

Commercial Poultry Success Stories in Nigeria

Drivers, Challenges, and Lessons

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Acknowledgement

The onset and rapid expansion of commercial poultry (CP) production in Nigeria coincided with the periods during which there were no financial constraints on imports. Using the Food and Agriculture Organization of the United Nations (FAO) definition, CP enterprises are those in Sectors 1-3. Sector 2 is where most of the CP producers in Nigeria belong. Sector 1 includes enterprises with clearly defined commercial goals that closely follow the industrial integrated production system with standard operating procedures for bio-security such as Hazard Analysis Critical Control Point (HACCP) and products that are distributed and marketed either nationwide or extensively. This study focused mainly on Sector 1 poultry enterprises with a view to identifying the factors that contributed to their success in Nigeria.

The study hypothesis was that the most significant factor that determines the success of a new CP start-up business is the access to sufficient finance to obtain an optimum scale of operation and to quickly be able to achieve increasing levels of vertical integration. Seven research questions were formulated to test this hypothesis. Case studies were used as a method to identify the drivers of growth, and cross-case study analyses were used to investigate the key factors that have contributed to the development of successful commercial poultry enterprises in Nigeria. The conceptual framework used for assessing successful commercial poultry farms assumed that there are four indicators of a successful commercial poultry farm: years of existence, capital base, turnover/current output, and profit level. The indicators are influenced by some factors that serve as precursors, such as interest policy, credit policy, import policy, export policy, public physical infrastructure, legal infrastructure (rule of law), and national economic performance.

The sample population consisted of 24 farms that were adjudged successful; They were purposively chosen to represent the entire country with 15 from the South West, four from the North Central Zone, four from the South East, and one from the Federal Capital Territory. Out of these 24 farms, eight farms were purposively selected to represent meat and egg producers out of those that indicated their willingness to participate in the case study. Using the case study approach and based on the promptness of their responses to the request to study their operations, five farms were involved in the case study.

An interview guide based on the research questions was developed. Scheduling and undertaking the interviews were only undertaken after a Consent Form was signed. Two types of data were collected and analyzed—secondary data from local institutions on production and trade. Primary data from the five selected case study enterprises were obtained through semi-structured interviews with senior staff of the business, by a face-to-face meeting while observing all COVID-19 protocols in one case; by Zoom with another case; and for the other three cases, the Interview Guide was exchanged by email. All cases were followed up by telephone communication and text messages.

The profiles of the farms studied showed that all the sampled farms were registered as limited

liability companies that raised their capital privately. Sixty percent of the farms combined broiler and layer enterprises, while 80% had Parent Stocks and hatchery and were able to produce Day Old Chicks. The study indicated that the majority of the farms had single promoters, with 50% of the promoters having a degree in agriculture or veterinary medicine. All the farms studied got their start-up capital from either personal savings, bank loans, or both bank loans and personal savings. The age of the farms ranged between five (5) and forty-three (43) years. The start-up capacity of the farms ranged between 5,000 and 95,000 birds, while the current capacity at the time of data collection was between 230,000 birds and 880,000 birds. The annual minimum and maximum output in egg production were 365 MT and 5,940 MT; in DOCs, produced was 8 MT and 280 MT; in broiler production was 120 MT and 8,710 MT, respectively.

All the case farms agreed that the poultry sector had experienced growth in the last five years. They identified factors that have triggered the growth as the increasing urban population, which increased the demand for poultry products; market differentiation by branding, and introduction of further processed or value-added products (cut-up or portioning of the carcass, smoked chicken, chicken nuggets) as well as the COVID-19-induced rapid growth in take-out and home delivery services of the fast-food restaurants. The delivery services were aided by the widespread use of social media and financial technology for payments for ready-to-eat poultry products marketed online.

The success factors given by the case study farms as being entirely within their control are Integration of Poultry Value Chain Activities; Possession of Cutting-Edge Technology or Constant Innovation; Access to Investment Capital; Quality of the Human Resource within their organizations; Operating different production units within the farm as separate competing profit centers.

Cross-case-study analysis revealed the following drivers and challenges: the high risk that high feed cost constituted to their business and their investments; trade policies related to the protection of domestic enterprises from foreign competition as having a positive effect on domestic investment that led to entrants of new farms and expansion of existing farms.

The lessons learned included: the size of the domestic market, demand growth (both increased population as well as growing per capita incomes), and the growth of the urban middle class were deemed to affect the profitability of poultry business investments in egg production and poultry meat production; the expansion of the fast-food chain and the rise of supermarkets affected poultry investments and profitability positively, particularly in urban areas; vertical integration is associated with higher success rates in the commercial poultry business; innovations (both institutional and technological) have a vital role to play in the growth of commercial poultry operations.

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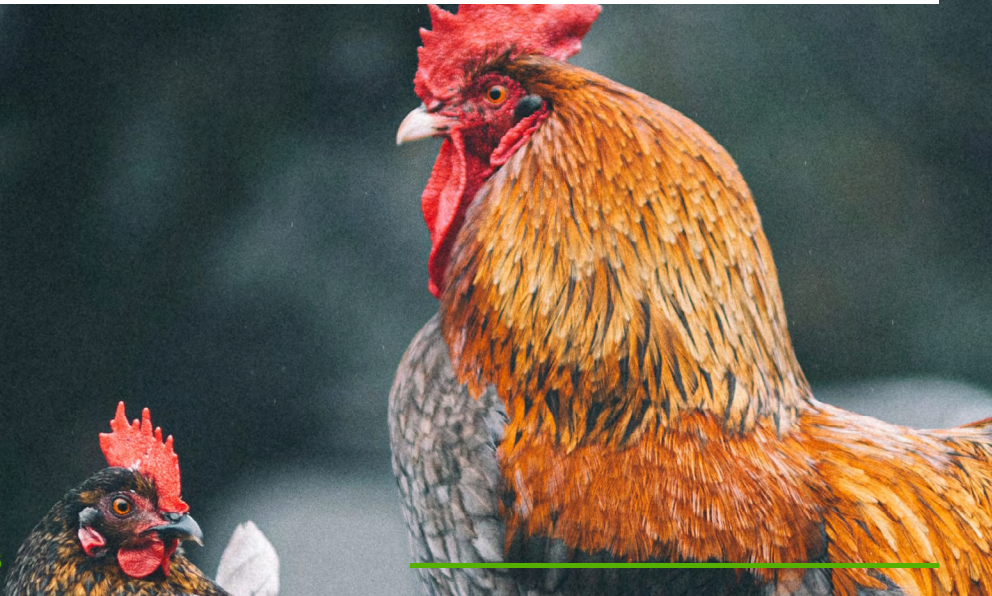
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Introduction

Commercial poultry (CP) production started in 1957 when the Government of Western Nigeria (GWN) developed a policy and plan to produce table eggs and stop the importation of eggs from Britain. In partnership with the State of Israel, the GWN built farm settlements in the pattern of the Israeli kibbutz. Hatcheries and feed mills were built and operated by the government at three farm settlements at Fashola, Agege, and Iwo. In contrast, feeds, birds, and poultry cages were sold at highly subsidized rates on credit to the farm settlers and the public. Commercial poultry production soon spread to other parts of Nigeria from this beginning. The White Leghorn and Rhode Island Red breeds were initially used based on their heat tolerance, lower feed consumption, and high egg number. Later, other breeds such as Ross, Yaffa, Hubbard, Shavers, Lohmann, Harco, and Isa Brown were introduced for their various traits of economic merits.



Definition of Commercial poultry at the onset

From the 1950s to the 1960s, holdings of 500 birds were considered commercial poultry. The total hatch per week from the poultry breeding center in Agege, Lagos, was 5000 birds. In the late 1960s and 1970s, limited liability companies, like Ladipo Daniel Farms, Shaver's, and Mitchell Farms, entered the poultry business and enlarged the capacity of commercial poultry farms to 10,000 chickens. Currently, in 2021, some broiler farms have the capacity for 1 million birds per batch, and many feed mills now have a production capacity exceeding 450,000 MT (Oyediji, 2021, personal communication during Focus Group Discussion¹ -FGD).



The role of the private sector in commercial poultry production.

The government of Western Nigeria promoted CP by providing free drugs and vaccinations, but cages and other poultry equipment were sold at subsidized prices, while loans and grants were offered to stimulate private investors. By the early 1960s, poultry had become so attractive to the point that government facilities could not cope with the demand for day-old chicks (DOC) and feeds. On March 31st, 1963, Pfizer, an American pharmaceutical company, opened the first commercial feed mill in West Africa at Ikeja, Lagos. This company, Livestock Feed, was the major turning point for the Nigerian commercial poultry business and was so successful that the early commercial poultry farmers in the northern city of Kano (Menttedem, 1976. Memoirs as a Pfizer Sales Representative for

feeds. Personal communication with Oyediji, 2021, FGD) and from the eastern city of Enugu (Adekanbi, 1985), came to Lagos to buy feed. By 1973, Mitchell Farms, was the biggest broiler meat producing company in Nigeria and had contract farms in Kano, Aba, Lagos, and other sites in the Western region. Mitchell Farms was highly integrated from hatchery up to parent stock (PS), grandparent stock (GPS), and great grandparent stock (GGPS) (Badejo, 2021, personal communication, FGD). Flour Mills Ltd, a sister company to Mitchell farms, had a huge amount of the by-product, wheat offal, an ingredient for poultry feed, so the decision was made to set up a feed mill which was registered as Topfeeds Ltd (Isebor, 2021, personal communication, FGD). With the increasing demand for DOC, Topfeeds registered a hatchery Topchicks Ltd (Isebor,

2021). The United States Feeds Council (USFC) and the American Soybean Association (ASA) sponsored members of the Poultry Association of Nigeria (PAN)

1 A virtual FGD was held as part of this study on 13/7/21 with six pioneers of commercial poultry in Nigeria (see App 1).

to the Atlanta International Poultry Exhibition (Ogunshina, 2021, personal communication, FGD). USFC and ASA also provided poultry extension services to poultry farmers on technology improvement and innovation, which have become major factors in the development of commercial poultry in Nigeria.

Government policy to create an enabling environment for commercial poultry

As soon as the private sector was firmly established in commercial poultry production, the GWN withdrew from direct production to its traditional role of policy development, regulatory support, and tactical interventions.



As soon as the private sector was firmly established in commercial poultry production, the GWN withdrew from direct production to its traditional role of policy development, regulatory support, and tactical interventions. Lagos State (created from Western Region in 1969), for example, created an enabling environment by supporting investors to acquire land in Epe, Badagry, and Ikorodu and established poultry estates or cluster farms where farmers take advantage of extension services, government empowerment, and support programs and infrastructure development in energy, water, and roads. The Ikorodu Poultry Estate, for example, has 74 ha

of land, with 200 CP farmers (Bashorun, 2021, personal communications, FGD). In the last 15 years, these poultry estates have attracted a lot of start-ups into commercial poultry, with the result that egg production capacity has kept increasing in Lagos State. The poultry estates were designed for commercial poultry production at a scale (between 5,000 to 10,000 layer birds) equivalent to FAO sector 3. Growth in the capacity beyond sector 3 requires the poultry operation to relocate to privately sourced land outside the poultry estate. Commercial poultry operations at the FAO sector 1 level were established in stand-alone locations and not within the Poultry Estate.

What is the current size of commercial poultry?

In the absence of data from nationwide surveys, estimates of the size of the commercial poultry sector in Nigeria can only be made through proxy variables. Proxy variables that were used to develop a quantitative estimate of the size of the industry included: a) import of grandparent stock (GPS) and the production of parent stock (PS) and day-old chicks (DOC); b) import of critical feed ingredients (lysine, methionine, fish meal and soya meal) and c) import, local

production and distribution of poultry drugs and vaccines. A set of estimates based on GPS import, PS, and DOC production shows that the annual meat production capacity of the CP sector is about 345,000 MT, while estimates for annual egg production is about 650,000 MT of eggs. Efforts to meet the consumer demand for poultry meat and eggs have attracted investors to large-scale commercial poultry production.

The objective of the Study

Despite the increasing demand for poultry products and the ensuing growth in the CP business, there are considerable challenges that have led to the closure of some poultry

farms. This study examines the factors that have contributed to the success achieved in CP and the government policies that have helped or hindered the CP business.

Study Delimitation and Methodology

The onset of commercial poultry (CP) production in 1957 coincided with the commercial exploitation of crude petroleum resources, which made available considerable financial resources. Hence, in the 1960s and 1970s, a period during which there were no financial constraints on imports, there was a rapid expansion of CP enterprises. This expansion was reversed during the structural adjustment program (SAP) of the 1980s (Adebiyi et al, 2020) when financial constraints became severe. From the 1990s onward, the national economy improved, and CP production steadily increased until the decline associated with the outbreak of avian influenza (AI) in 2006. By 2013, when Nigeria was declared free of

AI, the growth in CP production was quickly restored due to public-private partnership in enlightenment programs to address the safety concerns of consumers (Federal Ministry of Agriculture and Rural Development – FMARD, 2014). Clearly, the performance of the CP system depended on the state of the national economy. Here, it is important to define what is referred to as commercial poultry and the factors that contribute to its success.

