CLIMATE SMART AGRICULTURE, FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

GLOBAL ISSUES & LOCAL PERSPECTIVES volume One

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SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-8-8 @ SAEREM World

Society for Agriculture, Environmental Resources & Management (SAEREM)

First published 2025

SAEREM World

Nigeria

Typeset in Times New Roman

CLIMATE SMART AGRICULTURE, FOOD SECURITY AND SUSTAINABLE DEVELOPMENT
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SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-8-8

Printed at: SAEREM World

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Preface

This book adopts an exegetical approach as well as a pedagogic model, making it attractive agriculture and environmental economics teachers, professional practitioners and scholars. It is eschews pedantry and lays bars the issues in such clarity that conduces to learning. The book elaborates on contemporaneous **Climate Smart Agriculture, Food Security and Sustainable Development** issues of global significance and at the same time, is mindful of local or national perspectives making it appealing both to international and national interests. The book explores the ways in which climate smart agriculture (CSA) food security, Sustainable Development issues are and should be presented to increase the public's stock of knowledge, increase awareness about burning issues and empower the scholars and public to engage in the participatory dialogue climate smart agriculture, food security, and sustainable development necessary in policy making process that will stimulate increase in food production and environmental sustainability.

Climate Smart Agriculture, Food Security and Sustainable Development: *Global Issues & Local Perspectives* is organized in three parts. Part One deals with The Concept of **Climate Smart Agriculture**, Part Two is concerned with The Concept of **Food Security And** and Part Three deals with the Concept of **Sustainable Development**

Eteyen Nyong; October 2025

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Introduction

The estimated world pig population of 826 million (FAO, 1988) means that there is approximately one pig for every six people in the world. A comparison of the meat produced by pig with other domestic species has revealed that more pig meat is produced than any other meat despite the fact that pigs are numerically fewer than other domestic species. The distribution of pigs around the world is not the same. Almost half the world's pig population is in Asia, 30 percent in Europe and the former USSR. The population of pigs in large parts of the tropical and subtropical developing regions for example Africa and Latin America is relatively small.

Pig (*Sus scrofa*) is a domestic animal and common animal from the family *Suidae* and order *Artiodactayla* (Adetunji and Adeyemo, 2011). Pigs are the most important domestic animals in Nigeria (Ugbomoiko *et al.*, 2008), not only by the number of farmers rearing it, but also on its economic value (Osondu *et al.,* 2014). Pigs are major important non-ruminant animals reared in the derived savannah (also called open parkland with only few fire tolerant trees) and rain forest zones of Nigeria (Rahman *et al.*, 2008). 'Pig production alongside with poultry production is the fastest growing livestock sector in the world' (FAO, 2012a). Pigs are reared in most parts of the world principally for provision of pork, manure and biomedical raw materials (insulin) (Ajibo *et al.*, 2020). Additionally, the popularity of pigs as pets in western cultures has increased in recent times, as many pig lovers now keep small-sized pigs (mini or micro pigs) as companion animals in their homes (Marissa, 2014). A typical example of pig kept as pet is the miniature "Kunekune " breed cherished due to its personality, temperament and ease of management (Marissa, 2014). Other advantages are: (1) They have the potential to be highly prolific. Because they are cable of producing large litters after a relatively short

