

AGRICULTURAL REVOLUTION: A PANACEA TO URBAN FOOD INSECURITY AND DEVELOPMENT IN AFRICA

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Abstract

The rising urban population across the globe is mounting pressure on food system. More than halve of the world population is estimated by the United Nations to live in cities by 2030, this in effect result into increase in food demand. Increased food demand is bound to come from Africa and Asia among others due to 60% increase of the world urban population which is being expected from the two continents. But Africa can feed itself and by extension the rest of the world based on its large expanse of arable land, seasonal rainfall and semi-skilled labour. The study investigated the contribution of agricultural sector output to the growth of domestic economy and discovered a decline in agricultural sector's contribution to the growth of the economy from 60% in the earlier 1970s to less than 26% between 2000 and 2007 which used to be the backbone of Nigeria economy in the areas of employment, revenue generation and food security. Specifically, the study examined food insecurity as one of the challenges posed by rapid urbanization in developing countries and especially in Nigeria. It therefore used South African experience to derive lessons for tackling food insecurity in Nigerian urban areas. More specifically, the study assessed agricultural innovations undertaken in South African drawing out overarching lessons that will inform Nigeria decision on how to better integrate urbanization in national development planning frameworks and processes thereby addressing the problem of food insecurity. Major development that brought about the rethinking of agricultural practices is: the spate of neglect of agricultural sector since the discovery of oil in Nigeria about half a century ago which needs urgent attention. Others are unfavourable government policies on smallholder farmers and inability to attract direct foreign investments by cities in Nigeria. The study then recommends agricultural revolution in the form of establishment of multifaceted and linked global strategy leading to exchange of farm produce and interconnectedness within cities in Africa.

1.0 Introduction

Global demand for agricultural crops is on the increase, and may continue to do so for decades, propelled by a 2.3 billion person increase in global population and greater per capita incomes anticipated through midcentury as analysed by Tilman *et al.* (2011). Currently, the world population is estimated to be over 7billion and requires

meeting the food needs of this population. Ironically, Asubonteng (2016) reported that Africa is the fastest urbanising place on earth according to the Oxford Poverty and Human Development Initiative (2015) yet 61% of the population is poor according to the Multidimensional Poverty Index (MPI) and prominently so in West Africa and one in nine are malnourished. In Africa, Agricultural

sector contribution has been described as the backbone of its economy. The World Economic Forum on Africa (2016) attestation to this came up during one of its programmes in Kigali. It was reported that agriculture is the backbone of Africa's economy growth. The possibility of this assertion is not farfetched. Asubonteng (2016) attributed the comparative advantage of Africa in the global economy to its arable land, seasonal rainfall and semi-skilled labour in agriculture.

Food and Agriculture Organisation of the United Nations (FAO) definition of agriculture broadly includes crop cultivation, livestock production as well as fishing, hunting, and forestry. These are the main sources of food for the world's population. The current round of heightened international attention to food security according to Crush and Frayne (2010) can be traced back to 1996 and the World Food Summit in Rome. The Rome Declaration on Food Security noted that 800 million people worldwide were under-nourished and affirmed "the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger."¹ The Declaration's stated objective was to reduce the number of undernourished people by half no later than 2015, a commitment later reaffirmed in the first of the Millennium Development Goal (MDGs) in 2000.² MDG Goal One included a commitment to halve the proportion of people living on less than a dollar a day and to reduce by half the proportion of people who suffer from hunger (as measured by the prevalence of underweight children under-five years of age and the proportion of the population below the minimum level of

dietary energy consumption). And now, the Sustainable development goal (SDG) 11 hinged on food security. The Millennium Challenge Goal (MCG) of halving world hunger by 2025 may not be feasible if food security interventions do not consider rethinking agriculture in both rural and urban areas.

Crush and Frayne (2010) in the book 'the invisible crisis in Africa' reported the predictions of United Nation (UN) that by 2020, the urban population of less developed countries will exceed the rural population and continue to climb thereafter. Over the next 30 years virtually all of the anticipated three billion increase in the human population is expected to occur in cities of the developing world. The 2006-7 State of the World Cities Report predicted even higher rates of urbanization for Africa: Cities of the developing world will absorb 95 per cent of urban growth in the next two decades, and by 2030, will be home to almost 4 billion people, or 80 per cent of the world's urban population. It further predicted that after 2015, the world's rural population will begin to shrink as urban growth becomes more intense in cities of Asia and Africa, two regions that are set to host the world's largest urban populations in 2030, 2.66 billion and 748 million, respectively.

