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Food Security and the Challenges of Post Harvest Waste in Nigeria

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ABSTRACT

The Protest Against Soaring Food Prices And Insecurity That Swept Across Nigeria Within The First Quarter Of 2008, Prompted Evasive Answers And Reactions From The State And Its Collaborators In The Private Sector. The Nigerian State Attributed The Crises To Land Degradation, Climate Change, Drought, Floods And Desert Encroachment, And Suggested Increased Food Import As A Short Term Measure. (Yar'adua, *The Nation*, June 8, 2008) P.32. Others Like Obasanjo Farms Limited Attributed The Global Food Crisis To Short Falls In Production And Diversions Of Food Items For Industrial Uses (Obasanjo, The Nation October 16 2008) P,5. How Valid Are These Explanations? Using Food Crop Production And Distribution In Nigeria, This Article Lays Bare The Poverty Of These Rebuttable And Limited Presumptions On The Causes Of Food Crisis In Nigeria. The Study Posits That Waste Rather Than The Above Presumption Is The Primary Reason For Food Insecurity In Nigeria. The Study Examines The Extent Of Waste In Banana, Rice, Yam And Cassava Production And Distribution And Concluded That Waste And Food Insecurity Should Be Assigned To State Corruption, Inconsistent Agricultural Polices, Poor Service Delivery And Dysfunctional Infrastructure Such As Poor Transportation, Weak Processing, Poor Storage, Unfair Pricing And Low Application Of Science And Technology In Production And Distribution Of Food Items In Nigeria.

INTRODUCTION

The protest against soaring food prices that swept across Africa since 2008 threatened governments and international aid agencies. The threat prompted actions to lower the cost of basic staples and expand form production. The price rise affected cereal crops (cassava, yam, potatoes) plantain, banana, fruits and others. Price rise equally affected cattle, chicken and other meat producing animals. These basic food items comprise the basic diet of millions of people in Africa and beyond.

Food and Agricultural Organization (FAO) report reveals overall price index for foods which increase by eight percent (8%) in 2005 and 2006; rose by twenty-four percent (24%) in 2007 and went further to a staggering fifty-three percent in 2008. The price hikes have fallen hardest on the poor in eighty-two nations, designated by the United Nations as Low-Income-Food Deficit Countries (LIFDCS). Forty-two of these countries are in Africa (Fleshman, 2009).

Factors driving increase in food prices in Africa are numerous and still much debated. Gordy Oshoko informed by dependency theory, attributed food crisis in Africa to Breton Woods Institution of Western nations. Pressures on developing nations to liberalize their economies and open their markets to western foods led to a short fall in domestic production of food items in Africa. Others attribute the crisis in Africa to rising energy prices, diversion of grains to bio-fuels, drought, declining productivity, governments, civil wars and social disorder in Africa.

In Nigeria, the situation is similar. Prices of essential food items such as yam, garri, rice, beans, onions, tomato, meat, chicken, vegetable oils and others, rose drastically within the first quarter of 2008 by more than fifty percent. This prompted reactions and explanations from both the state and the private sector concern with food production and distribution. The Nigerian state and organized private sectors explained or attributed soaring food prices to land degradation, climate change, drought, floods, desert encroachment, declining productivity and diversion of food items for industrial uses (Yar'Adua & Obasanjo, 2008).

None of these factors in isolation or together, are enough to explain soaring food prices in Nigeria. Using rice, cassava, yam, banana, plantain, vegetable and fruit production and distribution in Nigeria, this study reveals waste as the major problem responsible for soaring food crisis and insecurity in Nigeria. The study further reveals that waste of food items is largely informed by dysfunctional transport system, poor preservation, weak processing and low application of science and technology in production, preservation and distribution of food items in Nigeria.