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gestation period, and have a short generation interval and grow fast. (2) Their productivity in terms of yield of meat per tonne of live weight of breeding females per year is in the region of six times that of cattle. (3) There body size makes them more flexible for Marketing and consumption compared to cattle. (4) Pigs meat is suitable for processing and some of the processed products have a longer shelf life than fresh meat, and can thus be distributed to a wider section of the population. (5) Pigs are efficient feed converters to meat twice as efficiently as ruminants. (i.e. they have high feed efficiency) (6) Pig production provides quick turn-over on investment compared with cattle. (7) Curative and preventive drugs are available for most swine diseases. (8) Pigs also gives useful by-product like their feaces can be used as a good source of manure. (9) Pigs can be reared almost anywhere given suitable housing and management although their management in extreme temperature can be expensive. (10) They produce meat without contributing to the deterioration of the natural grazing lands. This is important considering the steady desertification, soil erosion and loss of productive land in some areas of the tropics. While disadvantages are: (1) There is poor product acceptance in areas where the Islamic religion prevails, e.g. the Middle East, Pakistan and parts of Africa, Muslims are forbidden to eat any pig meat, similarly, believers in the Jewish faith are instructed not to eat pork meat, and many Zionist sects obey the same rules. In other words there is strong taboo against the eating of poultry product, thereby negatively affecting the market for the products. (2) While Social factors play an important role in their acceptance, the pig has historically been considered an un clean animal, wallowing in filth, an object of dislike and a risk to human health. (3) The digestive tract of pigs and Birds is relatively short compared to other farm animals and can only utilize high quality concentrate feeds (E.g. staple grains and oilseeds) These are also use as feed for human making them to be in direct competition with man. (4) They cannot provide a source of drought power for farming operations. (5) They are raised close to human habitation and thereby making their waste product a pollution problem.

There are over 90 recognized breeds and an estimated 230 varieties of pigs in the world. They can be broadly classified into indigenous or unimproved types or the more modern exotic types which have been selected and developed for specific commercial purposes. The Nigerian indigenous pigs are found in the southern part of the country and along the coast of countries in West Africa. They are small bodied, produce small litters and roam about as scavengers in compounds and villages. They were considered of poor performance, inefficient and uneconomic to be used for commercial production (Umesiobi, 2000). The litter traits performance reported by Adeoye *et al.* (2003) for

Nigerian indigenous pigs were poor compared to the values reported in the literature for exotic breeds. These notwithstanding, the indigenous pigs have some superiority characteristics over the exotic ones. The indigenous pigs have superior adaptation ability to tropical conditions compared to the exotic ones. Under intensive management and adequate rations (Fetuga *et al.,* 1976) indigenous pigs had less mortality up to weaning. The study conducted by Ilori *et al.* (1976), had revealed that local pigs weaned more piglets compared with the exotic breeds under low protein intake. Chiboka (1981) noted that indigenous pigs reached puberty at earlier age than exotic pigs such as Large White or Duroc. Indigenous pigs can be maintained on low dietary ration (Ilori *et al.*, 1974), which implies that they have low cost of feeding as reported by Adebambo and Dettmers (1979). Profitability in pig enterprise primarily depends upon overall reproductive performance of the pigs comprising age at first farrowing, farrowing interval, litter traits, sex ratio, and pre-weaning mortality (Singh and Khanna, 2000). These traits are important to reduce cost of rearing up to rearing age, reduce generation interval and increase genetic gain per unittime (Das, *et al.*, 2005).

The production systems of pig in Nigeria and Africa, generally often range from traditional scavenging, smallholder systems, to more intensive commercial setups (Chenais *et al.*,2019). The traditional system allows the pigs to roam around to scavenge for food and as such are exposed and become vulnerable to the threats of extremes of weather and disease infection, as well as, theft. Animals reared under this system are mainly indigenous breeds. Crosses between the indigenous and exotic breeds are also used in this system, but they do not reach market weight easily. This is because traditional system may not provide adequate nutrition for optimal growth, while the scavenging activities utilizes energy that is supposed to be used for growth and development (Mbuthia *et al.*, 2015]). Scavenging animals are usually associated with high rate of disease infection. The intensive system, is based mainly on the exotic breeds, and their crosses. However, they require use of formulated diets, which can be expensive, due to the high cost of imported feed ingredients and scarcity of grains, which is required to meet the nutritional needs of the animals for optimal productivity in confinement. Intensive system of production also involves provision of good housing, health services and waste disposal facilities for proper management, thus, requiring more capital. While some pig farmers in Africa are investing in the use of modern pig farm equipment, many, especially the smallholder farmers use locally sourced materials such as canes, bamboo, planks or mud for wall or demarcation of the house. The indigenous breeds of

pigs and their crosses are the common breeds reared in the traditional system, though not exclusive. The exotic breeds, such as Large white, Landrace, Duroc and Hampshire are common in the intensive system of production (Mbuthia *et al.*, 2015]), even though Large White, Landrace and their crosses are more prevalent. The traditional systems with its open scavenging and minimal biosecurity measures facilitates disease spread (Chenais *et al.*,2019). Intensive systems, if managed well, can implement biosecurity measures to mitigate disease risks. However, the cost of implementing biosecurity measures may be a challenge for small scale pig farmers in Nigeria and Africa (Chenais *et al.*,2019).

