

ASSESSMENT OF POULTRY FARM STRUCTURES AND FACILITIES IN ISIALANGWA-SOUTH, ABIA STATE, NIGERIA



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ABSTRACT

Poultry needs to be protected from harsh environmental condition of heat, rainfall, direct sunlight, and dangerous wind by placing poultry under good housing, structures and facilities, in order to get the best performance and output from the birds. The structures and facilities of five farms were assessed in Isialangwa-South of Abia State, for their effectiveness in poultry farming. The farms are Good Seed, Buchi, Pelmet, Amenchim Integrated, and Ugwuma farms respectively. The observed structures and facilities were compared with relevant literatures. It was observed that the birds in the five farms can easily be attacked by disease because only Pelmet farm chlorinates the drinking water; closeness of the poultry buildings; lack of footbath; protective clothing and shoes respectively. Also, wood shaving as bedding material, roof design, stocking density needs improvement. In the building design, the height of building of Ugwuma farm with 2.1 m needs improvement for good ventilation. Only Buchi and Amenchim farms with 2 and 5 birds/m² respectively followed the recommended stocking density of 6 birds/m² for broilers, also, it was only Good-Seed farm with 9 birds/m² for layers that exceeded the recommended value of 8 birds/m² according to FAO (2011). Therefore, Isialangwa-South of Abia State poultry farms needs to improve in terms of planning and design of poultry structures and facilities for excellent utilization of the benefits in poultry farming.

Keywords: Poultry, Structures, Stocking density, Farms, Footbath

1. INTRODUCTION

Poultry farm structure can be defined as the structure planned, designed and constructed for poultry in order to have a favourable environment that facilitates and improves their productivity, and development for the purpose while they are being reared. According to Ekwe *et. al.* (2003), Poultry includes chickens, turkey, duck, goose, swan, guinea fowl, peafowl, ostrich, pheasant, etc. There are some poultry that have more economical and commercial value than others; they are chickens, guinea fowls, and turkeys (FAO, 2006).

The subsector in agricultural sector that is most developed is the poultry sub-sector at commercial level, because of its great contribution to the Nigerian economy in terms of increase in gross domestic product, employment opportunities, nation's foreign exchange (FAO, 2006). One of the benefits of poultry is that poultry products are affordable, and they provide protein in form of meat and eggs.

Investment on poultry farming yield high interest on output if the necessary housing and environmental requirements are available. The output comes in the form of good quality egg production and meat respectively. The major parts of poultry building comprises of the floor, the lower wall design, the

upper wall design, and the roof structure (FAO, 2006). There are some parameters that must be put into consideration in practising poultry farming, they are stock density; building orientation; space between buildings; roof design; building dimension; accessibility to facilities like main road, feed mills, water, electricity supply, and waste management.

There are two systems of poultry production in Nigeria, which are the commercial and the rural poultry production respectively. The commercial poultry production is a large system with large scale of production, high level of technical know-how; while rural poultry production is usually in small scale and low skill level.

Poultry houses have two types of ventilation methods; they are natural and mechanical ventilation. The natural ventilation method is found majorly in tropical region and developing countries, while the mechanical ventilation is common in mechanized farms and the temperate region of the world with extreme temperatures (Chia *et.al.*, 2014). It was observed by Mabbett (2011) that with good management of the mechanical ventilation system, it enhances good environment for the poultry and generates more income than natural ventilation method.

According to Oduntan (2016), poultry subsector has the largest contribution to agricultural sector; contributing about 25% to Nigeria's annual gross domestic product (GDP). It

shows that poultry subsector is getting the deserved recognition. The challenges that have been observed facing poultry farming are substandard buildings; inadequate space; financial instability of farmers; insufficient food materials like maize; limited access to high interest rate loan; problem of collateral security; and poultry disease like bird flu among others. These challenges can be minimal with the assistance and support by the government.

