

The structure and importance of the commercial and village based poultry systems in Nigeria



**THE STRUCTURE AND IMPORTANCE OF THE COMMERCIAL AND VILLAGE
BASED POULTRY INDUSTRY IN NIGERIA**

FAO (ROME) STUDY

OCTOBER 2006.

D.F, ADENE ,
Poultry Diseases Unit, Dept.of Veterinary Medicine,
University of Ibadan,
Ibadan Nigeria

and

A. E. OGUNTADE
Dept. of Agricultural Economics & Extension,
Federal University of Technology,
Akure, Nigeria

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LIST OF ABBREVIATIONS

ABU	Ahmadu Bello University
CDC	Center for Disease Control, USA
DFID	Dept for International Development
DOC	Day old chicks
EU	European Union
FAO	Food and Agricultural Organisation
FVM	Faculty of Vet Medicine
GDP	Gross Domestic Product
GoN	Government of Nigeria
GPS	Grand Parent Stock
HPAI	Highly Pathogenic Avian Influenza
IBAR	Inter-African Bureau on Animal Resources of AU
LGA	Local Government Area
LIDP	Low Inputs Dependent Production
ND	Newcastle disease
NBS	National Bureau of Statistics
NVMA	Nigerian Veterinary Medical Association
NVRI	National Veterinary Research Institute
PACE	Pan African Programme for Control of Epizootics
PAN	Poultry Association of Nigeria
PS	Parent Stock
SAP	Structural Adjustment Programme
TCP	Technical Cooperation Project
USAID	United States agency for International Development
UI	University of Ibadan
WHO	World Health Organisation
WPSA	World Poultry Science Association

CHAPTER ONE

1. INTRODUCTION

1.1 Background Information

Agriculture continues to be the most important sector of the Nigerian economy in terms of provision of employment in spite of its declining contribution to the nations foreign exchange earnings. About 65% of Nigerians are estimated to depend on agriculture for their livelihood while 34.8% of the GDP and over 38% of the non-oil foreign exchange earnings, are contributed by the agricultural sector.

Agriculture contributed an estimated 32% of Gross Domestic Product (GDP) in 1998 to the Nigerian economy. An estimated 35.2% of the labour force was employed in the sector in that year. The principal cash crops are cocoa (which accounted for only 0.7% of total merchandise exports in 1995), rubber and oil palm. Staple foods include rice, maize, taro, yams, cassava, sorghum and millet. Timber production, the raising of livestock (principally goats, sheep, cattle and poultry), and artisanal fisheries are also important. According to World Bank estimates, agricultural GDP increased at an annual rate of 2.9% in 1990-98. The sector remains the largest contributor to the Nigerian economy, accounting for over 38% of the non-oil foreign exchange earnings, and employing about 70% of the active labour force of the population. Although, the sector has suffered much neglect by the Federal Government since the discovery of petroleum in commercial quantity in 1958, but its importance cannot be over emphasized in the Nigerian economy.

The poultry sub-sector is the most commercialised (capitalised) of all the sub-sectors of the Nigeria's agriculture. There is however no comprehensive data on the sub-sector; thus making proactive intervention and planning in the sub-sector due to lack of accurate information or current data.

With the global spread of Highly Pathogenic Avian Influenza (HPAI) across several countries since 2003 and especially, the confirmation of the epidemic in Nigeria in February 2006, there is a new attention focussed on the sub-sector by the Government of Nigeria (GoN) and the international community. As part of this new initiative, FAO intends to collate the available current information in order to provide an overview of the poultry sub-sector in Nigeria. This report titled "**The Structure and Importance of the Commercial and Village Based Poultry Industry in Nigeria**" is prepared for this purpose.

1.2 Scope of Study and Terms of Reference

This study was designed to be a desk review of the poultry sector in Nigeria. It was to be used for further investigation on, either the epidemiology of Avian Influenza and/or other poultry diseases and their socio-economic impact. The report emanating from the study, based on statistical data, reports, literature information and interviews with key

stakeholders, is to provide a 5-year overview of developments in the poultry sector. It includes a review of the structure of different poultry production systems; husbandry practices, poultry health measures; evolving marketing chains; the role of poultry in rural livelihoods and household food security, and policy/economic factors which have contributed to changes in the sector.

The detailed terms of reference is presented in Appendix 1

1.3 Data Sources, Collection Approach and Analysis

The data for this study were collected mostly from secondary sources. The sources include: Federal Livestock and Pest Control Department, National Bureau of Statistics, Poultry agro-industrial entities, selected or representative rural poultry keeping households, as well as institutional sources of published and unpublished documents, etc. Data collection was guided with checklists of information that were designed to elicit information to meet the terms of reference. In selected cases, complementary data were actively sourced through interviews with stakeholders.

The data analyses were both qualitative and quantitative. Quantitative analysis and extrapolations were carried out wherever possible to provide information on the structure and size of the operations in the poultry sub-sector.

1.4 Limitations and Constraints

The major limitation is paucity and in some cases, the accuracy of information, which can provide a comprehensive overview of the poultry sub-sector. The Federal Livestock and Pests Control Department has not carried out any nation-wide survey of the sub-sector in recent years. The National Bureau of Statistics, until 2005, had not conducted any survey on the sector for several years. In addition, the year-2005 survey, which covered the sub-sector and is still being processed, has significant gaps arising from lack of appropriate inputs from poultry subject matter experts and socio-economists. Thus as much as possible, proxy variables were used to obtain indicative quantitative overview of the sub-sector. It therefore became crucial to cross-integrate data from other related sources to achieve improved accuracy. These were also combined with information obtained from experts and operators in the sub-sector to develop this report. Nigeria is a very extensive country which demands equally extensive travels to reach data sources. The lack of e-data sources further compelled physical contacts directly or through proxies in the diverse and country-wide locations.

In spite of these, this exercise has generated very considerable data and yielded a very good and full overview of the poultry sub-sector. In the report wherever necessary, the specific data requirements for the future are highlighted and suggestions or justifications are made to guide such future contingencies.

1.5 Layout of the Report

This report is presented in eight chapters. The introduction to the report is presented in Chapter One. Chapter Two is devoted to providing an overview of commercial and rural

poultry production in Nigeria while chapter three provides an indication of the importance of poultry in household food security in Nigeria. Information on the marketing of poultry inputs, products and services is presented in chapter four while the support programmes for poultry industry is presented in chapter five. An overview of health issues and HPAI in Nigeria's poultry is addressed in chapter six while the bibliography of recent studies on poultry in Nigeria is covered in chapter seven. The conclusions and recommendations of this report are presented in chapter eight which is followed by cited literature and the Appendix.

CHAPTER TWO

2. OVERVIEW OF POULTRY PRODUCTION IN NIGERIA

2.1 Preamble

The types of poultry that are commonly reared in Nigeria are chickens, ducks, guinea fowls, turkeys, pigeons and more recently ostriches. Those that are of commercial or economic importance given the trade in poultry, however, are chickens, guinea fowls and turkeys, amongst which the chickens predominate.

2.2 Description of the Main Characteristics of the Different Production Systems

There are two distinct poultry production systems in Nigeria, as in most developing countries of Africa and Asia. Each of these two systems is associated with features of scale, stock, husbandry and productivity that therefore define the two distinct production systems. The two systems are conventionally referred to as the Commercial Poultry and the Rural Poultry, respectively. The Commercial Production System as the name implies is industrial in its prototype and therefore based on large, dense and uniform stocks of modern poultry hybrids. It is capital and labour intensive; as well as inputs and technology demanding. On the other hand, the Rural Poultry is by convention a subsistence system which comprises stocks of non-standard breeds or mixed strain, types and ages. It is generally of small scale, associated with household or grass root tenure and little or no veterinary inputs. The rural poultry sector is therefore in its original sense, a village-based, household or individual holding and occupation which has however been extended to non-village settings in peri-urban localities, mainly by the middle class dwellers. The common features to all these intermediate grades are in their subsistence scale generally, with minimal or no inputs and labour overheads.

However, between these two rather distinct prototypes, intermediate grades have evolved over time, in response to the national agro-economy and consumer demands. Thus as can be seen later from existing statistical data and from findings in the current review of poultry sector, intermediate grades which constitute what has now been globally tagged “Family Poultry” is comprised of the rural or indigenous poultry types in some cases or a mixture of both indigenous and exotic hybrids or even totally exotic breeds.

Available information shows that the scale of operation can range from stocks of a few units or a few dozens of a variety of poultry birds (species) in the household poultry to tens or hundreds of thousands of chickens in the grades of commercial poultry. These two distinct production scales and systems as well as the range of the intermediate types have been conveniently grouped (FAO) into four operational sectors, viz:

- Sector 1: Industrial Integrated System with high bio-security systems.
- Sector 2: Commercial Poultry Production System with moderate to high bio-security systems
- Sector 3: Commercial Poultry Production System with low to minimal bio-security systems
- Sector 4: Village or backyard Production with minimal bio-security.

It is implied therefore that Sectors 1 to 3 cover grades of intensive and or commercial poultry production systems, while Sector 4 embraces types and scales of village or family subsistence but mostly extensive poultry production. The major features of these operational sectors are shown in Table2.1.

Table 2.1: Major Features of the Four Production Sectors

MAJOR FEATURES	SECTOR 1	SECTOR 2	SECTOR3	SECTOR 4
Integration Scale	High & Full	Medium	Minimal/Nil	Nil
<ul style="list-style-type: none"> • Grand Parent Stock • Parent Stock • Hatcher • Intensive system • Mixed species 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ x 	<ul style="list-style-type: none"> x x x ✓ x 	<ul style="list-style-type: none"> x x x ✓ x 	<ul style="list-style-type: none"> x x x x ✓
Inputs Scale				
<ul style="list-style-type: none"> • Own Feed mill • Own electricity • Own water system • OwnVet vacc&drugs 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ ✓/ x ✓/ x ✓/ x 	<ul style="list-style-type: none"> x x x x 	<ul style="list-style-type: none"> x x x x
Biosecurity Scale				
<ul style="list-style-type: none"> • Perimeter fence-guard • Specified housing • Movement restriction • Staff Hygn,showering • Facility Equip hygiene • All-in all-out site 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ /x ✓ ✓/x 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓/x ✓ ✓/x 	<ul style="list-style-type: none"> ✓ ✓/ x ✓/ x x ✓ ✓/x 	<ul style="list-style-type: none"> x x x x x x
Products				
<ul style="list-style-type: none"> • Parent stock DOC • Comm DOC • Table eggs per farm • Meat or broiler 	<ul style="list-style-type: none"> ✓ ✓ ✓/x ✓/x 	<ul style="list-style-type: none"> x x ✓✓ ✓✓ 	<ul style="list-style-type: none"> x x ✓✓ ✓ 	<ul style="list-style-type: none"> x x ✓ ✓
Further Processing	✓/x	✓ /x	x	x
Economic roles				
<ul style="list-style-type: none"> • Labour generating scale • Import & Export • Rural / Culture Impact 	<ul style="list-style-type: none"> ✓✓✓ ✓✓ ✓ 	<ul style="list-style-type: none"> ✓✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ x ✓/x 	<ul style="list-style-type: none"> x x ✓✓

It is therefore implicit that the Integrated Commercial Sector 1 features a maximum bio-security level as the complement to the management and operational demands for the GPS, PS and Hatchery which are the key components of the Sector. By extrapolation the Sectors 2 and 3 represent high and medium levels of commercial poultry production, which typically do not involve GPS, PS and Hatchery but consist of intensive commercial scale of eggs and broiler production from chickens. In very few instances, some limited and seasonal turkey productions are included in the Sector 3. From observation, it seems that a capacity base line of 20,000 and 1000 chickens can be applied for Sectors 2 and 3 respectively. The upper scale for sector 2 is up to 500,000, in a few instances.

2.2.1 Structure of the Commercial Poultry in Nigeria

Within the three operational sectors, which constitute the commercial system of poultry production, the Industrial Integrated Sector occupies the apex position, which by virtue of the possession of GPS and PS serves as the foundation to the entire commercial production system. In conformity with global trends in poultry industry, this foundation is based on very few fully and vertically integrated holdings, dictated by capital and technical facilities, which are implicit in that level within the system. For these reasons, most of the eight or so of such operations on PAN'S list in Nigeria are rooted on foreign franchise or joint venture or with links in Europe. The list and production profile of Nigeria's poultry foundation stock (GPS & PS; Sector 1) are shown in Table 2.2.

Table 2.2. List of GPS / PS / Hatchery Companies (Foundation Stock)

S/No.	Company	Products
1.	Obasanjo Farms Nig. Ltd., Ogun State	1. PS-DOC, 2. Equipment, 3. Broiler DOC, 4. Pullet DOC, 5. Frozen chicken, 6. Cockerels
2.	CHI Ltd (AJANLA FARMS) Oyo State, Farm HQ. Lagos State.	1. PS D.O. Chicks, 2. POL pullets, 3. Boiler DOC, 4. Emus, 5. Pullet DOC, 6. Equipment, 7. Table eggs, 8. Drugs, 9. Cockerels
3.	AVIAN SPECIALITIES Ltd, Oyo State.	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Cockerels
4.	ZARTECH FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen Chicken, 5. Further Processed Chicken, 6. Cockerels
5.	AMO FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Feeds, 5. Cockerels
6.	TUNS FARMS, Oshun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	LIPAKALA FARMS, Ondo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Dressed chicken
8.	S & D FARMS, Ogun State	1. P/S DOC, 2. Broiler DOC, 3. Pullet DOC, 4. Eggs, 5. Dressed chicken, 6. Cockerels
9.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs

Although the precise value of Nigeria's Integrated GPS and PS poultry stock is unavailable, the estimated stock value at that level from a summary of the size of the Sector (Table 2.3) is over N3.5 billion with an annual projected production worth over N13.59billion. These exclude the costs of overheads, hardware and other inputs, especially feeds and feeding costs which are integral to the operation of the sector.

2.2.1.A: Production Capacity (Pre - HPAI Epidemic) PAN.

The data available from the Poultry Association of Nigeria (PAN) on capacity of the commercial are as follow:

Table 2.3: Grand Parent Stock (GPS) and Parent Stock (PS) Capacity

A.1: Grand Parent Stock (GPS)

Heavy Breeds	46, 000	1, 308,125 PS/year
Light Breed	33,000	1, 543.750 PS/year

A.2: Parent Stock (PS)

	Broiler PS	Black layer PS	Brown layers PS
Confirmed Fig.	885,500	311,500	287,000
Unconfirmed Fig.	88,550	31,150	28,700
TOTAL	974,050	324,650	315,700

NB: Estimated cost of mature GPS = N3000; mature PS = N2000 per unit

B: Housing and Husbandry Practices

The housing and husbandry practices for GPS and PS in Nigeria, follows the conventions in tropical intensive open-sided deep litter housing and poultry management. The specifications for housing include concrete core flooring; 2 to 3 feet dwarf perimeter walls with chicken wire mesh sides and roofs of corrugated asbestos or galvanised sheets. Although this is a design which is relatively cheaper than the closed and environmentally controlled designs in temperate countries, it exposes poultry stock to the impacts of direct vagaries of climate and weather with negative consequences on the productivity and health of stock. The daily variations in temperature and relative humidity in parts of Nigeria can reach 12⁰ C or more and 25 % respectively. These unfavourable circumstances have therefore, in some instances, compelled the incorporation of environmental amelioration systems like industrial or tunnel ventilator fans, foggers and cooling pads along with shade trees planting. In recent times, one of the major (integrated) operators in this sector, which is located in the South-West Nigeria, introduced custom built closed environmental housing, thus blazing the trail in this innovation.

The watering and feeding systems for poultry in this Sector are either the manual trough or bucket types. However in the more advanced integrated holdings, automated chain feeding and watering systems are involved. Egg collection is mainly based on manually operated nest boxes with straw or wood shaving floors. Although the man-labour to stock

ratio can be 1: 1000 for GPS and PS, the degree of automation brings the ratio down by even 50% or more.

C: Hatchery Capacity

Although nine hatchery producers are listed in PAN's record (Table 2.2), there are certainly a few other medium to small scale or limited hatchery producers in Nigeria. Examples of such unlisted hatcheries are :

- 1.The Mayfield Hatchery, Ajah, Lagos
2. Akpata Hatchery, Epe Rd, Lagos
- 3.Alanco Farms Hatchery, Abeokuta
4. Farm FenderH Hatchery,Ilishan, Ogun
- 5.NAPRI Hatchery, Shikka Zaria
- 6.. Kaduna hatcery

Majority of these hatcheries are active, each producing tens- or hundreds of thousands of chicks weekly while a minority (e.g. Kaduna) have closed down production. In the circumstance, PAN's data will realistically represent the elite and perhaps 70% component of the Integrated Sector.

D: Disease Control and Poultry Health Practices in GPS and PS

All GPS and some of the PS used in Nigeria are sourced from Western Europe, especially Holland, Belgium, UK and Israel; and possibly in recent times, from franchise links in Egypt. There are therefore two main theoretic sources of diseases in this Sector, viz:

- a. Diseases that accompany foundation stocks vertically, via genetic and ovarian channels. The examples are: Luekosis, Salmonelloses, and Mycoplasmoses
- b.Diseases that reach stock locally via horizontal spread. These are in the majority and include examples like: Marek's disease, Newcastle disease, Fowl cholera, and Colibacillosis .

The spread of the current Avian influenza epidemic across continents opens a new dimension to the epizootiology of horizontally transmissible disease problems in poultry. However, none of the foundation stocks (Sector 1) in Nigeria has so far been affected by the disease.

Generally speaking, the control of diseases in the entire poultry industry has a lot to do with the bio-sanitary status of the foundation stocks and hatcheries. This is particularly so, with the vertically transmitted diseases that are difficult to control, except by ensuring that foundation stocks are free *ab-initio* from such diseases. The control strategy for such diseases in Sector 1 is to obtain statutory guarantees (certificates) of freedom of stock from such diseases, from importing countries. As for the horizontally spread diseases, it is the scope and intensity of the local (farm) bio-sanitary / bio-security measures that determine disease prevention and control efficiency. The components of such measures are in three major groups:

Management and Hygiene practices.

These cover the range of measure and practices that harness the merits of good housing, feeding and husbandry standards, including all-in-all-out system to protect stock from disease predisposing factors, especially stress. It also specifically entails the application of daily hygienic precautions concerning the environment, utensils, stock and handlers, through standard cleansing and disinfection, to reduce (possibly exclude) the contamination of environment and stock by primary and secondary microbial/disease agents. The enforcement of operational guidelines like the restriction of human and vehicular movements, etc fall under this area. The objective is to

keep out infections and minimize the need for medication. Observance of these practises appear to vary widely in Nigeria, from optimal to sub-optimal.

Preventive Medication

Preventive medication or prophylaxis is one of the cornerstones of disease prevention in farm stocks. The practice is to apply medications strategically ahead of predicted period of disease incursion. The risk from horizontal disease spread is high in the typical open-sided poultry housing system in Nigeria. In this regard, most integrated and indeed the whole of the commercial poultry sectors 1, 2 &3, in Nigeria rely on this strategy to reduce disease outbreaks and spread within and between the flocks. The examples of preventive medication are the application of coccidiostats and anthelmintics, periodically in stock (Table 2.4). These two medications are virtually inevitable in GPS and PS in Nigeria because they are conventionally floor-reared in environment, which is very conducive to the propagation of parasites. An extension of the principle of preventive medication, is in the periodic application of antimicrobials / antibiotics which is common in Nigeria's poultry, to minimise the progression of bacterial infections into clinical diseases. This is a controversial practice that is capable of encouraging the development of antibiotic resistance, especially as the practice can be open to abuses by farmers.

