

Full Length Research

Economic Analysis of the Characteristics Of Extensive System Of Poultry Farming Interprises In Northwestern Nigeria

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The study analyzed the economic characteristics of extensive system of poultry farming in Northwestern Nigeria. The study examined habits and practices, numbers of chickens and other animals cared for, causes of chicken loss, chickens' diseases and health care awareness by respondents, and preferred extension capability to provide linkage services. Fifty farmers were selected using multi-stage sampling procedure. Data were collected with the administration of structured questionnaires and analyzed with frequency counts and percentages. Result showed that 70% of respondents were female and 42% were within 18 to 45 age bracket. Adult female (48%) spend the most time caring for the chickens while, 30% and 24% keep chickens for sales and consumption respectively. 76% provide housing, 74% provided feed-supplement and 80% give medication to support their flocks like intensive system. Predators (40%) and disease (36%) were the main causes of poultry loss. Continuous sensitization on basic information about chicken care (100%) and market accessibility (76.51%) were some of the preferred extension capability by farmers continuous training and provision of linkage services in terms of simple housing, feed-supplement, vaccination against Newcastle-Disease and deworming of bird) are recommended extension capability to develop FPP business.

Keyword: Economic, Analysis, Extensive System, Poultry farming, Enterprises.

INTRODUCTION

Extensive system of poultry farming otherwise known as free range is often applied generically to all poultry raised outside of a cage and are often referred to

as "family-poultry" (FPP) practiced mostly by households in developing world. The poultry sub-sector is the most commercialized in the livestock sector of Nigeria's

agricultural sub-sectors (Okechuku, 2016). The study of Opebiyi (2014) revealed that chicken, ducks, guinea fowls, turkeys, pigeons and ostriches are the commonly reared types of poultry in Northwestern Nigeria. Chicken population in Nigeria is about 155 million of which 25% are commercially farmed, 15% semi-commercially and 60% in backyards (Unaeze and Akinola, 2006). Extensive and intensive are the two classes of poultry production systems, where extensive production system presently account for about 85% (Sonaiya and Swan, 2004).

Sonaiya, (2007) pointed out that poultry are raised extensively or semi-intensively in relatively small numbers (usually less than 100 in any flock) with minimal investment in input; most being generated in the homestead, labour is drawn from the family, and production is geared essentially towards home consumption, income and savings. The small flocks scavenge sufficient feed in the surroundings of the home to survive and to reproduce. However, any significant increase in flock size often leads to malnutrition if no feed supplement is provided. And any move to fence in or enclose the poultry then involves the need to provide balanced rations and medications which increase the input requirement that the farmers might not cope with.

The evolution of the extensive or free-range chicken can be traced to village or rural poultry. At the village level, many people keep small numbers of poultry for home consumption, to sell and of various socio-cultural uses. This practice was originally concentrated in villages and thus known as "village poultry" production. Increasing urbanization has resulted in the growth of village type poultry in urban and peri-urban areas which is often called "backyard production" (Thieme, *et al*, 2014). Women are the major input; labour and beneficiaries of this production system. Women often have an important role in the development of family poultry production as extension workers and in vaccination programmes (Swan, 2004). Family poultry according to Thieme, *et al.*, (2014) described the full variety of all small-scale poultry production systems found in rural, peri-urban and urban areas of developing countries. In the context of this study, extensive or free range poultry farmers would be used interchangeably as village chicken, family poultry, backyard chicken and smallholders chicken farmers who reside in rural, peri-urban and urban areas of Niger State.

Family poultry is an integral component of the livelihoods of poor rural households, and is likely to continue playing this role for the foreseeable future (Thieme, *et al.*, 2014). Notably, Kryger, *et al* (2010) reported that smallholder farming system worldwide constitute a myriad of different ways of providing livelihood for rural families, depending on: i) agro-ecological conditions; ii) sociocultural factors; iii). Access to markets at the local, national and international levels;

and iv) possibilities for generating income from non-farm activities. The capability of extension agents in communicating information, and intervention in the areas of flock size management, sources of viable chicks, feed/supplement source, housing, access to veterinary and health care, access to urban market and value of time spent in raising a flock before market are significant to development of sustainable business of extensive or free-range poultry farming.