It has been observed that there is increase rate of interest in poultry farming in Isialangwa-South Local Government Area of Abia State, because of high demand for poultry egg and meat noticed from increase in rate of population. The discovery of the increased growth rate in poultry farming in the study area prompts this research, to assess whether the major factors that bring out the maximum productivity in poultry, in terms of housing conditions from the recommended standards are put into consideration by the poultry farmers. These factors are the structures of the poultry farm building; the type and number of birds that are and can be accommodated in each building; the building materials for the construction of the building; the type and size of the facilities; the method of waste disposal (FAO, 2011).

2. METHODOLOGY

Area of Study

Isiala-Ngwa South Local Government Area (L.G.A.) is located in Abia State, in Umuahia agro-ecological zone as shown in figure 1. Abia state comprises of seventeen (17) L. G. As, and falls under three agro-ecological zones. The agro-ecological zones are Aba, Umuahia, and Ohafia. It lies on latitude 5° 21' 45" north and longitude 7° 23' 60" east. The height above sea level is 88m, and the neighbouring local government areas are Ikwuano, Isiala-ngwa North, Umuahia North and Umuahia South local government areas respectively. The rivers in Isiala-ngwa south LGA are Imo River (Owerrinta), Isi-iyi umunta, and Amaudo River respectively. It has an area of 258 km² and a population of 134,762 at the 2006 census (NPC, 2006). The rainy season ranges from March to October. The dry season occurs from November to February. The mean annual rainfall ranges from 2000mm to 2500mm with the southern areas receiving more than the northern areas. The mean annual temperature ranges from 22°C (minimum) to 31°C (maximum). The climate is tropical and humid all the year round. The climate supports the cultivation of a wide variety of food and tree crops such as cassava, yam, kolanut e.t.c, as well as rearing of livestock such as poultry, sheep, and goat. Farming is a major occupation of the indigenes of Isiala-Ngwa South. Some of them also engage in marketing of agricultural produces (Ifenkwe, 2007).

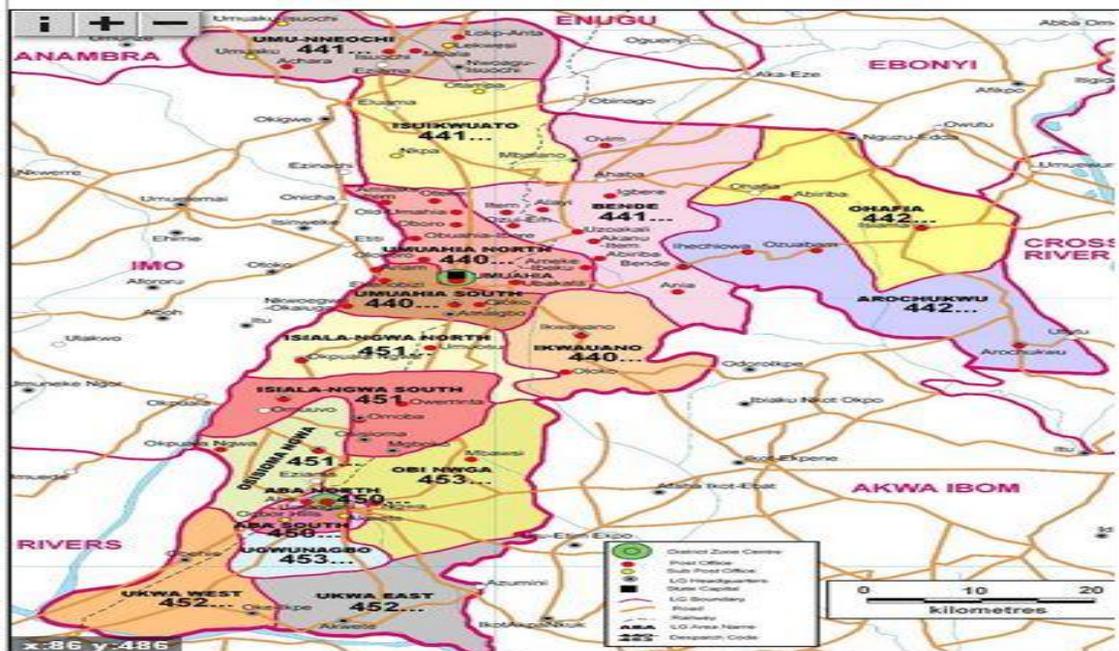


Figure 1. Map of Abia State Showing Isiala-Ngwa South L G A.

