Sustainable Food Security in the Global Food System is very important in the light of global quest for sustainable food security, nutrition and health. The global food system today faces the significant challenges of feeding

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more people amid dwindling national resources and agriculture is the foundation of the global food supply system.

Agriculture is one of the most important practices developed by mankind for its survival. It is a major driving force for rural growth and development in many countries including Nigeria. Also, it is one of the major contributors to the GDP and economy of many developing countries. It employs and provides livelihood for a significant proportion of the population of many countries, “accounting for up to 70% in some cases”. Consequently, agriculture has a great potential in solving the problems of poverty, hunger and employment in several developing countries.

In African countries, as in many emerging economics and other developing countries in the world, the major sub-sectors of agriculture contributing to the economy are crops, livestock, fisheries, and forestry. Smallholder’s resource poor farmers are major contributors of food production in developing countries “accounting for about 70% of the total output”. When agricultural productivity is improved, the farmers’ financial status also improves leading to poverty alleviation. However, with unprecedented increase of population, the pressure on agriculture is also high. FAO (2012) reports that there is need to increase the agriculture production by 60% if we want to fulfill the needs of about 9 billion people in the world by 2050. In 2017, the World Bank notes that 83 million people in 45 countries were starving. The proportion of under-nourished people reaches 20% in Africa and 13% in Asian countries. Lipton and Saghai (2017) point out that there is a noticeable deterioration in food security in Africa and South East and West Asia. With a stable population growth, the possibility of eradicating hunger by 2050 may become questionable.

The challenges of meeting the rapidly growing food need globally require agricultural sustainability. Agricultural sustainability can be achieved by utilization and implementation of techniques of farming which would increase production of crops, livestock, fisheries to meet demands of growing population while at the same time conserve and protect environment and its natural resources.

SUSTAINABLE AGRICULTURE AND FOOD PRODUCTION SYSTEM

Sustainable agriculture is not just about food production but about increasing the capacity of rural people to be self-reliance and resilient in the face of changes and about building strong rural organization and economics. It is a system that combines tradition, innovative and science to benefit the shared environments

and improve on a good quality of life. Sustainable agriculture emphasizes adding value to agricultural production through agro-processing, marketing and other off-farm activities; thus, creating employment and income generating opportunities while retaining the surplus in the rural economy. In addition, it enhances productivity and harness genetic resources for food, strengthens the rural livelihood and promotes equity in social well-being. Survey reports by FAO (2014) enumerate some actions to be taken to make food production more sustainable. These include:

- Appropriate use of fertilizers and pesticides to avoid pollution of soils and waterways
- Reduce greenhouse gas emission to help maintain air quality.
- Reverse soil loss and restore organic method content in soil.
- Increase biodiversity through farming practices that safeguard land, water and energy resources, wet land and forest areas.
- Implement sustainable fishing practices to restore fish stocks and eliminate catch and discard.
- Reduce pollution of coastal areas from litters and other waste.
- Use of functional packaging to reduce spoilage and waste of perishable food.
- Close yields gaps and reduce yield variability through improved crop varieties with tolerance to drought, salinity, submergence, disease and insect pest.
- Close yield and efficient gaps through an agronomic revolution and more precise crop management through locally adapted, affordable new technologies and access to information
- Adopt harvest and post-harvest technologies that save labour, reduce grain losses and improve product quality. Combine harvest, dryness and hermetic storage.
- Take advantage of cheap information (mobile phone, internet, social media and videos) to provide digital agricultural solution for farmers.
- Invest in agricultural infrastructure to enable intensification and diversification of agriculture through access to input, market, health services, road, electricity, internet, storage and processing. Create a decent living environment for people to stay in rural areas.

- Support the growth of rural agribusiness hubs that provide the full range of input and services to farmers and their families.
- Shift from subsidies to providing low cost financial and technical supports as key incentive for local business and farmers to adopt proven and science based technologies that increase productivity and efficiency.
- Participation of farmers and rural people in all process of problem analysis, technology development adaptation and extension, monitoring and evaluation.

As the world population continues to grow, much more effort and innovation will be urgently needed in order to sustainably increase agricultural production, improve the global supply chain, decrease food loss and waste (IPES, 2015) and ensure that all who are suffering from hunger and malnutrition have access to nutritious food. Agricultural systems worldwide must become more productive and less wasteful. Sustainable agricultural practices and food system including both production and consumption must be pursued from a holistic and integrated perspective. Sustainable food productions also necessitate the development of sustainable food value chains in order to offer innovative pathways out of poverty. Food waste reduction represents an important but often overlooked component of sustainable food system. Globally, up to 35% of all food harvest is wasted and addressing the problem of food wastage offers a major opportunity to improve food security (HLPE, 2014).

However, sustainable agriculture and food security cannot be treated in isolation without food production system. Food production system is the main driver to the food security. A food system is all the processes and infrastructure involved in satisfying a population food security. The processing, packaging, transporting, marketing and consumption of food and disposing of food waste. The outcome of food production system activities culminate to availability, utilization, and access to food as well as other socio-economic and environmental factors. Erickson (2008); Erickson *et.al* (2010) report that changes in food system drivers give rise to change in food security outcome.