Table 2.4: Typical Preventive Medication for Disease Prevention in Poultry

Day 0 -1	First 24 hours, glucose in water
Day 3 -5	Supplementary Vitamins in water of feed
Week -2	Anti-CRD; Broad Spectrum antibiotics
Weeks 3, 6, 10. POL	Coccidiostat in water OR in feed for week 2 to
Weeks 5, 7, 12	Anthelmintic
Every 2 weeks	Vitamins as anti-stress
Every 2months	Preventive antibiotics

In Nigeria, the spate of such antibiotic resistance problems has caused some of the integrated operators to resort to the monitoring of such medications through periodic antibiograms. It is noteworthy that the greater bulk of the antibiotics are sourced through importation.

Vaccination

There is an established practice of vaccine application for disease prevention in Nigeria's poultry industry. There are two major sources of vaccine supplies to Nigeria's poultry industry, viz:

1. NVRI, Vom
2. Import

From a short list of about five vaccines in the 1980s, the range and volume of poultry vaccines have nearly trebled in recent times. Although the local production at NVRI has continued to expand in response to demand, it would appear that the demand has remained above the production by NVRI in terms of range and volume, (Table 2.5). In the circumstance, the poultry industry is compelled to supplement through importation of the needed range and volume. It

would appear that many of the integrated Sector 1 operators depend on supplementary importation and thereby also create a vaccines market for Nigeria's poultry.

The implications of such a sizable dependence on imported vaccines, including those associated with heterologous imported strains, have been explained by Adene (2004). The typical vaccination schedule in integrated foundation stock is represented in Table 2.6.

Table 2.5 NVRI: Poultry Viral Vaccines (Doses)

Year	VIRAL	FTV	FCV
1985	59,795,000	1,341,050	303,250
1995	-	487,100	290,800
2001	36,703,800	260,200	328,000
2002	35,248,200	1,828,700	943,600
2003	56,273,200	1,360,100	1,083,200
2004	86,453,300	3,075,700	1,128,700
2005	108,811,800	108,811,800	1,808,100
2006	-	276,400	981,600

Table: 2.6. Typical Vaccination Programme for Parent Stock

Week 1	ND-H (i/o; spray...)
Week 2	Gumboro dis Vacc (live) ; Bronchitis (high passage)
Week 4	F.Pox Vacc Week 5; Bronchitis booster (low pass)
Week 6	ND –K or booster
Week 8 -10	F.Cholera Vacc; Coryza Vacc
Week 14	Gumboro dis booster vac; EDS Vacc
Week 16	ND –K or KOEV booster; AIE Vacc
Week 35	Gumboro dis Vacc booster
Week 37	ND –K or KOEV booster vac
NB:	Anti-coccidial vaccines have recently been introduced during week 2-4

The deciding consideration or vaccination strategy in the Sector is to achieve a meaningful level of vertically integrated transfer of immunity to DOC- offsprings.

E.Poultry Products

Within the context of Sector 1 as the Integrated Commercial Poultry, the products range from mainly PS DOCs to a combination of PS and commercial DOCs, which include pullet and broiler type DOCs. However, that sector in its broader sense as the Apex Investment, encompasses, other integral complements like poultry housing equipment, feed mills and health inputs as well as facilities for further processing of poultry for meat. The range and outlay in this sector is represented in Tables 2.7.a & b. The layer breeds that are being supplied into the market by these GPS and PS hatchery companies are black (Nera Black and Harco Black), brown (Isa Brown, Amo Brown, Swiss Brown and Babcock) and white (Hyline) for layers while the broiler breeds include Anak, Abor and Cobb.

Table 2.7a. List of GPS/PS/Hatchery Companies

S/No.	Company	Products
1.	Obansanjo Farms Nig. Ltd., Ogun State	1. PS-DOC, 2. Equipment, 3. Broiler DOC, 4. Pullet DOC, 5. Frozen chicken, 6. Cockerels
2.	CHI Ltd (AJANLA FARMS) Oyo State, Farm HQ. Lagos State.	1. PS D.O. Chicks, 2. POL pullets, 3. Boiler DOC, 4. Emus, 5. Pullet DOC, 6. Equipment, 7. Table eggs, 8. Drugs, 9. Cockerels
3.	AVIAN SPECIALITIES Ltd, Oyo State.	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Cockerels
4.	ZARTECH FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen Chicken, 5. Further Processed Chicken, 6. Cockerels
5.	AMO FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Feeds, 5. Cockerels
6.	TUNS FARMS, Oshun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	LIPAKALA FARMS, Ondo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Dressed chicken
8.	S & D FARMS, Ogun State	1. P/S DOC, 2. Broiler DOC, 3. Pullet DOC, 4. Eggs, 5. Dressed chicken, 6. Cockerels
9.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs

Table 2.7b Inputs Support Services in Sector 1

S/No.	Company	Products
1.	FEED MASTERS Ltd	1. Poultry feeds, 2. Concentrates
2.	GRAND CEREALS Ltd., Plateau State,	1 Poultry feeds, 2. Concentrates
3.	POULTRY EQUIP FACCO W. AFRICA Ltd.	1. Equipment, 2. Incubators, 3. Turkey projects.
4.	BENDEL FLOUR MILLS Ltd. Edo State	1. Poultry feeds, 2. Concentrates, 3. Drugs
5.	TOP FEEDS Ltd. Delta State	1. Poultry feeds, 2. Concentrates
6.	ANIMAL CARE KONSULT, Ogun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs
8.	Several Medium and Small holdings Nation-wide scale	1. Eggs, 2. Feeds, 3. Drugs, 4. Equipment

The full structure of Nigeria's poultry industry, as in other industrialised poultry countries, is complemented by the downstream Sectors 2 and 3, which represent gradations of non-foundation poultry stocks. Although these are conveniently defined by their bio-security frame work, as

stated below, the other crucial determinants such as size and range of products are already shown in Table 2.1.

- Sector 2: Commercial Poultry Production System with moderate to high bio-security systems
- Sector 3: Commercial Poultry Production System with low to minimal bio-security systems

Some of the farms in this Sector are satellites of the sector1 companies, for the marketing of products and surpluses. Such surpluses arise from failure of agents and customers to pick up subscribed products. It is therefore not unusual for the apex companies to create facilities for rearing of as much of such surpluses as possible for the production of eggs and table birds. In other instances, the Apex Companies actually sponsor agents who serve to rear specified quantities of broilers on franchise, to feed their own and other meat processing facilities. However the greater bulk of the farmers in Sectors 2 and 3 are independent farmers who buy DOCs from Sector 1 hatcheries, and rear them for eggs and table broilers through retail markets. A variety of this involves the production of eggs and meats for the fast food outlets. These non-franchise producers source their own capital and operate independent of the apex companies.

Individual operators in these two Sectors produce either eggs or broilers or both. In some cases, turkeys are raised for Christmas and similar seasonal markets. A few of them are quite large with over 250,000 birds and considerable high bio-security and automation. Their poultry stocks enjoy similar disease control measures to Sector 1 except that the vaccination schedules are not meant to achieve vertical integration/transfer of immunity. Many of them have their own feed mills and produce qualitative and cost-effective nutrition to their stocks. However, most of those in sector 3 which represent the lowest level of commercial poultry are not as sufficient in inputs like feeds and disease control tools. While all the members of Sector 1 and the majority of those in Sector 2 maintain a complement of Poultry Veterinarians and Nutritionists, the operators in Sector 3 depend at best on occasional consultations with such professionals. This partly explains why their bio-security compliance is low. They are often compelled by the smallness of scale and economy to patronise sub-standard veterinary inputs (e.g. vaccines without cold chain storage) or even skip some health inputs.

The marketing and pricing structure for the two sectors, take their cue from those in Sector 1. The bigger operators in sector 2 actually compete with Sector 1 for a share of markets and pricing while the other extreme represented by the smaller Sector 3 operators is to a large extent restricted to immediate localities as sales outlets. In some cases, products may be sold in this Sector on credit during production gluts precipitated by the bigger operators in sectors 1 and 2.

F. The Number and Spread of Sectors 2 and 3 Operators

There has not been any comprehensive and recent survey of these Sectors. However, available information confirms that the bulk of Sector 2 Operators are based in South-West Nigeria and especially the States nearer to Lagos-industrial capital of Nigeria. In this regard, it is estimated that over 65% of Nigeria's commercial poultry is located in the 5 states of Lagos, Ogun, Oyo, Oshun and Ondo; while another 25 % is based South-South and South-East geo-political zones.

The balance of 10% or less of Nigeria’s commercial poultry is based in the 15 North-Central, North-West and North-East states. Table 2.8 reflects the list of the major operators in Sectors 2. This list is not comprehensive, as it excludes Sector 3 which is composed of numerous small stocks – farms and difficult to be covered in the present study. Indeed, the current exercise reveals that there is a pressing need for a well planned, comprehensive and structured survey of Nigeria’s poultry, starting with the 3 commercial segments.

Location	Annual D.O.C. Projection
Lagos State	485,000
Ekiti, Ondo, Delta and Edo States	927,000
Oyo, Osun and Kwara States	791,000
Ogun State	1,060,000
South-South/South-East	1,161,000
Core-North	105,000
Total	4,529,000

ϕ Please see details in Appendix 2.

2.2.2 Backyard and Rural Poultry (Sector 4)

A. Preamble:

In its conventional sense, this category of poultry is rural (non-urban) in location and subsistent or non-commercial in purpose. However, with decades of appreciation of its position as the true poultry of the non-urban/rural dwellers (i.e. over 70% Nigeria’s population), the socio-economic importance of this category of poultry has been receiving some increasing attention. In the process, the nomenclature in Nigeria and globally, has been evolving to include descriptive and development-friendly terminologies like: *family poultry*, *smallholder poultry*, and *village poultry*. Considering that village poultry is not limited to Africa, the more global picture which takes into account the inclusion of mixtures of exotic and indigenous poultry in parts of Africa and Asia, confers good justification for these new names in this low inputs dependent production (LIDP) system. The effect of national and global attention on this sector over the decades has manifested in various interventions, including the cockerel introduction and exchange programmes, tokens of extension and health input services that have resulted in some changes in the original structure and practices in the system. In which case, the “rural poultry” sector as currently constituted includes isolated pockets of mini-commercial mixed stocks with some inputs into housing and feeding. This version has also enjoyed some patronage from low to middle class peri-urban dwellers who therefore keep pockets of poultry in their backyards.

A previous report by Sonaiya (1990) showed that “the backyard system uses both local and improved breeds. It is a common practice for families to purchase hybrid cockerels or broilers and leave them in the family backyard until needed. With other poultry species such as guinea fowl, pigeons, geese and to some extent ducks and turkeys, the systems of production utilise local birds. This section will therefore focus on conventional rural poultry sector as practiced by the overwhelming majority of rural dwellers. In Africa and especially Nigeria, available data confirm that the rural poultry is in essence household and subsistence farming operation, with minimum stock size, low input system production and equally low off-take capacity.

B. Husbandry Practices

Most of the farmers manage their flocks extensively, allowing the birds the free-range of the village and the surrounding area. Sonaiya (1990) also reported that at the village level in Nigeria, about 65% of respondents did not provide housing in whatever form for their birds thus exposing them to environmental hazards and predators. The chicken are kept mostly by women, for both household consumption and income generation. Usually, the birds are fed some grains and household food remnants in the mornings and are left to roam around the neighbourhood “picking a living”. In the evening they come home to roost in cane baskets, makeshift structures or even trees in compound. There are no current reports on these aspects in Nigeria. In an effort to redress this deficiency, some limited survey-interviews were conducted during this study on the structure of village /household poultry in selected places in the North, West and East of Nigeria. Five families / households per village in selected LGAs were covered in the study. The findings which showed the numbers of the different species of poultry kept by households are presented in the following Tables 2.9 a, b c & d.

Thus in Kano State (North), the household stocks ranged from 5 to 38 for chickens; 0 to 26 for guinea fowls; 0 to 8 for turkeys; 0 to 8 for ducks; and 0 to 11 for pigeons. In Jigawa state (North), the figures were 11 to 49 chickens; 10 to 47 guinea fowls; 0 to 3 turkeys; 3 to 21 ducks and 0 to 131 pigeons. In Oyo state (West) the figures were chickens; guinea fowls; turkeys; ducks and pigeons. While in Enugu (East) they were 59 to 181 chickens; 0 to 18 guinea fowls; 0 to 31 turkeys; 8 to 31 ducks and 0 to 34 pigeons. It will be noticed that the modal figures in some cases are lop-sided; as in the case of Enugu where 3 of the 4 households have no pigeons while the fourth has 34; thus giving the range 0 to 34!

Table 2.9a: Family Poultry Sector: Summary from Household Stocks, Kano State, 2006.

LGAs & VLLGs*	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
GARKO LGA										
*Lamire	89	0	11	76	0	18	0	2	15	0
*Uta	29	12	29	0	48	6	0	0	3	0
*Danin	37	12	15	49	0	7	2	3	10	0
*Kafin Malamai	55	0	0	40	0	11	0	0	8	0
*Gurjiya	41	0	12	40	0	8	0	2	8	0
DAWAKIN KD										
*Kode	50	2	21	46	0	10	0	4	9	0
*Kantsi	43	2	21	55	0	8	0	4	11	0
*Busaye	59	4	14	55	0	12	0	3	11	0
*Maifawa	36	0	20	12	0	7	0	4	2	0
*Dakatsalle	68	0	0	27	0	13	0	0	5	0

LGAs & VLLGs*	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
KUMBU TSO										
*Yaushana	44	9	9	14	4	9	2	2	3	1
*Tamburawa	27	7	4	0	16	5	1	1	0	3
*Kureke	38	0	12	51	0	8	0	2	10	0
* Dotsa	50	5	17	34	0	10	1	3	7	0
*Marimari	47	0	10	22	0	9	0	2	4	0
KURA LGA										
*Dan Hassan	99	7	5	19	29	20	1	1	4	6
*Bumkure	63	0	16	15	0	12	0	3	3	0
* Karfi	84	0	40	17	40	17	0	8	3	8
*Imawa	86	0	12	23	55	17	0	2	4	11
* Kasawa	111	9	13	99	0	22	2	2	20	0
DAWKIN TOFA										
*Dawanam	54	15	28	0	30	11	3	6	0	6
*Amariya	96	40	8	38	55	19	8	1	8	11
* Tumfafi	188	4	13	130	0	38	1	2	26	0
*Ganduje	190	6	34	119	0	38	1	7	14	0
*K.Dumawa	107	3	20	52	6	21	0	4	10	1

Table 2.9b: Family Poultry Sector: Summary from Household Stocks, Jigawa State, 2006.

LGAs & VILLGs*	TOTAL FROM 5 H.HOLDS IN VLLG.					PER H.HOLD AVERAGE				
	Chk.	G.fwl.	Dks.	Tks.	Pgns	Chk.	G.fwls.	Dks.	Tks.	Pgns.
GUMEL LGA										
*Gumel Hm.	104	91	36	9	656	21	18	7	2	131
*Zuge	113	179	12	0	24	23	36	2	0	4
*Hammado	117	118	8	0	28	23	24	2	0	6
*Alkakawa	130	268	28	0	0	26	54	6	0	0
*Dawali	96	97	31	2	189	19	19	6	0	38
KAZAURE LGA										
*Hazaure	145	38	25	4	174	29	8	5	1	35
*Gada	146	89	36	0	60	29	18	7	0	12
*Ban Dawa	101	103	28	10	153	20	21	6	2	31
*Dandi	137	94	49	2	24	27	19	10	0	5
*Tsamiyar Ilu	156	112	37	3	8	31	32	7	0	2
HADEIJA LGA										
*Fantai	218	36	71	6	118	44	47	14	1	24
*Kuka	204	143	84	13	50	41	29	17	3	10
*Gardun S'ki	259	89	49	8	40	52	18	10	2	8
*Hago	243	145	63	0	37	49	29	13	0	7
*Madaci	233	101	18	6	23	47	20	4	1	5
BABURA LGA										
*Insharuwa	362	241	106	0	147	72	68	21	0	21
*Insharuwa -2	354	224	44	0	24	71	45	8	0	5
*Ungwal Gw	166	89	38	2	30	33	18	8	0	6
*Kyara Fln	106	170	40	0	0	21	34	8	0	0
*Garin Gn	244	156	48	2	24	49	31	9	0	8

LGAs & VLLGs*	TOTAL FROM 5 H.HOLDS IN VLLG.					PER H.HOLD AVERAGE				
	Chk.	G.fwl.	Dks.	Tks.	Pgns	Chk.	G.fwls.	Dks.	Tks.	Pgns.
KAUGAMA LGA										
*Kaugama Tu	58	53	38	8	221	11	10	7	2	44
*Zaburan	105	76	16	4	66	21	15	3	1	11
*Marke	87	127	38	4	128	17	25	7	1	26
*Unguwar Jb	112	146	28	6	90	22	29	6	1	18
*Yanleman	103	145	68	18	279	21	29	14	4	56

Table 2.9c: Family Poultry Sector: Summary from Household Stocks, Oyo State, 2006.

LGAs & VLLGs	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
IDO LGA										
Adabi	64	21	17	4	0	13	4	3	1	0
Aderogba	80	0	13	0	0	16	0	3	0	0
LAGELU LGA										
Kotilo	48	0	0	0	0	10	0	0	0	0
Oke	62	17	36	2	0	12	3	7	0	0
IBADAN NORTH LGA										
Abadina	69	0	10	0	0	14	0	2	0	0
Orogun	50	0	0	0	0	10	0	0	0	0

Table 2.9d: Family Poultry Sector: Summary from Household Stocks, Enugu State, 2006.

LGAs & VLLGs*	TOTAL 5 H.HOLDS-VLLG					AVE PER H.HOLD IN VLLG.				
	Chks	Tks	Dks	GFwls	Pgns	Chks	Tks	Dks	Gfws	Pgns
IGBO EZE LGA.										
*Amuzu	600	0	40	30	0	120	0	8	6	0
*Amokpu	905	0	100	90	0	181	0	20	18	0
NSUKKA LGA										
*Unmuke	245	65	95	40	0	59	13	19	8	0
*Ovidinaso	300	155	155	0	170	60	31	31	0	34
TOTAL 2 LGAs (20 H.holds)	1829	220	390	160	170	420	62	78	32	34

C.Trends in Structure and Growth of the Sector

An historical analysis of this sector suggests that the village poultry population including household stocks has undergone some growth over the decades to date, in Nigeria. Thus while the average households stock for chickens (the most populous) was 4.8 in 1983/84 (FOS); 17.0 in 1989 (Otchere,et al,1989) or 17.6 in 1990 (Adegbola,1990) . The data from the current limited survey showed that the household chicken stock size in the North where the rural poultry system remains largely intact was up to 49. The figure from Eastern Nigeria, was up to 181, suggesting that semi-commercial backyard poultry has probably entered the concept of rural poultry system in the East. This is not unexpected, in view of the greater tendency towards urbanisation in Eastern Nigeria. It also exemplifies the growing convergence in definition of aspects of sectors 3 and 4. The FAO/TCP report in 2000, (Adene, 2000) which attempted to avoid the flaws in definition, gave a summary from household study in Kaduna (North), Enugu (East) and Oyo-Ogun (West), as shown in Table 2.10 below. The table shows that the average number of poultry per household varies from 16.1 to 33.4 while the average number of chicken per household varies from 14.7 to 17.1. In any case, it is an emerging reality that the rural poultry sector has been growing despite the constraints, as previously revealed by Suleiman (1990) who stated that the population of rural poultry grew from 124 million to 149 million between 1979 and 1987.