Sustainable development cannot be achieved without significantly transforming the way we build and manage our urban spaces. The rapid growth of cities in the developing world, coupled with increasing rural to urban migration, has led to a boom in mega-cities. In 1990, there were 10 megacities with 10 million inhabitants or

more. In 2014, there are 28 megacities, home to a total 453 million people. Extreme poverty is often concentrated in urban spaces and national and city governments struggle to accommodate the rising population in these areas. Therefore, the concept of making cities safe and sustainable means, ensuring access to safe and affordable housing, food as well as upgrading slum settlements. It also involves investment in public transport, creating green public spaces, and improving urban planning and management in a way that is both participatory and inclusive of the urban poor. Unfortunately, the continent has struggled with food insecurity for many decades in spite of its vast arable land and resources. It therefore means that rethinking agriculture is presently required than later.

Continuing population and consumption growth will mean that the demand for food will increase with the bulk of the demand coming from urban areas where quest for infrastructural development has displaced arable lands meant for agriculture. Growing competition for land, water, and energy, in addition to the overexploitation of fisheries, will affect our ability to produce food, as will the urgent requirement to reduce the impact of the food system on the environment. The effects of climate change are a further threat. But the world can produce more food and Africa can feed itself as well as ensure that it is used more efficiently and equitably. The question requiring an urgent answer remains "Why then do hunger persists in our cities". The answer has provided by series of research done by Agency for Cooperation and Research in Development (ACORD) 2013,

have shown that Africa produces 130% of what could meet its food needs but 60% is usually lost. \$35 billion is used to import food while 80% of farming system is done by household and mostly women in the rural space and this portend the reason Sub-Saharan Africa remains the most poverty stricken region in the world. This influenced the need to engage in knowledge sharing.

The situation is not in any way different in Nigeria. Michael (2017) opined that the contribution of the agricultural sector to the growth of the domestic economy of Nigeria was relatively significant prior to early 1970s; and however, as the oil sector emerges as the major export earner of the economy, the agricultural sector's contribution to the growth of the economy declined from 60% in the earlier 1970s to 40%, 30% and less than 26% between 2000 and 2007. Export crops like cocoa, cotton, groundnut, rubber, palm oil and palm kernel that initially contributed up to 65% and 75% of the foreign exchange earnings and which was the main source of revenue of the government through export product, suddenly declined its contribution to total RGDP due to agricultural sector neglect, as oil sector emerged in the economy. The contribution of the sector to total real gross domestic product in Nigeria declined from 48% in 1970s to 20% and 19% between 1980 and 1985. The decline in the sector's performance to total RGDP was attributed to high revenue receipt recorded from the sales of crude oil products during the era of oil boom during 1970s to early 1980s, occasioned by the Middle East war of 1973 and the analysis showed an estimated 1% increase in the value of agricultural sector output would result to 1.9% increase in real

GDP (Michael 2017). This paper acknowledges the need to bring together all stakeholders and channel different resources into making food available and affordable for the urban poor through its multifaceted and linked global strategy. The concern however remains as African cities began to experience rapid urbanization which is expected to witness more and faces a host of challenges ushered in by urbanization which includes food insecurity, best practices in agricultural needs to be explored and replicated in order to achieve food resilient African cities.

2.0 Urbanisation and food Security Urbanization

Global food demand has increased as a result of growth of cities which reduces millions of hectares per year of arable lands (World Bank 2015). United Nations (2017) report on the state of urbanization in Africa also revealed the new and emerging trends is the wave of urbanization that is sweeping across most of Africa. Indeed, while Africa's population is currently estimated to be 40% urban, in less than 20 years, it is projected that more than 50% of Africa's population will be living in urban areas, and by 2050 this will have risen to 60%. If the projections are realized, this will profoundly change the profile of the continent, and will present a challenge for policymakers in their efforts to manage urbanization strategically for Africa's structural transformation. Urbanization is multidimensional in nature, as it affects the social, economic, political, cultural and environmental aspects of development in a cross-cutting way. The rapid urban transition unfolding in Africa presents both opportunities and challenges. Evidence