Conceptualization

Wholesome food or balanced diet refers to meals rich in minerals and vitamins derived from different food items available and affordable in the market by the upper, middle and lower classes of the society. (The Nation October 31 2008). When the quality and quantity available is affordable by greater majority, especially the urban poor and rural dwellers, food security is presumed. However, food security is defined in terms of failure or in ability to afford wholesome meals, scarcity of essential food items and lack of purchasing power by consumers. In Nigeria, the greatest challenge to food security is not non-availability of food items or shortfalls in productions, but waste induced by poor preservation and processing confronting the urban

poor and rural dwellers who constitute more than seventy percent of the population.

The duty to feed a family rests on the parents. The duty to feed a nation rests on the states. The State's duty to feed its citizens is recognized by the United Nations and other specialized agencies concerned with global food security. The Nigerian state is a member and signatory to many International agreements on food security. However, the states have neglected its primary role in proving the enabling environment to promote food security.

It is instructive to note that 2008 commemoration of World Food Day also marked the sixth decade of the Universal Declaration of Human Rights adopted by the United Nations in 1948. Every one has the right to a standard of living adequate for the health and well-being of himself and family. The right to food was formally recognized in the Declaration as enshrined in Article 25. The inalienable Right to food was entrenched by various agenda of actions and international resolutions amongst others. These include International covenants on economic, social and cultural rights adopted by the United Nations General Assembly in 1966, which came into force in 1976. A total of 156 nations, including Nigeria have ratified the Declaration (The Nation, October 31, 2008).

The right to food security was defined in 1999 with general comment 12 by the UN Committee on economic, social and cultural rights which oversees the implementation of the covenant. It states that the right to adequate food is realized "when everyman, woman and child alone or community with others has the physical and economic access at all times to adequate means for its procurement" (U.N.O., 1999).

The right to food was further re-affirmed on 13th November, 1996 in Rome. A commitment was made in the Declaration to reduce by half the number of under-nourished people by 2015, and the Millennium Development Goal one (MDG1), to reduce by half the proportion of people afflicted by extreme poverty and hunger by 2015.

However, while individuals must realize their rights to food, governments that have ratified the international covenants on economic, social and cultural rights have their levels of obligation to honor. The state must respect the obligation of taking actions that will prevent people from hunger, arising from state neglect and poverty. These obligations include actions that will strengthen people access to and use of resources, provide adequate security and good governance. When people are unable to realize the right to food for reasons beyond their control, government is socially liable. For Nigeria to achieve this global objective of food security, the state must re-interpret or re-examine its role in agriculture production, storage and distribution.

In Nigeria, food is still grown, collected and harvested by over 70% of the population of small farmers, pastoralist forest dwellers and artisans. Food is primarily sold, processed, resolved and consumed locally with many deriving their incomes and livelihood through work and activities at different parts of food chain, from seed to plant. Localized food production system

helps to provide nutrition and expand income level to neighborhood, municipal and regional levels. Localized food system depends on many factors to sustain, expand or reduce incidence of food insecurity. These factors include the role of the state in providing relevant infrastructure and agricultural extension education and services in Nigeria. This paper critically examines the causes of food crisis to locate the dominant factors that agitate for food crisis in Nigeria.

METHODOLOGY

To identify problem of food insecurity and soaring food crisis in Nigeria, the study examines major processes in rice, cassava, yam, plantain, banana and fruits production and distribution using oral evidence from major stakeholders. This method involves oral interviews with farmers, traders, transporters and consumers. Oral evidence confirms that post-harvest waste rather than ecological and bio-technology is largely responsible for soaring food prices and insecurity in Nigeria. The study also relies on suggestions from stakeholders and related local and external experiences to recommend what is to be done to reduce the current incidence of food insecurity in Nigeria.

Post-Harvest Waste and Food Insecurity in Nigeria

Factors driving increases in food prices in Nigeria are numerous and still very much debated. These include the hike in the price of oil with ripple effects on transportation, fertilizers and processing cost. Improve living standards and urbanization increases food consumption and demand for meat, fruits and cereals. Decades of under-investment and declining yield in agriculture led to increase demand for food supplies. The state attributed soaring food price and crisis in 2008 to poor weather affecting major food items such as rice, beans, fruits and cereals. Corporate farmers like Obasanjo Farms Limited attributed the crisis to low productivity and diversion of food items to industrial purposes.