A sustainable food system (SFS) delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generation are not compromised. That means economic sustainability when it became profitable but when it has broad benefit for the society it becomes social sustainability while environmental sustainability occur when the food system has a positive impact on the environment.

FOOD SECURITY AND NUTRITION

The issue of food security is a necessity to life through sustainable agricultural development. Every human being needs food not just for energy giving but to sustain life in general. World leaders at the 2012 conference on Sustainable Development reaffirmed the right of everyone to have access to safe and nutrition food consistent with the right to adequate food and fundamental right of everyone to be free from hunger. According to FAO (1996), during the world food summit declared food security to exist “when all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and health life”. It require food to be available locally, and that people should have the means to acquire it, either by growing it or purchasing it throughout the entire year. Food security can also be seen as a state of affairs when all people at all times have access to adequate supply of food. Therefore, the key component of food security is production and availability of nutritionally adequate and safe food or capacity to acquire nutritionally adequate and safe food.

To achieve food security globally, the following four conditions must be observed. These are availability, affordability, accessibility and utilization of food. The nutritional aspect of the food security is based on the diversity of diet including stable food, vegetable, fruits, meat, milk, eggs and fortified food (FAO 2011). Sustainable food production needs to be nutrient dense to allow people to have diverse diet that contain a balance and adequate combination of energy and nutrient to support good health.

It is possible to eradicate extreme poverty, hunger and undernourishment in 2030 through sustained food security and this can be achieved through the following recommendations:

1. Increase productivity by at least 70% on existing crop and pasture land.
2. Make farming an attractive economic development opportunity for people living in rural areas, particularly small holders farmers and small to medium entrepreneurs.
3. Preserve the environment through ultimately stopping the expansion of agriculture in sensitive ecosystem.
4. Reduce food wastage. Although on the site processing of agricultural products are limited by energy poverty or lack of storage facilities.

Global food production methods must change to minimize the impact on the environment. It is estimated that 25% of total global greenhouse gas emission

are directly caused by crop and animal production and forestry. The level of environmental impact on food production relates to where and how the food is produced and the local availability of natural resources such as water and soil.

LIVESTOCK PRODUCTION AS A DRIVING FORCE FOR FOOD SECURITY

Livestock production is a driving force for food security and nutrition. It constitutes a very important component of the agricultural economy of developing countries. In 2013, the livestock sector accounted for one-third of global agricultural gross production value (FAO STAT). Livestock make huge positive contribution to livelihood and nutrition of the poor and vulnerable people in the developing world. It is often said that 1.3 billion people depend on livestock for their livelihood among which 600 million are poor farmers.

Livestock contribution goes beyond direct meat and production to include multipurpose uses of important products from the animal as well as capital accumulation. Their contribution increases at a higher rate than some crops. Animal products are primarily sources of protein and essential amino acid. About 60% of dietary protein supply is derived from animal production. Animal productions are not only representing a source of high quality food but equally important source of income of many small farmers in developing countries.

At the national level, livestock food products represent about 27% of the total agricultural output. This sub sector has achieved the greatest growth in production over the last two decade and it is expected that it will continue to grow faster than all other agricultural sub sector in the next 20 years.

Livestock product processing sector has also been identified as a contributor of employment generation and reduction of rural depopulation. It also provide increased economic stability to the farmer or household acting as a cash buffer (small livestock) and as a capital reserve (larger animal) as well as a determinant against inflation. In mixed farming system, livestock reduce the risk associated with crop production. They also represent liquid asset that can be realized at any time, adding further to the production system.

FISHERIES SUB SECTOR: CONTRIBUTION TO FOOD SECURITY

Fisheries make particular contribution to food security and more than 90% of the people engaged in the sector are employed in small scale fisheries, many of whom

are found in the poorer countries of the world (Cochrane, Andrew and Pama, 2011). Global average consumption of fish and other production from fisheries in 2011 was 18.6kg per person per year derived from a total production of 148.5 million tons of which 86% was used for direct hunger consumption (FAO, 2012).

FACTORS THAT AFFECT FOOD SECURITY AND NUTRITION

1. Climate Change

Climate change is one of the major factors that affect food security and nutrition globally. Climate change is a human induced phenomenon forming a major challenge for agriculture and food security (FAO, 2016). It impacts differ widely among region, countries and agro-ecological zone. Most poor livestock keeper living in Africa and South Asia are vulnerable to climate change. Dry lands in Africa and Middle East are severely affected by climate change with significant impacts on the availability of water and forage resources (IPCC, 2014). Pastoralist and small holder in their areas are highly vulnerable to climate changes which sometimes trigger conflict within the community.

Warming climate has negative effect also on crop production and generally reduce yield of staples such as rice, maize and wheat, and this differ between region and latitude. Climate change also affects fisheries and aquaculture through gradual warming and ocean acidification. It tends to be a major drive of food insecurity and contribute to negative impact on nutrition. Flood and tropical storm are the product of climate change and it affect food security by destroying the livelihood of assert of the farmers. Globally, climate change is contributing to global food crisis and shape increase in food prices.