around the world suggests that linking economic and urban development generates positive interactions and spill overs that improve productivity and well-being. The role that urbanization plays in the transformation of the continent is recognized in the 2030 Agenda and in Agenda 2063, nevertheless, the integration of urbanization into African national and regional policy frameworks as a cross-cutting factor has been limited (UN, 2014). Few African countries have adequately integrated urbanization in their national development plans as a mega trend of considerable proportions shaping all aspects of development, including employment, poverty and inequalities. Yet, planning plays a fundamental role in determining a country's development objectives, as well as to ensure a rational allocation of national and external resources to support strategic development goals. Thus, development planning can be a vehicle to harness urbanization for African countries' long-term inclusive and sustainable development vision and goals. A strategic national response to the urbanization wave in Africa must also be accompanied by strategic sectoral national policies. Such policies are important instruments to optimize the opportunities, and minimize negative externalities of urbanization, while being informed and guided by national development planning vision, goals and objectives. It is in this context that the Urbanization Section of Social Development Policy Division/Urbanization Section (SDPD/US) of ECA has prepared a report on the integration of urbanization in national development planning. The main aim of the report is to strengthen member States'

knowledge and capacities in integrating urbanization into national development planning frameworks and processes to promote inclusive and sustainable cities for Africa’s structural transformation.

In order to ensure that that the young population flooding the urban centres and cities supply; do so in ways that are environmentally and socially sustainable; and ensure that the world’s poorest people are no longer hungry, the challenge requires changes in the way food is produced, stored, processed, distributed, and accessed that are as radical as those that occurred during the 18th- and 19th-century Industrial and before the oil boom.

Food security

Food security exists when at all times; all people have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 1997). The concept connotes of four dimensions namely Physical Availability of food (supply and demand); Economic and physical Access to food (affordability and preference) Food Utilisation (nutrition) and the stability (sustainability) over time. Several factors such as the low productivity, economic shocks, political instability and poor weather conditions may affect these dimensions and their stability (FAO, 1997). Figure 1 below illustrates the decline in prevalence of Africa’s undernourished while the numerical count rises giving an indication of the persistence of hunger on the continent.

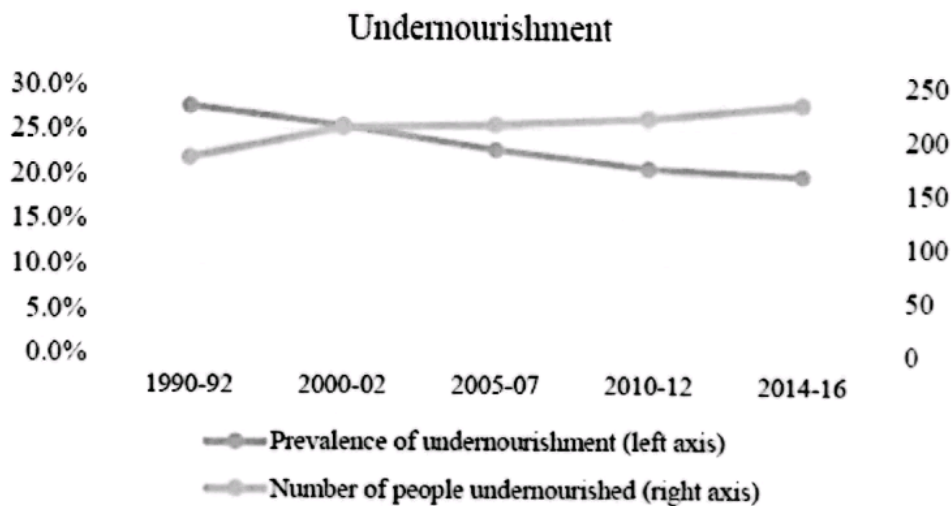


Figure 1: Undernourishment in Africa, 1990 – 2015
 The State of Food Insecurity in the World (SFIW), 2015 adapted from Asubonteng 2016

Emerging and pressing threats to food security have been amplified by poverty, rapid urbanisation, population growth, hiking

food prices, conflict and civil strife, misguided policies as well as weak institutions and failing markets, climate

change, reduced productivity and investments and increased demand for food with population growth.

Food Quality

Another aspect of the food security is food quality. This consists of a bundle of characteristics/attributes which depict food utility and performance. These attributes include food safety; nutritional value; packaging and production processes. They influence the interactions between food demand, supply, and market prices. For instance, it is assumed that a rational consumer with the ability and willingness to pay would pay a higher price for food based on its safety and/or packaging values. These semantics play out fairly well in high income countries where policies, regulations, and profitability motive nudge food producers into quality assurance.