None of these factors can cause high increases within the period under review. Together, they could influence food production and pricing in countries were state intervention is low and agricultural polices disarticulated. This study acknowledges the contributory role of these factors in stimulating food crisis but locate the Nigerian situation on the poor management of post-harvest waste by the state, commercial farmers and peasants. Using farming, processing and distributive systems of basic food items within the Cross River region of south eastern Nigeria, the study uses agrarian society of Yakurr, Abi, Obubra, Ikom, Etung, Boki, Ogoja, Yala, Bekwara, Obudu and Odukpani Local Government Areas as case studies in the production and distribution of rice, yam, cassava, plantain banana and fruits grown in

commercial quantities. The study also examines exchange activities and demand for inter-village and inter-city transportation link.

Within this region, farmers are unanimous that post-harvest waste is the greatest challenge to optimum production and income gain. In major centers of rice production and processing, informants are firm that post-harvest waste and leakages towers above other problems experienced by producers. According to a source:

> "Here in Obubra at least two out of every ten bags of rice cultivated are wasted or lost to rodents, birds, pest, locust and through manual harvest. We need farm chemicals and harvesters to reduce waste. Our profit margins are low because we use profits to meet family needs, so little is left to pay for social services" (Awasan and others 2009).

Informants from Yakurr, Abi, Obudu, Ogoja and Yala, confirm Obubra experience and also stated that the situation gets even worst during drought and seasonal locust invasion from the north without state intervention and control. Waste is not limited to cultivation and harvest; it extends to processing or milling which is a critical stage in the production process. In Abi, Yakurr, and Obubra LGAs, most rice mills are not owned by farmers. The millers buy unprocessed rice, mill and sell to the traders or the farmers par-boils their rice and pay milling charges. Whoever mills, both millers and farmers, complaints over waste or loses are common. According to informants:

> After harvest, rice is washed and par-boiled to separate immature seeds and chaff from mature seeds. A lot of matured seeds are washed away. A lot more is wasted by the type of machines we use to process the rice. At least 20kg worth of rice is lost per bag. The machines are old. The technology is out-dated. Apart from breakdown, a lot of rice seeds are lost unprocessed, broken or partially processed (Awasan & others, 2009).

The above situation replicates in Yala, Ogoja, Bekwarra and Obudu LGAs in the Cross River region. Both farmers and millers are firm that the waste arising from poor processing can be checked by modern rice harvesters and processing machines. Current method of harvesting and processing, waste about one out of ten bags of rice.

Besides rice, yam production and distribution is popular within the region, produced in commercial quantity, harvest waste is largely attributed to poor storage and high incidence of road accidents on badly maintained inter-city highways. Amongst the Boki, Ogoja, Abi, Yala and Bekwara Local Government Areas, informants are firm that:

> Our main source of income is yam production. Our income is reduced and labor wasted because of rot. About 30% of yams, cocoyam and fruits rot away because of poor storage facilities. We don't have chemicals and technology to prevent rot. Our indigenous knowledge system of preservation cannot withstand existing chemical volume of cultivation and preservation. In fact, to reduce loses, we often consume "rotten" yams, cocoyams and fruits and take good ones to the market (Ukpor and others 2009).

Amongst the distributors of yam, cocoyam, oranges, pawpaw and mangoes waste or rot usually lowers gain. High cost of limited transport facilities to convey products from farm lands to local and inter-city markets increases over head cost, while increasing incidence of road accidents and armed robbery reduces the quantity available in the market (Table 1).

Table 1: Average cost of transportation and distribution of yams between Cross River State and Benue regions of Nigeria (September–December 2008).