Definition of Commercial Poultry Operations in Nigeria

Using the Food and Agriculture Organization (FAO) of the United Nations definition (Table 2.1), CP enterprises are those in Sectors 1-3. Currently, in Nigeria, Sector 1 producers keep

100,000 – 1,000,000 birds or more, Sector 2 producers keep 10,000 – 99,999 birds, while Sector 3 producers keep 1,000 – 9,999 birds (FMARD, 2014). There are many small-scale CP producers who have much fewer number

of birds than 1000. Iyanda (2013) reported that Poultry Association of Nigeria (PAN) members in Kwara State kept between 100 to 1000 birds, and 62% of them kept layers, 27% kept broilers and 11% kept cockerels.

Table 2.1: Summary of FAO classification of poultry production systems

Production Sector	Main characteristics
1	Integrated, industrialized enterprise with sophisticated, high-level farm biosecurity measures. Complete control over all farm inputs and outputs (e.g., breeding stock, feed mill, slaughterhouse, processing, distribution, animal health services).
2	Commercial, intensive poultry production involves largely independent enterprises or contractors practicing moderate to high-level biosecurity. Distribution of poultry to slaughterhouses and to live poultry markets.
3	Commercial farms with relatively poor biosecurity. Sales are more likely to be through live poultry markets or to traders who on-sell through live bird markets. This system covers ducks and other poultry. Production may be intensive, semi-intensive, or extensive.
4	Village-level, scavenging chickens for local consumption. These small flocks are reared in village households. An occasional bird is sold locally, bartered, used as a gift, or, occasionally, sold to a poultry trader for cash.

Source: Sims (2008)

Sector 2 is where most of the CP producers in Nigeria belong. Sector 1 includes enterprises with clearly defined commercial goals which closely follow the integrated industrial system of production with standard operating procedures for bio-security, such as Hazard Analysis Critical Control Point (HACCP), whose products are distributed and marketed either nationwide or extensively. This study focused mainly on Sector 1 poultry enterprises with a view to identifying the factors that contributed to their success in Nigeria.

Review of the literature on Success Factors in Commercial Poultry Operations

According to Adeyonu et al. (2021); Akpa (2017), and Akinola (2014), the challenges of commercial poultry (CP) production include: the high capital-intensive nature of the business, the perceived high-risk nature of the business by the banks which is reflected in the high-interest rate of about 2-digits that they charge the investors, inadequate technical know-how on industrial poultry management and the relative scarcity and highly unstable prices of inputs especially feed, drugs and vaccines.

Some of the major challenges that can be classified as business risks are listed in Table 2.2, along with the measures of mitigation of the risks.

Table 2.2: Commercial Poultry Risks and their Management in Nigeria

Risks	Mitigation Measures
Financial Risk: The risk that project cash flows may be insufficient to pay an adequate return on the private debt and equity invested in the project	This risk is mitigated by ensuring that the farm has strong cash generation capacity, particularly from other established businesses of the promoter that are different from the poultry business.
Operations & Maintenance Risk: refers to the risk that farms may not have the capacity to operate the business and maintain the facilities. This is not limited to farm business in Nigeria, as many businesses complain of a lack of adequately trained, experienced, and committed staff.	The CP operator addresses 'operations' risk by recruiting staff with the required capacity and by providing additional staff training. The maintenance risk is addressed by engaging professional firms with proven track records on contracts with specific service level agreements and penalty clauses. Power generation facilities, for example, are usually maintained under such service contracts.
Political Risks: Political risk concerns government actions that could negatively affect the business. Such activities could include lifting of the ban on the importation of poultry products, policy changes on accessing funds from the Central Bank, etc.	CP farms participate in industry trade groups such as the Poultry Association of Nigeria (PAN), whose activities are to influence government policy in their favor and, if not, to maintain a dashboard of information triggers for timely response to unfavorable policies.
Global events like wars, epidemics e.g., AI outbreak, Covid-19 that could disrupt the free movement of people, flow of input or sale of products	Vigilance, increased local content, double banking of assets.

Over the years, a number of CP businesses in Nigeria have overcome these challenges and are continuing to thrive. A review of the literature has identified some factors that are key determinants of the success or failure of the commercial poultry business in Nigeria (Monitor Deloitte, 2014; Sahel, 2015; Mulugeta et al, personal communication, 2021). These include:

- i. The strong financial and personal commitment of the promoters.
- ii. Availability of funding for the business in a timely manner. Some have been able to leverage off-shore financing options as well as the Central Bank of Nigeria (CBN) intervention funding at rates much lower than the commercial money deposit bank interest rates
- iii. Deployment of the right equipment and facilities: Equipment and accessories procured from companies with good track record of manufacturing and managing high quality and durable equipment.
- iv. Technical partnership with companies with proven experience in the poultry production and processing business.
- v. Engagement of highly qualified firms and personnel in the management, maintenance and customer service

- vi. Ability to identify and take advantage of diverse markets and income opportunities.
- vii. Effective marketing and sales strategies
- viii. Safe and secure operating environment.
- ix. Effective collaboration with Out-growers when they are used

Successful commercial poultry businesses in Nigeria are those that have found ways to maintain a positive cash flow by minimizing input and production costs and by creating multiple sources of revenue. For example, successful broiler farms focus not only on the delivery of live chicken, but offer fresh and frozen cut-up chicken parts and offal (gizzards, necks, feet and heads). Successful commercial egg-layer farms sell fresh shell eggs, slaughtered and frozen spent layer carcasses as well as poultry manure. Hence, successful CP businesses in Nigeria are those that have embraced full vertical integration from parent stock production to hatching day old chicks, to table birds' production, slaughtering and processing.

In order to optimise their investment in parent stock farms and hatcheries, some Sector 1 CP operators use smaller capacity (Sector 3) CP operators that are specialized in the production or growing-out of day-old chicks up to table birds of a specified slaughter weight. To ensure operational efficiency, some of the components of the integrated operations, for example, parent farms, hatcheries and feed mills, are managed as distinct strategic business units, with different business managers accountable for their operations and financials (Monitor Delloitte, 2014; Umoh et al, 2019).

Hypothesis on Success Factors

Our initial hypothesis is that the most significant factor that determines the success of a new CP start-up business is the access to sufficient finance to obtain an optimum scale of operation and quickly be able to achieve increasing levels of vertical integration. It is practically impossible to borrow money from commercial banks to start a poultry business. These banks usually lend to existing poultry farms for specific equipment or expansion of operations. Finding the initial capital is the major hurdle to cross. That is why most commercial poultry farms start on a small-scale or, at best, medium-scale bases but still in Sector 3. Success, then, is the ability to manage the risks confronting commercial poultry business and to grow in capacity to reach the level of operation for Sector 1 or 2.

In order to test this hypothesis, the following research questions were formulated:

1. How did poultry businesses mitigate the risks that affected the viability of their investments?
2. How have policy measures related to the protection from foreign competition via tariffs or sanitary barriers (e.g., Avian Influenza) affected foreign and domestic investment in poultry business?
3. How did the size of the domestic market, demand growth (both increased population as well as growing per capita incomes), and the growth of the urban middle class affect the profitability of poultry business investments?

4. How did the expansion of the fast-food chain and the rise of supermarkets affect poultry investments, particularly in urban areas?
5. Is vertical integration associated with higher success rates in the poultry business? If so, what are the main reasons?
6. What role did innovations (both institutional and technological) play in the growth of poultry operations?
7. Are smaller commercial operations more viable in egg production due to its lower competition from imports and lower dependency on infrastructure and cold chains?

Case Studies as a Method to Analyze the Drivers of Growth

Cross-case study analyses was used to investigate key factors that have contributed to the development of successful commercial poultry enterprises in Nigeria. Cross-case analysis is a research method that facilitates the comparison of commonalities and differences between the units of analysis, i.e. the cases studied. In this study, the units of analysis were the commercial poultry operations. The objective was to analyse in what areas the different cases suggest the same success factors, in what areas they suggest different success factors, and in what areas the suggestions of the cases conflict. Cross-case analyses provide opportunity to learn from the different cases and to gather critical insights that can support future policy making in the development of the commercial poultry sector. A 3-person country team carried out the data collection, analysis and report writing. The country team identified a 6-person focus group (see Chapter 1 Appendix) which played a key role in refining the study protocol, identifying initial hypotheses to be tested by the study, and identifying potential case study enterprises.

Conceptual Framework

Figure 2.1 presents the conceptual framework for assessing successful commercial poultry farms. The indicators of a successful farm that are shown in the figure are years of experience, capital base, turnover/current output and profit level. The number of years the farm has been in existence without going out of business determines how successful a farm is. Also, a farm business can be said to be successful if the capital base, turnover/current output and level of profit are sustainably managed for a long period of time. All these indicators cannot be realized without the influence of some factors that serve as precursors. Interest policy, credit policy, import policy, export policy, public physical infrastructure, legal infrastructure (rule of law) and national economic performance, have direct influence on input supply and poultry products outputs and demand by the consumers. For example, unfavourable interest policy can preclude farmers from acquiring inputs that can enhance production and efficiency because of non-availability of funds. The resulting inability of farmers to purchase production enhancing inputs will lead to low output and subsequent inability to meet the demand for poultry products. Inputs supply and products output are determined by the level of technology used, types of enterprise combination and, in turn, will affect the market reach/distribution network. It is the combination of the level of technology deployed, the types of enterprise combination and the market reach that predict the rate of increase of the capital base, of turnover and of the level of profit or success of the business.

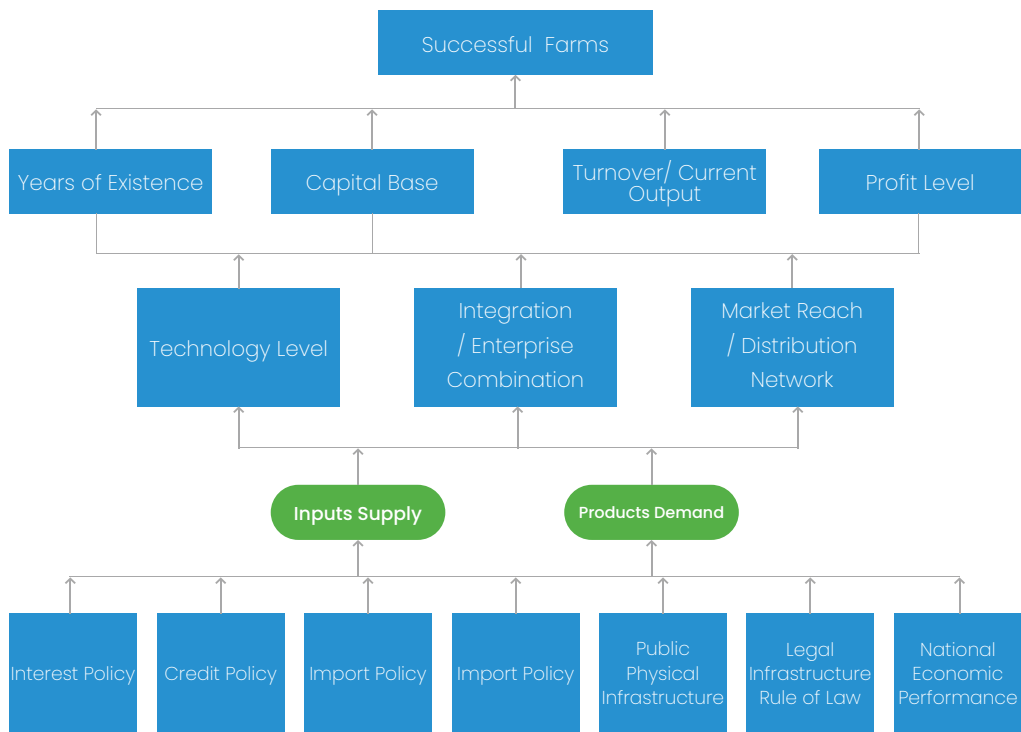


Figure 1: Conceptual Framework for Assessing Successful Commercial Poultry Farms

Data Collection Approach

The following 24 farms which were adjudged successful by the country team and the Focus Group formed the sample population.