Swine production can be divided into two types: purebred and commercial. Commercial production systems can be further divided into three systems: feeder pig production, buying and finishing feeder pigs, and complete sow and litter systems. The production of purebred hogs is a specialized business. Registered purebred hogs make up less than 1 percent of the total hogs raised in the United States. Purebred producers perform an important function in the swine industry by producing the foundation stock used in commercial hog production. Much of the improvement in hog type comes from the work of the purebred producer. Purebred producers must be excellent managers. They often have higher investments in labor and record keeping than commercial hog producers have. The purebred producer must keep accurate records of the ancestry of the hogs produced. Careful recording of breeding and farrowing dates is essential for the purebred operation. Purebred producers spend a great deal of time advertising, showing, and promoting swine breeds. In addition to purebred swine producers, seed stock is also produced by large companies that develop lines of breeding stock using genetic principles. Purebred breeders are also using genetic principles to produce improved breeding stock that meets current consumer demand for lean pork. Most commercial hog producers use some type of crossbreeding system to produce hogs for market. Purebred boars are oft en used on crossbred sows to produce market hogs. Good management is necessary for success in the commercial hog business. Feeder pig production is an enterprise that produces pigs for sale to feeders, who then feed them to market weights. Th e feeder pig producer has a breeding herd of sows. Th e baby pigs are taken care of until they reach weaning weight. A high-producing herd that raises large litters is required. It usually requires an average of 14 to 16 pigs marketed per sow per year to break even in feeder pig production. Health problems must be prevented or carefully treated. Th e goal of the producer is to raise uniform groups of feeder pigs for

sale. Generally, only small investments are required for this type of production. A good manager tries to schedule farrowings so as to have a steady supply of feeder pigs for sale. Less total feed is needed for this type of production system than for the other types. Buying and fi nishing feeder pigs is an enterprise in which the operator buys feeder pigs and raises them to market weight. Th is type of operation requires the least investment and managerial ability of any of the hog production systems. It is possible to feed pigs on pasture or with very limited facilities. However, there is a trend toward investing in more confinement systems. Th e costs of this type of operation are greater, but hogs gain somewhat more efficiently in confinement systems. Th e high price of land makes its use as hog pasture questionable. Buying and finishing feeder pigs does require a high investment to purchase the pigs to be fed. This system is well adapted to the producer who has large amounts of grain for feed. It requires less labor than other systems. Buying and finishing also have certain disadvantages. Th e possibilities of health problems are greater in this operation because the purchased feeder pigs may bring diseases to the farm. The complete sow and litter system is the most common method of hog production. Th is operation involves having a breeding herd of sows, farrowing pigs, and caring for and feeding the pigs to market weights. Investment in facilities can be low for pasture systems. Confinement systems, on the other hand,
can require very high investments in facilities. Th e trend is toward more confinement systems, with larger numbers of sows being kept in the producing herd. This system permits spreading the production and, thus, the marketing of pigs, more evenly through the year. Th is results in an increased potential for profit. Labor, management, and investment requirements vary considerably with thebkind of system used. Pasture systems require more labor, less management, and lower investments. Confi nement systems require less labor, more management, and much higher capital investment.
Recently, there have been establishment of clusters and pig farm estates for smallholder farmers in Nigeria. In some instances, they are organized into farmer groups or cooperatives. This is to grant smallholder farmers easy access to some facilities large scale farmers also enjoy. As a member of a cluster or cooperative, the farmers have easy access to facilities such as credit, government interventions, procurement of inputs on wholesale to share among members, veterinary services, good infrastructure and easy access to market. A good example is the Oke Aro Pig Farm Cluster in Lagos State, Nigeria, which is the largest pig farm estate in West Africa (Adesehinwa, 2023). A major challenge of this system is the inability to consistently implement and enforce good biosecurity measures. Farmers and farm attendants

compromise biosecurity protocols through sharing of equipment and labour among different units in the cluster, thereby facilitating easy spread of diseases and re-occurrence.