Asubonteng (2016) opined that exported food from Africa does not usually end up on retail shelves (exception of South Africa) in developed and emerging countries for quality reasons. In 2014, Kenya recorded low agricultural exports due to the poor quality of products and this led to a national Standards and Market Access Programme (SMAP) which runs till 2017. The United Nations Industrial Development Organization (UNIDO) iterated that the compliance of quality standards was essential for regional (i.e. Africa) and international trade. When major agricultural importing entities like European Union, USA, Japan among other institute food quality standards they eventually act as trade barriers for the exporter. The food industry in Africa becomes attractive for investment and

admission into the global food economy (market) only when consumers perception and demand of quality are met. Tester (2010) briefed on reducing agricultural inputs especially those of nitrogenous fertilizers, which could in effect reduce environmental degradation caused by emissions of CO₂ and nitrogenous compounds from agricultural processes and also increase crop's ability to maintain yields with lower water supply and quality will be critical. Both international and local consumers increasingly demand quality in food. Researchers acknowledged setting food standards or regulations nationally affects prices, variety, and quantity supplied by producers. Depending on how the supply chain firms strategically adjust to these policies, prices may increase affecting affordability and eventually food security.

Owing to the fact that the focus of this research, apart from seeking the continent is food secure also looks into its potential as the world food basket through agro-food trade. A major motive of investor-exports is competitiveness and market access which may either be addressed or deterred by policies in quality standards at both country and international levels. Hence the quest is not only for food to be available and affordable but also of high quality.

Smallholder Farming

The smallholder is the spine of the agricultural sector and instrumental in the food security fight according to FAO. They form 70% of the world's vulnerable, food insecure and poor but produce 70% and over 80% of food consumed globally and in Africa respectively. Many models have emerged out of the necessity to involve the smallholder farmer into the agri-business. Vorley *et al.*

(2009) reported smallholders-inclusive business models in Vietnam as one with focus on making the smallholder farmer spearhead revamping the agriculture sector and increased income. Inclusiveness of small-scale producers in the agenda for food security is necessary for a holistic solution. Several types of research in the region show that these farmers practice subsistence farming to provide food for their families first and then sell any surplus. The African Forum for Green Revolution (AFGR) in its advocacy puts the smallholder farmers at the fore front of economic development of the Africa region through agricultural productivity. This system would be logically efficient if the farmers were not faced with several predicaments; drought and adequate access to the weather forecast, labour-intensity, and disease, resource and input constraints, land tenure issues, limited extension services, poor transport network to markets among others.

Asubonteng (2016) observed from the Africa Competitiveness Index, 2015 that myopic concentration on smallholder agricultural development may not yield our desired output. A sustainable approach is to encourage Foreign Direct Investment (FDI) in form of loans and stocks in agricultural sector at all scales. However, the World Bank report on Human Development in Africa in 1981 records investments in similar smallholder programs across the region that failed. The report cited mismanagement, over employment of staff, poor maintenance, underutilisation of expensive machinery and infrastructure. Frelat *et al.* (2015) found out from their survey of about 13000 households in 93 sites and 17 African countries that

produce an income from their farms were inadequate for the families. Households with a positive significance of being food secure had other off-farm income sources. Market access was shown to be very important to the smallholder farmer. The volatility of the local markets to food price fluctuations limited the ability of the subsistence farming to generate enough income or create more jobs. This calls for the involvement of stakeholders at all levels of government as suggested by this paper.

Competitiveness of the Agriculture sector

Food security is viewed as another form of security and perhaps as important as political, economic, socio-cultural and religious security (Asubonteng, 2016). Within the region, development should be structured to reflect the role agriculture and food security play in making cities competitive. Central to this is the positions adopted by developed countries in the Organisation for Economic Cooperation and Development (OECD) mainly USA, Netherlands, United Kingdom, Israel, Korea, Germany and France and partners like Brazil and China on agricultural policies to ensure the right use of nutritiously affordable food which is continuously available for their citizens. In Africa, food is not a human right as other countries like India and these top economies have instituted. Few countries have put this right into law (UNDP, 2012). Regional policy and perception need to be oriented to put food on the small scale as oil, coffee, cocoa, and others.