Destination market	Purchasing price quantity per ten tonne lorry (₦)	Carriage cost per ten tonne lorry (₦)	Produce tax (₦)	Wholesale price (₦)	Surplus value (₦)
Zakibiam to Calabar	150,000.00	80,000.00	20,000.00	300,000.00	50,000.00
Ogoja to Portharcourt	110,000.00	100,000.00	14,000.00	271,000.00	56,000.00

Source: Authors research 2009.

A careful analysis of the above data suggests strongly the following conclusions and considerations. Accidents often cause injuries to the yam, induce rot and extra security. Vehicular breakdown usually cause delay in delivery, rot and extra cost to hire new trucks. Armed robbers often dispose traders of working capital and other valuables resulting in depressions and insecurity. The presence of any of these variables can put victims out of business. The implication of road transport challenges such as poorly maintained roads, accidents and insecurity, also reduce the quantity of yams in circulation.

Like rice and yam, banana, plantains and fruit farmers and traders also identify post harvest waste as a dominant challenge food security and income gain. Produced mostly within Boki, Etung, Ikom and Akamkpa rainforest areas, bananas and plantains are transported to local exchange centers through land rovers, tractors and motor cycles. During raining seasons products are trapped in farmlands because of inadequate vehicular transport on poorly maintained feeder roads. Harvested bundles last less than a week before getting ripe. Traditional knowledge system used by farmers and traders involve covering green leaves to prevent harvested bunches from

direct sunlight, rainfall and rodent. The method does little to prevent ripening, rot and pest from attacking the harvest (Ewah 1992).

The banana that reach local markets are transported to Gboko, Makurdi, Jos, Zaria, Kaduna, Kano, Maidugri, and Sokoto in the North and Enugu, Owerri and Portharcourt in the east using trucks and buses. Traders engaged in inter-city business complain of limited trucks and buses to transport banana. They also complain of armed robbers, bad roads and high rate of accidents and breakdown of trucks and buses. This at times led to drivers refusal to transport bananas from Cross River to distant cities especially Kano, Maidugri, Sokoto and Kastina in the north. Apart from soaring prices the poor circulation of bananas in these distant cities limits traders profit margins and income gain (Ncha and others 1995). Harvested bananas from farmlands to local and regional markets take about one week to reach destination. Within this period, both the trader and the farmer lack the capacity to handle post harvest waste. More than 30% of bananas rot away on account of poor transportation, lack of storage facilities, road accidents and armed robbery. To check transportation challenges traders often pair with others to be able to hire trucks and buses. The cumulative impact of these challenges in the transportation of bananas, creates seasonal and steady rise in banana prices and food insecurity in Nigeria (Table 2).

Table 2: Average cost of banana transportation and distribution between Cross River and Northern regions of Nigeria

Destination market	Purchasing price quantity per ten tonne lorry (₦)	Carriage cost per ten tonne lorry (₦)	Produce tax (₦)	Selling price (₦)	Average profit (₦)
Boki (CRS) to Kano (North)	120,000.00	Ten seater Bus 55,000.00	16,000.00	230,000.00	39,000.00
Boki (CRS) to Kaduna (North)	600,000.00	Ten tone Truck 150,000.00	25,000.00	850,000.00	75,000.00

Cassava is another food crop produced in commercial quantity within study area. It is cultivated extensively in Ugep, Obubra Ikom, Boki and Ogoja areas. Cassava is processed locally ino garri and akpu. Present methods of harvest, processing and marketing are highly wasteful. Traditional method of processing adds little income or value to the product. The absence of processing machines and modern storage facilities leaves the knife as the only instrument to peel cassava tubers.

Export of cassava chips to Europe and Asia is still at infancy and restricted to infancy in Igboland within demonstration farms organized by United States Rural Sector Enhancement Programme (RUSEP). The agency donated cassava processing machines capable of making garri, starch, chips to meet specified standards by local industries. However, to export cassava chips,

policy makers must make sure that post-harvest waste is drastically reduced with garri and akpu produced in sufficient quantities to meet ever increasing domestic demand. Unless this is achieved, export of cassava chips will further induce soaring food prices and insecurity in Nigeria (Suwa 2003).