In September 2019, leaders of the whole world met at New York, United State of America for United Nation climate Action Submit with the Theme “A race we can win” the President of Federal Republic of Nigeria, Muhamadu Buhari announced plans and initiative by his administration to tackle negative effect of climate change in Nigeria. In his address, he said Nigeria will;

- Issue a green bond for irrigation and construct multipurpose dams for power, irrigation and water supply.
- Strengthen solid and liquid waste management system to attract more private sectors investors.
- Mobilize Nigeria youth towards planting 25 million trees to enhance Nigerian carbon sink.

2. Price Volatility

Another importance factor that influence food security is price volatility. This affects the price of international traded food commodities. These prices reflect the overall balance of supply and demand and the accessibility of food for consumers' integration with regional to global market. Price volatility thus interacts with price levels to affect food security and nutrition and increases risk to producers with implication for resources allocation and for investment decision. The main local factors that exacerbate price volatility in developing countries are weather (especially in area that depend on rainfall agriculture) and high transport cost etc. These also result to global food crisis ultimately causing widespread of hunger as many families in the world are using as much as 75% of their income for food. This is caused by increased demand for food across the global with resultant increase in prices.

3. Other Factors

Other factors that militate against food security and nutrition include; water scarcity, post-harvest losses and poor support from government. The productivity of most of the least developed countries, Nigeria inclusive is relatively low due to the above mentioned factors. Farmer has little support from the government with African countries spending only 3% of their budget on agriculture which is disproportionate to the size of the sector in terms of employment and economic activities. In addition, post-harvest losses in most developing countries are enormous with at least one-third of food produced being lost before reaching the consumers due to spoilage, poor storage and transport facility. All these leads to food insecurity and is closely tied to poverty and hunger. Hunger leads millions of desperate people to leave rural area for the citizen.

4. Changes in Government Policy in Agriculture

Policy changes affect the food security of a country and the world in general. The inconsistencies in agricultural policies within a country always result to weak agricultural development, especially when there is a change in administration. There should be continuity and perpetual implementation of agricultural development policies by the current and future administration for impact of the policies to be felt. Political unwillingness is yet another factor that has been acting as impedance to agricultural development and preventing agricultural policies.

STRATEGIES FOR THE PROMOTION OF FOOD SECURITY IN THE GLOBAL FOOD SYSTEM

Promoting food security and nutrition involves increasing production, access and availability of quality nutritious food to the consumers. Therefore, the world agriculture and food system must become more productive, more resources efficient, more resilient and less wasteful. Farming must become more attractive and more profitable for all who are involved in the different value chains and to many small-scale farmers and small-medium size entrepreneurs in the developing countries. We need to ensure equity in terms of access to inputs and market in all parts of the world to help smallholders escape from poverty and resource depletion trap. Social support programme are needed to benefit women and the most vulnerable.

For effective and successful effort towards achievement of sustainable agriculture for food security and nutrition, the following areas require attention:

- (1) Investment in agricultural research should receive high priority and there is need for long term strategic plans for research and development as this will have significant impact on productivity growth.
- (2) There is an urgent need for a fundamental shift in national and donor policies. Funds for agriculture should increase many folds and this should be used in supporting small – scale farmers who are the main source of food for the world hunger.
- (3) Agriculture extension services should be resuscitate and strengthened to ensure appropriate feedback mechanism between the government, researchers and farmers.
- (4) Awareness should be sustained among the farming populations to use only improved varieties and certified seed, to enhance crop productivity.
- (5) People should exploit soilless agriculture that affords the opportunity of increased agricultural production where people can have farm regardless of ownership or access to farmland.
- (6) Government should make agriculture an attractive economic development opportunity for people living in the rural areas and slow down migration to urban areas. This is possible through infrastructural development in the rural areas.
- (7) Government should encourage the farmer by subsidizing some farm inputs and by creating easy access to credit facilities to enable farmers improve their production capacity.

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- (8) More importantly is ensuring agro-ecological intensification of food production. This primarily implies to implement good agronomic management principles in local content.

CONCLUSION

Food security, nutrition and health are complex issues that cannot be solved by one sector or stakeholder alone, but need to be backed in a coordinated way with the necessary political community and integrated leadership. The developing countries should be supported to accelerate progress in improving food security and nutrition by strengthening their capacities and capability to realize their commitment to make hunger and poverty a thing of the past. Globally, we need to re-invent farming as an attractive local business opportunity for small holder farmers and also create opportunity for entrepreneur in the value chain and thus relying less on government support. There should be a major transformation in agriculture and food system in order to end hunger, achieve food security and improve nutrition by the year 2030.

To this end, I wish you successful and exciting deliberation at the symposium and technical session of the conference. Thank you and God bless the Federal Republic of Nigeria and Akwa Ibom State.

Professor Godfrey Akpan Iwo

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