Over the years, pig production in Nigeria and Africa have been influenced by a combination of factors, including technological advancements, increased awareness of sustainable practices, changing consumer demands and perception, as well as efforts to address challenges like disease management and food security (Jiang *et al.*, 2022). There has been progress in developing pig breeds that are well-adapted to local conditions and exhibit improved disease resistance, growth rates, and reproductive performance. South Africa and Nigeria appears to have the highest pork yield per animal across Africa (FAOSTAT, 2013) and this may be as a result of the use of improved breeds and adoption of intensive or modern production system. The objective of this book chapter is to review the current status, opportunities, prospects and challenges of pig production in Nigeria.

CURRENT STATUS OF PIG PRODUCTION IN NIGERIA

Nigeria is a major pig producer in the West African Sub-region, producing about nine of the 14 million pigs reared in the Sub-region (Ajibo et al ., 2020). In Nigeria, pig production activities are concentrated in the South, particularly in the Southeast, due to religious and cultural proscription to pig production and pork consumption in some parts of the North (Nwanta et al ., 2011). As a result, pig production is a popular agribusiness in Enugu State, as crop farmers, civil servants and traders usually engage in pig farming for additional income. With about 10 million Nigeria households in rural and semi-urban areas involved in pig farming (World Bank, 2017), swine production may have not just supported the economic well-being of these families but have also improved the animal proteins deficit in the country. The shortfall in the provision of animal protein in Nigeria may have been occasioned by low rate of food-animal production in relation to human population growth rate (Nkwocha et al., 2010). Fortunately, pigs have the potentials to become the leading animal protein-deficient gap filler in Nigeria due to their polytocous and multiparous natures. Additionally, pig farming can also be a major employer of labour in the livestock subsector and therefore contribute significantly to job creation, poverty alleviation.

Pig processing

Pig processing start by transporting them to the slaughter house. The method, by which they are restrained, transported and the stress to which they are subjected becomes very important. The final phase of pig production is the sale and disposal of the end product. The pig is extremely versatile in terms of the number of product which can be derived from pig meat. The main categories are: Fresh meat, Cured products, Other processed products, Lard (pig fat), Pig skin, Bristles, Intestines, Offals, Blood, Slaughterhouse by-products and Hoofs.

Pig meat yield in Nigeria

Pig have higher carcass weight compared to other red meats producing animals. MSUE (2011) revealed that the pig is a more efficient carcass yielder than cattle, sheep or goat and has an
average dressing percentage of about 70 % compared to 62 % for cattle and 50 % for sheep and goat. In addition to this, pig carcasses have a smaller proportion of bones and higher proportion of edible meat. Pig manure is a valuable fertiliser and can be aerobically digested to produce cooking gas. It also stimulates the growth of microorganisms for feeding fresh water fish and
ducks (Okoli, 2006).

Marketing

The main systems of marketing pigs are:

Private sales This is the most common method in the tropics among small scale producers. One, or a number of pigs are sold to local consumers, other producers, butchers or middlemen. The pigs are sold live and the price is generally subject to negotiation this system has the advantage of being the simplest, but in rural areas individuals who are not aware of current prices can be taken advantage of by speculators and dealers. Due to this problem, marketing co-operative have bee formed in some rural areas to ensure adequate prices for producer members. Public sales This involve taking the pigs to a central market place, where they are sold by auction on a live basis to the highest bidder. Direct sale to an abattoir or butcher This is more applicable to a largerscale producer. The big disadvantage of direct sales is the effect of the 'pig cycle'. This is the notorious fluctuation in price which occurs in most countries. When pigs are in short supply, prices rise, but this in turn stimulates increased

production among producers, and consequently prices fall. As it takes approximately a year for a producer to react to price changes, the cycle will occur every 12 to 18 months. This leads to lack of stability with producers going in and out of pig production. Contact sales By entering into a contract with an abattoir to supply a certain number of pigs over a period at a set price, the producer is largely protected from the effects of the pig cycle. In turn, this allows him to plan his production output over a longer time.