1. Adar Global Ventures Limited, Sabon Fobur, Jos, Plateau State
2. Akin Sateru Farms, Lekki, Lagos State
3. Amo Farms, Awe, Oyo State
4. Animal Care, Ogere, Ogun State
5. Argandu Integrated Farms, Jos, Plateau State
6. Avian Specialties, Ibadan, Oyo State
7. Big Sam Chickens, Lagos, Lagos State
8. CHI Farms, Ibadan, Oyo State
9. F.A. Farms, Ijebu Ode, Ogun State
10. Gbagolo Integrated Farms Limited, Akpabuyo, Cross River State
11. Goshen Gwottson Integrated Farms Limited, Kuru, Jos, Plateau

12. Green Pasture, Ibadan, Oyo State
13. Lakatabu Farms, Ibadan, Oyo State
14. Obasanjo Farms, Ota, Ogun State
15. Obassi Farms, Kilometre 2, Akamkpa, Cross River State
16. Oslat and Kubot, Ijebu Ode, Ogun State
17. Phinomar Farms, Enugu, Enugu State
18. Premium Farms, Abuja, FCT
19. Profundis Farms, Mowe, Ogun State
20. Taghini, Ibadan, Oyo State
21. Tufanic Farm, Ogoja, Cross River State
22. Tuns Farms, Osogbo, Osun State
23. Valentine Chickens, Ilorin, Kwara State
24. Zartech, Ibadan, Oyo State

These 24 farms were deliberately chosen to cover the entire country with 15 from the South West, 4 from the North Central Zone, 4 from the South East and 1 from the Federal Capital Territory. The 24 farms were purposely chosen to reflect the distribution of commercial poultry businesses in Nigeria (see Fig. 2.2).

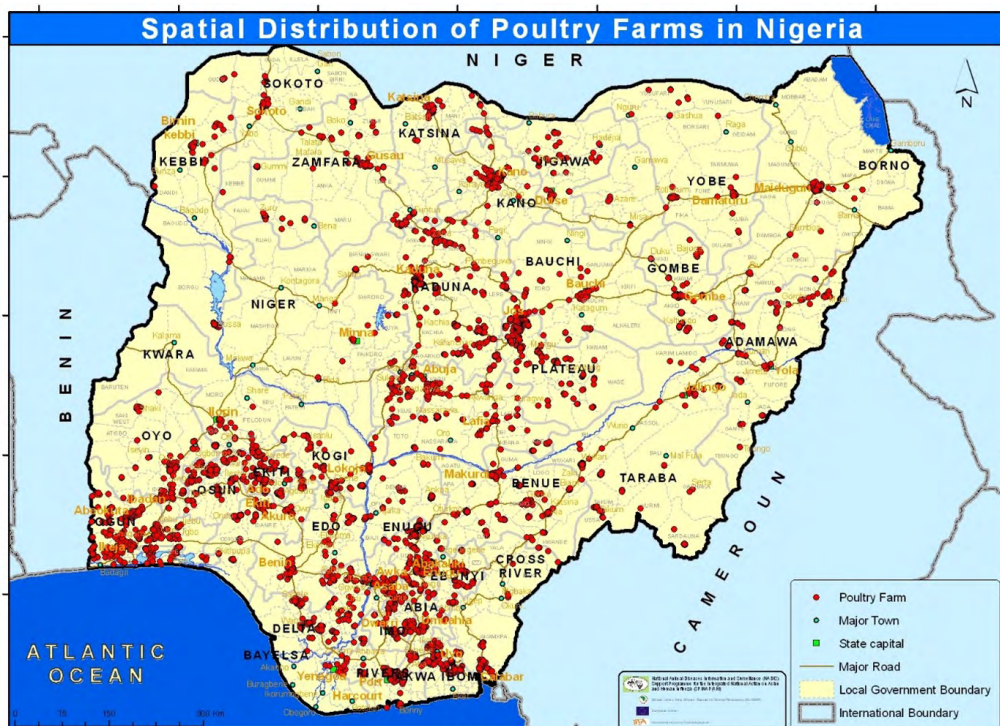


Figure 2.2. Spatial Distribution of Poultry Farms in Nigeria. Source: Federal Ministry of Agriculture and Rural Development, Abuja.

Out of these 24 farms, 8 farms were purposively selected to represent meat and egg producers out of those that indicated their willingness to participate in the case study. Using the case study approach, it was decided to study a few selected farms in some depth rather than more farms superficially. Based on the promptness of their responses to our request to study their operations, 5 farms were involved in the case study.

An interview guide based on the research questions previously formulated was developed by the country team in collaboration with FARA and ZEF, tested and refined accordingly (Appendix 2). Scheduling and undertaking the interviews with selected commercial poultry enterprises required the country team to establish initial communication with the selected commercial poultry enterprises to inform them about the study objective and obtain their consent to participate. A Consent Form was signed by all the five case-study enterprises.

Two types of data were collected and analyzed. Secondary data from local institutions on production and trade. Primary data from the five selected case study enterprises were obtained through semi-structured interviews, by a face-to-face meeting while observing all COVID-19 protocols (with other team members joining by Zoom) with a senior staff of the business in one case; by Zoom with another case; the other three cases were contacted by telephone and texts while the Interview Guide was exchanged by email. Given the low number and the in-depth nature of the enquiry in each case, interviews were performed by the country team (not by enumerators). The two Zoom meetings were recorded and a hard copy was produced. The email interviews have soft copies available as computer files.

Evolution of the Commercial Poultry Sector Over the Last Five Years in Nigeria

Growth of the commercial poultry sector

Up to the mid-1980s, the CP businesses operated in a buoyant, dollar-sufficient national economy that freely imported breeding stock of various breeds, feed ingredients, supplements, vaccines, medicines, poultry housing and production equipment. In CP production until 2018, all breeds used were imported. Common broiler breeds used were Ross®, Arbor Acres®, Cobb® and Hubbard®. Among layer breeds used were ISA Brown®, Bovans®, Hyline®, Marshall® and Lohmann®. Sustainable growth in the CP industry in the last five years became impossible because of shortages of Grand Parent Stock (GPS) as well as Parent Stock (PS) due to an import ban since the 1990s. It was as far back as 1985, when the Structural Adjustment Programme started to restrict access to foreign currency for imports that the CP industry began to be forced to look inwards for biological, technological and financial resources.

This inward look led to the efforts to develop a Nigerian foundation stock for poultry production. A layer breed, SHIKA BROWN, developed by the National Animal Production Research Institute (NAPRI), Ahmadu Bello University (ABU), Zaria, (Kallah, 1999) was registered and released in 2000 by the Technical Sub-Committee on Naming, Registration and Release of Livestock Breeds/Strains of the

National Centre for Genetic Resources and Biotechnology of the Federal Ministry of Science and Technology. The issues of genetic stabilization, multiplication and distribution of the breed have never been properly addressed until date. Hence, Shika Brown has not been used regularly by the Sector 1 CP businesses. In 2018, an improved poultry breed, FUNAAB Alpha, developed by the Federal University of Agriculture, Abeokuta (FUNAAB), was registered and released as a dual-purpose bird (Adebambo et al, 2018) but the same issues of commercial distribution and genetic stabilization still needs to be resolved for this breed before Sector 1 CP businesses can utilize the breed. A third breed, NOILER, a dual-purpose bird, developed between 2013 and 2018 by a private company, Amo Farms Sieberer Hatchery Limited, Awe, Oyo State is in the process of registration and has achieved country-wide industrial-level distribution (Oduntan et al, 2020) unlike Shika Brown and FUNAAB Alpha which have not achieved country-wide distribution. However, most Sector 1 CP businesses still rely on importation of GPS and even some PS, as the indigenous Noiler breeding programme has not been able to meet the needs of the industry for highly efficient broiler and layer breeds. In 2016, Nigeria produced a total of 650,000 MT of eggs and 354,000 MT of broiler meat (LSMS Survey, 2016). In the years 2015-2020, production of broiler DOC grew by 8.67 per cent per year which was an increase of about 14 million broiler DOC every year while layer DOC grew by 2.61 per cent per year which was an increase of 1.2 million layer DOC/year (Table 3.1). The average size of the broiler enterprise also increased from 10,000 to 50,000 per batch while the largest broiler farms have built capacity up to 1 million birds per batch.

Table 3.1. Hatchery production in Nigeria, Year 2015 to 2020.

DOC numbers (millions)	2015	2016	2017	2018	2019	2020	Average growth /year, millions	Avg Annual Growth rate, %
Broiler	166	176	179	190	200	238	14	8.67
Layer	46	47	48	49	51	52	1.2	2.61

Source: Poultry Sector Study, Nigeria, 2020.

In the absence of accurate data, it is perceived that the gap between internal production and consumption of poultry meat and eggs in Nigeria has always been wide. The gap is negative for meat while it is positive (a surplus) for eggs. With a population of 206 million and per capita consumption of 1.9 kg (Poultry Sector Study, 2020), the ljebu total demand for poultry meat is estimated at 391,400 MT. The perceived position in the broiler industry is that illegal import (smuggling) of frozen broiler meat from Benin Republic is reducing the revenues and profit of broiler meat producers in Nigeria. In support of this view, the figures for imports into Benin Republic between 2016 and 2020 are (in MT): 126,743, 112,724, 117,352, No Data for 2019 and 89,748 for 2020 (Source: Institut National de la Statistique et de l'Analyse Economique du Benin). These import figures are much too high for a country with a population of 12.12 million people in 2020 suggesting that per caput consumption of poultry meat was 7.4kg in the year 2020. The absence of data for 2019, the year when the Benin/Nigeria border was closed, is also indicative of the final destination of the high import of poultry meat into Benin Republic.

Egg production at 650,000 MT is apparent oversupply of eggs which results in egg gluts every year even though egg consumption is only 65/person/year. Branded eggs and egg products aimed at overcoming this problem of egg glut have made an appearance in the last 5 years. Some producers export some quantity of the shell eggs they produce but many are having to bury the surplus egg during gluts. In 2016, the first commercial egg powder plant was established in Ijebu-ode, Ogun State by Answers Industries Ltd with an imported flash dryer and locally assembled egg breaker, clarifier and mixer. Industrial-scale egg powder plants are planned or being constructed in various sites in Nigeria.

Evolution of the policy environment

| Domestic Policy Environment

The government's last agricultural policy, The Agriculture Promotion Policy (APP, 2016 – 2020), was aimed at building on the successes of the earlier policy, the Agricultural Transformation Agenda (ATA, 2011-2015) while closing key gaps. In the APP, the sectoral allocation of loans to agriculture was increased from 15% to 25% with a moratorium period of two years for poultry (FMARD, 2016). Another innovative scheme was the NIRSAL (Nigeria Incentive-Based Risk Sharing Scheme for Agricultural Lending), which aimed to de-risk agricultural lending and thus make commercial banks more willing to lend to the agricultural sector. The NIRSAL scheme was particularly helpful to the Poultry Sector because the bird flu occurrences of 2006-2013 heightened the perception of risks associated with the poultry business, further discouraging banks from lending to poultry farmers. In 2015, the newly elected government of Nigeria expressed a desire to reduce importation and promote local production, and further strengthened the enforcement of the ban on smuggling of poultry products into the country. With a complete closure of the land border between Nigeria and Benin Republic, broiler farmers in Nigeria were able to enjoy protection against stronger foreign competitors and the dumping of broiler meat from other countries and were therefore able to expand their production capacity. The government also strengthened the Anchor Borrowers Programme, which enabled small- and medium-scale farmers to participate in agricultural lending schemes by being linked to off-takers whose guarantee enabled small farmers to access funding. This resulted in an increase in production capacity for the largest CP businesses which continued even during the COVID-19 pandemic while the smaller-sized (especially Sector 3) poultry farmers experienced painful reduction in capacity and many had to close their businesses because of the brutal effect of the pandemic on their businesses. The border closure policy only benefitted the Sector 1 CP businesses.



Regional and International Trade

Nigeria has existing regional trade agreements with ECOWAS countries; a brand-new continental trade challenge and opportunity with African countries through the African Continental Free Trade Area (AfCFTA). There is also the international trade watch dog, the World Trade Organization (WTO) which closely monitors trade relations globally and is not likely to ignore any infringement on free trade. In spite of these trade agreements, Nigeria does not have regional and international trade policies. This policy lacuna is demonstrated by the wariness and reluctance of the private sector to see Nigeria sign the AfCFTA.

Effect of Trade Policies on Commercial Poultry Enterprises

Ban on Import of Poultry Products

There has been a ban on poultry imports since 2003, yet, as of 2021, a sizable percentage of poultry products offered for sale in the open markets in Nigeria were smuggled in through the land borders with Benin Republic. These products are not necessarily cheaper for the consumer, but they offer higher trade margins for the intermediaries than locally produced chicken does. Even though the government banned the importation of chicken and turkey in 2003, the enforcement of the ban only became effective in about 2017. The enforcement of the ban was aimed at encouraging the growth and development of the Nigerian poultry industry (Netherlands Enterprise Agency, 2020).