Equally proximate to soaring food prices in Nigeria, is lack of storage facilities to preserve garri and akpu. The prices of cassava products are unstable and ever increasing because demand is higher than supply. The absence of silos to preserve garri and cassava chips promotes waste and reduces production targets. In Nigeria, existing eleven national silos are often restricted to grain storage. Most silos have been abandoned since 1983. The development of modern silos promised by Mr. President in 2007 is likely to face the challenges of energy supply when fully commissioned 2010 (Sani Mohammed in 2003).

Indigence knowledge system (IKS) in food crop preservation is limited in Nigeria. While the state provides limited silos for grains, farmers and traders fall back on traditional silos available during off season periods. Food stuff such as yams, bananas, plantains, carrots, onions, tomatoes and others are largely wasted because of absence of storage facilities. The state lacks adequate planning skills and finances to purchase and preserve surplus to last through off season periods. This scenario creates scarcity during off season periods and largely explains seasonal and sustain increases in prices often beyond the reach of ordinary Nigerians.

The problem of not providing adequate storage facilities for farmers and traders dates back to the colonial era when the West African stored products research unit was established in 1954. Until 1977 only exports were preserved by the research unit. Between 1975 and 1988, huge capital investment in public silos failed to provide adequate storage facilities for harvested food items. National contracts for the construction of silos are yet to be completed. This situation is further compounded by formidable challenges such as low energy and poor transport facilities (Chigbo 2009).

In Kano State, a major food producer in Nigeria, the commissioner for Agriculture stated that about 26,000 metric tones of tomatoes is wasted in Kano and Katsina states yet Nigteria imports about 36 metric tones of tomatoes paste from Europe and Asia annually. The same situation applies to production of oranges and mangoes in Benue state. Large quantities of fruits are wasted.

From the above examination of production, exchange and preservation of food items in Nigeria, it is clear that post-harvest waste is the greatest challenge to food security rather than climatic conditions and diversion of food items for industrial purposes as alleged by the state and some nascent farmers in Nigeria (Table 3).

Table 3: Post harvest waste of food items in Nigeria.

S/No	Crops Staples	Botanical Name	Percentage of post harvest waste
Grains			
1	Rice	Oryza sativa	30%
2	Beans		30%
3	Maize	Zea maize	30%
4	Groundnut		30%
5	Beneseed		30%
6	Suya Beans	Glycie max	30%
7		Anacardium occidentiate	30%
Fibre/ Root Crops			
8	Yams	Dioscoria	25%
9	Cassava	Manihot esculentia	25%
10	Bananas		30%
11	Plantains		30%
12	Carrots		30%
13			40%
FRUITS			
14	Tomatoes	Lycopesicum Esculentum	40%
15	Onions	Alum Cepa	40%
16	Oranges		70%
17	Mangoes	Magnifera Indica	70%
18	Paw-Paw		70%
19	Apple		10%
20	Bush-mango		10%
21	Coconut	Coco nucifera	20%

Sources: Newswatch special colloquium on food crisis in Nigeria August 3rd 2009.

RECOMMENDATIONS

From the above examination, it is clear that several factors account for soaring food prices insecurity in Nigeria. Dominant amongst these factors, is the prevalence of post-harvest waste arising from dysfunctional transport system, poor storage and preservation facilities and low budget and application of science and technology in the production and distribution process. To reduce post-harvest waste, the following short and long term measures are necessary:

i. At global level, short term measures aimed at reducing food crisis, should involve redistribution of food items from areas of surplus to areas of scarcity. States like United States, Brazil, Argentina, Israel, Thailand and India can export excess grains to Nigeria and other African country to meet short falls in production. The short falls can be financed by richer countries and agencies. United Nations World Food Programme, the worlds largest food aid agency announced in 2008 its food assistance to about nine million people in forty countries affected by soaring food prices especially in Africa. This includes seventeen million dollars to provide fertilizers, farm

implements and improved seedlings to farmers in Burkina Faso, Mozambique, Senegal and including Nigeria. this response will only alleviate hunger if African states complement United Nations effort on food security. This has become necessary because United Nations food support statistics reveals 25% drop in food subsidies in 2008 from industrialized countries. (Fleshman 2008).