CHALLENGES OF PIG PRODUCTION IN NIGERIA

Common challenges

The challenges of pig production in Nigeria are diverse and it varies from state to state, and even within regions. Some common challenges encountered in pig farming across Nigeria are as listed below:

Inadequate infrastructure

Inadequate infrastructure, including proper housing facilities, cold storage facilities and processing plants, waste management systems, and transportation networks, can hinder the development of the pig industry. These limitations make it difficult to efficiently transport pigs and pork products, resulting in increased costs and limited market access for farmers.

Veterinary services

Access to quality veterinary services, including vaccination programs, disease diagnosis, and treatment, is often limited in many parts of the country. This can hinder disease control and prevention efforts, leaving pig farmers vulnerable to disease outbreaks and leading to significant economic losses. Implementing effective biosecurity measures to prevent the spread of diseases is crucial in pig farming. However, limited awareness, inadequate resources, and poor biosecurity practices, can make it challenging to control disease outbreaks and maintain healthy pig populations.

Lack of Technical knowledge and skills

Dearth of access to training and technical knowledge about modern pig farming techniques and its adoption have continued to be a challenge for small-scale pig farmers, who form the majority in most State in Nigeria. The lack of expertise, in areas such as breeding, nutrition, artificial insemination, housing, and biosecurity practices has hampered productivity and limited the ability to adopt improved farming techniques, hence, decreased productivity and efficiency.

Cultural and market factors

A study by Ogunniyi and Omoteso (2011) showed that the neglect or slow growth of the swine industry can be attributed to reasons which include religion, acceptability and above all, management problems. Social factors that could influence pig production in Nigeria include
a general preference for ruminant meat and lack of incentives for investing in large scale pig production due to economic and political factors. There's also a popular belief that pigs are filthy and pose hazard to health because some people are of the belief that pork has too much fat. This is untrue for pigs that are produced under modern intensive husbandry production techniques
as pigs can be very clean animals (Ajala *et al.*, 2007) and when fed properly, can have low back fat content. Another important reason is the presence of a large population of Muslims in Nigeria especially in the northern part where eating of pork is a religious taboo.

Government policies and programmes

Inconsistency in disease control policies in Nigeria is a major challenge facing pig production. For example, ASF outbreaks have been a significant challenge for pig production in Nigeria and globally

Unstable cost of inputs (feed and drugs)

The cost of commercial feed, especially when it contains imported ingredients, can be high. Inadequate knowledge of the nutrient requirements of pigs, as well as, poor knowledge of feed formulation is typical among pig farmers in Nigeria. This knowledge gap influences the profitability of pig farming, as pig typically require a balanced mix of energy, protein and other essential nutrient sources. Indigenous pigs which can subsist

on low quality feed need not be fed high quality diet. However, imported breeds and hybrids require high quality feed. Good branded or commercial feeds, specifically for pigs, are rarely available in most State in Nigeria. Availability of good feed or feed ingredients, coupled with good breed, will drive increased pork yield in Nigeria. Additionally, inadequate storage facilities and infrastructure for drugs and medication, as well as, feed ingredients can lead to feed spoilage, thereby affecting the effectiveness of the materials.

Land Ownership and Usage

Land tenure remains a major obstacle to livestock development, for herders have no secured individual accesses or rights to land. Communities and individuals who crop the land often lay claim to ownership of the land.

Low Investment Potential

The slow rate of growth of the livestock industry in Nigeria denotes a long gestation period for investment to mature. This is contrary to quick return on investment desired by financial institutions like banks and investment houses. Livestock projects are scarcely attractiveunlike services and trades that have tendency to return borrowed funds and interest more quickly due to longer period of growth required and the high uncertainty it is associated.