Exploring the Global Competitive Index (GCI) and the top agricultural producing countries illustrate silent but relevant characteristics such as food security, agricultural investment, and trade. Such

countries have diversified economies which are captured in intra and inter sectorial and interdisciplinary policies. The concept of competitiveness is linked to productivity which is likely impact on Africa. A country or region becomes more competitive in the production of a commodity if the relative costs – resource supply, labour, technology, and energy are much lower than other

producers of the same good or service. Agriculture like other sectors is directly or indirectly affected by chain turbulences of the economy, globalisation, urbanisation as well as fluctuating commodity prices. According to FAO (2015) investment must be sought to make cities resiliently competitive. Figure 2 reveals countries attracting investment leading to increased competitive status.

Data for companies investing in Africa in the food & tobacco sector between January 2003 and July 2016.

Destination Country	Projects	Capex	Avg Capex	Jobs Created	Avg Jobs	Companies
Egypt	61	3,156.7	51.7	18,621	305	42
South Africa	46	1,562.4	34.0	8,797	191	29
Nigeria	43	1,917.8	44.6	12,605	293	26
Morocco	36	879.8	24.4	7,845	217	31
Kenya	30	466.3	15.5	6,066	202	24
Uganda	26	417.7	16.1	4,522	173	17
Mozambique	24	2,659.2	110.8	12,222	509	20
Ghana	23	1,639.0	71.3	13,324	579	21
Cote d'Ivoire (Ivory Coast)	22	1,231.2	56.0	7,843	356	13
Tanzania	19	456.1	24.0	3,822	201	12
Zambia	17	1,045.9	61.5	9,054	532	14
Ethiopia	16	996.1	62.3	6,326	395	15
Algeria	13	319.8	24.6	2,550	196	9
Angola	12	401.3	33.4	3,200	266	7
Tunisia	11	898.1	81.6	5,086	462	8
Cameroon	8	2,496.2	312.0	6,647	830	7
Rwanda	7	124.0	17.7	1,276	182	5
Senegal	6	78.4	13.1	755	125	6
Gabon	5	166.6	33.3	1,389	277	5
Namibia	5	204.9	41.0	1,393	278	5
Zimbabwe	5	169.3	33.9	1,241	248	5
Congo (DRC)	4	108.2	27.1	960	240	4

Source: FDI intelligence from the Financial Times Ltd, 2016

The determinants used are: Domestic market Growth Potential; Proximity to Markets or Customers; Regulations or Business climate; natural resources, infrastructure and logistics, government support, lower costs, skilled workforce availability and attractiveness.

3.0 Rural-Urban Linkages: The South African Experience

The KPMG's Report on performance of agricultural sector in South Africa (2012) showed that the sector contribution to South Africa's Gross Domestic Product (GDP) declined gradually over the past 10 years, from 2.7% in 2000 to 2.5% in 2010.

However, despite agriculture's reduced contribution to the country's GDP, the sector remains vitally important to the South African economy. With 8.5 million people directly or indirectly dependant on agriculture for income and employment, it was a sector in need of robust initiatives and support. The report acknowledged agriculture sector as a potential employment creator and one capable of achieving key development objectives, particularly through commercial farming and agro-processing initiatives.

While analysing the national situation, only 12% of South Africa's surface area is suitable for crop production with the biggest challenge being the availability of water. The South African agriculture sector is characterised by diversity and incorporates crop production, horticulture, animal production, dairy farming, fish farming, and game farming. In economic terms, the sector comprises a highly developed commercial sub-sector geared towards export, as well as a smaller subsistence sector though there is much diversity and fluidity within these categorisations. South Africa remains a major exporter of agricultural produce and ranks highly on many products. It is currently the world's leading producer of avocados, clementines, and ostrich products. With this background, South Africa brought about agricultural innovation through what they termed Agro-Park.

Agri-parks which is farmer controlled provides the catalyst around which rural industrialization takes place. At the initial stage, agri-park was supported by government to ensure economic sustainability. One of the identified benefits is to strengthen partnership between government and private sector stakeholders to ensure increased access to services (water, energy, transport) and production on the one hand, while developing existing and create new markets to strengthen and expand value-chains on the other. Equally important is to maximise benefit to existing state land with agricultural potential in the provinces, where possible. Other benefits are: maximise access to markets to all farmers, with a bias to emerging farmers and rural communities;

maximise the use of high value agricultural land (high production capability); maximise use of existing agro-processing, bulk and logistics infrastructure, including having availability of water, energy and roads thereby support growing-towns and revitalization of rural towns, in terms of high economic growth and promote rural urban linkages (Motswiane, 2016; and DRDLR, 2018). The Agric-Park Innovation involves both traditional and advanced crop and livestock breeding, as well as the continuing development of better chemical, agronomic, and agro-ecological control measures.