Though, village poultry makes up the largest proportion of the national poultry population in most developing countries, where in Africa, over 70% of poultry products comes from village poultry (Hailemichael, *et al* 2016). Hence, this traditional system of free-range poultry production is not sufficient to meet the growing demand for more quality food across the world. Hailemichael *et al.*, (2016) stated further that if the suppliers of poultry would better contribute to poverty reduction under conditions of expanding demand. Over 50% of the village chickens suffered constraints from theft, diseases and predator, thus, less than 50% enter the market and provide indicated that 91% of respondents surveyed in Ikeja metropolis, Lagos preferred to consume village chickens. Almost 58% of the respondents were willing to purchase any type (live or freshly processed) village chickens at amount equal or more than ₦2,000. Therefore, conventional system of production requires extension capability to bridge supply-demand gap and the up-rising need of residence in urban centers.

Many advantages have been adduced to this type of chicken production; nutritionally, economically and socio-culturally. Extensive or Free-range poultry production according to Hailemichael *et al.*, (2016) provide disposable cash income to poor households. Thieme, *et al.*, (2014) reported that, it serve as source of nutrients of high biological (protein) value through eggs and meat, sonaiya and Swam (2004) inferred that keeping poultry makes a substantial contribution to household food security throughout the developing world: It helps diversify income and provides quality food, energy, fertilizer and a renewable asset in over 80 percent of rural households. Also, the work of Higenyi, *et al* (2014) disclosed that native poultry meat is a cheap source of protein and household income particularly to the poor rural and peri-urban families in developing countries.

Consequent on the above advantages, this study thus, analyses the economic characteristics of extensive system of poultry farming Interprises in Northwestern Nigeria. The specific objectives were to:

- i. Describe the Socio-economic characteristics of extensive poultry farmers in the study area;
- ii. Determine respondents' habits and practices of extensive system of poultry production.
- iii. Investigate number of poultry birds and other

- animals respondents cared for;
- iv. Evaluate the causes of chicken loss in the study area;
 - v. Ascertain respondents' awareness of chicken diseases and health care; and
 - vi. Identify respondents' preferred extension services in the study area.

METHODOLOGY

Description of Northwestern Nigeria

The present day Northwestern Nigeria was an autonomous division within Nigeria, distinctly different from the southern part of the country, with independent customs, foreign relations and security structures. In 1962 it acquired the territory of the British Northern Cameroons, which voted to become a province within Northwestern Nigeria. In 1967, Northern Nigeria was divided into the North-Eastern State, North-Western State, Kano State, Kaduna State, Kwara State, and the Benue-Plateau State, each with its own Governor

The great savannah belt of the Great Plains of Hausa land dominates much of the rest of the province. This region experiences rainfall between 20 and 60 inches (508 and 1,524 mm) per year. The savannah zone's three categories are Guinean forest-savanna mosaic, Sudan savannah, and Sahel savannah. Guinean forest-savanna mosaic is plains of tall grass which are interrupted by trees. Sudan savannah is similar but with shorter grasses and shorter trees. Sahel savannah consists of patches of grass and sand, found in the northeast. In the Sahel region, rain is less than 20 inches (508 mm) per year and the Sahara Desert is encroaching. In the dry north-east corner of the country lies Lake Chad, which Northern Nigeria shares with Niger, Chad and Cameroon (Ibrahim, 2003) Northern Nigeria was divided into thirteen provinces: Bauchi, Benue, Borno, Kano, Katsina, Plateau, Sardauna, Niger, Adamawa, Zaria, Sokoto, Kabba and Ilorin.

Kano, the largest of the provinces in terms of population and economy, is in the North-Central part of the country. The Kano Native Authority, an offshoot of the fula Kano Emirate, inherited the ancient trade industries that fuelled the trans-Saharan trade with North Africa. The Province of Zaria is home to the City of Kaduna, an autonomous capital city that serves as the nation's capital and home to its national institutions (Ibrahim, 2003).

Groundnut and cotton industries in the province of Kano provided the main source of revenue for Northern Nigeria. Tin mining in the Province of Plateau, Steel mining in the Province of Benue, and other metal industries in the Province of Sokoto,

built up the diverse mining industry of the region.