Institutional Problems

Lack of genuine institutional support and political will to muster required efforts to improve livestock production cannot be divested from problems confronting the industry. In countries of India, Netherlands, Australia, New Zealand etc, deliberate action-packed programmes are outlined and implemented with very strong extension component that enables experts work in collaboration with native producers to find solutions to the problems of production. In Nigeria such plan programmes are tested within a limited area and frustrated by undue rivalry and competition for position,

Climate challenges

The increase in greenhouse gas production and concentration in the atmosphere are connected to high ambient temperature, increasing variability in precipitation pattern and other extremes of weather conditions (Cheng *et al.*, *2022*). These changes and associated variations in climatic conditions over time, termed as climate change affects the productivity of livestock species, including pigs. Invariably, livestock are also implicated in generating 14.5% of the total anthropogenic GHG emissions, while pig production and related activities contribute 10.1% of the total livestock contribution to

GHG production (Collier *et al.*, 2019). Africa agriculture, including pig production, is sensitive to climate variability because of over-reliance on rain-fed agriculture (Challinor *et al.*, 2007), thus making it one of the regions in the world that is most vulnerable to the detrimental effects of climate change (Gitonga *et al.*, 2020).

Water availability and usage for livestock and crop (feed) production are predicted to be affected by climate negatively (McCarl *et al.*, 2008). Water needs per pig for consumption and cooling, especially, as a means of ameliorating the effect of increased temperature, is increasing, while water availability is reducing. The reduction in water availability likewise, is negatively impacting plant-based feed resources supply, especially grains, thereby causing scarcity and increase in unit price of the commodities. The challenge of climate change on pig production is aggravated by incidence of drought and desert encroachment in some parts of Africa. Namibia, for example, has been experiencing drought, which has negatively affected pig and other agricultural production activities in the country (Saisai *et al.*, 2023).

Climate change has been identified as a major cause of increasing ambient temperature, which consequently leads to thermal stress and tends to have a more severe implication on the performance of pigs, than cold stress, especially in Nigeria. Heat is an important stressor of pig (Nardone *et al.*, 2010). Heat stress is caused by high ambient temperature, coupled with high humidity, and it compromises productivity in pig production by affecting growth rate, reproduction efficiency, as well as, its negative implications on the health status of animals and mortality.

Breeding for high adaptability and heat tolerance, using indigenous breeds of pigs in Nigeria is an important strategy that can be explored, to ameliorate the effect of climate change on pig production in Nigeria. However, animals may not be able to fully adapt to climate stressors themselves, thus, adequate cooling systems and management strategies are required to mitigate the effects of heat stress on pig production in Africa (Cheng *et al.*, *2022*). Forecasting seasonal climate variations for farmers and transmitting the information to them in good time can enable farmers to make climate-smart farm decisions, to avoid losses, and also, enhance grain production and supply. Pigs are affected by climate change and they also enhance it through GHG production. As such, proper management strategies to mitigate the effect of climate change on pig and minimize generation of GHG from pig production and related activities, are both important in enhancing pig production in Africa (Cheng *et al.*, *2022*).

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PROSPECTS, OPPORTUNITIES AND POINTER TO BETTER FUTURE OF PIG PRODUCTION IN NIGERIA

Prospects and opportunities of pig production in Nigeria

Pig production in Nigeria presents various opportunities and potentials that can contribute to economic development, food security, and improved livelihoods for local communities. To realize the full potential of pig production in Nigeria, it is crucial to focus on developing a robust and sustainable pig value chain.

Food security: Pigs are highly prolific and convert feed to edible meat, better than most livestock species. This makes them a suitable animal for production of meat in quality and quantity, especially to solve the challenge of malnutrition arising from low protein supply, which is prevalent in Nigeria. Also, pig meat is a rich source of protein, hence, raising pigs for meat can contribute to diversifying protein sources in diets, thereby giving consumers meat options and enhancing food security.