Figure 3.2 presents the poultry meat import quantity in Nigeria between 2010 and 2019. The quantity of poultry meat imported into Nigeria dropped sharply from 45,178 MT in 2010 to 1,135 MT in 2011. The fall in the import value continued till 2016 and picked up to 15,874 MT in 2017, 18,282 MT in 2018 before falling to 11,718 MT in 2019. The high import values of poultry meat in 2017, 2018 and 2019 is an indication that the ban on poultry meat importation has not been effective. The “importers” did not obtain import permits; the meat was smuggled into the country via the land borders. The amount smuggled depended on the effectiveness of the government’s anti-smuggling efforts. On the other hand, there was no record of poultry meat export in Nigeria in the last five years. Production cost and market prices of poultry products are very high, an indicator of poor efficiency. The ability to export poultry products requires increasing production efficiency resulting in lowering production costs to global market level.

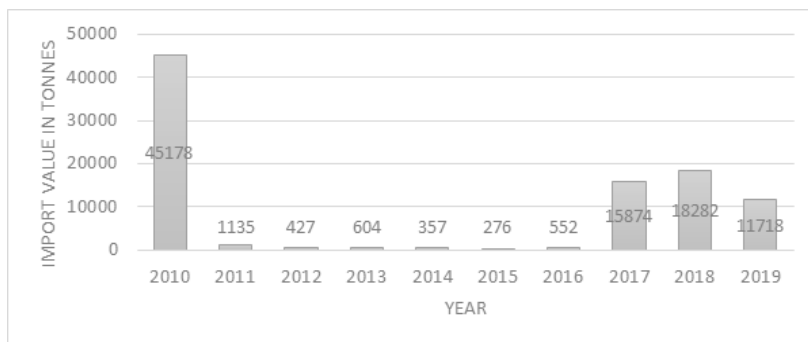


Figure 3.1: Poultry Meat Import Quantity in Nigeria

Ban on Maize Import and Border Closure

The Nigerian government enacted a ban on maize importation along with border closure in 2019. The ban on maize importation was partly responsible for significant increases in the price of poultry feeds and an increase in the price of eggs and broilers. It led to some poultry farmers becoming insolvent. The closure of the Nigerian border was aimed at curbing smuggling and boosting local production as well as conserving foreign exchange (Golub et al., 2019; Proshare, 2021). Another major reason for the scarcity of maize was the increasing insecurity in the northern zones where commercial production of maize takes place. This insecurity is due to the activities of Islamic fundamentalist terror organizations (such as Boko Haram and Islamic State in West African Province) in the north eastern zone; and of bandits, cattle rustlers and kidnappers in the north-central and north western zones. Yet another reason for maize scarcity is the effect of climate change and global warming which puts agricultural activities at increasing risk. The southward movement of cattle herds exposes food crops, including maize, to grazing and crop farmers to violent conflict with cattle herders resulting in the death of crop farmers and the destruction of crop farms, crop silos and farmers' villages. The end result of all these negative developments is that fewer hectares are put to maize, much lower yields are obtained and even much lower quantities of food crops, including maize, are available for sale to markets, feed mills, and other industries that use maize as their raw material.

Trade Barriers and Foreign Investment

According to the World Economic Forum (2021), trade barriers in Nigeria can constrain foreign investment in the poultry sector. The trade barriers have been classified into four:

- Lack of transport infrastructure, as well as inefficiency and opacity in border administration;
- Barriers to market access, such as import prohibitions, local content requirements, and import/export licensing regulations;
- A generally poor security situation (e.g. in terms of police availability and response times, and a willingness and ability to investigate crime) makes it difficult to keep staff, especially expatriates safe and prevent theft of finished goods and valuable assets;
- Delays at Nigeria's ports caused by inefficient border administration which stems from general mismanagement, undeveloped transport infrastructure and corruption.

Investment and Private Sector Support

The vision of the agricultural transformation agenda (ATA) in 2011 was to make Nigeria an agriculturally industrialized economy. The key strategic thrust of ATA was to reduce the involvement of government in the agriculture value chains and so create a conducive environment to attract investors both local and foreign. The specific goal of the poultry transformation agenda (PTA, 2012–2015) as a subset of ATA, was to expand the poultry industry competitiveness in the ECOWAS region and enable the export of domestic DOC and hatchable eggs. The PTA document covered all sectors and value chains for poultry, ranging from breeder stock, hatcheries, feeds and feed ingredients, manufacturing standard operating practices, industry production inputs and outputs

projections, and institutions that will be responsible, etc. Specific policies highlighted were the promotion of Feed Grade Cassava Chips for cheaper feeds, chicken population expansion through breeder stock expansion, and deployment of micro tracer technology for feed quality assurance, among others.

During ATA, the FGN also enunciated some financial policies for the agricultural industry: the Anchor Borrowers Scheme, and the Nigeria Incentive-Based Risk Sharing Agricultural Lending (NIRSAL) scheme as examples. All these ATA policies had a positive impact on the table meat sector which impacted commercial feed milling, animal husbandry professional practice, animal health services, local fabrication of poultry equipment, processing of poultry products, and export of DOCs to neighboring countries (Oyediji, 2021, FGD personal communication). On the whole, government policies were challenging, as they were not very well thought out. Businesses were caught unawares as the government was banning maize importation and day-old chicks' importation so quickly. Unfortunately, some of the farms that borrowed from the bank went down with the ever-changing government policies (Isebor, 2021, FGD personal communication).

The aim of the current government, which came into power in 2015, was that self-sufficiency in livestock products should be attained in the shortest possible time. For example, bridging the gap between demand for and supply of poultry meat was set to be achieved in five years (2020) while that of poultry eggs was set for four years (2019).

| PESTEL Analysis of Nigerian Poultry Sector 1

PESTEL analysis is carried out to identify the political, economic, social-cultural, technological, ecological, and legal factors that could influence the market entry (Heise et al, 2015).



i. Political Factors

Political factors relate to government political decisions which include provision of credit, import and export policy, tax regulations, among others. In sector 1, the relevant political factors include funding policies, import and export ban and corruption. In recent times, the Central Bank of Nigeria (CBN) has been playing a more prominent role in funding the agricultural sector. It has been making allocations of large amounts of money as credit to support both large scale and small-scale operators in the agricultural sector. The Anchor Borrowers Scheme (ABS) is a typical example (CBN, 2016).

The CBN also declared it was not going to allocate foreign exchange for the importation of maize despite the pressure from poultry operators in support of maize imports to bring down the cost

of poultry feeds. The Guardian newspaper reported in 06 May 2021, that the CBN Governor, while speaking in Katsina State, said “the Central Bank of Nigeria would not allow the importation of maize into the country and would do what was necessary to frustrate any effort in that direction”. The ban on maize import is thus a political as well as a macro-economic decision. The same argument goes for the ban on poultry imports.

ii. Economic Factors

It is estimated that improving the country's infrastructure further could boost annual real GDP growth by around four percentage points (PwC, 2014). Ohajianya et al. (2013) reported low economic efficiency on many poultry farms. As economic efficiency is a product of technical and allocative efficiencies, these factors should be improved to make poultry production even more profitable in the future. To be technologically efficient, farmers need to invest in production factors. Inadequate funding hinders farmers from acquiring the necessary resources and technologies to assist them to produce efficiently and remain in production (Esiobu et al., 2014). In recent years, there has been a rapid increase in the price of feed. Feed costs rose by over 75% in nominal terms between March and November 2020, and the President of the Poultry Association of Nigeria said this has caused many poultry farms to shut down their operations (Poultry World, 2021).

The macro-economic issues that can affect Sector 1 poultry include poverty (NBS, 2019) which limits purchasing power and demand for food, and inflation (Macrotrends, 2021) which increases the cost of production generally. These two factors are normally the results of various government (political and macro-economic) decisions. For example, the continuing but gradual devaluation of the Naira and the gradual removal of petroleum subsidy that has been fuelling inflation.

iii. Social-Cultural Factors

The level of education attained, the religion adopted, the years of experience and the health status of the poultry business promoter is important in relation to the adoption of innovation. Innovation adoption is vital to reduce production and marketing inefficiency. Contact with physical and virtual extension education could help farmers access technological information and improve production and productivity through the efficient use of available resources and improved technology.

iv. Technological Factors

Production technology is one of the important elements to be considered when taking a decision to invest in poultry business. Sectors 1 and 2 poultry systems rely on large, dense, uniform stocks of modern poultry hybrids which require a lot of capital and inputs. Most of the poultry in Nigeria is kept in Sector 4 extensive production systems which are characterized as low input-low output systems. Virtually all Sectors 3 and 4 farmers desire the bigger hybrid birds, which gain weight more quickly; but what they actually need are dual purpose birds that are adapted to the free range and backyard management systems (Bamidele et al., 2020). The Mother Unit system (MU) developed by Kegg Farm in India for its Kuroiler breed has been shown to be a viable system of technological cooperation between Sectors 1-2 and the less technological Sectors 3-4 in which

Sectors 3-4 buy and use the technologically advanced day-old chicks (DOC) of the hybrid layers as pre-vaccinated chicks from the hatcheries of Sectors 1-2. In the Sectors 3 and 4 systems, hatching, brooding and vaccinating day-old chicks has been a consistent challenge that results in the high mortality and morbidity suffered by birds raised under these two systems. The MU intervenes to ensure that from hatching until 3 to 4 weeks of age, the available best technology can be used to protect the lives and growth of the hybrid chicks until they are purchased by Sectors 3-4 for growing out to point of lay. During the 5-year (2015-2019) African Chicken Genetic Gains (ACGG) project which was led by the International Livestock Research Institute (ILRI) and funded by the Bill and Melinda Gates Foundation (BMGF), on-station and on-farm testing of improved tropically adapted hybrids was implemented in Ethiopia, Nigeria and Tanzania. Data collected in Nigeria indicated that Sectors 1-2 operators can find a ready market for DOC and pre-started 3-5 weeks old hybrid chicks (Yakubu et al., 2019; Bamidele et al., 2020; Ajayi et al., 2020; Alabi et al., 2020). In the ACGG project areas, 2000 farmers from 60 villages adopted the MU system and made profit from the 4-weeks starter chicks they bought at cost from the project partners who were commercial poultry operators. The farmers joined poultry cooperatives which coalesced into the Smallholder Poultry Forum that has been registered as a not-for-profit business to promote the MU system and the use of dual purpose breeds developed and distributed by Sector 1 for Sectors 3 and 4 operations. The Noiler breed developed by Amo Farms is distributed in all the 36 states of Nigeria.

v. Ecological Factors

A major constraint to Nigeria's poultry sector is the persistent scarcity and high cost of feed inputs, mainly maize and soyabean meal. Nigeria has highly diversified agro-ecological conditions, making it possible to produce maize and soyabean in sufficient quantity and quality for Sectors 1 and 2. The perennial scarcity of these feed ingredients indicates, however, that there are ecological factors involved. A study by Haladu and Sonaiya, (2017) showed that sorghum, millet and 'acha' (fonio) can be substitutes for maize in the poultry diet. These substitutes, which are cultivated as subsistence crops, are not being used by the feed mills because of inadequate supply. Large scale sorghum and millet farms are extremely rare due to a lack of technology for their industrial production. Even the ecological resources available may not be able to support equally expansive maize and soyabean value chains within the same agro-ecological zones in which rice value chain is expanding without significant technological innovations in breeding and genetics, agronomy and irrigation engineering.

vi. Legal Factors

The Finance Act 2020 has indicated that small and medium sized companies engaged in primary agricultural production are to enjoy a tax-free period of four years which may be extended for an additional maximum period of two years. The Act described a medium sized company as a company that earns gross turnover greater than N25,000,000.00 but less than N100,000,000.00 per annum, or as otherwise defined by the Companies Income Tax Act. Primary agricultural production includes primary livestock production comprising the production of live animals and their direct produce such as live or raw meat, live or raw poultry, fresh eggs and milk of all

kinds, but excluding any other associated manufactured or derivative livestock product. (NIPC Investment News, Jan 12, 2021). This is a newly enacted law [Finance Act 2020] only passed in mid-2021. It has the potential to encourage investments into large scale agriculture including the CP sector.

vii. Food Safety, Animal Health

Another serious challenge common to both egg and meat producers is disease outbreaks. Avian Influenza or bird flu occurred in Nigeria between 2006 and 2013. Early in 2020, bird flu outbreaks were reported and many farms had to be quarantined and their birds destroyed and the farm closed for 3 years (Poultry Site, 2021). All CP farms implement the hazard analysis critical control point (HACCP) protocol. Processors have another layer of regulation through the National Agency for Food and Drug Administration and Control (NAFDAC) which must inspect and give approval at several points and also register the final product before sale to public consumers is allowed.

Ease of doing business

Access to resources: land, capital, genetics, feed, and know-how.

Nigeria’s rating on the business environment (ease of doing business including: starting a business and registering property, getting electricity, trading across borders, enforcing contracts and resolving insolvency, etc.) are outlined in Table 3.2.