Table 2.10:Household Poultry Data (Year 2000)

Parameter	Kaduna	Enugu	Oyo-Ogun
Total poultry	1652	869	1504
Poultry per HH	20,7	16.1	33.4
Poultry per Capita	3.0	2,5	7.1
Chickens total	1176	839	770
Chicken per HH	14.7	15.5	17.1
Chicken per Capita	2.2	2.4	3.7

Source: Adene, D. F. (2000). **Action Plan – For Poultry Animal Health In Pilot Scale Study Under FGN/FAO/TCP/NIR/7822.** 81 pgs.

Although most villagers keep two, three or even more poultry species, chickens remain the commonest species in rural poultry kept in Nigeria. Older literature showed that between 65 and 88% of respondents included chickens in their household poultry stock. Although comparable data are currently unavailable, the figure from Tables 2.9 a-d, show that between 51 to 67 % of all five household's poultry species are chickens. Perhaps the only exception is among the Fulanis who do not keep ducks because of the taboo that associates ducks with detrimental impact on the performance of their main occupation, i.e. cattle rearing.

Housing for Rural Poultry

The available indications are that there has not been any tangible change in the housing system for rural poultry in Nigeria. Consistent with the low input structure, typical rural poultry are mostly unconfined, especially in day time but allowed to roam freely in household environment, scavenging to meet their needs. They often return to base towards night time when some of them roost outside the homestead, under shrubs or in disused huts or perch on trees. In some places they are provided with portable palm frond- or raffia baskets for night time roosting. In the more organised cases, the birds are provided with more permanent housing with mud walls and thatched roofs or wooden and wire cages. Such improvisations are components of the increasing sub-urban varieties of “rural” poultry and the convergence previously referred to. . In all cases, the poultry birds mainly use shelters for night time purposes. A summary from older reports showed that between 61 and 84 % of respondents provide such night time shelters for their poultry.

Feeding and Watering of Rural Poultry

Although this aspect is also influenced by the minimum input outlay of the rural poultry production system, their keepers make more tangible efforts in the sphere of feeding. Thus in most typical cases, the birds proceed to scavenge only after they have received offers of grains (corn, millet, sorghum) or bye-products like “*dusa*” in the early mornings. Some of the grains are ground into smaller crumbs for the baby chicks. It is reported that a wider variety including millet and guinea corn are more commonly used in the North while corn is more available in the South. The quantities of these items supplied vary, from one full or scanty offering to two or more servings per day. Again, in the peri-urban varieties, kitchen wastes / scraps or even some quantities of proprietary poultry feed are supplied as main feed or supplement. All these are followed in the most of the day time with scavenging for vegetable, wild fruits and seeds, grits, insects maggots and earthworms which are believed to provide a considerable proportion and variety of nutrients for rural poultry.

Majority of rural poultry keepers provide water in some form of receptacles such as broken pots and calabashes, old pans or in plastic containers. Type and quality of water are defined by the availability of natural sources like streams and brooks or improvised wells. Where rural development projects have endowed a village with bore holes or similar sources of water the birds are supplied from household stores of such water. Birds invariably search for and locate sources of water in the locality which they visit for supplementary drinking. A previous report from South-eastern Nigeria, claimed that 87.5 % of respondents do not make specific watering provisions for their poultry but expect them to locate sources of water in brooks and succulent wild fruits which invariably abound. It is obvious from all these that on the average, nutritional inputs for rural poultry is subject to a wide variations in quantity and quality; a situation which puts the fate of the birds on their scavenging proficiency. The majority of their keepers, who are mainly the household women and children, are generally interested in giving their poultry the best attention possible except where they are handicapped by elements of availability as in the limited water sources in the more arid localities.

D. Diseases Losses and Health Measures

With the minimum or no provisions for specified housing, the village poultry is inevitably exposed to the vagaries of climate and weather; stress, predators and diseases. The attrition rate from all these impacts is often up to 80%. Disease is the biggest single cause of losses in this sector.

The non-disease, losses come from chilling for growers, predators and in some cases pilfering. The major disease problems are Newcastle disease, Pox, Bursal disease, Colisepticemia, Coccidiosis and Worm infestation. Previous report claimed that 60% of respondents mentioned Newcastle disease as the major disease in their poultry. A recent FLD document also claimed that Newcastle disease alone claims over 60% of all the disease induced losses. The FAO/TCP study by Adene, (2000), clearly showed that Newcastle disease was well recognised by majority of respondent and ranked as the first disease problem (Table 2.11).

Table 2.11: Household Ranking of Major diseases of Poultry

Entries by HH	KADUNA	ENUGU	OYO-OGUN	TOTAL(%)
ND ranked first by HH	46	53	41	140 (78.2)
ND ranked second	8	1	2	11
F.Pox ranked first	3	0	1	4 (2.2)
F.pox ranked second	12	0	9	21
Other dis ranked first	26	1	1	28 (15.6)
TOTAL HH	80	54	45	179
NB: Other diseases: Gumboro, Coccidiosis, CRD, Tape Worms, Ascariidosis, Colibacillosis, Pullorum dis, F.cholera, Lice infestation				

The rural /village poultry system typically lacks access to any organised health inputs. Attempt to institute health extension services have been constrained by the structure of the system like, the small flock size and mixed age and species flock composition. Conventional poultry health packages are designed for the commercial sector and therefore feature large dose-packages usually x1000, for specific ages. The application of scheduled health inputs like vaccination and medication is therefore rare in conventional rural poultry, except in the peri-urban variety, where the keepers are more knowledgeable and have occasional access to human remedies like antibiotics and analgesics. A previous report claimed that drugs like tetracycline, M & B sulphas and aspirin fall in this category,

Of interest is the ethno-veterinary literature on the control of Newcastle disease (Abdu, et al, 2000) which lists the use of leaves of *Canabis indica*, the bark of locust bean tree,

termite hill-mushroom, barks of *Solanum sp* 'Gautan kura' or *Capsicum sp* in birds drinking water., for the control of the disease. A previous report similarly described the use of *Brtissum spp* 'Nchnwu' in Hausa, with *Capsicum annum* for treatment of diseased birds.

E. Productivity and Flock Profile

There are no recent or current data, which cover the productivity of rural poultry. Existing old reports however share the same view that the productivity of rural poultry is generally much lower than that of the commercial sector. This is a reflection of the combination of phenotype, management and environment. Under extensive management, egg production is in clutches with bimodal peaks in early rainy and early dry seasons. Declines in productivity are associated with the feed shortages in the dry season. There are no recent studies on productivity in rural poultry but the productivity parameters from previous reports, which are similar for all African indigenous chickens with the collated summary in Table 2.12.

Table 2.12 Productivity Parameters in Rural Poultry

Prodt. Parameters	Chkn	Duck	G. Fowl	Turkey
Age at first egg ,dys	159.0	NA	NA	NA
Eggs at 450dys	117.5			
Ave. eggs/clutch	8 -12	15.8	16.2	9.4
Clutch duration, dys	8.0+1.8	12.5+2.0	12.5+2.0	7.00+2.0
Annual egg output	35 -50			
%Hatchability (peak)	78.3 (90)	81.6	58.0	69.1
No chicks weaned	7.2	8.3	6.2	3.9
Age at weaning mnths	3.9	5.5	4.6	6.6
Pre wean mortality %	23.4	35.7	34.0	40.0

Sonaiya(1990)

2.3. Size of the Poultry (Livestock) Sub-sector

There is no comprehensive information on the size of the poultry sub-sector in Nigeria that is based on a fairly recent survey. The only recent survey was carried out by the National Bureau of Statistics (NBS) (formerly Federal Office of Statistics). It covered the whole livestock sector and the information generated on poultry rearing in the survey excluded the commercial poultry

production activities (Sectors 1,2 and 3). The information available from the survey has a number of shortcomings. First, there is no information on Lagos and Bayelsa States, thus presuming “wrongly” there is no rural poultry in these two states. Second, the survey, even though it covered information of flock size did not capture information on flock structure. Lastly, it also did not capture any information on diseases’ prevalence.

Table 2.13 presents projected population of poultry in Nigeria as presented by the Federal Department of Livestock and Pest Control Services. The table puts the estimated population of poultry in Nigeria as at year 2003 as 137,678,943 comprising 115,880,864 or 84% as backyard poultry and 21,798,079 or 16% as exotic poultry. Given the fact that there are commercial poultry farms based on exotic birds being operated backyard poultry and there are subsistence household poultry rearing also based on exotic birds mostly around the cities, (see Sections 2.1 above), this classification into exotic and backyard does not give a clear picture. The exotic birds have a higher productivity and provide opportunity for a higher annual off-take, especially when reared under intensive commercial production systems. Thus, it is necessary to have a clearer classification of the poultry population based on the production system.

A. Backyard/Households/ Subsistence Poultry

Information on household subsistence poultry extracted from the recent survey of the livestock sector by the National Bureau of Statistics is presented in Table 2.14. The table shows the percentage of sampled households keeping poultry. Table 2.15 shows the number of households keeping poultry in each of the states sampled. This is an extrapolation from Table 2.14. It is based on “Raising Factors” calculated by the NBS. Table 2.16 presents the average flock sizes for the various poultry covered by the NBS’s survey by states. Table 2.17, which is the product of Table 2.15 and Table 2.16, provides the estimates of the population of poultry in the different states.

The estimate contained in Table 2.17 puts the population of rural poultry at 65,269,582. This is exclusive of the population of rural poultry that may exist in Lagos and Bayelsa States. This estimated poultry population figure is much smaller than the FDL&PCS figure 115,880,864 that is contained in Table 2.13

Table 2.13: Nigeria's Poultry Population (2003)

States	Backyard Poultry	Exotic Poultry	Total
A/ibom	2,772,000	277,830	3,049,830
Abia	1,282,050	127,339	1,409,389
Adamawa	3,780,000	347,288	4,127,288
Anambra	2,483,250	248,889	2,732,139
Bauchi	5,832,750	5,846,006	11,678,756
Bayelsa	900,900	90,295	991,195
Benue	6,121,500	613,541	6,735,041
Borno	5,313,000	532,508	5,845,508
C/river	1,155,000	115,763	1,270,763
Delta	2,356,200	236,156	2,592,356
Ebonyi	2,347,514	3,542,333	5,889,847
Edo	1,120,350	112,290	1,232,640
Ekiti	2,656,500	266,254	2,922,754
Enugu	1,859,550	1,863,776	3,723,326
Fct	3,465,000	347,288	3,812,288
Gombe	462,000	46,305	508,305
Imo	5,832,750	584,601	6,417,351
Jigawa	4,389,000	439,898	4,828,898
Kaduna	2,564,100	256,993	2,821,093
Kano	3,528,000	324,135	3,852,135
Katsina	4,735,500	474,626	5,210,126
Kebbi	6,930,000	694,575	7,624,575
Kogi	3,349,500	335,711	3,685,211
Kwara	3,037,650	304,455	3,342,105
Lagos	2,852,850	285,933	3,138,783
Nassarawa	531,300	53,251	584,551
Niger	2,772,000	277,830	3,049,830
Ogun	3,234,000	324,135	3,558,135
Ondo	3,003,000	300,983	3,303,983
Osun	3,234,000	324,135	3,558,135
Oyo	2,829,750	283,618	3,113,368
Plateau	3,453,450	346,130	3,799,580
Rivers	3,465,000	347,288	3,812,288
Sokoto	1,339,800	134,285	1,474,085
Taraba	2,460,150	246,574	2,706,724
Yobe	3,118,500	312,559	3,431,059
Zamfara	5,313,000	532,508	5,845,508
Grand total	115,880,864	21,798,079	137,678,943
%	84%	16%	

Source: Federal Ministry of Agriculture and Rural Development, Federal Department of Livestock and Pest Control Services. Highly Pathogenic Avian Influenza Standard Operating Procedures, February 2006

Table 2.14: Percentage of Households Keeping Subsistence Poultry by States

State	Chicken	Guinea Fowl	Duck	Turkey	Other Birds	Total
Abia	58.5	0	1.1	0.6	1.2	61.4
Adamawa	26.5	2.9	5	0.1	0	34.5
Akwa ibom	48.1	0	0	0	0	48.1
Anambra	44.6	0.4	0	0.7	6.7	52.4
Bauchi	22.3	11.4	5.2	0.2	0.4	39.5
Benue	51.2	0	3.5	0.4	0	55.1
Borno	17.3	1	1.5	0.1	0.1	20
Cross_rivers	59.6	1.7	0.6	0	0	61.9
Delta	100	0	0	0	0	100
Ebonyi	49.1	0.3	0.5	0.3	0	50.2
Edo	53.6	0	1.7	0	0	55.3
Ekiti	47.7	2.4	2.2	0.4	0	52.7
Enugu	58.9	0.1	0	1	0	60
Gombe	27.3	4.7	4.6	0	0.5	37.1
Imo	48.8	0	0	0.9	0	49.7
Jigawa	16.4	4.3	2.2	0.1	0.4	23.4
Kaduna	34	2.8	5.1	1.1	0.4	43.4
Kano	17.3	7.1	3.7	0.4	0	28.5
Katsina	19.8	8.4	7.1	1.2	1	37.5
Kebbi	26.5	1.8	0.3	0	0	28.6
Kogi	42.1	0.3	8.4	0	0	50.8
Kwara	43.6	0.3	3.6	0.7	0	48.2
Nassarawa	40.1	2.6	4.9	0.1	0	47.7
Niger	43.4	3.1	6.1	0	2.1	54.7
Ogun	71.2	2.8	0	0	0	74
Ondo	54.7	1.1	0	0	0	55.8
Osun	56.6	0	0.3	0.1	0.3	57.3
Oyo	41.5	0	0.9	0	0	42.4
Plateau	41.7	2.4	4.9	0	0	49
Rivers	56.4	0.4	0	0	0	56.8
Sokoto	21.1	2	0.5	0.2	0	23.8
Taraba	43.7	0	2.4	0	0	46.1
Yobe	18.2	2.2	1	0.4	0	21.8
Zamfara	14.7	8.3	0.8	0.7	0	24.5
FCT	41.7	0	7.1	0	0	48.8
Total	27.2	4.6	3.3	0.4	0.4	35.9

Source Estimated based on raw data National Bureau of Statistics, 2006

Table 2.15: Number of Households Keeping Subsistence Poultry by States

STATE	CHICKEN	GUINEA FOWL	DUCK	TURKEY	OTHER BIRDS	TOTAL
Abia	81,382		1,508	831	1,662	85,383
Adamawa	119,355	13,058	22,315	450		155,178
Akwa ibom	119,023					119,023
Anambra	160,804	1,569		2,683	24,273	189,329
Bauchi	364,499	185,539	84,223	2,534	5,850	642,645
Benue	168,322		11,659	1,457		181,438
Borno	140,359	8,403	11,888	556	937	162,143
Cross_rivers	48,410	1,391	506			50,307
Delta	109					109
Ebonyi	15,709	82	164	82		16,037
Edo	41,348		1,328			42,676
Ekiti	35,534	1,761	1,669	322		39,286
Enugu	98,089	124		1,611		99,824
Gombe	74,232	12,843	12,577	84	1,427	101,163
Imo	208,844			3,841		212,685
Jigawa	154,449	40,590	21,063	901	4,039	221,042
Kaduna	267,545	22,317	39,747	8,304	2,855	340,768
Kano	463,713	190,480	98,438	11,006		763,637
Katsina	356,283	151,345	127,251	21,478	18,415	674,772
Kebbi	238,714	15,808	3,099			257,621
Kogi	40,626	322	8,130			49,078
Kwara	67,447	410	5,579	1,012		74,448
Nassarawa	97,039	6,180	11,873	360		115,452
Niger	92,807	6,568	13,036		4,513	116,924
Ogun	9,949	398				10,347
Ondo	20,334	403				20,737
Osun	73,710		447	149	447	74,753
Oyo	127,968		2,647			130,615
Plateau	132,070	7,665	15,444			155,179
Rivers	40,252	276				40,528
Sokoto	205,721	19,505	4,514	2,269		232,009
Taraba	57,973		3,155			61,128
Yobe	58,311	6,920	3,101	1,387		69,719
Zamfara	52,716	29,877	2,693	2,418		87,704
FCT	8,350		1,428			9,778
Total	4,241,996	723,834	509,482	63,735	64,418	5,603,465
Source Estimated based on raw data National Bureau of Statistics, 2006						

Table 2.16: Average Poultry Flock Sizes per Household

State	Chicken	Guinea Fowl	Ducks	Turkeys	Other Birds
Abia	14		5	3	17
Adamawa	10	5	9	1	
Akwa Ibom	9		55		
Anambra	10			6	5
Bauchi	20	16	10		
Benue	33		8	20	
Borno	22	14	9	43	15
Cross River	10	3	7		
Delta	177				
Ebonyi	14				
Edo	6		3		
Ekiti	8	10	7	12	
Enugu	11	5		3	
Gombe	15	8	6		4
Imo	18			7	
Jigawa	18	30	11		33
Kaduna	19	6	5	2	2
Kano				12	
Katsina	18	15	10	8	45
Kebbi		11	8		
Kogi					
Kwara	9		7	2	
Nasarawa	14	6	12	6	
Niger	16	10	9		17
Ogun	12				
Ondo	5	8	2		
Osun	6		5	4	2
Oyo	15		4		
Plateau	10	5	3		
Rivers	18		12		
Sokoto			8		
Taraba			14		
Yobe	13	24	8	2	
Zamfar	19	8	13	14	
FCT	14		6		

Source Estimated based on raw data National Bureau of Statistics, 2006

Table 2.17: Estimated Subsistence Poultry Populations by States

STATE	CHICKEN	GUINEA FOWL	DUCK	TURKEY	OTHER BIRDS	TOTAL
Abia	1,139,348	0	7,540	2,493	28,254	1,177,635
Adamawa	1,193,550	65,290	200,835	450	0	1,460,125
Akwa ibom	1,071,207	0	0	0	0	1,071,207
Anambra	1,608,040	0	0	16,098	121,365	1,745,503
Bauchi	7,289,980	2,968,624	842,230	0	0	11,100,834
Benue	5,554,626	0	93,272	29,140	0	5,677,038
Borno	3,087,898	117,642	106,992	23,908	14,055	3,350,495
Cross_rivers	484,100	4,173	3,542	0	0	491,815
Delta	19,293	0	0	0	0	19,293
Ebonyi	219,926	0	0	0	0	219,926
Edo	248,088	0	3,984	0	0	252,072
Ekiti	284,272	17,610	11,683	3,864	0	317,429
Enugu	1,078,979	620	0	4,833	0	1,084,432
Gombe	1,113,480	102,744	75,462	0	5,708	1,297,394
Imo	3,759,192	0	0	26,887	0	3,786,079
Jigawa	2,780,082	1,217,700	231,693	0	133,287	4,362,762
Kaduna	5,083,355	133,902	198,735	16,608	5,710	5,438,310
Kano	0	0	0	132,072	0	132,072
Katsina	6,413,094	2,270,175	1,272,510	171,824	828,675	10,956,278
Kebbi	0	173,888	24,792	0	0	198,680
Kogi	0	0	0	0	0	0
Kwara	607,023	0	39,053	2,024	0	648,100
Nassarawa	1,358,546	37,080	142,476	2,160	0	1,540,262
Niger	1,484,912	65,680	117,324	0	76,721	1,744,637
Ogun	119,388	0	0	0	0	119,388
Ondo	101,670	3,224	0	0	0	104,894
Osun	442,260	0	2,235	596	894	445,985
Oyo	1,919,520	0	10,588	0	0	1,930,108
Plateau	1,320,700	38,325	46,332	0	0	1,405,357
Rivers	724,536	0	0	0	0	724,536
Sokoto	0	0	36,112	0	0	36,112
Taraba	0	0	44,170	0	0	44,170
Yobe	758,043	166,080	24,808	2,774	0	951,705
Zamfara	1,001,604	239,016	35,009	33,852	0	1,309,481
FCT	116,900	0	8,568	0	0	125,468
Total	52,383,612	7,621,773	3,579,945	469,583	1,214,669	65,269,582

Source Estimated based on data from Tables 2.15 and 2.16

B. Commercial Poultry

There is no recent nationwide survey on commercial poultry. Thus, estimates of the size of the commercial poultry in Nigeria can only be through proxy variables. Proxy variables that could be used to develop a quantitative estimate of the size of the industry include:

1. GPS import, PS and day old chicks production
2. Critical feed ingredients (lysine, methionine, fish meal and soya meal) import and utilization
3. Poultry drugs and vaccine imports, local production and utilization

A set of estimates based on GPS import, PS and day old chicks production is provided in Table 2.18. The table shows that the annual production capacity of the commercial poultry in Nigeria is estimated as 96,981,001kg dressed broilers, 40,738,698kg dressed culled layers and 8,216,208,000 eggs (273,873,600 crates of eggs).