Employment opportunities: The pig production value-chain which include breeding, management, processing, and marketing, can create employment opportunities for skilled and unskilled labour of the rapidly growing population in Nigeria. These range from farmers and technicians, to traders, farm manager, specialists in different aspects of animal production, processors, input suppliers, artisans, facility managers, logistic operators, retailers in local markets, among others. Pig production activities can be practiced by women and youths, due to the relatively low space and initial investment requirements, compared to other livestock species

Income generation and foreign exchange earnings: Pig production enterprise is a highly productive enterprise with good returns on investment. Pig production has the potential to significantly impact per capita income in Sub-Saharan Africa by providing a steady source of income for small-scale farmers. The fast reproduction rate of pigs, high growth rate and short generation interval, allows for regular sales of piglets and pork, contributing to a consistent stream of income (Huynh *et al*, 2006). While pigs are produced in most countries in Africa to nourish their populace, it can also serve as means of foreign exchange earnings by exporting it to neighbouring countries or outside the continent. The recent gap in the supply and demand for pork in global market is an indication of potential of foreign exchange earnings from pig production. The projected increasing demand for pork products due to population growth and changing dietary

habits points to potential for increased income generation through pig production (Huynh *et al*, 2006).

Investment opportunities: The inherent reproductive and growth potentials of pigs, as well as, the improvement in techniques used in pig production over the years has made investment in pig production rewarding. Although the pig industry in Nigeria is developing, the low level of investment in technologies and infrastructure have slacked it off, from maximizing its productivity. Also, urbanization and changing dietary preferences have led to an increased demand for meat in many developing countries (Huynh *et al*, 2006). This presents opportunities for farmers to meet local market needs, as well as, potentially explore export markets for pork products. Investment opportunities in pig production in Nigeria cut across every aspect of its value chain, which is not limited to breeding, housing, feed production, animal aggregation, processing or value addition, cold storage, transportation, proper retailing outlets among others. The opportunities in pig value addition in Africa is enormous, but has not been properly tapped. Processing pork into cured products, sausages, and other value-added items can lead to higher profit margins, enhancing the overall income of farmers and processors. This presents farmers the opportunity to connect to both local and regional markets, thereby boosting trade and economic activity. As demand for pork products increases due to population growth and changing dietary habits, there is potential for further income growth (Huynh *et al*, 2006). The prospects of pig production in North African countries lie in the increasing demand for pork, driven by the attraction of tourists into the country and identifying pig production as an opportunity for foreign exchange earnings, by exporting it to nations with increasing demand for pork.

Strategies for Advancing Pig Production in Nigeria
Some strategies for purposeful development of the livestock industry in Nigeria are:
(1) Change in value and attitude of livestock producers from the present consideration for number of stock as status symbol to more important objectives of higher productivity and socioeconomic benefits that are business oriented.
(2) Careful selection of local breeding stock from breed and individual records.
(3) National upgrading and breeding programmes involving exotic and local breeds, thereby mass producing the heterozygous offspring for production purposes.
(4) Careful exploration of various farming systems to ensureavailability of feedstuff throughout the year and intensification agricultural production system.

(5) Feed quality improvement through deliberate supplementation and range exploitation to meet daily requirements for various nutrients.
(6) Exploitation of the biological abilities of the stock to derive maximally from the available feedstuff.
(7) Establishment of a responsive and resilient animal health system that is capable of quick intervention, continuous and effective management of animal diseases and their predisposing agents and conditions.

CONCLUSION

Pig production is an enterprise that is practiced widely across Nigeria and has been contributing immensely to the growth of the economy especially, as a means of livelihood for many of her rural population. In spite of the challenges facing pig production in Nigeria, it still has the potential to evolve into a huge contributor towards Nigeria's GDP and Poverty Eradication, by providing good source of animal protein to bridge the deficit in the protein requirement for the rapidly growing human population.
To benefit hidden treasure in pig production in Nigeria, smallholder farmers need to be provided with capacity building in the area of proper feeding and feed management, health management, biosecurity and value addition to enhance productivity and the development of the pig value-chain across the country. Putting in place appropriate policies to favour the establishment of private pig meat processing companies or plants is critical to the development of pig production in Nigeria.
Sustained research efforts in the development of cost-effective feeding systems, careful planning and execution of disease surveillance, prevention and control measures, focusing on the use of alternative feed resources or agro-industrial by-products, and development of highly adaptable breeds are important for the growth of the pig industry in Nigeria.

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