Table 3.2. The ranking of Nigeria on the ease of doing business in 2019 and 2020

Indicators	Global Ranking		Movement	Position in Africa*
	2020	2019		
Starting a business	105	120	15 ↑	21
Dealing with construction permits	55	149	94 ↑	6
Getting electricity	169	171	2 ↑	39
Registering property	183	184	1 ↑	53
Getting credit	15	12	3 ↓	5
Protecting minority investors	28	38	10 ↑	4
Paying taxes	159	157	2 ↓	35
Trading across border	179	182	3 ↑	46
Enforcing contracts	73	92	19 ↑	9
Resolving insolvency	148	149	1 ↑	36
Overall doing business ranking	131	146	15 ↑	34

Source: Doing Business 2020: Training for Reform. A World Bank Group Flagship Report.

Nigeria's socio-political environment has been volatile for some years and there are pockets of instability in many parts of the country. The World Bank Ease of Doing Business Report (WB, 2020) shows that Nigeria's ranking moved from 146 (in 2019) to 131 (in 2020) out of 190 economies (Table 3.2). This annual report looks at ten (10) parameters and Nigeria improved its rank in 5 parameters including construction permits (14.6%) and trading across borders (6.1%). The WB (2020) also recognized Nigeria as among the ten most improved economies. This improvement arose from reforms by the Presidential Enabling Business Environment Council (PEBEC). However, a 5-year historical review of distance to frontier (DTF) score shows that business regulations were tough from 2016 to 2017. The year 2018 marked a new cycle of better policies for businesses as the DTF score rose from 52.33 in 2019 to 56.9 in 2020 out of a maximum of 100 (WB, 2020).



Fig 3.2. Nigeria's ranking in the World Bank's Ease of Doing Business

The PEBEC, led by the Vice President of the Federal Republic of Nigeria, has been responsible for driving business reforms in Nigeria since 2016. This is in line with the Federal Government's Economic Recovery and Growth Plan (ERGP, 2017 – 2020) which targeted Nigeria attaining a position among the top 70 in the World Bank Ease of Doing Business Index by 2023.

Poultry Investment Related Laws

| Operating companies and live bird importation

The Nigerian Investment Promotion Act, 1995 enables a foreign entity to invest and participate in the operation of any enterprise in Nigeria and investors may buy the shares of any Nigerian enterprise in any convertible foreign currency, if investment is registered with the Nigerian Investment Promotion Commission. Investment in a company can be through mergers and acquisition, direct investment in shares, or by way of a loan. This implies that foreign investors can invest in Nigeria's poultry sector without any limitations. There are regulations, however, guiding

the importation of live animals into the country. While importation of all classes of poultry birds are banned, there is a specific exemption of poultry grandparent stock, whose importation requires a license from the FMARD. All regulations on imports can be found online at www.customs.gov.ng. The relevant phytosanitary laws are found in the Agricultural (Control of Import) Act and Animal Diseases (Control) Act.

Land access

The Land Use Act, 1978 guarantees the right of every Nigerian, including companies registered in Nigeria, to unrestricted access to purchase and possess land in all parts of Nigeria whether for agricultural or other purposes. This access to land is conveyed through a certificate of occupancy from the state Governor. Thus, foreign investors can have access to agricultural land through their company once it is registered in Nigeria.

Typology of commercial poultry operations

There is a concentration of CP farms in the South-West of Nigeria and especially in the states near Lagos, a major population and economic centre (Fig. 3.3). It is estimated that over 65% of Nigeria's CP production takes place in the 5 states of Lagos, Ogun, Oyo, Osun and Ondo, whilst another 25% is based in the South-South and South-East geopolitical zones. The balance of 10% of Nigeria's CP is based in 15 states in the North-Central, North-West and North-East geopolitical zones. CP products, especially frozen spent layer chickens, are moved predominantly from the South-west to the North, in most cases through Abuja, the Federal Capital Territory. For broiler meat, the main consumer markets are in Lagos, Abuja and Port Harcourt (Sahel, 2015).

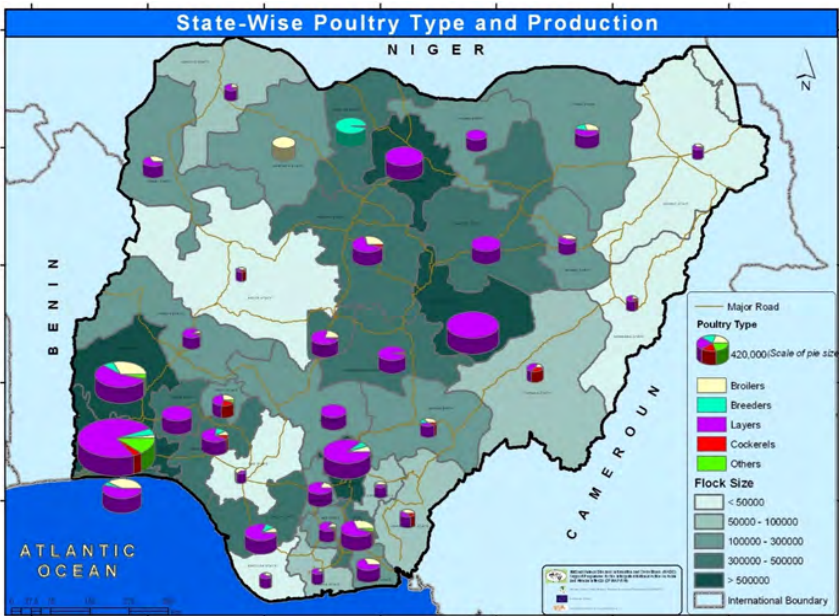


Fig. 3.3. Geographical distribution of type and flock size of commercial poultry in Nigeria.

Source: Federal Ministry of Agriculture and Rural Development, Abuja, 2014.

It has been estimated that there are 17,000 CP farms in Nigeria with a total holding of 45 million birds and average flock size of 2,625 birds (Netherlands Enterprise Agency, 2020). Within these CP farms, there are wide variations in production practices and technology adoption. Generally, broilers are reared on “All in All out” basis on deep litter aiming at a dressed market weight of 1.2 to 1.4kg, but a growing trend within the last five years is that feed manufacturers, hatchery owners and marketing companies have started their own broiler rearing. The big integrators have been acquiring bigger feed mills and bigger capacity hatcheries as well as slaughter and processing plants to enable them offer their final products of frozen chicken and further processed, value-added foods directly to the consumers (Fig 3.4).

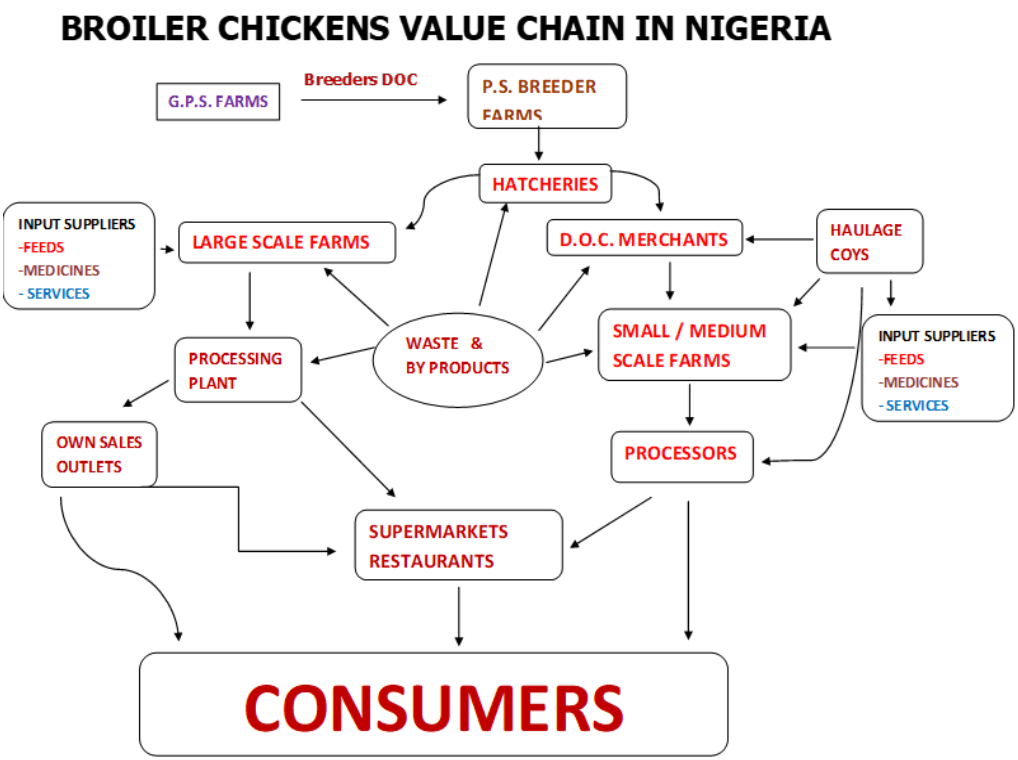


Fig. 3.4. The broiler chicken value chain in commercial poultry Nigeria

A similar trend is happening among bigger layer companies: automation in feeding and egg collection is increasing, branded eggs are offered for sale at supermarkets in packs of 6, 12, 15 and 30 eggs. Egg powder production facilities are beginning to appear, some are stand-alone while others are owned by integrated layer farm operators.

Profile of Case Study Farms

The profiles of the case-study farms are shown in Table 4.1.

Table 4.1. Profiles of 5 Commercial Poultry Farms Selected for the Case Study in Nigeria

S/N	Age, Years	Capacity, Number of birds		Output, MT/ Year	Average annual capacity increase, Number of birds	Rank in annual capacity increase
		Start-up	Current/batch			
1	38	5,000	450,000 Parent Stock. 500,000 Layers	5,940 Eggs	13,026	3
				1,200 Point-of-Lay Pullets		
2	31	40,000	120,000 Layer Parent Stock	8,710 Broilers	27,096	1
			160,000 Broiler Parent Stock	280 Parent Stock DOC		
			600,000 Broilers			
3	43	30,000	200,000 Broilers		4,651	4
			30,000 Broiler Parent Stock	2,740 Broilers 8.24 Broiler DOC		
				365 non-fer-tile eggs		
4	15	10,000	330,000 Layers	1,732.5 Eggs	26,000	2
			70,000 Broilers	840 Broilers		
5	5	95,000	85,000 Layers		1,000	5
			15,000 Broilers	1,178 Eggs		
			200,000 bird/hour capacity chicken	120 Broilers		
			processing plant. 100,000 eggs capacity hatchery	33.6 DOC		
Type of Business Registration						

All the sampled farms were registered as limited liability companies. Under Nigerian corporate laws, limited liability companies can only raise capital through private placements; they are not allowed to invite the public to subscribe to shares. This means the commercial farms studied must have raised their capital privately. While this may limit the amount of capital available to them, it allows for faster decision making and better control of the poultry business by the farm owners.

Types of enterprise

Three out of the five farms (60%) combined broiler and layer enterprises. One of them (20%) was into layer production only while one was involved with broiler only. Four of the farms (80%) had Parent Stock and hatchery, hence they also produce Day Old Chicks. It is expected that the farms that combined enterprises will have better capacity to cope with risk than the ones with single enterprise, all things being equal.

The logistics of distribution of eggs are different from that of broiler meat. The meat is normally distributed as frozen meat using cooling vans over wide geographical areas to supermarkets which have deep freezers as storage facilities and to fast food outlets. The eggs are usually distributed through bulk buyers who break the bulk and sell to retail shops on streets in the neighborhoods; the retail shops sell mostly to households/consumers in their immediate neighborhoods. Some of the eggs are supplied by the bulk buyers to fast foods outlets.

Promoters Profile and background

Findings from the study indicated that majority (60%) of the farms had single promoter while the remaining 40% had multiple promoters. About 50% of the promoters of the sampled farms have a degree in agriculture or veterinary medicine. This could have helped them to manage their farms very well and avoid the problem of disease outbreaks which sometimes cause significant loss in some poultry farms. The promoters of the remaining farms did not have any degree in agricultural related disciplines.

Source of start-up capital

All the farms got their start-up capital from either personal savings, banks or both banks and personal savings. The size of start-up capital is very important to the extent that it can determine how big a business can be at the starting point. The growth experienced in their respective poultry business could be attributed to the combination of personal savings and bank loans as the source of start-up capital. The need to depend on personal savings may force proprietors to start at a smaller scale than they would have loved to, but it also helps them to limit their initial risks and first operate more or less as a pilot entity designed to gain experience.

Start-up year

The start-up year of the sampled poultry farms was between 1978 and 2016. This places the age of the farms as ranging between five (5) and forty-three (43) years. This implies that the sustainability level in each of the sampled farms is high which can be linked to the training and experience of the promoters before they started the poultry business.