Table 2.18: Estimates of Commercial Poultry Production Capacity based on Grand Parent Stock and Parent Stock Capacities

Grand Parent Stock in Nigeria

Breed		Production Capacity	
Heavy	46,000	1,308,125	Parent Stock per annum
Light	33,000	1,543,750	Parent Stock per annum
Total	79,000	2,851,875	Parent Stock per annum

Parent Stock in Nigeria

	Confirmed figures	Unconfirmed figures	Total
Bx P.S.	885,500	88,550	974,050
Black Layer P.S.	311,500	31,150	342,650
Brown Layer P.S.	287,000	28,700	315,700
Total Layers P.S.	598,500	59,850	658,350

Estimated Annual Day Old Chicks

Broiler D.O.C.	
Bx D.O.C	74,486,176
Layers Commercial D.O.C.	
a) Black Layer: Black Px D.O.C.	17,817,800
b) Brown Layers: Brown Px D.O.C.	16,416,400
Total Layers D.O.C.	34,234,200

Frozen Chicken (Broilers)

2.0kg Live Weight	138,544,287	kg
70% Dressed Weight as Frozen Chicken	96,981,001	kg

Frozen Chicken (Culled Layers)

1.7kg Live Weight	58,198,140	kg
70% Dressed Weight as Frozen Chicken	40,738,698	kg

Table Eggs

Eggs	8,216,208,000
Crates of Eggs	273,873,600

Table 2.19 presents information on the quantities of some critical feed ingredients imported from year 2000 to 2005. These feedstuffs are lysine, methionine, fishmeal and soy meal. The first three feedstuffs are not produced at all in the country while soy meal is produced only in fairly small quantities. The quantities of these inputs imported are indicative of the quantities of feed produced in the livestock feeds industry in Nigeria.

Table 2.19: Imports of Selected Feedstuffs (2000 - 2006)
(kg)

<i>Year</i>	Fish meal	Lysine	Methionine	Soya meal
2000	2,537,489	283,077	511,447	7,499,870
2001	3,743,508	550,790	670,953	8,918
2002	2,451,993	793,328	425,722	3,100
2003	4,119,951	539,767	600,671	17,700,363
2004	35,972,571	849,430	721,963	7,142,399
2005	7,648,682	820,041	827,940	11,279,600
TOTAL	56,474,194	3,836,433	3,758,696	43,634,250
Annual Average	9,412,366	639,406	626,449	7,272,375

Source: National Bureau of Statistics, 2006

While fishmeal is used in feed formulation in the Nigerian catfish industry, lysine and methionine are usually used in poultry rations. Usually the inclusion rate of lysine and methionine in poultry rations varies between 1kg per tonne and 2kg per tonne, depending on the quality. Thus if we assume all the feeds produced are based on rations with lysine and methionine inclusion, the total annual feeds produced from the these feedstuffs will be between 313 thousand and 640 thousand tonnes on the average see Table 2.20.

Table 2.20: Estimates of Poultry Feeds Produced Based on Lysine and Methionine Imports (mt)

<i>Year</i>	Lysine (kg)	Feed (mt)		Methionine (kg)	Feed (mt)	
		1kg Lysine to 1mt Feed	2kg Lysine to 1mt Feed		1kg Mthionine to 1mt Feed	2kg Methionine to 1mt Feed
2,000	283,077	283,077	141,539	511,447	511,447	255,724
2,001	550,790	550,790	275,395	670,953	670,953	335,477
2,002	793,328	793,328	396,664	425,722	425,722	212,861
2,003	539,767	539,767	269,884	600,671	600,671	300,336
2,004	849,430	849,430	424,715	721,963	721,963	360,982
2,005	820,041	820,041	410,021	827,940	827,940	413,970
TOTAL	3,836,433	3,836,433	1,918,217	626,449	626,449	313,225
Annual Average	639,406	639,406	319,703	626,449	626,449	313,225

Source: Calculated based on data in Table 2.19

From Table 2.18, the total estimated live weight of broiler produced per annum is 138,544,287kg (or 138,544 mt). At a feed –meat conversion ratio of 2.2:1, the total feed requirement to support broiler production is 304,797mt. Similarly from Table 2.14, the estimated annual egg production is 8,216,208,000 eggs. At a feed consumption rate of 190.10 gm per egg, the total feed requirement to produce 8,216,208,000 eggs is 1,561,901mt. The total of these two major feed requirements of the poultry sub-sector are not conveniently accommodated within the estimated feed in Table 2.16. This could only mean that either lysine and methionine are being used in poultry feed at sub-optimal levels or some imports of these feed ingredients are not captured in the official imports data.

CHAPTER THREE

3. POULTRY IN HOUSEHOLD FOOD SECURITY

3.1 Tastes and Preferences; and Attitudes to Poultry Consumption

Among Nigerians, poultry meat and eggs are to some extent, still considered luxury foods. In the rural areas where household incomes are significantly lower than the national average¹, consumption of poultry productions is reserved for special occasions. Usually the source of the eggs and poultry meats consumed is the stocks kept by the households. The amount of eggs and meats available from this source is usually limited by low level of productivity of the birds that are reared free range.

In the urban areas, poultry meat is consumed more often due to the relatively higher level of incomes, ready availability of poultry meat either as fresh or frozen products and chains of fast foods outlets, such as “MR BIGGS”, “Sweet Sensation”, “Tantalizer”, etc whose recipes and menus are rich in chicken meat and eggs. Nonetheless, consumption of poultry meat is largely occasional for most families even in the urban centres.

However, eggs are more routinely consumed in the daily diets in the urban areas. Eggs are usually consumed as compliments to bread and yams as omelettes or in peppered sauces. When taken as breakfast, bread and egg or yam and egg are usually accompanied by tea or cocoa beverage. In some towns and cities, it is not uncommon to find the combination of bread, fried eggs and tea being sold as breakfast by the roadside.

It is important to note that the relatively lower consumption of poultry products compared to other livestock protein sources is not due to significantly higher costs of poultry products but rather due to perceptions. Table 3.1 presents the prices of livestock products in Nigeria from 2001 through 2005. From the Table, the prices per kg of meats are N474.47 -dressed chicken, N388.50 - dressed turkey, N433.37 – beef, N381.54 - goat meat and N272.83 - pork

Table 3.1: Prices of Livestock Products (Naira per Unit)

ITEMS	2001	2002	2003	2004	2005
Cattle (Bull)	49,250.00	40,234.40	41,520.70	54,800.00	56,305.00
Cattle (Cow)	44,189.00	40,935.00	50,727.20	52,370.00	51,812.00
Ram	6,958.00	8,257.00	13,197.00	14,406.00	12,978.00
Sheep	7,833.00	6,108.00		11,910.00	7,203.00
Goat	3,719.60	4,829.17	5,970.00	6,833.00	6,642.00

¹ Nigeria's per capita income is about US\$ 380. and 70% of Nigerian subsists on less than US\$1.00 per day (National Planning Commission, 2005) The Federal Government stipulated minimum wage is N10,000.00 per month. States of the Federation are free to fix their own salary structures some of which have been fixed at levels lower than that of the Federal Government.

ITEMS	2001	2002	2003	2004	2005
Pig	10,178.13	8,913.90	9,323.00	11,933.00	12,285.00
Rabbit		395.10	643.00	645.00	645.50
Cockerel	394.90	498.25	650.00	790.00	689.56
Local Chicken	423.75	355.60	403.70	521.00	507.59
Broiler	458.00	583.00	692.36	863.00	844.31
Exotic Turkey	3,000.00	3,741.25	4,590.00	4,589.00	4,372.50
Culled Layer	374.50	376.00	510.55	602.00	597.89
Guinea Fowl	335.00	389.53	395.24	418.00	421.82
Duck			576.14	583.00	-
Beef (per kg)	296.25	348.50	393.78	356.00	433.37
Goat Meat (per kg)	292.00	329.71	374.46	318.00	381.54
Mutton (per kg)	251.00	316.87	335.19	328.00	349.87
Pork (per kg)	250.00	273.23	272.14	269.00	272.83
Bush Meat (per kg)	325.00	389.20	467.50	700.00	575.00
Whole Liver (per kg)	297.00	294.17	375.00	316.00	340.80
Whole Kidney (per kg)	278.00	275.83	350.00	304.00	334.75
Dressed Chicken (per kg)	326.50	369.40	403.00	477.00	474.47
Dressed Turkey (per kg)		336.67	360.00	377.00	388.50
Eggs /Crate	298.00	346.10	356.38	408.00	403.44
Powdered Milk	350.00		365.00	370.00	370.00
Tinned Milk	56.90	55.83	58.00	59.00	65.00
Fresh Milk (per litre)			98.00	120.00	150.00
Nono (per litre)		21.00	25.00	-	50.00
Butter / Kg		151.25	165.83	268.00	235.97
Cheese /Kg		187.50		285.00	86.25
Yorghort/25ml	42.50	42.50		45.00	51.20

Source: Federal Livestock and Pest Control Department, 2006

3.2 National and Household Expenditures on Poultry

The proportion of households' expenditure that is devoted to poultry products provides an indication of the importance of poultry in household food security. National and household expenditures estimates on poultry meats and eggs are however not available. Household expenditure survey (consumer Survey) has not been carried out by National Bureau of Statistics for several years. Hence for this study, the quantities and values of poultry products produced by the commercial poultry industry in Nigeria plus imports and stocks slaughtered by households for consumption will be used as indicators of the importance of poultry products in the national food security. These quantities and values represent the contribution of the poultry industry to national and household food security.

3.2.1 Local Production from Commercial Poultry

Estimates of local production of poultry products from the commercial poultry industry in Nigeria are presented in Table 2.14. The intermediate products are day old chicks for parent stock, broilers and layers while the final products are table eggs and birds. Most of the final products are consumed by Nigerian households while a small proportion is

exported to neighbouring West African countries. The quantities and values of final products are presented in Table 3.2.

Table 3.2: Estimated Quantities and Values of Final Poultry Products

Product	Quantity	Price per Unit (N)	Value (N)
Chicken (dressed weight of broilers, kg)	96,981,001	474.47	46,014,575,544.47
Chicken (dressed weight of culled layers, kg)	40,738,698	335.99	13,687,795,141.02
Table Eggs (crates)	273,873,600	403.44	110,491,565,184
TOTAL			170,193,935,869.49

Source: Calculated from data contained in Tables 2.18 and 3.1. The assumption here is that the estimated production capacity based on DOCs are fully utilized.

3.2.2 Imports of Poultry Products

The imports of chilled and frozen poultry meats into Nigeria for the years 2000 to 2005 are presented in Table 3.3. The table shows that the total import of poultry products over the five-year period is 11,045,522 kg. The import figures declined from 421,569kg in 2003 to 2,235kg in 2005 probably in response to government policy support for local poultry production. Thus indicating a declining contribution of poultry imports to poultry products consumption in Nigeria.

Table 3.3: Imports of Chilled and Frozen Poultry

<i>Year</i>	<i>Net Weight (kg)</i>	<i>Value (N)</i>
2000	430,271	23,820,024
2001	5,818,551	151,827,551
2002	4,370,097	314,509,630
2003	421,569	5,485,661,280
2004	2,799	577,041
2005	2,235	7,614,045
TOTAL	11,045,522	5,984,009,571

Source: National Bureau of Statistics, 2006

3.2.3 Stocks Slaughtered By Households for Consumption

The contribution of rural poultry to household food security is indicated by the quantity of poultry products emanating from this type of poultry that is consumed. Normally these are meat and eggs with the meat being the more important of the

two. Most times the birds are allowed to hatch their eggs so as to increase the household stock. Thus egg offtake is usually not too significant.

Table 3.4 presents the number of stocks slaughtered and sold by various households. The slaughtered stocks were consumed by household members thus constituting part of their food the year 2005. The stock sold were either purchased for slaughter by other non-livestock rearing households especially in the urban communities or added to the stock of other livestock rearing households.

Table 3.4: Number of Livestock Slaughtered and Sold from Household Stock by Type, 2005

Type	Own-slaughters	Number Sold
Cattle		1,830,645
Goat	2,962,007	7,807,185
Sheep	1,715,471	3,617,708
Pig	100,412	348,229
Chicken	12,153,631	17,892,267
Guinea fowl	1,565,756	2,275,822
Duck	1,135,133	1,180,461
Turkey	60,312	69,718
Other birds	174,805	223,639
All birds	15,089,637	21,641,907

Source: National Bureau of Statistics, 2006

Table 3.5 presents the estimates of poultry meat derived from poultry stock slaughtered and consumed by poultry households in 2005. The table shows that the estimated dressed weight of the poultry stock slaughtered is 16,239,246kg. This quantity is exclusive poultry stock sold to earn income, which would either have been slaughtered/consumed by non-poultry keeping households or have been added to the poultry stocks of other households.

Table 3.5: Estimated Poultry Meat from Households' Own Slaughter, 2005

Type	Own-slaughters	Price per Live Bird (N)	Value (N)	Average Live Weight per Bird (kg)	Live Weight (kg)	Dressed Weight (70% of Live Weight) (kg)
Local						
Chicken	12,153,631	507.58	6,168,940,023	1.5	18,230,446.5	12,761,313
Guinea fowl	1,565,756	421.82	660,467,196	1.6	2,505,209.6	1,753,647
Ducks	1,135,133	583.00	661,782,539	2.0	2,270,266	1,589,186
Turkey	60,312	2628.00	158,499,936	3.2	192,998.4	135,099
Total	14,914,832		7,649,689,694		23,198,921	16,239,246

Source: Estimated based on Own Slaughter estimates from Table 3.4

The information contained in these tables provides an indication of the contribution of the poultry sub-sector to households' food security in the absence of national household expenditure survey. From these tables, the contribution from broiler meat from commercial poultry and poultry meat from household poultry are estimated at 96,981,001kg and 16,239,246kg per annum.

CHAPTER FOUR

4.0 MARKETING OF POULTRY INPUTS AND PRODUCTS

The main poultry inputs and products are:

- Input: Feed, drugs and supplements, vaccines and housing cages, feeders, waterers, etc.
- Products: Day old chicks, table birds and table eggs

This chapter is devoted to how these inputs and products are marketed in a sub-sector that is relatively more commercial oriented than any other sub-sector of the Nigerian Agriculture.

4.1 Poultry Inputs

There are several distinct players in the marketing of poultry inputs in Nigeria. These players are presented in Table 4.1

Table 4.1: Major Players in Poultry Supply Chain

Inputs	Supply Chain Players
Feed	Feed millers, grain merchants/buyer agents Importers of concentrates, additives and supplements; poultry shops and poultry farms
Drugs and supplements, and vaccines	Importers of drugs and supplements, NVRI, poultry shops, extension agents (public and private) veterinary doctors, poultry farmers.
Housing (cages, feeder, waterers, etc)	Importers, local fabricators and welders, plastic manufacturing companies, tinkers, poultry shops and poultry farmers.

4.1.1 Feed

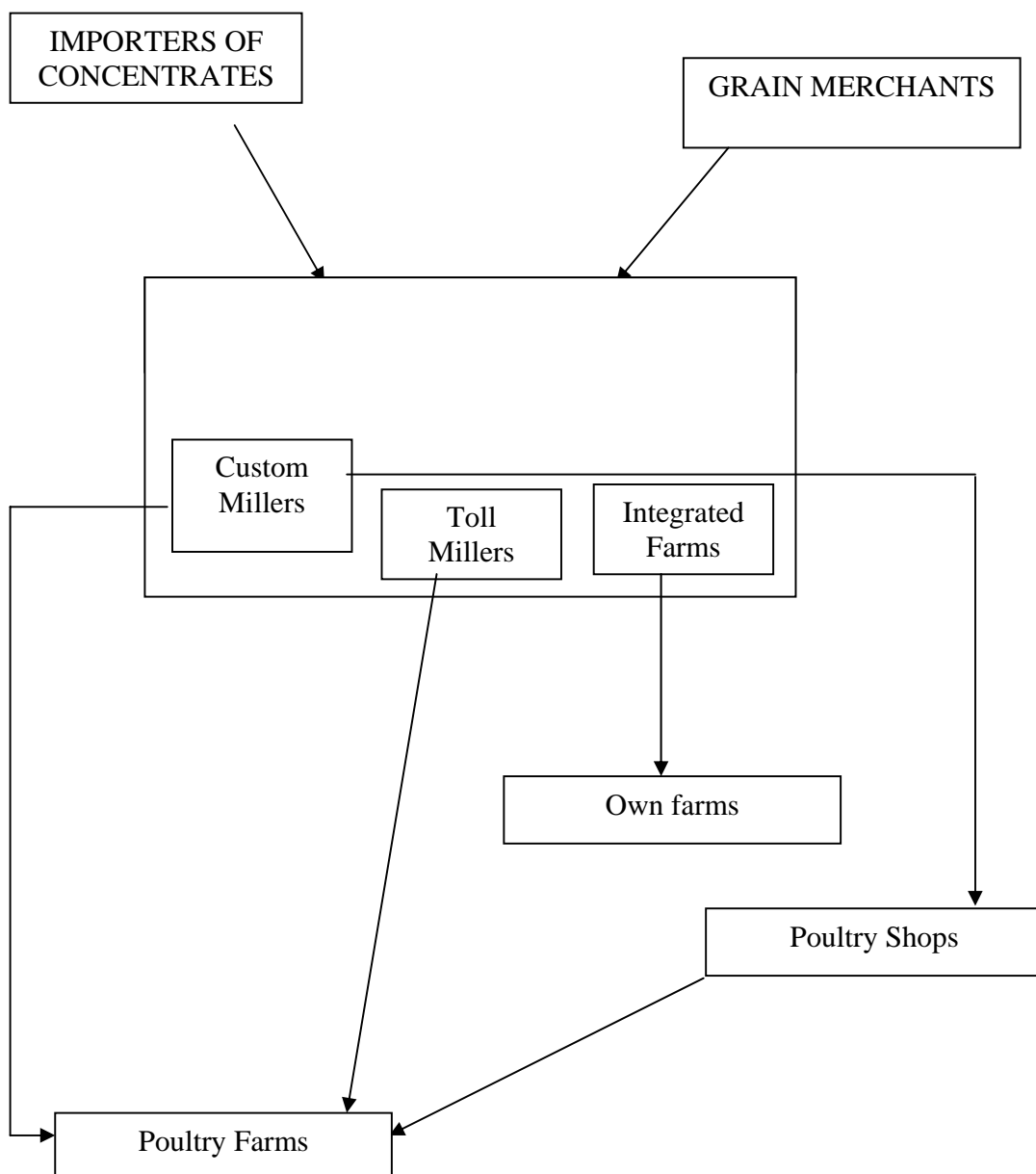
There are three types of feed millers, namely; custom, toll and integrated farms. The custom millers mill and market their feeds under registered trade names. The dominant trade names in the market include Amo Sanders, Guinea Feed, Top Feed, and Livestock Feed, among others. Some of these custom millers have adopted franchising as an operational method for achieving a wider reach across the country. The toll millers are spread across major locations with significant concentrations small to medium scale poultry farms. They will mill feed to the specification of customers (poultry and catfish farmers) and charge a fee (toll) per quantity milled. The customers either bring their feed ingredients or purchase them from the millers, if the millers have them in stock. The third category of feed millers is the integrated poultry farms, which own feed mills and produce feed for own use.