ii. Another step forward is learning from the experiences and initiatives of Senegal, Liberia, Cote d'Ivoire and Ethiopia at stabilizing food prices. Senegal relies on import for half of the cereals consumed in the country. The government announced a short term measure of 40% subsidy on flour, suspended food tariffs and imposed some price control in 2008. In Liberia, Cote d'Ivoire and Ethiopia, government introduced wide range of measures to mitigate soaring prices and check food insecurity. In Liberia and Cote d'Ivoire, import duties are also waived on imported staples. In Ethiopia where drought is threatening wide spread hunger, the government suspended value-added tax on grains and flour and introduced new subsidies for wheat and continuation of emergency food rations for about one million people in cities. In Ghana, the state enhanced one billion dollars aid package for hard-pressed consumers including lifting levies on food and fuel imports. The state also cancelled taxes on fuel, fishing, fleeting and subsiding fertilizer and other imports for farmers.

However, the greatest challenge to short term measures by African states is export bans by major suppliers especially rice exporters. The ban is intended to protect local consumers. This protective measure restricts global supplies and drive food prices higher. Price controls are difficult to enforce. Price control encourages the development of black markets and reduces prices for local farmers (Fleshman, 2008). While short term measures are intended to alleviate problems associated with food shortages, long term measures should on the other hand promote and boost local food production for exports. The latter creates self-sufficiency in food production by promoting or creating individual and natural wealth. To achieve this long term objectives, Africans should design long term national plans. The United Nations Organization advised African Nations in 1996 and 2002 to budget about fifteen percent annually on Agriculture. In 2001 African nations adopted the New Partnership for African Development (NEPAD) with detailed and comprehensive plan to restore depleted soils, increase harvest and preservation to lift millions out of poverty, hunger and disease (Fleshman 2008).

To achieve these goals, African leaders pledge in Mozambique 2003 to devote at least ten percent of National budget to fund agriculture and rural development. African Union also agreed to rebuild domestic grain stocks, cooperate with farmers and civil society groups in the formulation of agricultural policies. Five years after the agreement, African Union reported in June 2008 that only five percent increase was recorded or achieved by

African States. Less than ten percent of African States met and exceeded the ten percent spending on agriculture. The most outstanding investment came from Malawi and Kenya which doubled annual budget from ten percent to twenty and fifteen percent respectively (Fleshman 2008).

In Nigeria only thirty percent of annual budget was released in 2008, only 40% of 138 billion budgeted was released between January and August 2009. Budgets in Nigeria are hardly implemented to meet long term challenges. To reduce food crisis in Nigeria, the State must set aside at least ten percent of annual budget to promote agriculture. Recent declaration by nineteen northern states of the federation to vote at least ten percent of its annual expenditure on agriculture is a positive step towards food security in Nigeria. Those states are predominantly producers of grains, tomatoes, potatoes, pepper, yams, onions, sugarcane and others. Complementing National and State budgets are external subsidies. Since 2006, external subsidies especially those from the United States of America are targeted at diverting tones of grains for human consumption to industrial purposes.

Current efforts aimed at boosting the production of food crops should be sustained and expanded beyond cassava and yam. In the United States of America, Japan and Israel, production improved varieties of staple food crops is intensified. Investment in high yielding grains has enabled these States to meet domestic targets and export surplus. In Nigeria, efforts by the International Institute for Tropical Agriculture (IITA) in collaboration with Nigerian Root Crop Institute have developed high yielding cassava variety which matures within six months. The cassava contains high quality of starch which can be used for industrial purposes. Yam is another root crop which research has also boosted production of seedlings for planting. These efforts should be extended to other food crops such as rice, fruits, beans, onions tomatoes, vegetables and others (Muhammad 2003).