The older farms started their farm business in the years when it was easier to save and raise capital because the Nigerian currency (Naira) was stronger than it is at the time of this study. The promoters of the youngest farm, which is just five years old, must have made a significant amount of money from other businesses/sources to enable them invest at the scale they started given the capital required.

Start-up capacity

The start-up capacities of the five farms are 5,000, 10,000, 30,000, 40,000, and 95,000 birds. It may not be correct if one concludes that the start-up capacity is a function of source of start-up capital and the amount of capital that the promoters can raise at the point in time, since promoters may decide to start the farm business small in order to give room for gathering of experience.

Current capacity

The results of this study show that the current capacity of the poultry farms as at the time of data collection was between 230,000 and 880,000 birds. This implies that the farms have grown tremendously since they started production, which is the confirmation of earlier inference on the level of sustainability. It is worthy of note that the farm with multiple promoters had the highest current capacity. This may be an indication that the promoters were still supporting the farm either in provision of more capital or in ensuring the best management, marketing channels and government good will. The second highest current capacity was reported by the single promoter farm with the lowest start-up capacity and which was not the oldest in year of establishment. This could be attributed to the fact that the promoter is a very well trained professional and the management system and practices adopted may have enabled the farm to grow its capacity appreciably.

Current Output

On the output recorded by each of the sampled farms, annual egg production was between 365 MT and 5,940 MT. The minimum and maximum DOCs produced was 8 MT and 280 MT per annum, respectively. In the case of broilers, the minimum and maximum broilers raised on an annual basis was 120 MT and 8,710 MT, respectively. This is an indication that the farms are doing fine in spite of the downturn of Nigeria's economy and the COVID-19 pandemic.

Annual Output

Table 4.2 presents the annual output of case-study farms where farm 2 ranks highest with 8,710 MT of dressed chicken and 280 MT of DOC produced annually. This is followed by farm 1 with 5,940 MT of eggs and 1,200 MT of point-of-lay (POL) pullets sold per year. The two farms at the bottom are as farm 4 with 840 MT of broiler meat and 1,732.5 MT of eggs and farm 5 with output of 120 MT of broiler meat, 1,178 MT of eggs and 33.6 MT of DOC per year. Production of eggs for direct sale is much simpler than hatching the eggs into DOC or raising them into broilers or point of lay pullets. The sale value of these products compensates for the additional input needed. The sale of non-fertile breeder eggs is not usual and the production of a very high number of such eggs is not expected and the high cost of breeder eggs production makes its sale as table eggs not profitable. This

decision by farm 3 to sell non-fertile breeder eggs as table eggs is an attempt to recoup some of the cost of production but is an indication of some technical or management problems. These problems may have been responsible for the inability of the farm to grow in capacity as fast as it is expected.

Table 4.2. Annual Output of Case-study farms

Case	Eggs (Day old chicks, DOC and Point of Lay Pullets, POL), MT	Broilers, dressed weight, MT
1	5,940 Eggs	
	(1,200 POL)	
2	(280 DOC)	8,710
3	(8.24 DOC)	2,740
	365 non-fertile breeder Eggs	
4	1,732.5 Eggs	840
5	1,178 Eggs	120
	(33.6 DOC)	
Total	9,215.5 Eggs;	12,410
	(321.84 DOC; 1,200 POL)	

Performance of the commercial poultry business in the last five years

According to the response of the sampled poultry farms, there have been investments in broiler meat production and in cutting edge technology leading to size and output expansion by the farms. They further stated that the increased investments resulted from the increasing demand for slaughter weight birds from broiler meat processors and the demand for DOC by broiler out-grower schemes. The case farms faced more challenges in their egg production operations, especially in marketing such that only the larger and more innovative producers were able to avoid egg glut affecting the profit of the farm. All farms reported feed as a major challenge considering recurring problems of high prices and lack of standards for feed that have continued unresolved leading to declining profits and greater competition.

Effects of Egg and Poultry Meat Demand on Commercial Poultry Business

The sampled poultry farms reported that the underdeveloped egg marketing system has been highly impacted by the logistical challenge of poor road and transport infrastructure. This is so in spite of the better developed financial technology which makes remote trading and financial transaction easier. The poorly developed marketing system has created cycles of scarcity and gluts periodically which are compounded by the short shelf life of eggs.

It is worth noting that the problem of cycles of scarcity and glut is not uncommon in the markets for agricultural products. It is the phenomenon known as the cobweb cycle which describes the fluctuations in the quantity supplied by producers to the market as depending on prices in

previous production periods. It occurs most commonly in agriculture, because the decision of what to produce in the coming year is usually determined given the results of the current year. In the layer market in Nigeria, producers tend to plan the culling of their old layers towards the Christmas and end of year festivities because there will be an increased demand for poultry meat and hence better price during the period. The effect of this is that there is a significant fall in the supply of eggs (scarcity) around January and February each year. This result in higher egg prices which in turn stimulate producers to quickly replace their stock of DOC and POL pullets. By the time all the birds start laying maximally starting around April up to August, over-supply (glut) may occur within this period. The farms interviewed also pointed out that there is keen competition in the egg market which has led to the development of price and brand differentiation but quality or size grades have not been established.

Factors that Triggered Growth in the Poultry sector in the last five years

All the case farms agreed that the poultry sector has experienced growth in the last five years. They further gave some factors that have triggered the growth experienced in the poultry sector as: increasing urban population which increased the demand for poultry products; market differentiation by branding and the introduction of further processed or value-added products (cut-up or portioning of the carcass, smoked chicken, chicken nuggets) as well as the COVID-19-induced rapid growth in take-out and home delivery services of the fast-food restaurants. The delivery services were aided by the widespread use of social media and financial technology for payments of ready-to-eat poultry products that are marketed online.

During the COVID-19 induced lockdown, a number of unrelated developments which impacted the markets in different ways came up. First, the Government exempted agricultural workers from the lockdown movement restriction. This exemption was only applicable to the agricultural production operations whose workers could be formally identified as such and permit could be given. Small scale producers had some challenges in this respect with law enforcement agents. This implied an advantage for the big commercial poultry operators most of whom normally provided transportation for their staff in marked vehicles. Also, during the pandemic, the use of cashless financial transactions was accentuated because banking halls were largely closed to customers and people were directed to ATM machines, POS operators and to utilize Internet and mobile electronic money transfer services. Again, the formalized businesses were better placed to take advantage of these conditions.

Success Factors of Poultry Business

Some of the success factors given by the case study farms are discussed in this section.

Integration of Poultry Value Chain Activities

All the farms attributed their success to some level of integration of value chain activities (feed milling, hatchery production of DOC, grow-out of point-of-lay pullets) but the extent of specialization between egg and meat products differed in individual farms even when both products were offered in the same farm. Indeed, no single farm focused on just production of egg or meat

without ensuring the availability within the organization of key inputs especially feed and DOC.

Possession of Cutting-Edge Technology or Constant Innovation

The key to success identified by all the respondents is the possession of cutting-edge technology (automatic feeding, automatic harvesting of market birds, automatic egg collection and manure handling, slaughter and cut-up process, blast freezers) or constant innovation in production and marketing techniques (automatic egg branding and packaging, vacuum packaging of whole fresh and smoked carcasses and cut-up portions before freezing). The use of cutting-edge technology provided the poultry farms some advantages of automation which include the reduction in the cost of labour and the challenges of managing labour. Machines are much easier to control than labour; they do not go on strike and they do not poach the products. Machines are more reliable; operations are more efficiently carried out and phyto-sanitary conditions are easier to achieve. With mechanized operations, waste and by-products of chicken meat processing like trimmings and offal as well as feathers can be processed and converted to additional revenue streams.

Access to Investment Capital

Some of the farms with greater use of technology acknowledged the access to investment capital as a key to success but complained that the “interest rates were killing”. Farms with less technology installed or with other sources of investment capital beside the banks did not mention access to capital as a key to success. For other respondents who relied on bank loans and suppliers’ credit, “a good reputation with the bankers and credit suppliers” was a key to success.

In Nigeria, unless an agricultural producer is able to access special credit window such as the Anchor Borrowers’ Scheme, the normal commercial interest rate could be so prohibitive that no meaningful investment could be done at the required scale of operation. Also, most banks avoid tying down their funds for any period longer than a month; they prefer short duration loans for import or purchase of stocks of fast-moving consumer products rather than long term loans that are normally used for investment in agricultural infrastructure and technology.

Others success factors

Three out of the five case study farms identified the quality of the human resource within their organizations as a key to success. Quotes such as: “Constant and intentional human resource development” and putting together “the team of personnel with talents and experiences from different nationalities” indicate the two approaches to assembling the human resources required to run a modern commercial poultry business. Another key to success mentioned was operating different production units within the farm as separate competing profit centres whose performances are evaluated regularly.

Cross-case-study Analysis

Cross-case-study analysis was carried out following the method of Singh (2018) using the specific research questions that were adjusted to align with the questions on the interview guide. The results are shown on Table 4.3. All the respondents realized the **high risk that high feed cost**

constituted to their businesses and their investments. Addressing this long-standing problem will bring relief to the poultry industry and its customers and improve profits of the businesses in the sector.

Four of the five farms identified **trade policies related to the protection of domestic enterprises from foreign competition as having a positive effect** on domestic investment that led to entrants of new farms and expansion of existing farms. The identified policy here was the ban on import of poultry products. No respondent identified this policy as denying the Nigerian poultry industry of the competition it needs to improve its efficiency; and as restrictive to foreign investors, markets and trade which may invoke sanctions from the World Trade Organization. The general closure of the Nigerian land borders for up to two years was assumed by 4 out of 5 farms to be similar to, and considered to have had the same salutary effect as the ban on import of poultry products. One farm claimed that the general border closure had negative effects on the import of needed macro and micro ingredients of the feed mills as well as the import of drugs and vaccines.

The size of the **domestic market, demand growth** (both increased population as well as growing per capita incomes), and the growth of **the urban middle class** was deemed to affect the profitability of poultry business investments in egg production by 2 out of the five respondents while 4 out of the five respondents deemed the size of the market, demand growth and growth of the urban middle class affected profitability of investment in poultry meat production.

Again, 4 out of the five respondents agreed that the expansion of the fast-food chain and the rise of supermarkets affected poultry investments positively, particularly in urban areas. The only respondent that did not mention this factor specializes in egg production.

Examining the role of integration, 4 out of the five respondents agreed that vertical integration is associated with higher success rates in the industrial poultry business. All the respondents that agreed with this point already had their farms vertically integrated.

Innovations (both institutional and technological) have a vital role to play in the growth of poultry operations as 4 out of the five respondents agreed with this assertion. In Nigeria, a lot of these innovations fuelling growth are imported but locally developed innovations have been recorded in genetics and nutrition. The registration of two breeds, Shika Brown and FUNAAB Alpha by research institutions and the marketing and distribution of a third breed, Noiler, developed by a private poultry farm, are examples of innovation in genetics.

All the five respondents expected the mitigation of the risks to the sustainability of the poultry industry to come from government intervention while 2 out of the five expected the industry through PAN to engage government in seeking mitigation to these risks.

The recommendation for increased profits with the highest number of cases (3), was that feed quality and price should be controlled. The next recommendation with 2 cases was that access

of farmers to credit be liberalized. The support for the two recommendations cuts across geographical locations and size of the farms.

Table 4.3. Outcome of Cross-case-study analysis of the responses of the poultry farms

Question	No of Cases
a) Do poultry businesses recognize high feed cost as a risk that affected the viability of their investments?	*****
b) How have policy measures related to the protection from the foreign competition via tariffs (e.g., import ban on poultry products) affected foreign and domestic investment in the poultry business?	****
c) How did the size of the domestic market, demand growth (both increased population as well as growing per capita incomes), and the growth of the urban middle class affect the profitability of poultry business investments? (i) in egg production (ii) in meat production	** ****
d) How did the expansion of the fast-food chain and the rise of supermarkets affect poultry investments, particularly in urban areas?	****
e) Is vertical integration associated with higher success rates in the poultry business? If so what are the main reasons?	****
f) What role did innovations (both institutional and technological) play in the growth of poultry operations?	****
g) From where did poultry businesses expect mitigation of the risk to their survival to come? (i) From government intervention? (ii) From the Poultry Association of Nigeria	***** **
h) What are the recommendations for increased profit? - Land allocation for feed crops cultivation - Improved ease of doing business - Easier credit to farmers - Feed quality and price control - Improvement and development of breeds - Grain storage - Government policy for economic improvement - Collaboration among stakeholders - Improved national security	* * ** *** * * * * * *

Government policies affected your poultry business

The government policies that affected poultry business as presented by the representatives of the sampled farms are discussed in this section.

Agricultural Finance Policies like Anchor Borrowers

Some respondents welcomed the government's agricultural finance policies like Anchor Borrowers Scheme which they affirm has led to an expansion in their production capacity and access to production inputs.