The feed millers acquire their grains from grains merchants/buying agents who source their grains mostly from the northern parts of the country. These merchants have established networks for aggregating grains from smallholder farmers and have mastered the logistics of grain transportation across the country.

The feed mills mostly depend on some importers for the supply of the imported feed ingredients such as fish meal, lysine methionine, soy meal etc. These importers also use intermediaries to reach the feed mills that are spread across the country but with higher concentration in the south. The poultry shops generally market various inputs of the poultry sub-sector; one of which is branded feeds obtained from custom feed millers. The poultry farms that do not have their own feed mills hence have the options of patronizing the toll millers, custom millers, or the poultry shops.

An overview of supply chain for feed is provided in Figure 4.1

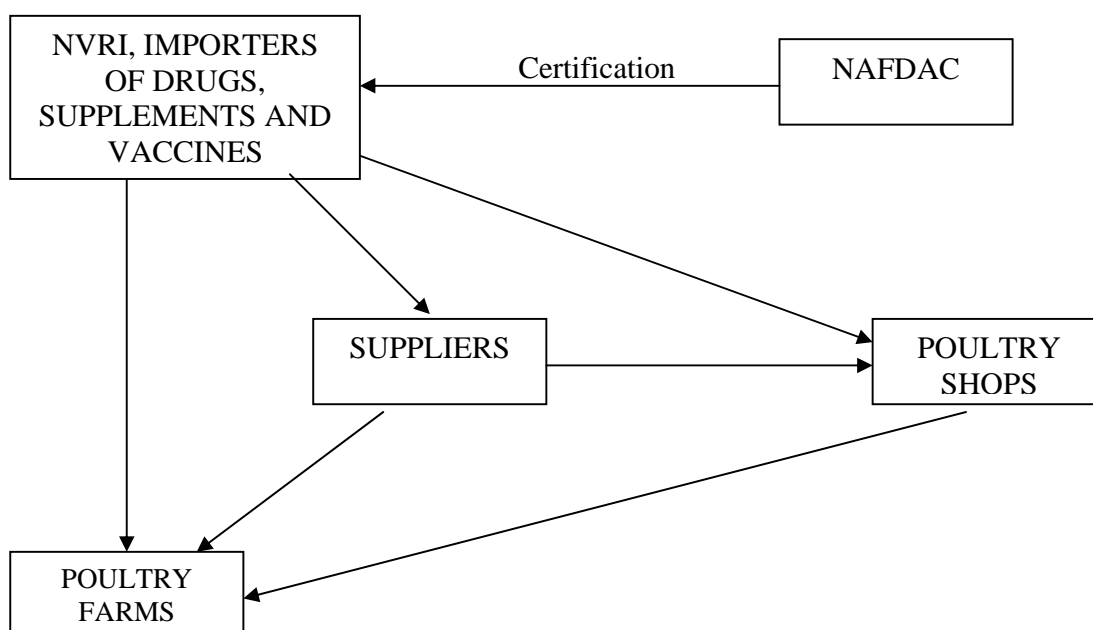
Figure 4.1. Poultry Feed Supply Chain



4.1.2 Drugs, Supplements and Vaccines

There are major importers of poultry drugs, supplements and vaccines. NVRI also produces some quantities of vaccines locally. The large-scale poultry farms obtain their supplies either directly or through suppliers from these importers. The small to medium scale poultry farms obtain their supplies from the poultry shops, private sector poultry extension agents and at times from veterinary doctors. An overview of the supply chain for drugs, supplements and vaccines is provided in Figure 4.2

Figure 4.2: Supply Chain For Poultry Drugs, Supplements and Vaccine

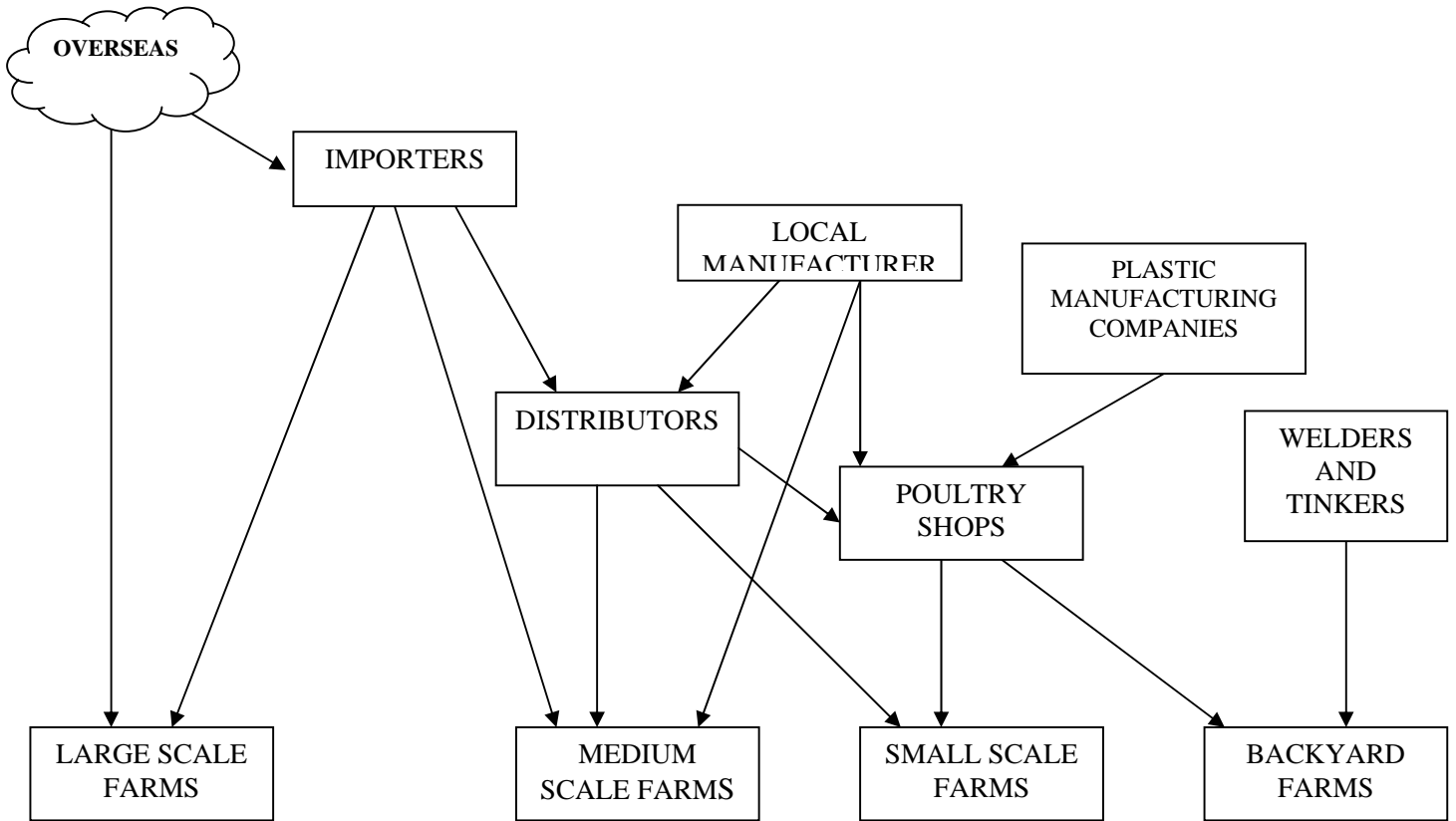


4.1.3 Housing

Poultry pens are usually custom-designed and built while other poultry housing equipment, are usually procured already finished. They are a few major importers of poultry equipment among which are Dizengoff and FACCO. The products of these importers are usually patronized by the medium to large-scale poultry farms. Most of the small-scale poultry farms usually patronize the locally manufactured poultry equipment.

An overview of the supply chain for poultry housing equipment is presented in Figure 4.3

Figure 4.3: Supply Chain for Poultry Housing and Equipment



4.2 Poultry Products

4.2.1 Products Distribution

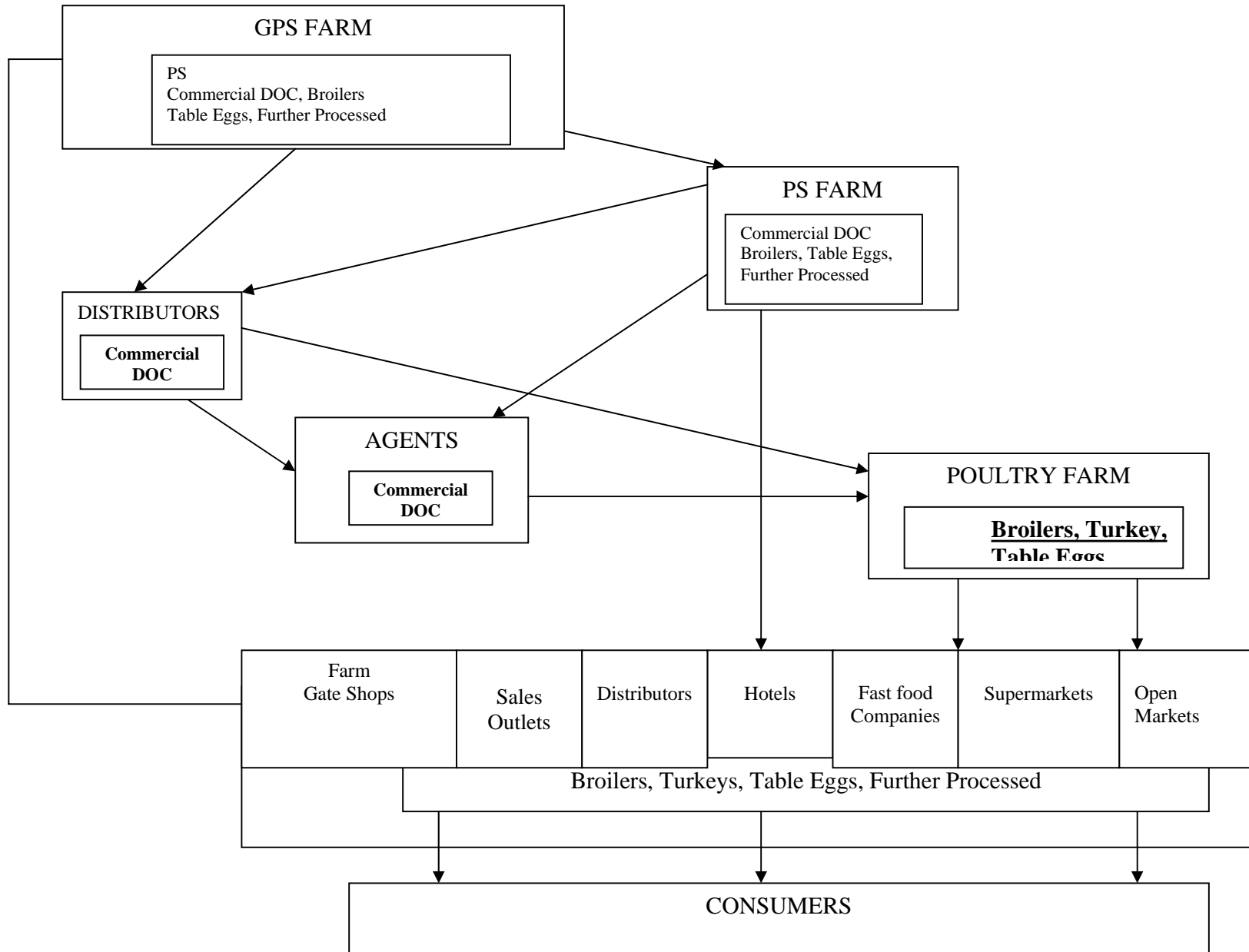
The main poultry products from the Nigerian poultry sub-sector are parent stock, commercial day old chicks, frozen chicken, table birds. The parent stocks are sold either directly to farms or through distributions or agents. Similarly, commercial day old chicks are also sold either directly to farms through distributor or agents. Some of the agents are the operators of the poultry shops who market various types of poultry inputs.

Frozen chicken and table eggs are sold to the consumers through a number of sources. These are

- ❑ Farm gate
- ❑ Sales outlets
- ❑ Distributors
- ❑ Hotels
- ❑ Supermarkets
- ❑ Fast foods companies
- ❑ Hospitality industry operators
- ❑ Open markets

Table birds, broilers, culled layers and turkeys are sold through the farm gate, agents and open markets to the final customers. An overview of the supply chain for poultry products is presented in Figure 4.4.

Table 4.4: Supply Chain for Poultry Products



4.2.2 Products Pricing and Prices

The major determinants of products pricing are costs of production and season of the year. There is usually seasonal peak in the demand for poultry meat. These peaks are usually at December (Christmas/New year festivals) and April (Easter Festival). The demand for eggs is fairly stable at all the year round. Current average of products at farm gate are:

Product	Average price (₦)
Broilers P.S	750
Layer P.S	800
Commericla P.X	120
Commercial B.X	130
Dressed broiler	350/kg

Most of the transactions are on cash basis.

4.2.3 Slaughtering and Processing

There are designated abattoirs in major towns and cities across Nigeria. However, only cattle are slaughtered and divided amongst beef retailers in these abattoirs on daily basis. A relatively insignificant number of other ruminants is also slaughtered in the abattoirs. Beyond slaughtering, splitting the carcass into smaller portions that fall within the capacity of retailers to buy and actual sales to retailers, nothing else take place in these abattoirs.

In most cases, it is the large-scale poultry farms that process their table birds into frozen chicken, chicken and turkey parts. Industry experts indicate that about 90% of broiler production are slaughtered, processed and sold as frozen chicken, while the rest is sold live in the open market and slaughtered in various homes. About 50% of the broiler produced are processed in automated slaughtering plants and stored in cold rooms before distribution and sales.

4.2.4 Transportation of Products

Transportation of poultry products is mainly by road. Occasionally, air freighting of dayold chicks in done for long distances.

Usually the big hatcheries transport dayold chicks with appropriately designed vans. Otherwise, other types of vehicles (cars, buses, truck, motorcycles, etc) are used. Frozen chicken are usually transported by processors to their sales outlets, supermarkets and major customers in cool vans and refrigerated trucks. Retailers use all types of vehicles including motorcycles.

Live table birds are put in plastic and cane basket cages and then transported in all types of vehicles. Table eggs are packed in crates. The crates are stacked in cartons that are then transported in all types of vehicles. Often, the crates are loaded directly into the vehicles and transported.

4.3 Marketing of Products from Rural Poultry

The products from rural poultry sector are eggs and meat. An overview from old literature and available comments showed that poultry mean more than eggs and meat (food) to the keepers. The farmer may sell off surplus cocks and hens, especially the unproductive ones

for cash needs. Although efforts are made to get as much as possible of the eggs hatched for the replenishment of stock, some may occasionally be sold for cash needs. Guinea fowls, which are the most prolific among the rural poultry species but poor hatchers and mothers, have most of the eggs sold for cash and food. Indeed, guinea fowl eggs are relished by Nigerians for their superior taste. On the other hand, pigeons are kept mainly for meat. However it is the purposes for which the birds are kept that can present a more realistic picture of the value of rural poultry. Such other purposes which rural poultry serve are as gifts to honoured guests, for ritual or religious sacrifices or for ceremonial foods on communal scale. Cock fighting is not a popular game in Nigeria and the rural poultry has little or no role to play in such games. Sales of live birds, are sold mainly by women and children on village market days which often attract buyers from other villages and the urban market agents. Some of such agents assemble large numbers of chickens bought from a number of markets and convey them in large baskets in trucks to southern cities and towns for sale.

4.4 **Regional (Inter-State) Trade in Poultry Products**

There is a concentration of commercial poultry farms that are based on the exotic chicken in the South; especially the South-West Nigeria, while most of the rural poultry that is based on the “indigenous” chicken” and guinea fowl is found in Northern Nigeria. This seeming regional specializations form the basis of the inter-regional trade. The products of commercial poultry, especially frozen chicken, are moved from the Southwest to the North, in most cases, through the Federal Capital Territory. On the other hand, products of rural poultry - live chicken and guinea fowls -, are moved from the North to the South, especially the Southwest.

This inter-regional trade in poultry products has implication for poultry disease transmission, especially Avian Influenza in recent times. The movement of significant number of live poultry from the North to the South provides a potential route for the transmission of Avian Influenza and other poultry diseases from the North to the South. Poultry products from the South to the North are mostly processed, frozen and containerised, thus minimising the potential of disease spread from the South to the North.

CHAPTER FIVE

5. GOVERNMENT SUPPORT PROGRAMME TO THE POULTRY SECTOR

5.1 Historical Background and Transition to the Current Status

Nigeria's poultry industry has its root in the initiatives of regional governments from the 1960s when, for example the Western Regional Government entered into joint pilot poultry production schemes with some foreign partners, notably the Israeli government.