Cement industries in Sokoto and Bauchi and leather processing industries in Kano constituted the main manufacturing sector.

Northwestern Nigeria though an ethnically and religiously diverse region, is an overwhelmingly majority Muslim region. The Hausa and Fulani dominate much of the North Western and eastern part of the Country. The Hausa, Fulani are chiefly Muslims. A small part of the Hausa population also adheres to the ancient religion of Hausa Animism. The Nupes and the Kanuri are also chiefly Muslims. Small Christian populations also exist in the north. They were converted to Christianity after the colonization of the country by the British (Ibrahim, 2003).

DATA COLLECTION PROCEDURE

Data for the research were collected with 58-item questionnaires and data were analyzed using frequency counts, means and percentage.

RESULT AND DISCUSSION

Socio-economic Characteristics of the Poultry Farmers

Table 2 showed that about 42% are in their active age (18 – 45 years), thus, have strength and agility to engage in extensive system of poultry production. This implies that farmers have strength to adopt any intervention that would increase their production. This is in agreement with the result of Abanigbe, Oladoja, Jaji and Onasanya (2015) that farmers with active age will be willing to intensify or diversify their income into more productive ventures that could improve their livelihood. The gender distribution indicates that the majority (70%) were female. This agrees with the work of Rajiur (2012) which reported that 78% of women were involved in different activities of poultry rearing like feeding and rearing baby chicks. Also, 94% of respondents were educated with primary, or secondary or tertiary from the education or having all the three forms of education. This implies that they would be positively related innovation on poultry production. This result is in agreement with the study of Hailemichael *et al.*, (2006) which stated that educated farmers are engage in poultry keeping perhaps due to their better awareness and knowledge of its value and production efficiency. Household population also, indicates that 62% and 68% had one boy and girl under the age of 15 years respectively in the family, while almost (30%) had four adults over the age of 15 years living within the households. This implies that, the household requires sustainable economic activities in order to provide food security and income for family sustenance.

Table 2: Socio- economic Characteristics of the Poultry Farmers

Item	Percentage (n=50)
Age (years)	
18 – 45	42
46 – 60	38
Over 60	20
Gender	
Male	30
Female	70
Educational level	
No formal education	6
Primary education	26
High school or above	68
Primary source of household income	
Paid work in agriculture	18
Growing own crops	12
Raising own livestock	12
Non-farm activities	58
Boys under the age of 15 in the household	
1	62
2	22
3	12
=>4	4
Girls under the age of 15 in the household	
1	68
2	16
3	12
4	30
=>4	30
On a day- basic, who cares for the chicken?	
Adult male	26
Boys in the family	48
Girls in the family	16
Neighbour	4

Source: Field Survey (2015).

Farmers' habits and practices of Extensive system of poultry production

Table 3 reveals that 32% of respondents keep chicken primarily for consumption and selling. However, 38% raised chicken for almost 9 months before selling at market. While, (42%) sell one chicken between ₦1,000 and ₦1,500. Also, 56% sell between one and two chicken per month. The majority (76%) owns a poultry house, 46% and 74% buy compounded feed and supplement for their chicken regularly. And 32% spend ₦500 on feed supplement (maize and guinea corn) per month.

Numbers of Chickens cared for by farmers

Table 3 reveals that respondents kept between one and five chicks (68%), growers 46%, hen 84%, and cocks (78%). The majority (82%) have bought

almost five grower chicks as replacement flock in the past three months. And 86% own other poultry like guinea fowl, turkey and ducks. This is in agreement with the study of Hailemichael *et al.*, (2016) that of all the households that kept poultry, 52% had five or less birds. Krygeret *et al.*, (2010) reported that 85% of rural households in sub-Saharan Africa keep chickens or other types of poultry. Sonaiya and Swan (2004) Stated that family poultry represented 83% of the estimated 82 million adult chickens in Nigeria.