Equally relevant to food production in Nigeria is the development of infrastructure that will promote production, circulation and preservation. Infrastructure relevant to agricultural production includes development of roads, silos, energy and transportation. Improved transport system will help to evacuate food crops from production centers to exchange and storage centers. To achieve these results the Nigerian Railway Cooperation should be re-activated. Efficient transport system will improve profit margins and limit road accidents. To boost economic growth in Nigeria, the State should key into the Yokohama action plan of 2008 which encouraged building, roads, ports, energy, water systems, and other infrastructure vital for expanding the Nigerian economy. The plan supports the development of these sectors by providing grants and support from Asia especially Japan. Both Yokohama and MEPAS are rated as Millennium Development Goals (MDGS) adopted by world leaders in 2000 and 2008 respectively to reduce global poverty and promote well-being of humankind (Harsch 2008).

To reduce waste, construction of parking houses to store and preserve perishable food stuff such as tomatoes, banana, plantain, oranges, potatoes, cabbages, yams and others is very important. Parking house technology

ensures that perishable food crops can be stored from season to season. It is estimated that about 70% of perishable food crops waste annually creating scarcity in off seasons with attending high prices, indigenous knowledge system of preservation and existing state silos are grossly inadequate to check post harvest waste. Strategic grain reserve intervention of about 250 metric tones preserved by the state cannot stabilize grain consumer prices from one season to another.

Finally, Kwara sate government policy of granting large hectares of land to Zimbabwean white farmers in the state to engage in commercial farming is a positive step towards boosting food security in Nigeria. Intensive farming on large acres of land for the production of grains, vegetables, root crops and provision of storage facilities will definitely increase production and availability of food items in Nigeria. It does not matter who produces the food we need, what is important is that foreign commercial farmers should partner with locals to limit the pains of land alienation. The contractual partnership must clearly be defined and adhered to by both parties. Issues involving employment of locals, training and lease conditions, must be explained to the satisfaction of partners. The Nigerian example in Kwara State and Congolese experiences were Zimbabwe and South African white farmers are currently involved will definitely create surplus food items and security for the people.

CONCLUSION

From the above examination, the causes of food crisis in Africa vary from one region to another. In Nigeria, the underlying cause is the prevalence of post harvest waste. This study reveals that waste rather than diversion of agricultural products for industrial uses by developed nations, especially the United States of America and China is responsible for Nigeria's food crisis. Equally, the position of the Nigerian State, which attributes food crisis to adverse weather conditions, is unacceptable. This study equally reveals that the quantum of waste from low application of science and technology in production process account for food crisis in Nigeria and Africa.

Inability to identify very high waste as major challenge to food production, preservation and marketing is highly responsible for food crisis in Nigeria. To reduce food insecurity in Nigeria, the State must adopt United Nations and African Union guideline on agriculture. The United Nations suggests 15% annual budget on agriculture, while African Union through NEPAD rolled out a comprehensive and detailed plan to restore depleted soils, increase harvest and enhance preservation. Equally relevant to food security in Nigeria is the Yokohama Infrastructural Development Plan (2008). The plan emphasizes the need for African states to develop transportation, ports, energy, water systems and other Infrastructure which are vital for expanding development. These approaches will help to attract development grants from India, Japan and China. Internal guidelines within Nigeria should

focus on increased budget allocation and development of rail and earth roads, food processing, preservation, energy and provision of financial assistance to support intensive farming and purchases of storage facilities. This will complement external policy guidelines on food production. All these factors are possible if the Nigerian political class is willing to implement budgets and promote the welfare of farmers and consumers. Hunger, poverty and disease are essentially bi-products of dysfunctional state policies on food security in Nigeria and Africa at large.

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