The entry of private investors into poultry production in the late 1960s to early 1970s marked the onset of indigenous commercial poultry industry which then spread from the west to the eastern region and parts of the Northern region. The first decade or so of this period witnessed a tremendous growth in the industry, especially in the West. The size of the industry grew from less than 1million in the mid 1960s to over 40 million by the early parts of the 1980s. All along, the growth of the industry had been propped on government initiatives and incentives especially in terms of training, technological support, input support services, and others. Thus for example, many of the poultry technical staff were products of government subsidized training programmes, while inputs like vaccines and diagnostic services were subsidized by government or even free initially. Meanwhile the national economic climate was enjoying a boost from the newly advancing petroleum sector and this visibly helped to propel national investment sector, including poultry, rapidly forwards. As from this time, the poultry industry had started to be self-supporting, viable and attractive to financial institutions. However towards the end of the 1980s, government introduced policies, like the Structural Adjustment Programme (SAP), including floating foreign exchange market which were intended to diversify the economy and stimulate the nation's agricultural and industrial sectors. These policies however resulted in some unintended counter productive effects on some sub-sectors like the poultry industry. The fate of the industry in the scenario was dictated by its conspicuous dependence on imported inputs like GPS and PS, grains, feed stuff, drugs, vaccines and others. The new policies had placed a ban on the importation or restriction on the importation of many of these inputs which were the lifelines to the industry. The devaluation of the national currency obviously heightened the predicament of the import dependent poultry industry. Under this policy environment, the poultry industry collapsed rapidly. Only about 20 percent of the more than 5,000 commercial poultry farmers existing pre-SAP survived by the mid 1990s. The resulting decline in national commercial poultry stock to an all time low of about 9 million with the attendant deficit in animal protein supply, became a source of grievous concern to the government and the country. Quite naturally the indigenous (rural) poultry sector was not seriously affected by these policies, because of its low inputs demand structure. Indeed, available information claimed that the indigenous (rural) poultry grew by over 16% in the period.

These negative development in commercial poultry challenged successive governments between the late 1990s to date. The governments realized there is the need to rejuvenate the poultry industry and redress situation through policy incentives and other similar programmes. With the intensification of such programmes in recent times, the poultry sector, has through its innate responsiveness started to rediscover its feet The real turning point in this regard has been the FGN policies which placed a ban on the importation of commercial DOCs , eggs and frozen chickens. – a policy which has had the effect of boosting internal production and sufficiency in these items.

5.2 The Thrust and Examples of FGN Support Programmes

The government support programmes, which have boosted the performance of the poultry sector, have been designed to cover not only the industrial or commercial sector but also the rural and smallholder poultry. The following passages reflect the thrust and nature of such programmes.

5.2.1 General Policies on Livestock and Meat/Dairy Policies

The role of government still remains initiating national livestock policy and executing regulatory functions relating to the livestock sector. In 2002, the agricultural policy document was reviewed but the key focus is still improving the productivity and output of available resources with a view to attaining self-sufficiency in foods of animal origin. The major interventions are to ensure efficient production, stability of prices and supplies of meat and other products, promotion of animal and human health and the general welfare of livestock producers.

The general policy objective in the livestock industry is to put all available livestock resources into best use. This will be achieved by expanding resource base or increasing productivity of the existing resources through systematic improvement of the production system. An important goal is self-sufficiency in the shortest possible time for meat and milk.

The specific objectives include

- restructuring and diversifying the productive base of the livestock sub-sector
- matching available feed resources with the livestock production system
- achieving stability in livestock prices, output and income
- improving rural income from livestock production enterprises
- protection of rural farmers from the vagaries and risks incidental to production
- generating rural employment opportunities through expanded livestock production and processing
- effecting proper land use and maintenance of the ecosystem for expanded livestock production

5.2.2. Poultry Production Policy

Policy Objective: To develop a Nigerian Foundation Stock that will be more productive in terms of eggs and meat within the context of our present environment.

Policy Strategies

The policy strategies are:

1. Employment of the most modern method in genetic engineering to develop a Nigerian stock
2. Collaboration between our research institutions and some well established and experienced companies from developed countries (e.g. Euribrid of Netherlands) in the development of Nigerian Grand parent stock.
3. Establishment of grand parent farms in different ecological zones to produce parent stock for the poultry farms nationwide.

The project, which has been justified with the production of the “Shika breed” by NAPRI, recorded rapid progress and achieved this commendable outcome over the years. Although it was still active on efforts to upgrade this unique product to international standards, its progress appears to have been stalled with lack of funds. The following Tables show the productivity of the Shika brown layer breed.

Performance of FGN/NAPRI Foundation stock (Pure Breed)

Table 5.1: Performance During Wk 1-8

Age (Wks)	Mean feed g/bird -Wk	Cumulative g/bird	Avg. B. Wt g/bird	Weight gain g/bird	Mortality (%)
1	51.17	51.17	43.79	9.71	35 (6.4)
2	77.53	130.87	66.60	20.95	21 (3,8)
3	116.63	247.77	105.77	39.25	01 (0,18)
4	182.56	430.32	167.44	61.46	-
5	237.97	669.17	239.63	71.85	01 (0.18)
6	338.41	1007.58	356.81	117.17	-
7	419.3	1426.89	476.00	80.79	-
8	439.02	186.56	506.40	68.80	-

Table 5.2: Performance During Wk 9-20

Age (wks)	No. of birds	Feed (kg/wk)	Mean B. Wt (kg/wk)	Mortality (%)
9	492	227.80	0.571	-
10	492	240.59	0.686	-
11	492	276.01	0.777	-
12	489	293.89	.0884	3 (0.61)
13	488	296.70	0.964	1 (0.20)
14	487	318.50	1.043	1 (0.20)
15	487	329.70	1.127	-
16	487	292.20	1.107	-
17	487	287.82	1.190	-
18	487	293.17	1.280	-
19	461	285.82	1.258	-
20	461	332.38	1.445	-

Table 5.3: Performance 20-40wks In-Lay

Age (wks)	No. of birds	Feed (kg/wk)	Eggs Prod. (No./wk)	Feed Conv. (kg fd/doz egg)
20	461	332.3	5	797.47
21	461	343.8	26	158.65
22	460	345.2	176	23.56
23	460	327.6	461	8.53
24	460	304.9	2137	2.66
25	460	350.0	2137	1.96
26	459	341.0	2415	1.69
27	459	345.0	2380	1.74
28	459	347.9	2390	1.75
29	459	356.0	2358	1.81
30	459	412.0	2366	2.08
31	458	450.0	2224	2.43
32	458	445.0	2135	2.50
33	452	439.0	1998	2.60
34	452	439.5	1693	3.11
35	452	430.0	1898	2.72
36	452	432.0	1981	2.62
37	450	435.0	1953	2.67
38	449	435.0	2095	2.56
39	449	433.0	2069	2.51
40	449	436.0	2126	2.46

Table 5.4: Body Weight, Ages, Mortality, Feed Intake and Feed Conversion Ratios at Certain Stages of the Laying Period. NAPRI

Body weight (kg) at:		Age (weeks) at:		FCR (12 eggs) at:		Mortality % at	
50% production	1.51	First egg	19	20-32 weeks	193.4	20-32 wks	
50% production	1.69	5% production	22	33-42 weeks	6.9		0.65
40 weeks of age	1.67	50% production	24	47-59 weeks	6.8	33-42 wks	3.10
72 weeks of age	1.68	Peak production	27	60-72 weeks	9.0	47-59 wks	10.5
						60-72 wks	8.2

Government is supporting the National Animal Production Research Institute (NAPRI) to develop the Nigeria broiler line Parent Stock of Poultry as it has done for the Nigeria layer line parent Stock. The Ministry is also strengthening the role of the Strategic Grains Reserve Department in providing grains to feed millers in the event of scarcity or market shocks. Since feed constitute over 60% of the production cost of the livestock industry, Government has continued to support research into alternative local feed formulations. Research conducted outlined promising

5.3. Support Policies

5.3.1 Price support Policies

There are no records of explicit and directed livestock price policies other than those contained in the general agricultural pricing policy. The policies affecting livestock pricing in Nigeria are therefore mainly implicit and indirect deriving from monetary and fiscal policies and associated measures.

5.3.2 Methods of implementing producer price support schemes

The methods of implementing these price interventions are limited to tariff and non-tariff barriers, input subsidies and exchange control as well as Value Add taxes (VAT). Some State Governments have also re-introduced the cattle tax “Jangali” on pastoralists in order to raise the internally generated revenue of the State.

5.3.3 Non-Price measures

Some non-price planning strategies and instruments undertaken during the period under review include the restructuring of the Agricultural Bank and the reduction of interest rate on credit to less than 10%. Some anti-dumping measures were undertaken which included the restriction in the *importation of Poultry products* only through the land borders. Some projects like the Special Programme for Food Security (SPFS) and the Pan African Control of Epizootics (PACE) are being implemented to support production by promoting technical improvements and animal health.

5.3.4 Consumption Patterns and Policy

There are no administered consumer prices as prevailing prices are determined through the market forces of the demand for and supply of livestock and meat/dairy products. Livestock products are not subsidized, hence no information on changes in subsidy. Government plans to encourage the consumption of some products of through the introduction of the *School feeding Programme whereby milk add eggs* are served in primary and secondary schools at break time free of charge or at subsidized rate. Pilot projects have already been initiated in some States.

5.3.5 International Trade Policies

The objectives of government’s trade policies are to promote exports both as a way of diversifying the country’s export and as a means of boosting growth and development of the sector.

Government export policy is to minimize administrative controls of external trade through trade liberalization and promotion of competitive international trade. Nigeria is a member of the World Trade Organization and therefore will continue to respect agreements reached on international trade.

As part of the policy thrust for 2002 fiscal year, government sought to protect domestic industries against unfair competition from imports and dumping through the upward adjustment of *tariff rates for certain livestock products such as turkey parts and dressed chicken from 25% to 75%*. Also to encourage local production, poultry feed grade vitamins such as L-Lysine, antibiotics, etc were reduced from 15% to 5%, and day old chicks maintained at 5%.

5.4. **Developments in International Technical Assistance**

Until recently, the World Bank has been the main source of assistance to the sector through the First and Second Livestock Development Projects. However, in recent years technical assistance has been received through the EU/IBAR for Pan African Control of Epizootics (PACE), FGN/FAO/UTF for Special Programme for Food Security (SPFS), USAID technical assistance for Strengthening the Manpower Development in Epidemiology and Veterinary Public Health and FAO technical assistance for meat inspection and the production of the Country Report on Animal Genetic Resources.

The demonstration of the effects of this international assistance programme became very obvious during the recent HPAI epizootic in Nigeria, when fund and material supports were received as follows:

World Bank -	\$ 50 million
USAID:	\$ 25 million
	PPE = 1425 units supplied
FAO:	PPE 5655 units Supplied
	Disinfectant (750 litres) Supplied
DFID/WHO :	PPE (7000 units) (Supplied)
CDC, USA :	Training Laboratory personnel and Upgrading of NVRI laboratory facilities to characterize HPAI viruses
Thomas A Gioanis :	Chairman American Board of Health care Law & Medicine
	2,500 liters of Disinfectant
People Republic of China:	Equipment and Medicine for Artificial Insemination (AI)
South Korea	

5.5 **Pilot Vaccination Programme of Rural Poultry Against Newcastle Disease.**

Over the years, statistical data from field reports indicate that diseases, especially Newcastle Disease (ND), account for over 60% mortality in rural chickens. This high mortality can be drastically reduced through effective vaccination against these diseases especially ND. It has been established that as little as a 10% reduction in the current mortality level of the disease would lead to a 30% increase in production level in the industry.

The specific objective of the programme is to increase the production and productivity level of rural chickens that are being raised under the village production setting and, in so doing, further improve the economic returns of the rural chicken producers.

The total estimate for the programme is Two Hundred Million Naira (N200M) only. This covers the cost of disease control materials and inputs as well as other logistics (vaccines, drugs, equipment, mobility, field allowances, etc). Details of the cost estimates are as follows:

5.6 **The Millennium Development Goal Project of Federal Ministry of Agriculture**

This is a futuristic and ambitious programme, which exemplifies the focus of government policy on the poultry sector. The crux of the millennium development plan is captured in the Table 5.5 below.

Table 5.5: Highlights of The Millennium Development Goals (Fed Ministry of Agriculture and Rural Development)

PROPOSED PROJECTS	Poultry Development	
<p><u>Poultry production</u></p> <p>i. Increased in the numbers of eggs and poultry meat production</p> <p>Broiler production: (0-8 wks) % feed cost / total production 57.04%</p> <p>ii. Cockerel production: (0 – 6) weeks) 45.30%</p> <p>iii. Starter Pullets (0-8 wks) 50.2 %</p> <p>iv. Point of Lay production: (9-20wks): 68%</p> <p>v. Commercial Eggs Production: (21 – 72 wks) 72%</p>	<p>Syndication of loanable funds at interest rates not exceeding 9% through NACRDB for poultry farmers</p> <p>Resuscitation of moribund poultry breeding farms to enhance the utilized capacities of existing hatcheries to produce 250,000 Parent Stock for distribution to Poultry farms</p> <p>Rehabilitation of abandoned hatcheries and establishment of new ones to achieve hatching capacity of 3.0</p> <p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p> <p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p>	<p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p>

5.7 Presidential Initiative on Livestock

This represents the initiative of FGN to re-activate the huge but rather dormant national livestock sector of the Nigeria agriculture. The programme seems to have emerged from the President’s personal drive towards the realization of the potential of the Nation’s livestock production capacity. The policy and programme are comprehensive. They cover all livestock types. The aspects of the initiative directed at poultry are excerpted below:

5.7.1 Background

From the inception of the present Administration, the President has organized a series of Stakeholders fora tagged “Saturday Forum” where Stakeholders discuss matters affecting their industry and propose future direction of the industry in consultation with Government. At one of these meetings, the livestock industry was the subject of discussion. The President set up a 26-man Committee on Livestock to carry out a detailed assessment of the livestock industry and make its recommendations on the way forward.

5.7.2 Targets

The Committee developed a terms of reference (TOR) with specific objectives that focus on the overall improvement in livestock production and marketing which include the following on the poultry sub-sector:

- To examine and recommend the ways of increasing animal protein intake by 50% within the next 3 years. To achieve this, requires a new policy thrust and programmes aimed at doubling the output of meat, milk and eggs during the target period

- To seek ways and means of entering the export market with commodities that can earn foreign exchange within the next 5 years.
- Poultry Production to be resuscitated to pre-SAP level by using the unutilised installed capacities in hatcheries, feed mills, and breeding units. The commercialisation of the Shika Brown, which was developed by NAPRI as source of local parent stock of poultry, to be pursued vigorously.
- Inputs Supplies, Marketing and Support Services to be developed to ensure a proper linkage with production by making available veterinary services, extension services, vaccines and drugs, feeds, processing and storage facilities, development of abattoir and slaughter facilities, including utilization of by-products of animal origin.

After a general review of various development areas within the livestock sub-sector, the Committee went further to identify the types of intervention required and thereupon recommended programmes in these areas that will assist in achieving set objectives, which include:

i. Feed and Nutrition

ii. Animal Breeding and Genetic Improvement

Establishment of Cattle, Sheep, Goat, Pig Multiplication Centres

Establishment of Poultry Production Units and micro livestock or meat from non-conventional sources

iii. Poultry Development

- Hatchery Capacity Enhancement Programme
- Shika Brown Layer and Foundation Stock of Broiler Development Programme
- Breeding Farms Expansion Programme
- Feed mill Capacity Enhancement Programme
- Promotion of Institutional Demand for Poultry Products
- Promotion of Industrial Demand for Poultry Products
- Poultry Research and Development Programme
- Poultry Producers Registration Programme
- Family Poultry Development Programme

iv. Livestock Processing and Marketing

- Standardisation of the Marketing system
- Development of an Export market for Livestock and Livestock Product
- Poultry Products Processing Programme

v. Animal Health and Veterinary Services

- Effective control of Trans-boundary Animal Diseases (TADS), Zoonotic and other diseases of economic importance.
- Provision of functional infrastructure for vaccine production and veterinary services delivery
- Institutional strengthening (FDL&PCS, NVRI, NAFDAC, States & LGA)
- Provision of veterinary inputs
- Food Safety
- Establishment of Export Processing Zones

vi. Grazing Reserves and Stock Routes

- Accelerated Development of Stock Routes and Grazing Corridors

vii. Livestock Extension Services

- Draw up extension priorities at local level, as livestock production needs may not be predictable in
- Train animal health workers in Information and Communication Technology (ICT) and use them for extension in a targeted way.

viii. Export of Livestock Products

- Vitamins, Premixes and Concentrates
- Livestock vaccines, and veterinary drugs
- Valued added livestock products e.g. eggs and poultry products, Hides and Skins, Processed horns.

5.7.3. Funds Requirement and Funding

The Committee arrived at cost implications for the total number of activities at 15 billion Naira but a total of 5 billion Naira was approved for the 3 years spanning 2004 to 2006. The spread of funds from

Table 5.6: Budget for The Presidential Initiative Programme on The Livestock Sector

<u>S/N</u>	SUB-COMPONENT	<u>YR 1</u>		<u>YR 2</u>		<u>YR 3</u>		<u>TOTAL</u>	
		2004		2005		2005			
		Appraised	Approved	Appraised	Approved	Appraised	Approved	Appraised	Approved
1.	Feeds and Nutrition	750	250	450	150		100		500
2.	Animal Breeding/Genetics	1500	500		300		200		1000
3.	Poultry Production	750	250		150		100		500
4.	Processing and Marketing	900	300		300		200		800
5.	Animal Health and Vet. Services	1200	400		350		250		1000
6.	Grazing Reserve/ Stock Routes	1500	500		300		200		1000
7.	Livestock Extension Services	300	100		50		50		200
	Total	2.30	2.30	1,600		1,100			5,000

5.7.4 Implementation

The aspect concerning the formation of a Livestock /Fisheries Marketing and development agency has been successfully started. Also a total of ₦ 100 million was appropriated for the Presidential Initiatives on Livestock in 2004. This represents less than 2.5% of the expected ₦2.3 billion for the year. Even then the fund could not be accessed before it lapsed and so no meaningful implementation was carried out during the year. A total of ₦44.0 million was released for the first and second quarters of 2005 and was utilized for:

- rehabilitated and resuscitated 4 Nos. existing livestock breeding centres
- re-stocking 4 Nos. breeding centres with improved breeds (60 animals)
- provision of infrastructure such as boreholes and watering facilities in grazing reserves in the North West, North East, and North Central Zones (6 Nos . boreholes sunk and 5 No. earth dams built; 3 No. earth dams reactivated and 4 Nos. Broken down boreholes reactivated.
- Demarcation of 116 km of stock routes in the North West axis of the transhumance stock route to reduce pastoralists/crop farmers' clashes.

- v. The poultry industry is recovering fast and has now developed to the extent that it is now exploring the possibilities of exports.

Other activities programmed for implementation include:

- i. procurement of CBPP vaccines, syringes and needles
- ii. development of Grazing reserves and Stock routes
- iii. Procurement of Supplementary Feeds
- iv. Refurbishing and rehabilitation of eleven (11) Breeding Centres
- v. Procurement of Day-old chicks for Family Poultry Programme
- vi. Procurement of Equipment for Livestock Extension Services
- vii. Livestock Processing and marketing Inputs
- viii. vaccination of 10 million heads of cattle in the North
- ix. vaccination of 1.0 million local poultry including vaccine procurement, mounting an enlightenment campaign for the involvement of Rural Women in poultry keeping as part of our contribution to Poverty Alleviation and gender mainstreaming under food security;
- x. surveillance of crop and livestock pests in 10 Frontline States
- xi. Development of additional 156 grazing reserves from the 433 already identified, to increase the number of grazing reserves slated for development to 208 covering a total area of 3,391 hectares.
- xii. Development of 17,032 km of transhumance stock routes and grazing corridors.
- xiii. To achieve 88 million broiler and 30 million layers to produce 170,000 metric tonnes of meat and 350,000 metric tonnes of eggs.