Table 3: Habits and practices of Extensive poultry

Item	Percentage (n=50)
Primary reason for keeping chicken	
Consumption of chicken eggs	6
Consumption of chicken meat	24
Selling chicken	30
Selling eggs	4
Selling chicken + eggs	32
Period of raising chicken before selling	
Less than 3 months	12
3 – 6 months	32
7 – 9 months	38
10 months & above	18
Numbers of chickens currently own	
1 – 5	68
6 – 10	20
11 – 15	6
16 – 20	2
More than 20	4
Numbers of growers currently own	
1 – 5	46
6 – 10	22
11 – 15	12
16 – 20	6
More than 20	6
Numbers of hens currently own	
1 – 5	84
6 – 10	10
11 – 15	6
Numbers of cocks current own	
1 – 5	78
6 – 10	8
11 – 15	8
16 – 20	2
More than 20	4
Price of chicken sold	
< ₦1,000	14
Between ₦1,000 and ₦1,500	42
Between ₦1,501 and ₦2,000	24
> ₦2,000	
Ownership of poultry house	
Own poultry house	76
Do not own poultry house	24
Employment of people to help manage chicken flocks	
Employ people	8
Do not employ	92
Provision of supplement feeds for your chickens	
Provide supplements	74
Do not provide supplements	26

Source: Field Survey, (2015).

Causes of Poultry Losses

Table 4 shows that predators (40%) are the main causes of losses to chicken flocks. The majority (54%) revealed that hawk is the main type of predators that attack chicks and 34% said Newcastle disease (ND) is the main disease killing chickens in the study area. These agrees with the report of Sonaiya and Swan (2004) that out of 142 hens lost up to 13 months of age, records were kept for 92% causes of mortality revealed predators (32%), ND (15%) and theft (5%) losses.

Furthermore, 82% of respondents affirmed that lack of simple poultry house exposed the chicken to disease, theft and predators. These results are in line with the view of Sonaiya and Swan (2004) that out of ten chicks, only about two reaches adulthood, due mainly to disease, predators and road accidents. Also, 66% and 76% affirmed that inadequate feed and poor marketing systems of older flocks respectively causes great losses in chicken flocks in the study area. Consequently, 48% said that, they cannot afford the cost of input that can alleviate them from these

Table 4: Causes of poultry losses

Item	Percentage (n=50)
Causes of poultry losses	
Disease	36
Theft	24
Predators	40
Main disease killing your chicken	
Fowl coryza	34
Parasites	2
Newcastle disease (ND)	34
Do not know	30
Type of predators attacking your chicken	
Hawk	54
Rat	10
Snake	20
Cat	16
Lack of housing predispose chicken to disease, theft and predators	
Yes	82
Inadequate feeds predispose chicken to disease, theft and predators	
Yes	66
Poor marketing lead to chicken loss	
Yes	76
No	24
Reason preventing you from owning more chicken	
Cannot afford	48
Do not have space	22
Cannot manage large flock	12
Too much risk	18

Source: Field Survey (2015).

Awareness of Poultry Disease and Health Care

Table 5 shows that the majority (80%) of the respondents spent money on medicines or veterinary services for their chicken. Also, almost 78% have spent between ₦500 and ₦1,000 on poultry medicine and vaccines in the past three months. A total of 80% of the respondents have cared for Newcastle disease, Fowl pox and Fowl coryza. This result affirmed that 74% have heard about Newcastle Disease Vaccine (NDV)

and 44% said they find out about NDV through visitation by local vaccinator. These result imply that respondents are aware of different types of chicken's disease and they are exploring the available health care to them.

Table 5: Poultry disease and health care

Item	Percentage (n=50)
Spend money on medicines or veterinary service for your chickens	
Yes	80
No	20
Amount spent on chickens medicine or vaccines in the past 3 months	
<=N500	62
N501 - <=N1,000	16
N1,101 - <=N2,000	8
N2,000	14
Disease often cared for	
Fowl coryza	30
Newcastle disease	50
Do not know	20
Awareness of Newcastle Disease Vaccine (NDV) for chickens	
Aware	74
Not aware	26
How did you find out about NDV	
Visited by local vaccinator	44
Television/radio advert	6
Flyer or poster	22
Friends & neighbors	12
Village meeting	6
At market	10
Why do you vaccinate against ND?	
Increase chicken value	36
Increase egg production	20
Reduce chickens death	44
Who administers NDV?	
Government Veterinary	20
Private Veterinary	34
Community poultry Agent	22
NGO service providers	16
Farmers	8
How was the vaccine administered?	
Injected	6
Drops in the eye	62
Drinking water	32

Source: Field Survey (2015).