Ban on Poultry Products Imports

Most respondents agreed that the ban on poultry products import (which did not cover eggs) resulted in the establishment of more broiler farms and hence higher broiler production.

General Border Closure

All the respondents stated that the effect of the general closure of the border was to stop the supply of soyabean and groundnut cake from neighbouring countries, shrinking further the supply of these inputs and forcing their prices to go up.

Land Use Act Implementation by State Government

According to the respondents, the implementation of the Land Use Act by the state governments varied from making the issuance of land documentation easier to state governments imposing other taxes on land use which invariably increased the costs of the poultry companies.

Licensing for Grand Parent Stock Import

The respondents stated that the policy of licensing GPS import ensured the supply of GPS to farms with GPS facilities. Only one of the four farms originally licensed is still importing GPS.

Others Government Policies

Other policies that the respondents approved as favouring the poultry industry were the lifting of the embargo on importation of maize and the supply of maize from the strategic grain reserve, both of these provided a good, though short-lived relief to the escalating price of maize. The government policies of encouraging the export of soyabean and the unfavourable naira to dollar exchange rate forced up the price of poultry feed ingredients and ultimately, poultry feed prices.

Major challenges to Poultry Business

The major challenges to poultry business as identified by the respondents include the absence of steady supply of electricity coupled with exorbitant electricity tariffs and the need to run operations on diesel generators; the poor roads that increase the cost of transportation of inputs and outputs; the ever-present insecurity of lives and properties; the high prices of inputs especially feed ingredients coupled with the 'quackery' that forces producers to buy poor quality at high prices; the scarcity of forex for business transactions; high interest rates charged for bank loans which restricts access to needed finance; and the price war among producers.

Mitigation Measure for Challenges

On how to mitigate the identified challenges, all the respondents called on government to intervene by regulating the supply, quality and price of inputs like power, feed, vaccines; to ensure access of farmers to lower interest rate loans and forex. Some respondents (2 of 5) called upon PAN to 'proactively' engage with government on the right policies for all these crucial factors.

Recommendations to Make Commercial Poultry Business More Profitable

The recommendations made by the respondents to make commercial poultry business to be more profitable are that government should:

- facilitate access to land for cultivation of feed ingredients,
- improve access to finance,
- provide silo for storage of feed ingredients especially soya and maize,
- develop and enforce regulations and standards for quality of inputs, especially feed,
- Promote the improvement of available breeds and introduction of new and more profitable breeds,
- provide security nationally; and
- improve the economy in order to increase the purchasing power of the consumers.

They also recommended that poultry industry stakeholders should cooperate rather than engaging in price wars.

Brief Presentation of the Individual Cases

1. Case 1 started in Sector 3 as a sole proprietorship and by 2020 had become established as a Sector 1 enterprise in egg production but with interests in commercial feed milling, vitamins and minerals production, production and procurement of veterinary medicaments and vaccines. It is one of the best managed commercial replacement pullets rearing and egg laying operations in Nigeria. The founder/President and Chief Executive obtained DVM and MBA degrees. The farm has won the Farmer of the Year award of the Central Bank of Nigeria twice in 1987 and 1989 at the state level and once in 1992 at the national level in terms of loan utilization and repayment. The farm has also won the National Best Farmer award of the National Council of Agriculture – the highest agricultural policy organ in Nigeria in 1995. The co-founder and Executive Director (M.Sc. Agric. Economics) spoke for the farm.
2. Case 2 is an integrated producer of broilers and breeder birds. The general manager has a DVM. The promoters are involved in other sectors of the economy. The source of start-up capital was the promoters' savings and bank loan. Start-up year was 1990, start-up capacity: 40,000 broiler birds; current capacity: 120,000 layers parent stock, 160,000 broilers parent stock and 600,000 broiler birds. Current output: 670,000 kg of live chickens monthly which comes to over eight million kg annually. The Executive Director –Technical (with an MSc Animal Science) and the National Sales Manager (with a DVM) spoke for the company.
3. Case 3 is an integrated broiler and breeder bird production company. The promoter,

Chairman/CEO has a Diploma in Journalism with previous work experience in print, radio and TV media. The farm is involved in other sectors of the economy especially real estate and food industry. Source of start-up capital was the promoter's savings. Start-up capacity was 25,000 broilers and 5,000 breeders. Current capacity is 200,000 broilers, 30,000 breeders. Monthly output is 190,250 broilers and 235,544 DOC. Other products are: frozen chicken and chicken parts, 22,142 non-hatchable eggs per month. The general manager (with an MBA), is the son of the promoter and spoke for the farm.

4. Case 4 is a limited liability company registered for integrated layers and broiler production. The promoter has DVM and MSc degrees. Source of start-up capital was the promoters' savings and bank loan. Start-up year was 2006. Start-up capacity was 10,000 layer birds. Current capacity is 400,000 made up of 330,000 layer birds and 70,000 broilers. Monthly Output is 3500 crates of eggs and 70,000 slaughter point broilers. The promoter spoke for the farm.
5. Case 5 is a limited liability company for integrated layer and broiler production. Source of start-up capital was the promoters' savings and bank loan. Start-up year was 2016. Start-up capacity was 85,000 layers and 10,000 broilers. Current capacity is 85,000 layers and 15,000 broilers. Monthly output is 59,500 crates of eggs and 10,000 broilers. The General Manager spoke for the farm.

Lessons Learned from the Study

- a) What types of business models have in the recent past been particularly successful in Nigeria?

All the poultry companies interviewed in the case study are limited liability companies operating an integrated value chain system. They are specialized for either eggs or meat production but no single company focused on just production of egg or meat without ensuring the availability within the organization of key inputs especially feed or day-old chicks (DOC). The estimated 2019 revenues of the leading 20 poultry companies in Nigeria indicated that 35 per cent of them earned \$1 million each, 60 per cent earned less than \$5 million each while the top 25 per cent earned \$25 million and \$50 million each per year.

(Asoko, <https://www.asokosights.com/content/market-insights/nigeria-poultry-value-chain>)

Two business models have been used successfully by the commercial poultry companies in Nigeria: direct sale and retailer models. In the direct sales model, the products, live and slaughtered chickens and branded and unbranded shell eggs are sold in wholesale quantity at the farm gate or through contracts to the distributors. In the retailer model, the poultry company develops its own retail outlets or supplies independent retail outlets with slaughtered and dressed chickens and/or packaged, branded eggs. All case-study companies produce live birds either as DOC, point of lay pullets (POLP), slaughter weight broiler birds or spent layer hens. All the companies used the direct sales model for the sale of the live birds. Sixty per cent of the case-study companies, in addition to production of live birds, also slaughter and sell chilled and frozen chicken carcasses and cut up carcass portions. These companies use both direct and retailer models for the sale of the slaughtered and dressed chickens. Forty per cent of the companies have no slaughter facilities. They only produce live birds and shell eggs which they sell using the direct sale model for live birds and unbranded eggs but use the retailer model to sell their own brand of packaged eggs.

The use of direct and retailer business model has contributed to the success of the companies as the combination of business models allowed the vertical integration of value chain activities to support the different sale models as well as the contribution to the growth in capacity of the business at the different value chain ends. The companies' capacity and the average annual growth of capacity are important factors in their successes and do not seem to depend on the age of the farm, the start-up capacity and the type of promoter whether single or multiple, local or foreign, private or former government officials.

The poultry meat product types in demand in Nigeria are live birds for the local markets and the slaughtered and processed chilled or frozen whole carcasses and cut-up portions for the

supermarkets, fast foods and restaurant chains. To adopt the retailer model for selling slaughtered carcasses, sixty per cent of the companies studied invested in slaughter plants and cold rooms. The added investment was justified by the added control over the sale of their products as selling of live birds to distributors often came with logistic hitches that resulted in feeding live birds beyond the due slaughter weight and days. Coordinating the grow-out period with the slaughter process ensured complete control over the sale of the product whether as live birds or as slaughtered carcasses. Some of the companies, as soon as they acquired the slaughter facilities, offered the service to other companies without slaughter facilities but soon stopped this arrangement as the hazard analysis critical control point (HACCP) analysis indicated the critical biohazard point for the slaughter plant was at the reception of live birds from external sources and, hence, stopped receiving live birds for slaughter from outside the company farms. In many cases, the need to invest in more growing houses to meet the demand for slaughter birds was quickly realized and led to increased capacity for live bird production within the company farms.

While forward integration towards slaughter facilities and cold rooms enabled the companies to adopt both direct and retailer business models, backward integration towards feed milling and parent breeding stock required only direct sale business model as the companies restricted their sale of feed and parent stock to large distributors who, in the case of feed, became sale agents for the companies as the feed is usually sold in 25 kg bags bearing the poultry company's name and logo. Backward integration into feed production provided a safety margin in times of feed scarcity as the companies simply restricted its feed to its own growing out operation rather than to external buyers. The direct sale business model which is operated on a cash-and-carry basis is perfectly suited to this arrangement and ensured that the companies were able to make money from their products, poultry meat and eggs, regardless of the level of supply of feed ingredients available generally.

b) What innovations have been critical to the growth of poultry businesses?

Technology improvements and innovations in financial transactions were major factors in the development of commercial poultry in Nigeria especially in the last five years. Technical improvements that have been important include: automatic control of the feeding of birds both in cages and on deep litter floor; automatic harvesting of market birds on deep litter floor by machine harvesters; automatic egg collection from layer birds raised in cages by conveyor belts; automatic sorting, branding and packaging of shell eggs; conversion of liquid eggs into egg powder; automatic movement of manure of caged birds by conveyor belts for evacuation into open air oxidation ponds or air drying on the conveyor belts and bagging of the dry manure into 25 kg bags for use as manure fertilizer; overhead rail slaughtering and dressing of birds followed by chilling or blast freezing of packaged whole carcass or cut-up portions.

The most critical innovation that led to sustained capacity and financial growth in commercial poultry businesses in Nigeria is the adoption of full vertical integration of all the value chain operations within the same organization. All respondent companies attributed their success to some level of integration of value chain activities (feed milling, hatchery production of DOC, grow-

out of point of lay pullets (POLP) as well as slaughtering and processing) and maintained that their vertical integration of the value chain activities in the poultry business allows them better control of the risk factors and their mitigation.

Poultry egg production, which was introduced first before broiler meat production, started on a small scale but quickly grew into medium scale. At the small and medium scales of egg production, feed milling, day-old chick hatching and slaughter and processing of spent layer birds for meat were separate and distinct business from poultry egg production and were carried out by value chain actors different from the actors in poultry production. It is with the entry of investors focused on the Sector 1 poultry business and particularly broiler meat production that vertical integration became feasible as such investors had the required capital.

Vertical integration of poultry meat production companies involves production of feed, parent stock birds, birds that are specialised for meat production and the processing of live chickens into fresh and frozen whole and cut up chickens. Since the introduction of cooked chicken service by the indigenous company, Chicken George, in 1980, there has been continued growth in the demand for poultry meat products by the fast-food service industry. It is the integrated poultry companies that were able to offer for sale at the volume required by the fast-food industry, the live broiler birds and the slaughtered and processed chickens as well as more value-added products such as cut-up chicken parts and even offal (gizzards, necks, feet and heads).

Vertically integrated layer farms incorporate parent stock and layer birds' production and are able to sell eggs, spent layers as well as poultry manure. They are also able to avoid egg glut by signing contracts with vendors and final egg consumers such as HRI users – hotels, restaurants, institutions and confectionary industries – that use large amounts of eggs on a daily basis. One of such end user is the home-grown school feeding programme (HGSFP) that was first introduced in Osun State but is now operating in up to ten states. The HGSFP attempts to include eggs into the school meal plan three times a week if they can be assured of egg supply at the right quantity and price. Another emerging HRI users are the factories for the production of powdered egg. Hence, the integrated poultry layer companies minimise or eliminate the recurring egg gluts suffered by non-integrated layer farms in sectors 2, 3 and 4.

Innovations in financial technology (Fintech) that facilitate internet and mobile banking for electronic payment have provided opportunities for expansion of the poultry business within the last five years. The increasing urban population that resulted in greater demand for poultry products and the growth in the fast-food service industry combined to press for differentiation of the market for poultry products either by branding, especially of packaged shell eggs, or by introduction of further processed or value-added poultry meat products (cut-up or portioned chicken carcass, smoked chicken, chicken nuggets etc.). The COVID-19 pandemic, rather than reducing the sales and growth of the sector 1 poultry companies, instead induced their capacity enlargement due to a rapid growth in the “take-out” and “home delivery” services of the fast-food restaurants. The fast-food restaurant growth during the pandemic was aided by the wide spread use of Apps for ordering, and financial technology for payments for ready-to-eat poultry

products that are marketed online. For the Sector 1 poultry companies covered in the case study, the COVID-19 pandemic did not reduce customer demands as the sector's main consumers are the upper middle class whose jobs were not threatened during the pandemic as they could work from home and possessed skills that could not be easily dispensed with by their employers or were, in fact, the owners of their own companies.

c) What policies were critical to attract investors to develop poultry businesses and under what conditions?