The overview reveals that although the presidential initiative policy is an excellent concept on the livestock sector, which ideally encompassed industrial and rural poultry, its implementation has been problematic, not the least through poor funding and even then the share that accrued to the poultry sector in the first tranche of funds left the poultry sub-sector unattended. Indeed, all these go to show that Nigeria has never been short in support and policy initiatives, the real problem as always is in the funding and implementation of such policies.

CHAPTER SIX

6. OFFICIAL REGULATIONS AND INTERVENTIONS IN POULTRY HEALTH (IN PARTICULAR AVIAN INFLUENZA MEASURES.)

6.1 The Animal Diseases (Control) Decree.

The control of the diseases of all animals in Nigeria are regulated by rules and laws set out in decree No10 which was gazetted in February, 1988, pages A477 to 501. The decree contains the definitions and rules guiding the importation and exportation of animal and poultry products; surveillance and notification of their diseases; compensation policy; duties of Veterinary Officers, Law enforcement agents and the powers of the Minister in the determination of contraventions, etc. The major aspects in relation to this report are as follows:

- The importation or exportation of animals, poultry and their products including; hatching eggs and biologics is prohibited, except under a permit granted by the Director. It provides for manned control and monitoring posts, listed in a schedule and stipulates sanctions for contraventions
- The decree defines the rules for the establishment of a hatchery or a poultry farm of up to 250 birds under licence, demands that such operations must be registered annually (fee N50) and managed hygienically with compliance on vaccination programmes.
- It empowers the Minister to make regulations on the importation, exportation and the management of any disease outbreak of national economic importance by control or eradication measures.
- At the state level, the decree empowers the Directors /CVOs to adopt and apply disease control and related measures , subject to the approval of the Minister or Commissioner.
- Schedule 1 of the decree contains a list of 80 Animal Diseases including 20 poultry diseases, viz:

No 8 Avian Encephalomyelitis	No 9 Avian Infectious bronchitis
No 10 Avian Leukosis Complex	No11 Infectious Laryngotracheitis
No 22 Coccidiosis	No 27 Chronic Respiratory Disease
No 30 Duck Plaque	No 31 Duck virus hepatitis
No 43 Fowl Cholera	No44 Fowl Plaque
No 45 Fowl Typhoid	No 47 Gumboro disease
No 52 Infectious coryza	No 53 Influenza and Parainfluenza
No.57 Marek's disease	No 62 Newcastle disease
No 64 Pox diseases of all spp.	No 65 psittacosis and Ornithosis
No 70Salmonella infections (...S.pullorum)	No 79 Tuberculosis (Bovine and Avian)

There are well-articulated provisions for compensation with regards to animals slaughtered for disease control purposes. However, the relevance of the provisions to poultry is less obvious or subsumed under generalised frameworks for animals, hides and skin.

Schedules 4, 5 and 6 contain the design of the Import Permits while Schedule 10 shows the format for the Farm/Hatchery Establishment Licence.

6.1.1 Technical Overview of the Decree

The decree was established in 1988 and it is comprehensive and explicit. However, it is obvious that many core areas of the decree have lapsed out of relevance to a dynamic sector such as livestock and poultry health. The most glaring examples of such lapses include:

- The definition of size (250) of poultry and hatchery to be registered
- The penalty of N50 for contraventions.

- The list (context and specificity) of poultry disease; Nos 44& 53, for example.

There are many important poultry disease which have been globally recognised or reclassified in decades after the advent of the 1988 decree. For instance, the globally adopted name for Fowl plaque which has removed the lopping together of two Myxoviral disease entities are Newcastle disease for the Paramyxoviral disease and Avian Influenza for the Orthomyxoviral counterpart. The two diseases have important epizootiologic and economic differences, which can no longer justify their location in the vague bracket of Fowl Pest – a terminology that derived from the early part of the last century. It is therefore obvious that a total review and up-date of Nigeria’s Animal disease regulations is urgently necessary. Indeed, the emerging pre-eminence of the poultry sub-sector under the impetus of the current Avian Flu epidemic should help focus greater attention on the sub-sector in the new Animal Diseases Edict /Regulations. The responses to efforts of the FGN on the management of the flu epidemic in Nigeria, gives hope for such positive dispensations in the sub-sector.

6.2. Management of Avian Influenza Outbreak in Nigeria.

The geographic spread of the current Avian Influenza (AI) pandemic started in the later part of 2003 in Southeast Asia and moved eastwards to Europe during 2004 to 2005. It was more logical to expect it to continue further eastwards into Europe or perhaps jump across the Mediterranean into Libya, Egypt or other contiguous countries in North Africa. It was therefore rather a surprise in the trend, that it was first encountered or reported from Africa in Nigeria. Some of the enabling factors to the early cue in the diagnosis of AI in Nigeria are partly traceable to the following:

6.2.1 Pre-epidemic Background in Nigeria.

With the global alert on H5N1 AI, the pre-epidemic activities in Nigeria included:

- Preliminary proposal to FGN by a team of subject specialists based in the University of Ibadan, early in 2004.
- ABU/FVM: A Colloquium on Bird Flu in Ahmadu Bello University, Zaria invited a multi-disciplinary team of experts to make contributions which were published with a copy sent to the Hon Minister of Agriculture in December. Adene,et al.(2005).
- FGN : 1. Inter-Ministerial Expert Committee on Flu subsequently in early 2005
 - 2.The Health Sector Technical Advisory Committee, Dec 2005
 - 3.Technical Committee of Experts, in Fed Livestock Dept., Dec 2005
- These two committees which were primarily concerned with the medical and agricultural sectors respectively, promptly submitted separate preparedness documents to FGN in December, 2005
- Poultry Industry and Investors under the forum of Poultry Association of Nigeria (PAN), made some mild attempts to overtly focus on the pre-epidemic stage but rose more stoutly to the challenges when the epidemic was eventually reported.
- MEDIA : The print and electronic media were generally active in giving space and time for publicity from all the above mentioned sources.

6.2.2 Preparedness Plans in Nigeria

Although the two earlier mentioned committees submitted what could be regarded as good preparedness plan dossiers which included operational logistics and material requirements to FGN promptly in Dec, 2005, the **arrival** of the epidemic so soon after, through a signalling diagnosis from ABU, Zaria in Jan, 2006 appeared to have caught the country by surprise and rather unprepared. There was hardly any time to study, adopt and procure logistic

requirements. The requisite preparedness training of field staff etc could hardly be done and so panic was therefore inevitable in the circumstances. However with the rather emphatic policy stance of FGN, national and international efforts were speedily mobilized to put a concerted response programme to replace the initial panic.

Plans were immediately evolved to send samples to the national Veterinary Research Institute (NVRI) where the appropriate containment virologic facilities were available, for further investigation and laboratory confirmation. After the preliminary tests in NVRI, specimens were forwarded to Padua, Italy for the typing and sub-typing of the virus. A confirmation of H5N1 bird flu in Nigeria came from the reference laboratory on the 7th Feb, 2006.

6.2.3 Poultry Sector and Public Reactions

There was palpable fright and frustration from economic implications on poultry production. The responses from the various stakeholders include:

- Small-scale (rural poultry) operators were scared by the danger of losing source of family livelihood
- Large commercial operators bemoaned the looming loss of their investment capital.
- Employees were grieved by the helplessness in the face of impending lay-offs.
- Consumers progressively abandoned patronage of poultry meet and eggs and opted for fish, beef and other substitutes, with attendant cost implications from demands.
- Producers and marketers of poultry products lost a good chunk of sales and incomes.
- The Poultry Association of Nigeria (PAN), Poultry Marketers Association with active support of the media as well as some professional associations like the Nigerian Veterinary Medical Association (NVMA),
- World Poultry Science Association (WPSA,Nig) also hosted public enlightenment seminars and lectures in locations across the country.

The municipality of Jos in Plateau State was one of the places to be caught in the bird flu epidemic. There were losses in the poultry population in terms of mortality and slaughter of poultry. The following Tables reflect the changes in poultry as stock holdings and as market commodity as at June ,2006. Thus, there was a depletion ranging from 33 to 100 % in sampled farms, about 50 % in feed mill out-put, while a maximum of 50 and 20 % were observed in the domestic fowl and guinea fowl markets. The depletion in a major local Suya (barbecue) spot was between 37 and 50% over the period.

Table 6.1: Structure of Response To HPAI in Jos Environ (Production)

FARMS	Layer Poultry Stock		Feed Mills (tonnes)	
	Pre-HPAI	Current	Pre-HPAI	Current
Agro Kaffin Hs	30,000	nil	40	20
Danladi Auyo	20,000	< 10,000	5	?
Fulata Dutse	15,000	< 10,000	?	?
Babangida	1,000	nil	?	?
(Range % Depletion) = (33.3 to 100)			(50 ?)	

Source: NVRI, July,2006

Table 6.2: Structure and Response To HPAI in Jos Environ (Market Daily Estimates)

MARKET	D. FOWLS		G. FOWLS		DUCKS		PIGEONS	
	Pre	Now	Pre	Now	Pre	Now	Pre	Now
Babara	2000	1000	-	-	500	280	500	200
Maigatari	4000	2500	2500	2000	1000	600	400	100
Gujungu	5000	3000	2000	2000	500		500	150
(Range % Depletion)	(37.5 to 50)		(0 to 20)		(0 to 44)		(0 to 75)	
SUYA Depo 1	600	350	NA		NA		NA	
..... 2	500	250						
..... 3	800	400						
(Range % Depletion)	(25 to 50)							

Source: NVRI, July 2006

6.2.4 Aspects of Bird Flu Emergency & Management Responses in Nigeria.

The responses consisted not only of the general stereotypes but also customized components to suit the local demands. FGN proclaimed a slaughter and eradication policy for the *stamping - out* of the flu epidemic. Responses were targeted on the following:

- Poultry operations: enlightenment campaigns on intensified preventive biosecurity; detection and reporting; slaughter/depopulation, disposal and decontamination procedures; etc
- Slaughter policy but no vaccination was not officially adopted.
- Poultry products as food: handling and kitchen safety precautions.
- The scientists especially those in the Universities called for multi-lateral and comprehensive surveillance strategy and implementation that will be a pro-active epizootiologic tracer.
- The command chain appeared top-heavy and over-centralized, with minimal States, LG and peripheral or grassroots involvement. Commercial poultry farms instituted a '*red alert type*' sanitary (bio-security) precaution. Movements in and out of farms were placed under strict control and hygienic precautions.
- The less structured rural poultry sector appeared less compatible with these programmes and was therefore rather side-lined.

6.2.5 Current Status and Trends in Flu Outbreaks

Bird flu outbreak in Nigeria *initially and simultaneously* involved two contiguous states (Kaduna & Kano) in the northern part of Nigeria, from where it spread in a matter of few weeks to six other states in the Middle belt and North. Outbreaks were subsequently reported in the southwest, from a few farms in Ogun and Lagos states (the commercial poultry headquarters in Nigeria) and then from Anambra state in southeast of Nigeria in March/April. As at May 2006, outbreaks have been reported from 14 states covering 32 LGAs (Table 6.3 & Fig 6.1.). The spread was initially rapid despite the slaughter/stamp-out programme but it conspicuously slowed down in April, which coincided with the ingress of the hot season in the northern epi-centre. Thereafter, only few sporadic outbreaks involving mainly small scale operations in the North were reported. However, as at June 2006, a few more outbreaks

were reported in the southwest (Lagos State) from two commercial farms. Generally, the worst victims were in the poorly managed poultry farms while the larger *bio-security-alert* commercial farms have so far, had minimal encounter with the epidemic. This is an aspect, which deserves to be empirically examined. The initial involvement of local (*indigenous*) chickens in Katsina state, appears to have been followed recently with another outbreaks in Taraba state. It is not clear if this is truly representative of the status of the susceptibility to the epidemic in this category of poultry.

Table 6.3. Monthly Summary of HPAI Reports In Nigeria (Jan to June, 2006)

	JAN	FEB	MCH	APR	MAY	JUN
Number of States Suspected	6	20	20	10	10	9
Number of LGA Suspected	7	34	40	22	12	13
Number of Cases Suspected	23	126	93	73	51	71
Cases Positive	7	50	21	15	9	7
% Positive	30.4	39.7	22.6	20.5	17.6	9.9

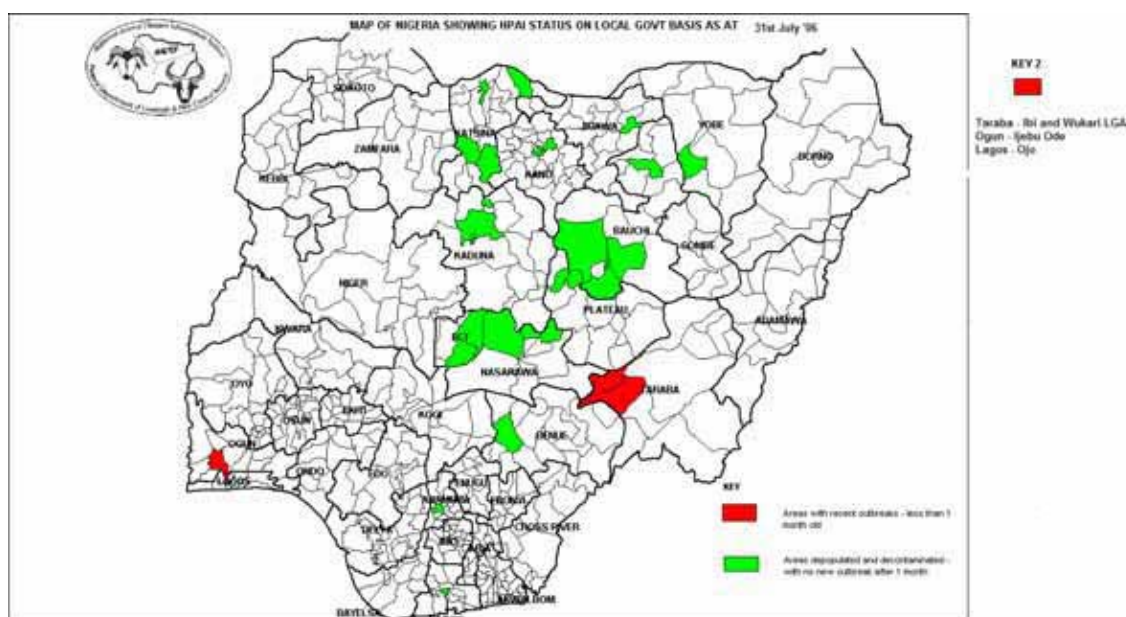
Source: NVRI, 2006

6.2.6 Compensation Programme

The slaughter policy adopted for the eradication of the disease in Nigeria necessitated a contingent compensation programme. The objective was to help ameliorate the losses without pretext to full-scale payback of costs of the slaughtered birds. This policy generated mixed reactions amongst stakeholders, leading to incomplete compliance by some of them. Necessary logistics were evolved to document the details in each affected farm. Table 6.4 presents the summary of the payouts in this programme.

1. Total Allocation to the containment of the epidemic **₦ 2.00 billion**
2. Total Expenditure in tackling the epidemic **₦ 200.00 million**
3. Number of States affected is 13

Figure 6.1. Epidemiological Map Showing the Locations of AI outbreaks in Nigeria.



Source: FLD. 2006

Table 6.4.:FGN's Allocation on Avian Influenza

S/No.	States	State Poultry Population (2005)	No of farmers	No. of LGA affected	Type of birds	Bird population Of the affected farms	No. Dead	No. depopulated	Amount for Compensation (₦)
1.	Anambra	82,876	1	1	L	500	500	0	
2.	Benue	1413402	2	1	L/Hy		NA	NA	
3.	Bauchi		6	2	Layers	147,782	63,654	84,128	21,032,000.00
4.	Abuja, FCT	45,205	3	3					
5.	Kano	226,024	58	10	Mixed	---	77,465	143,375	35,638,250.00
6.	Kaduna	188,353	59	3	Mixed	113,798	76,149	37,303	13,481,500.00
7.	Katsina	180820	4	2	Layers	N/A	N/A	4,071	1,017,750.00
8.	Lagos	663,100	1	1	Layers	18,050	14,361	3,689	942,250.00
9.	Nassarawa	650,948	517	1	L/Hy	9,817	1055	8306	3,141,000.00
10.	Ogun	403899	1	1	Layer	125,000	39,793	85,210	21,304,750.00
11.	Plateau	789,576	13	2	Layer	54,358	12,053	42,305	10,576,250.00
12.	Rivers	206,985	1	1	Layer	N/A	N/A	N/A	
13.	Yobe	182,957	2	2	Layer	N/A	N/A	N/A	
								331,865	

Source FLD, 2006

6.2.7 International Support

The global importance of AI epidemic is evident in the support, which Nigeria received from International bodies. Table 6.5 presents an overview of donor support for tackling the AI epidemic in Nigeria.

Table 6.5.:Plegdes from International Bodies.

World Bank -	\$ 50 million PPE = 1425 units supplied	USAID:	\$ 25 million
FAO:	PPE 5655 units Disinfectant (750 litres)	DFID/WHO :	PPE (7000 units)
CDC, USA :	Training Laboratory personnel and Upgrading of NVRI laboratory facilities to characterize HPAI viruses		
Thomas A Gioanis :	Chairman American Board of Healthcare Law & Medicine 2,500 liters of Disinfectant		
People Republic of China:	Equipment and Medicine for Artificial Insemination (AI)		

6.2.8 Implications of AI in Nigeria for the Rural Poultry Sector and its Genetic Base.

Although the effects and economic and public health implications of the AI epidemic on the Rural Poultry sector needs to be assessed, there are reports of losses in the sector through AI mortality and collateral slaughtering.

One main cause for concern about the current H5N1 avian flu is in the evidence that it has crossed the species barrier and become infective to humans. In the typical rural and peri-urban settings in Nigeria, it is known that humans live in close proximity with their poultry, while poultry and pigs both share the same or close husbandry ecology. It is not unusual for rural poultry to enter the abodes of their keepers for food crumbs in the day time or for rest at night time. Children are fond of pet-plays with family chickens while marketers do not only handle chickens closely and regularly but are indeed known to rest in proximity with the chicken baskets or for brief naps during day-long market periods.

There is pre-2005 serologic finding by scientists in Ibadan, Nigeria(Adeniji, et al.1993; Owoade,et al.2002) on infections of type A influenza viruses, including H1N1and H5N1 in Nigeria's poultry and pigs which may afford potential linkages. to historical profile of the disease in the country. With these reports which may serve to confirm older preliminary unpublished *clinical records* on bird flu (Adene,1984;1986 Unpublished) it seems impossible to rule out low grades flu virus activities in Nigeria's industrial and rural poultry, which predates the current H5N1 epidemic. These and other technical questions deserve empirical consideration and investigations for answers.

6.2.9 Slaughtering for a the Stamping-out of AI

In Nigeria, a stamping-out policy looked good at the onset. However, the dynamic nature of the disease should be allowed to influence the trend of control programmes, with time. There are arguments for and against the adoption of vaccination for the control of bird flu in Nigeria. The peculiarities of the typically small family/rural poultry flocks will demand some special considerations, in terms of dose-package, shelf life or stability, route of application and even the accessibility to such range-inclined mini-flocks

The impacts of current control measures need to be scientifically assessed while the best comprehensive vaccination options and packages for all sectors of the poultry in Nigeria should be similarly designed.