Preferred Extension Service by Farmers

Table 6 shows that all (100%) the respondents preferred continuous sensitization on smallholder chicken development. The majority (98.66%) preferred continuous training and capacity building on basic of chicken care. However, 97.99% preferred linkage to the use of herbal leaves and biological drugs to prevent chicken disease. One on one discussion with most of the farmers showed that they want linkages to Ethno Veterinary Medicine (EVM) like mixture of ginger and garlic to serve as regular antibiotic for the chickens. EVM has observed is of great important to smallholder poultry sector in terms of accessibility

inexpensive and effectiveness hence, it gains recognition at the expense of conventional drugs.

Table 6: Preferred extension services

Item	Percentage (n=50%)
Continuous sensitization on basic information about chicken care	100.00
Continuous training and capacity building on basic of chicken care	98.66
Use of herbal leaves and biological drugs to prevent disease	97.99
Guide on construction of simple and least cost chicken house	96.64
Provision of information/linkage to supplementary feed	93.29
Regular vaccination and deworming of chicken by agent at a cost	87.25
Provision of other simple health care to chicken	86.58
Guide to the sourcing of viable chicks	85.91
Techniques about artificial brooding system	85.91
Market linkage and accessibility	76.51
Linkage to input suppliers	76.51
Linkage to micro-finance agencies	73.15

Source: Field Survey (2015).

The majority preferred guide on constructing of simple and least cost chicken house (96.6%), and linkage to supplementary feed (93.3%) for their chickens. The report of Alders (2014) inferred that housing village poultry at night will protect them from rain, cold, predators and from theft. Also, Rajiur, in his work (2012) suggested that shelter for poultry birds can be easily built at low cost by using locally available wood materials, grass straw, rock, mud paste, thereby reducing predation. However, Rajiur (2012) stated that a small amount of crushed yellow maize can increase the quantity and quality of the daily ration and hence increase productivity.

Also, on their expectation on basic health care of their chickens, 87.25% preferred linkages to regular vaccination and deworming, while 86.58% want linkages to other simple health care for their chickens. This corroborates the report of Sonaiya and Swan (2004) that virus and parasites caused the most important disease in indigenous chickens and that they were seasonal in their onset. Thus, the farmers are willing to prevent or control diseases because of their aspiration to turn the flock into family food and income. Further interaction with the respondents on the business development of their flocks indicate that they preferred linkage to sourcing of viable chicken and techniques about artificial brooding system (85.91%), market accessibility and input supplier (76.51%), and linkage to micro finance agencies (73.15%). The result on input supplier is similar to the findings of Hailemichael (2014) which stated that about 20% of households purchased and used at least one type of input in poultry production. The types of inputs that the farmers are medications, vaccinations, vaccines, viable day-old chicks, simple watering and feeding troughs.

CONCLUSION AND RECOMMENDATIONS

The respondents are in their active age, educated, with female members of the households actively involved in chicken rearing. There was preference of ethno veterinary medicine by poultry farmers. Extension services should focus on continuous sensitization of Extensive poultry farming on the basic of chicken rearing and business potentials in the study area.

Extension agencies should facilities the establishment of free-range chicken farmers' cooperative group. The group will thus, serve as formal structure for the inputs accessibility, technical assistance, market channels and credit linkage.

Extension agencies should organize training and capacity development for local poultry health personnel, who will have capacity to provide simple veterinary services, medication and extension services to farmers at affordable cost.

Exposure available local materials and resources by extension agencies to farmers, that could be useful to construct simple poultry housing and other equipment that will facilitate the caring of sustainable poultry production..

Encouragement of private organization to participate in development of value addition and marketing of free-range/village chicken to urban centres and cities.

Advocacy through bottom-up approach of all the rural enterprises and stakeholders in development of rural infrastructures and policy framework for sustainable smallholders' poultry business.

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