The strategy involves:

1. The Farmer Production Support Unit (FPSU) - a rural small-holder farmer outreach and capacity building unit that links farmers with markets. The FPSU does primary collection; provides some storage, some processing for the local market, and extension services including mechanization.
2. The Agri-hub (AH) - a production, equipment hire, processing, packaging, logistics, innovation and training unit.
3. The Rural Urban Market Centre (RUMC). The RUMC has three main purposes;
 - i. Linking and contracting rural, urban and international markets through contracts.
 - ii. Acting as a holding-facility; releasing produce to urban markets, based on seasonal trends.
 - iii. Providing market intelligence and information feedback, to the AH and FPSU, using the latest Information and communication technologies.

South African Department of Rural Development and Land Reform (DRDLR) working together with the Department of

4.0 Lessons for Nigeria

South Africa demonstrated how with low land much can be achieved through technology and farmer led initiatives. This informs the analysis of South African experience and lessons that Nigeria could gulp out to better its agricultural performance owing to the amount of arable land available for agricultural purposes which in turn would attend to urbanization challenges of food insecurity and unemployment. Therefore suffice it to say, that lessons abound:

1. In bridging the gap in food demand and supply, local food producers requires technical knowledge and skills to increase productivity and tolerance of crops to drought, salinity and other climate change effects which is provided at the agric hub to small holder farmers. Although more food is needed for the rapidly growing human population, food quality also needs to be improved, particularly for increased nutrient content.
2. Mapping out of small holder farmers and their location within cities, towns and villages would really help in bringing together stakeholders in urban food security; identify their strength and challenges as well timely dissemination of relevant information necessary for increased agricultural food chain and income generation. This can be achieved through the effective deployment of planning tools and technology. The essence is to reduce wastages, improve food supply and distribution and achieve sustainable development.
3. The strategy involves transforming rural areas into hub of activities in terms of food production and linking same to the urban areas for processing, packaging and marketing of the food products. This serves as a veritable way of retaining a larger percentage of population rushing to urban centres in search of better living and end up adding to the vulnerability of the urban poor to food insecurity.
4. Land is one of the three main factors of production and for agriculture, it is the most essential. The nature of land tenure in the Africa is mostly dual; statutory and Indigenous African tenure (customary). Hence defining land as a mere productive tool is a blunder more so for a region such as Africa. The smallholder farmers should have access to secured land for agriculture purposes in both the rural and urban areas. With this in mind, foreign investment in agricultural infrastructure could increase which would lead to increased productivity of land and labour to its fullest potential.
5. The strategy ensures maximum use of available infrastructure including water supply. Climate change is expected to intensify the low productivity of the rain-fed agricultural sector of the Africa which already suffers extensively from the unreliability of the seasonal rains and severe droughts. Human activities involving pollution of rivers and streams through irresponsible disposal of industrial waste into water bodies

which could serve as alternative water supply for irrigation should be discouraged. To meet the nutritional needs of the rapidly growing Africa population, other innovative systems of improving water productivity even as other factors are enhanced are essential. Conversely, for sustainability, agriculture management should ensure freshwater supply is not disrupted because accessibility to clean and safe drinking water is part of food security.

5.0 Conclusion

Rethinking agriculture for Africa means increased productivity while investing in technological innovations tailored towards reducing wastages and blocking avenues through which there has been losses. This is certainly one of the ways of providing urban security and meeting the crisis of urban poverty and food insecurity as propelled by rapid urbanization in developing countries like Nigeria. Establishing an effective urban rural linkage through transformed transportation system and informed policies on multi-level agricultural strategy in addition to access to markets guarantees sustainable transformation of lives of rural dwellers. Beyond achieving sustainable development of cities, the continent becomes food resilient with less dependence on importation of food products and a hub of foreign investments. Engaging the model of agric park ensures food availability at all times, with high nutritious content and affordable. This is made possible by discovering the strength of individual states within the country, involvement and

inclusiveness of these cities within the country in all sectors of food security. Nigeria can feed itself and the regional surplus could be moved out in continental trade within Africa. This can invariably be extended to the rest of the world.

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