6.2.10 Implications for the Rural Poultry structure and Genetic base

It is useful to remember that the rural poultry or family flocks are not only important from the point of being integral to the global poultry population but more especially as the poultry of the 70% or more (rural) population in the developing countries of Asia and Africa. This indeed therefore sums up the reasons why the rural poultry sector should deserve a better-defined and proactive engagement in the management of such a massive threat like the current bird flu. For now, it would seem that the rural poultry sector is surviving largely on its innate resilience. It is conceivable that the bird flu situation will not be static, as explained in the preceding sections here. It is not impossible that, the flu epizootiologic equation will eventually lean towards any one of the two sides (advance or regress) or even force a state of equilibrium and become more and more endemic in certain host populations. Such an important sector like rural poultry should not be ignored or exposed to the grave prospects of decimation through endemic bird flu and the consequences of poverty aggravation for the rural poultry owners.

It is becoming increasingly appreciated that the exploitable genetic potential of existing strains of commercial hybrids in the industrial poultry sector has reached its plateau. Geneticists have advocated a resort to the preservation of the un-tapped genetic resources in the germ plasm of indigenous poultry world-wide. In Nigeria, previous works have shown that Nigeria's indigenous poultry can be improved through selection and breeding. Similarly, the presence of basic evidence of certain allotypes or their analogues defining productivity or resistance to disease may be present in rural poultry birds. (Nwosu, 1990; Adene, 1990).

It is perhaps a long-standing viewpoint on this that encouraged FGN to include plans for a Poultry Breeding Centre in its Livestock Improvement Plan. Unfortunately, there is little or no sustained effort especially in terms of current and pro-active research in this direction. It is a subject of global interest and so it should be possible to generate some bilateral or even multilateral research theme on the study and exploitation of the genetic resources of indigenous poultry stocks in Nigeria and Africa.

CHAPTER SEVEN

7. **BIBLIOGRAPHY OF RECENT PUBLICATIONS ON NIGERIAN POULTRY SECTOR**

The terms of reference requires this report to contain “a comprehensive bibliography including all relevant publications and reports that describe the level and type of production and the production systems”. A comprehensive set of publications has been assembled, which as a matter of fact, does not represent all publications on the Nigerian poultry sector in the last five years.

The bibliography assembled, which runs into over 30 pages, has been categorised into six groups as follows:

- Diseases:
- Feeds and Nutrition
- Economics & Statistics
- Husbandry and Management
- Avian Influenza
- Household. Food Security

The bibliography is represented in Appendix 3.

CHAPTER EIGHT

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The key conclusions arising from the study are presented as follows.

1. The four sector classification of poultry enterprises which emphasises the level of bio-security is not entirely applicable to the Nigerian environment especially as it relates to sector 4: Backyard or village poultry. At the moment the range of poultry being kept at backyard in Nigeria varies from completely free-range subsistence poultry with a flock size up to 30 to intensive, housed and totally restricted commercial-oriented poultry with a flock size varying from 50 to 500.
2. The poultry industry in Nigeria is currently dominated by the large-scale integrated farms in terms of strategic position in the industry, product range and volume of operations
3. The commercial poultry in Nigeria is largely private sector driven. The government only provides policy support.
4. Household poultry flock size appears to be larger on the average than in the previous decade probably because of some elements of commercial poultry being introduced into it.
5. There appears not to be a clear-cut definition of what constitute household poultry and flock. The grey areas include the definition of the term household
6. There is no recent well structured study yielding information on the Nigeria poultry sub-sector
7. Contribution of poultry to household food security is very significant if local production is taken as an indicator of consumption.
8. The contribution of the commercial poultry to household food security is far greater than that of subsistence poultry given the different productivities and off take rates.
9. There is a decline in poultry products imports in last few years.
10. The total value of the poultry sub-sector is very significant
11. The introduction of fast foods outlets into the marketing system in recent years has facilitated access to well-processed and better culinary presentations of poultry products thereby enhancing poultry products consumption.
12. There is currently no monitoring and certification of poultry meat processing and there are no quality criteria in place.
13. There are no effective hatchery monitoring and certification protocols in place.
14. There is a good number of old and recent Federal Government policies and programmes in place but most of them are ineffectively implemented with respect to the poultry sub-sector
15. There are signs of active response to and management of HPAI epidemic in Nigeria but the control options (eradication versus vaccination) need to be re-evaluated for more comprehension and lasting benefit
16. Considering the numerous often inaccessible foci of rural poultry in Nigeria, a special consideration is required for an effective control of HPAI in this group of poultry to minimize the implications for the economy and public health.

8.2 Recommendations

The following recommendations are made in furtherance of the objectives of this study.

- 1) Comprehensive and well-designed study of the poultry sub-sector should be carried out. The study should be divided into two components namely commercial poultry and

household poultry. Prior to carrying out the study, proper definition of household poultry within the Nigerian context should be established such that whatever is not captured as household poultry is captured as commercial even if it is situated at the backyard.

- 2) Standard protocols for monitoring and certifying poultry meat processing plants should be established.
- 3) Standard protocols for effective hatchery monitoring and certification should be developed and implemented.
- 4) Re-evaluate the options for the control of HPAI with a view to determining which of the two options (eradication and vaccination) will provide more comprehensive and long lasting benefits.

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APPENDICES

APPENDIX 1: TERMS OF REFERENCE

National Consultant

Poultry Sector Analysis: The impact of animal disease on production systems and market structure

Job description

Under the technical supervision of the Chief of the FAO Animal Production Service (AGAP) and the operational supervision of TCEO, the national consultant will prepare a desk review of the poultry sector in Nigeria. This review will be used for further investigation on either the epidemiology of Avian Influenza and/or other poultry disease or socio-economic impact.

Based on statistical data, reports, literature information and, if required interviews with key stakeholders, the report will provide a 5-year overview of developments in the poultry sector, including a review of the different poultry production systems, evolving marketing chains, the role of poultry on rural livelihoods and household food security, and policy/economic factors which have contributed to changes in the sector. While the main focus of this review should be on the status and developments during the past five years, historic information should only be included as far as they are required to understand the present situation.

The length of the paper should be 4500-5000 words and the content, in agreement with the responsible FAO officers (AGAP/AGAL), in a format suitable for publication by FAO. The paper would be provided in electronic format (MS Word).

Working title: The structure and importance of the commercial and village based poultry industry in Nigeria.

Sections of the report:

1. Description of numbers, and level of production for all relevant poultry species during the past five years. Analysis of the information with respect to numbers and production in the main administrative units (Provinces) and the various sectors (according to the FAO classification into the sectors 1-4). This should include detailed information on location and type of production systems, size of operators, types of poultry species. Maps/tables should be provided which easily portray location/size of holdings and regional densities of poultry flocks. If maps are not available, tables will be provided so the maps will be done in a later stage in FAO H.Q. Important to provide numbers by production systems and species at level of districts.
1. Information about the numbers of poultry operations in the different sectors. Number of farms or estimates of numbers of families keeping the different poultry species.
2. Description of the main characteristics of the different production systems with respect to husbandry practises, animal health measures and marketing channels.
3. The role that poultry plays in household food security should be discussed. This should draw from any reviews of household expenditure surveys which have been undertaken in the country.
4. Description of Government support programmes for the poultry sector, community based development activities for sectors 3 and 4, and any donor development activities related to poultry.
5. A comprehensive overview of the marketing structure for poultry over the period should be provided, focusing on the different types of supply chains which have evolved in response to growth in demand. Provide an overview of the market players, the number and location of formal abattoirs, the mechanisms on how poultry is produced and transported in the formal/informal sector. A review of prices developments over the past 5 years should be presented, including monthly retail/wholesale prices over the period.
6. Provide an informal assessment of consumer responses to recent animal disease outbreaks and recent producer responses to animal disease outbreaks.
7. Review and description of official regulations and interventions to control poultry animal health (in particular AI measures) and to support the development of the poultry sector.
8. Preparation of a comprehensive bibliography including all relevant publications and reports that describe the level and type of production and the production systems.

**APPENDIX 2: SELECTED COMMERCIAL POULTRY FARMS
JUNE, 2006**

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (LAGOS STATE)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	OLOGUN FARM	5,000
2	OCHIOBI FARM	5,000
3	FABAK FARM	9,000
4	NEW EARTH FARM	20,000
5	BEN-K FARMS	10,000
6	FASASI FARM	10,000
7	BUSYVICE FARM	8,000
8	CORA FARM	8,000
9	TONBOL FARM	5,000
10	MARTAY FARM	2,500
11	OLABOSCO FARM	90,000
12	GOODHEALTH FARM	60,000
13	TADE TAIYE FARM	30,000
14	FIRM FARM	20,000
15	DECEMBER FARM	40,000
16	ILOTI FARM	20,000
17	DUTEL FARM	25,000
18	S&S FARM	10,000
19	OLA FARMS	20,000
20	BOLAB FARM	2,000
21	DAODU FARM	5,000
22	DR. MRS JOHNSON	5,000
23	BAFORT FARMS	5,000
24	LAWAL FARMS	2,500
25	SOUTHERN HERITAGE	2,500
26	SACHEL FARM	2,500
27	DELE FARM	2,500
28	ZIONHILL FARM	4,000
29	ADAMORE NIG. LTD	24,000
30	SHARP CORNER FARM	5,000
31	MULTI-ACCESS FARM	5,000
32	DAN FARMS	2,500
33	BM AGRO	5,000
34	MUSTARD SEED	2,500
35	OJEAGA FARM	2,500
36	A.A ODUNLAMI	2,500
37	RITLAB FARM	2,500
38	LEGACY FARM	2,500
39	UKIDY FARM	2,500
	TOTAL	485,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (EKITI, ONDO, DELTA AND EDO STATES)		
S/N	NAME	Operation Capacity
1	JOF IDEAL FAMILY FARMS	60,000
2	JOFA FARMS	40,000
3	ADEGOKE FARMS	15,000
4	ABRAHAMSUM FARMS	10,000
5	Mrs Ojo, (Principal)	5,000
6	PROVIDENCE FARMS	3,000
7	IGBINO FARMS	40,000
8	IGHODALO FARMS	20,000
9	EMMA TEGHELI FARMS	20,000
10	DORA JOY FARMS	15,000
11	OLONIMOKE-ADE	25,000
12	GOD BLESS FARMS	2,500
13	HENRY MILLER NIG LTD	20,000
14	DR. OSABI	15,000
15	EMAT FARMS	15,000
16	ENROPEE FARMS	5,000
17	OKUNBOR FARMS	3,000
18	PROGRESS FARMS	5,000
19	FASORANTI FARMS	2,000
20	MRS OGUNSUYI % JOFA FARMS	3,000
21	MRS FALOPE % MRS ADEGOKE	3,000
22	DR. OMOTOSHO	1,500
23	IFE SOUTH EAST FARMS	3,000
24	ORNAMENT OF GRACE	1,500
25	MRS OLUDE	3,000
26	DR. OBAGIE	1,000
27	ENWEREM FARMS %PROBCAR AGRIC	3,500
28	OKUNBOR SNR. % PROGRESS AGRIC	3,500
29	EGHAREFA FARMS IPKOBA SLOPE % EFO AGRIC	3,500
30	ADA FARMS % EFO and PROSCAR AGRIC	10,000
31	OYAKILOME FARMS %AKIOBWE	5,000
32	PROGRESS AGRIC AGENCY	100,000
33	EFO AGRIC	60,000
34	PROSCAR AGRIC	60,000
35	DR ATIRI	40,000
36	MAFURU LIMITED	40,000
37	TUTU VET CONSULT	30,000
38	VET VENDORS	80,000
39	ANIMAL DOCTOR	

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (EKITI, ONDO, DELTA AND EDO STATES)		
40	RUSELF / KESSAG	
41	SONNY EBOH	15,000
42	GOD DEY FARMS	60,000
43	FUNMILOLA FARMS	40,000
44	CROWN FARMS	40,000
	TOTAL	927,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OYO, OSUN AND KWARA STATES)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	MIRTH AGRIC FARMS	60,000
2	FEED NATION	45,000
3	HI-FLO FARMS	40,000
4	DOLIL FARMS	20,000
5	ABIOLA ADIO FARMS	30,000
6	FOLAWIYO FARMS	120,000
7	J.C.L FARMS	80,000
8	OYEWONUOLA FARMS	45,000
9	GRACELANDB FARMS	15,000
10	ARICA FARMS	20,000
11	DIDVET NIG LTD	Drugs
12	HANDEM FARM	10,000
13	ADEROUNMU FARMS	15,000
14	POSAK FARMS	10,000
15	OODUA FARMS	6,000
16	K. FARMS	8,000
17	TOLUDEX FARMS	40,000
18	ABOGUNDE FARMS	8,000
19	OLA-OLU FARMS	10,000
20	HARMONY FARMS	8,000
21	AJAYI FARMS	8,000
22	OAA FARMS	10,000
23	OLLAN FARMS	8,000
24	AFTCOM NIG LTD	-
25	TOPEX FARMS	10,000
26	GLOBAL WEST FARMS	20,000
27	TOMSEY/RESCUE FARMS	
28	OSAS TWINS	10,000
29	CANNA FARMS	
30	NISSI FARMS	20,000
31	JOLAOLUWA FARMS	5,000
32	AJIKE POULTRY FARMS	2,000
33	FARM SUPPORT SERVICES	-
34	HOPE POULTRY FARM	-
35	COPPACK FARMS	16,000
36	OLAYEMI FARMS	20,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OYO, OSUN AND KWARA STATES)		
37	BAMIDELE FARMS	15,000
38	NIKLOL FARMS	6,000
39	SAGO FARMS	10,000
40	ADEBIYI FARMS	4,000
41	SAMTAD FARMS	10,000
42	WILLIAM FARMS	4,000
43	CDI FARMS	5,000
44	VICTORY FARMS	12,000
	TOTAL	791,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OGUN STATE)		
S/N	NAME	Operation Capacity
1	AYOKUNLE FARMS	250,000
2	ANIMAL CARE SERV. KONS.	100,000
3	SHOBOWALE ANIMASAHUN	120,000
4	RABIU FARMS	35,000
5	GAFO FARMS	25,000
6	STELLAN FARMS	50,000
7	LIZPAD POULTRY	25,000
8	ZIMI FARMS	30,000
9	OSTAN FARMS	20,000
10	ERIKU FARMS	50,000
11	TOPSPEED	30,000
12	OWONOKO FARMS	25,000
13	ALESINLOYE FARMS	18,000
14	OLUYEMI FARMS	12,000
15	AKIN SATERU FARMS	15,000
16	NOTA FARMS	20,000
17	DR DAIRO FARMS	10,000
18	OLUBISI FARMS	12,000
19	BIMBA AGRO	25,000
20	AJOSE FARMS	25,000
21	KATHY FARMS	10,000
22	F.A FARMS	20,000
23	MYTIN DREHER	5,000
24	AKANDE FARMS	7,000
25	RAO FARMS	10,000
26	SJ FARMS	15,000
27	GOLDEN YOLK FARMS	14,000
28	OLUWASOMI AJAYI FARMS	8,000
29	SANNI LUBA FARMS	6,000
30	BARRY FARMS	3,000
31	KLOT MARKETING	5,000
32	ALH HAMZAT FARMS	3,000
33	WALTAJ POULTRY	4,000
34	ALL TRUST FARMS	6,000
35	STRAGAS	4,000
36	BERACHA FARMS	5,000
37	KAZIM POPOOLA FARMS	5,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OGUN STATE)

38	FEMI AJAYI FARMS	5,000
39	AKIN FARMS	4,000
40	NENARO FARMS	3,000
41	WUMITOLA FARMS	4,000
42	RETAWEM FARMS	6,000
43	HOSSANNAH FARMS	3,000
44	FODAKS FARMS	4,500
45	OGUNNUPEBI FARMS	2,500
46	DR OYETOYE FARMS	1,000
	TOTAL	1,060,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (SOUTH-SOUTH/SOUTH-EAST)

S/N	NAME	Operation Capacity
1	RALPH VET SERVICES	10,000
2	DAVID-VET	20,000
3	LAGROMED VET	20,000
4	OGBAJIMI FARMS	20,000
5	MOOS FARM	5,000
6	DILIFY FARM	3,000
7	N&N FARM	5,000
8	U.O.O FARM	15,000
9	ABIODUN EDUN	20,000
10	RAC-CHIGEL	20,000
11	NEXT INVESTMENT	
12	UNFAILING VET	60,000
13	NEWIET AGRO	60,000
14	GRACIB FARM	10,000
15	AUSTIN FARM	10,000
16	RAN KAY FARM	20,000
17	PALMARK AGRO	100,000
18	PETER SUMMER	5,000
19	JEFF-CON FARM	50,000
20	EM-FARM	50,000
21	CENA VET	5,000
22	APAKA FARM	5,000
23	BROTHERS OF ST. STEPHEN	3,000
24	OWELLI FARMS	5,000
25	OZOKWOR FARM	50,000
26	PHINOMAR FARM	100,000
27	NEBO FARM	70,000
28	UKWUOWO FARM	5,000
29	FAVOURS FARM	5,000
30	BANC FARM	10,000
31	CHIEF OWOH FARM	15,000
32	COSIN VET	60,000
33	ALPHA POULTRY FARM	60,000
34	CALIMAX	5,000
35	1ST TROPICAL	20,000
36	MALIBEK	30,000
37	ANIMAL HEALTH	10,000
38	CANDID VET	10,000
39	ZION LIVESTOCK	60,000
40	PAMALOW W.A	20,000
41	W.S ENENDU	10,000
42	OLORUNOSUN	10,000
43	GOFONS VET	10,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (SOUTH-SOUTH/SOUTH-EAST)		
44	NJ AGRIC	30,000
45	IGWE FARM	5,000
46	BIECON FARM	10,000
47	IBRACHO FARM	5,000
48	PATOKS FARM	20,000
49	VICTORY FARM	10,000
	TOTAL	1,161,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (NORTH)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	MEEZA FARMS	25,000
2	YELWA FARM	30,000
3	FANASSON INVESTMENTS	45,000
4	NANA FARM	5,000
5	ABU TURAB FARM	
6	ABUBA FARM	
7	GOKRA FARM	
8	CITY SIDE FARM	
9	DAYIJA FARM	
10	DALA FARM	
	TOTAL	105,000

APPENDIX 3: BIBLIOGRAPHY OF RECENT PUBLICATIONS ON NIGERIAN POULTRY SECTOR

DISEASES

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5. Abdu, P. A., Sa'idu, and B. D. J. George, 2002. Diseases of local poultry in Nigeria. *Discovery and Innovation*, 14(1/2):107-118.
6. Abdu, P. A., T. K. Manchang, and L. Sa'idu, 2004. The epidemiology and clinicopathologic manifestations of Newcastle disease in Nigerian local chickens. *Proceedings of the 41st Congress of the Nigerian Veterinary Medical Association*, November, 22-26, 2004, Vom, Nigeria, Edited by Kalejaiye, J. O. Pp. 57.
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14. Abdu, P.A., and A.M. Bashir, 2003. Avian pox in Zaria, Nigeria. *Proceedings of the 39th Annual Congress of the NVMA Sokoto* October 27th- 31st 2002, Edited by Daneji, A. I. Agaie, B. M. Graba, H. S. Oloredo, B. A. Umo, O. J. Chafe, U. H. and Elsa, A. T. Pp. 150-154.
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