Government policies that attracted investors into the agricultural businesses include provision of credit, import and export policy, and tax regulations, among others. The agricultural finance policies of the Central Bank of Nigeria (CBN) such as the Anchor Borrowers Scheme (ABS) have had much greater positive impact on investments in the crop sector – cassava, rice and maize production. The ABS is a typical example of a credit policy that CP companies have utilised to set up out-growers' schemes for production of maize, a critical ingredient in poultry feed. For example, under the ABS, a Sector 1 poultry company [who is the Anchor Borrower] bears the main risk as the guarantor of the loan which is paid directly to the smallholder maize out-growers usually under an off-taker contract with the anchor. Forty per cent of the case-study companies have used the ABS to produce maize for their feed mill or to raise day-old chicks or 4-weeks-old broilers to market weight on the farms of their collaborating out-growers. When out-growers are used to raise broilers, the integrator who is the anchor usually owns the birds and provides feed, medication and other supplies; the out-grower owns the chicken house and provides litter, labour and utilities. The poultry company, the anchor, offtake the maize or the market weight broilers in lieu of the credit extended to the out-growers. The main condition is that the anchor company must be operating or be ready to operate at such a large capacity as to be able to off-take the products of at least a hundred out-growers.

The risk of the maize out-growers not selling the product to the anchor is always very high for two reasons. The more common reason is that the out-growers have a higher price offered by non-anchor buyers who did not guaranty credit nor provide production inputs to the out-growers. The second reason is because the out-growers are not satisfied with some part of the out-grower contract especially the interest rate charged for the loan. In either case, the anchor does not receive the contracted goods but bears all the risk for non-repayment of the credit as the guarantor of the out-growers to the ABS. To reduce the risk to the anchor, the CBN introduced another credit policy; the Nigerian Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) where the anchor borrower bears only 50% of the risk while NIRSAL bears the remaining 50%. NIRSAL Plc is a US\$500 million non-bank financial institution wholly-owned by the CBN which focuses mainly on extending financial access to smallholder agriculture. The ABS qualifies for NIRSAL support because of the relationship between the anchor and the contract farmers who are smallholders. NIRSAL has brought a great relief to the anchors of ABS as all operations of the ABS now incorporate NIRSAL. This synergy between ABS and NIRSAL has, however, not addressed the real credit behaviour problems of the smallholders when receiving loans from government schemes and sources. These behaviour problems are: lack of respect for contractual agreement

and a reluctance or refusal to pay the cost of credit (the interest rate) and also pay back the capital by the smallholder out-growers.

The CBN, in an import-export policy statement that assumed that ABS and NIRSAL are working efficiently without any problems, declared that it “would no longer allow the importation of maize into the country and would do what was necessary to frustrate any effort in that direction”. This policy declaration has made the cultivation of maize within Nigeria more attractive to investors due to the assurance of a market protected from competition with imported maize which landing cost is much lower than domestically produced maize. A supporting policy implemented by state governments is the provision of access to land for cultivation of feed ingredients; the provision of silo for storage of feed ingredients especially soya and maize and the development and enforcement of regulations and standards for quality and price of poultry production inputs, especially feed. In Lagos State, for example, investors are supported to acquire land in the rural agricultural areas of Epe, Badagry and Ikorodu, and to have access to poultry estates or cluster farms where farmers can take advantage of extension service, government empowerment and support programmes and infrastructure development in energy, water and roads. The poultry estates were designed primarily for Sectors 3 and 2 start-up poultry farms.

The latest in a long series of protectionist policy placing a ban on the import of poultry products has been in operation since 2003. This policy has not been successfully implemented as the amount of smuggled frozen poultry products has not significantly reduced. Two years ago, citing the damage done to domestically produced agricultural products like maize, rice and poultry, the Federal Government closed the border between Nigeria and Benin Republic. This closure of the border was supported by sixty per cent of the case-study companies who attributed their growth in capacity in the last two years to the closure of the land borders. Twenty per cent of the companies studied were apprehensive of the effect of land borders closure on the regularity in supply and lower price of imports that are crucial to the continued success of the poultry business in Nigeria. These crucial imports include soyabean, vaccines and medicines, and vitamins and minerals which are used as additives in poultry feed. Another twenty per cent of the case study companies were apprehensive of the deleterious effect of monopolistic tendencies on the sustenance of the poultry companies that require implementation of trade barriers such as border closure and import bans. These case study companies acknowledged that “competition led poultry companies to the development of price and brand differentiation” as they confronted the relatively unstable prices of inputs especially feed, the high capital-intensive nature of the business, the perception by the banks that poultry is a high-risk business, the high interest rate on loans (usually 2-digits rates) by the commercial money deposit banks, and scarcity of appropriate drugs and vaccines. The protectionist policies of the government may be allowing some less efficient poultry companies to survive and may be responsible for the higher prices of poultry products produced within Nigeria in comparison with the prices of poultry products imported legally or illegally.

d) Under which conditions can growth factors (policy interventions, innovations) of the different types of poultry businesses be mobilized to help other poultry businesses grow?

The identified growth factors of poultry businesses in Nigeria are: access to capital, land and supportive government policies at start up and in the years after, as well as introduction of innovations in production, processing, quality control and marketing channels. These factors can be mobilized to support new investors as well as existing poultry businesses in their growth if the following conducive environment are available. The first is the political will. Since the Government of Western Nigeria introduced modern poultry production in cages and deep litter houses in 1957, and thereby inaugurating poultry production as a business, the federal and many state governments had provided the political will to keep poultry production business as private businesses (even during the military interregnum, 1966-1979, 1983-1999) and provided the conducive environment for their growth. Successive agricultural development plans of the federal government had maintained this position and directed government parastatals like the CBN, the Nigeria Custom Service, NIPC and even the private sector service like the deposit money banks to provide credit to the poultry business either directly from their own resources or indirectly as a conduit for funds from the CBN. One such indirect CBN funding is the Commercial Agriculture Credit Scheme (CACS) which was channeled through the deposit money banks. Direct CBN funding schemes include the ABS and the NIRSAL. In addition to these avenues for provision of government funds to the poultry industry, governments at federal and state levels place a lot of emphasis on the ability to attract foreign direct investment (FDI) into the economy. This policy environment encourages the flow of investments from external sources into businesses operating in Nigeria. The National Investment Promotion Act, 1995 enables a foreign entity to invest and participate in the operation of any enterprise in Nigeria and investors may buy the shares of any Nigerian enterprise in any convertible foreign currency, provided that the investment is registered with the Nigerian Investment Promotion Commission (NIPC). Investment in a company can be through mergers and acquisition, direct investment in shares, or by way of a loan. This implies that foreign investors can invest in Nigeria's poultry sector without any limitations. As shown by a case in the case study, the start-up capital of a poultry business can be sourced either from domestic or external sources. Land is a critical factor of production. The Land Use Act, 1978 guarantees the right of every Nigerian, including companies registered in Nigeria, to unrestricted access to purchase and possess land in all parts of Nigeria whether for agricultural or other purposes. This access to land is conveyed through a certificate of occupancy from the state Governor. Thus, all investors, indigenous or foreign, can have access to agricultural land through their company once it is registered in Nigeria. Some state governments have gone further to make access to land for poultry businesses much easier by establishing poultry business incubation centres which are called Poultry Estates where land and other services are provided to the poultry business start-ups.

One of the services provided to poultry businesses at the poultry estates and at other sites is the research and extension service. The federal government has 4 research institutes that carry out research that is applicable to poultry business. These are the National Veterinary Research Institute

(NVRI) which produces and sells the main vaccines against poultry diseases (Newcastle disease and others), the National Animal Production Research Institute (NAPRI) which has a Poultry Research Programme that has produced a poultry layer breed that was registered in 2000, the Federal Institute of Industrial Research, Oshodi (FIRO) and the Project Development Agency (PRODA) which have produced industrial prototypes for poultry incubators, feed mills and smoking chambers for poultry carcasses. One of the chronic challenges of the poultry industry is the scarcity and high prices of poultry feed ingredients. The Raw Material Research and Development Commission (RMRDC) has coordinated the results of research funded by the Presidency through a Presidential Task Force on Alternative Formulation of Livestock Feeds making the results available for industrial take-up. An example is the uptake of the use of cassava meal as a poultry feed ingredient by industrial feed mills. The National Agricultural Extension and Research Liaison Service (NAERLS) of the Federal Ministry of Agriculture and Rural Development (FMARD) coordinates the interface between the federal owned and managed research institutes and the extension services which are state owned and managed.

Sector 1 poultry businesses, like all other industrial sector, require quality standards and control. The Nigerian Standards Organization (NSO) has developed standard operation procedures and quality standards for industrial manufacture of poultry feeds and every other slaughtered poultry product. All industrial production sites must comply with the Nigerian Industrial Standards (NIS) while the food products of the poultry industry must be manufactured in compliance with the regulations of the National Agency for Food and Drug Administration and Control Commission (NAFDAC). In addition to government regulatory agencies, there are industry level associations and organizations that support and monitor the poultry industry operators. They include the Commercial Egg Producers Association of Nigeria (CEPAN), the National Poultry Breeders and Hatcheries Operators of Nigeria (NPBHON), the Fowl Sellers Association of Nigeria (FSAN). There are scientific bodies that contribute to the provision of knowledge and innovation to the poultry industry such as Animal Science Association of Nigeria (ASAN), the Nigerian Society for Animal Production (NSAP), the Nigerian Veterinary Medical Association (NVMA), the Animal Products and Processing Association of Nigeria (APPAN). Finally, there are statutory bodies established by law to regulate the practices of professionals in the poultry industry such as the Veterinary Council of Nigeria (VCN) and the Nigerian Institute of Animal Science (NIAS).

The standard insurance cover against fire, flood, theft and other hazards have always been available to manage these risks for property, machines and infrastructures in poultry businesses and can be underwritten by any general insurance company. Such insurance products do not cover the poultry and poultry products on the poultry farm. The federal government owned Nigerian Agricultural Insurance Corporation (NAIC) has developed and has regulatory oversight over insurance products that cover livestock and livestock products (including poultry) against disease outbreaks, fire, flood and theft. There are 3 private insurance companies offering insurance products covering the poultry and poultry products.

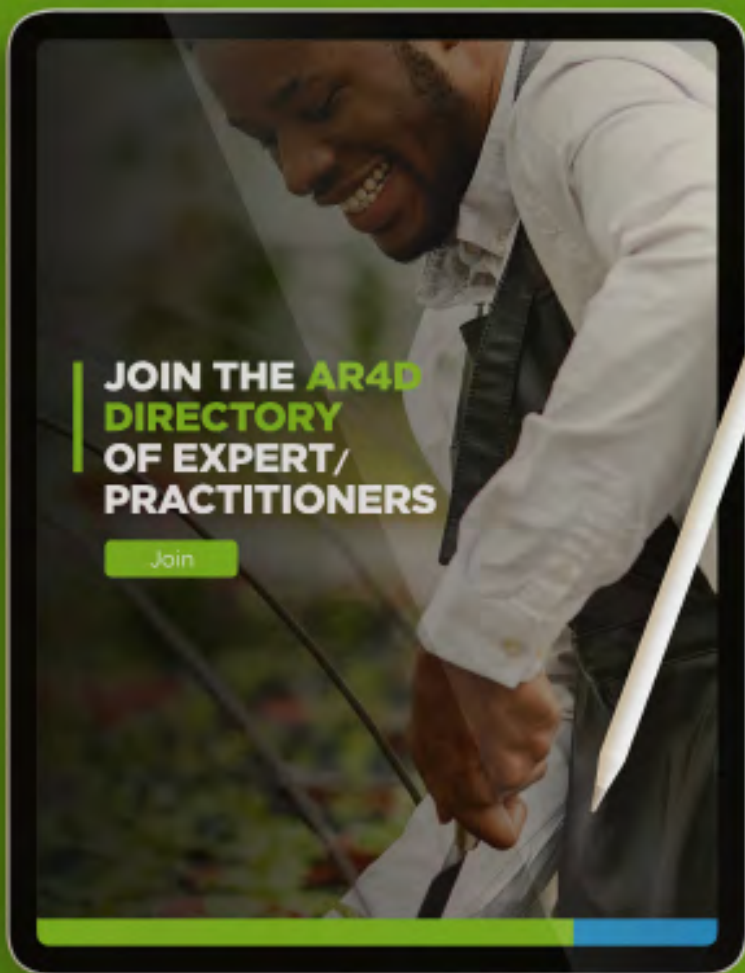
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