Table 1: Table Showing Structural and Geographical Description of the Poultry Buildings

S/N	Name of farm	No of Building	Structural Dimension (m)	Building Orientation	Space between buildings (m)	Roof Design
1	Good-Seed farms	6	10.5, 9, 3.0	East – west	1.8	Gable and hip
2	Buchi farms	1	15, 4, 3.6	North – south	-	Gable
3	Pelmet farms	3	10, 9, 4.0	East – west	3.6	Gable
4	Amenchim Integrated farms	5	7.5, 4.5, 3.6	East - west	1.2	Gable and shed
5	Ugwuma farms	2	6, 4, 3.6			
		6	15, 7.5, 2.1	North – south	15.0	Hip and gable

Table 2: Table Showing the Population and Type of Poultry Birds

S/N	Name of farm or farmer	Location	No of poultry birds	Poultry Type	Stock density (birds/m ²)	Feeder space (birds/m ²)	Water space (bird/m ²)
1	Good-Seed farms	Umuokata village,	– 30,000	Layers	9	3 – 8	3 – 2
2	Buchi farms	No 5 umuopia rd. Ovorji	2000	Layers and broilers	2	2 - 6	9
3	Pelmet farms	Umuire umuoba,	– 3000	Layers & broilers	7	3 – 5	8 - 7
4	Amenchim Integrated farms	Ovorji 2	4000	Layers & broilers	5	4 – 3	6 - 5
5	Ugwuma farms	Ugwuma layout	10000	Layer and broiler	8	7 - 6	10

Farms under assessment are Good Seed, Buchi, Pelmet, Amenchim Integrated, and Ugwuma farms respectively.

Data Collection:

A design manifest was created for recording the observation from the poultry farms under study (Tables 1 and 2). The tools used for the study were (a) Measuring Tape: To determine the length, width and height, stock density, as well as space between the buildings. (b) Compass: To determine the building orientation. (c) Camera: it is a device for recording visual images in form of photographs. Visual observation was done to record the location, number of buildings, number of poultry birds, type of poultry birds, and roof type/design. Survey/Investigation of the farms was done to investigate on the farms facilities, sizes and types of

materials used for constructing the farm buildings' components, waste management methods.

3. RESULTS AND DISCUSSION

The five poultry farms were assessed between January and March 2017. Pictures of the farms were presented in appendix, and the information observed was described below.

Accessibility: All the farms are close to the main road; also, the road of Ugwuma farm is tarred road, while the other farms' roads are untarred road.

Services: Only Good-Seed farm has feed mill, others buy feeds from outside. None of the farms has hatchery. The

eggs from the layers are taken out of the farms for hatching; also, the birds for the farming were bought as day old chicks from outside. The five farms make use of borehole as source of water.

Farm/Environmental Control: Good-Seed farm uses only electric bulb heat production, while pelmate and buchi farms use electric bulb and lantern as means of heat production respectively. Also, Amenchim and Ugwuma farms use electric bulb and charcoal heat for heat production respectively.

Feeders: Amenchim and Good-Seed farms use galvanized metal feeders only; meanwhile, Pelmate, Ugwuma, And Buchi make use of wooden feeders. in addition, Buchi and Pelmate farms also make use of plastic and metal feeders respectively.

Drinkers: Manual plastic drinkers are used by Pelmate, Amenchim and Buchi farms, while automatic drinking system is practised in Ugwuma and Good-Seed Farms. Automatic drinkers make poultry farming management easier than manual type.

Farming System: Battery Cage System is practised by Goodseed Farm, while others use deep litter system.

Ventilation: The five poultry farms are naturally ventilated, with similar window height ranging from 2.1 to 4.0 m. The buildings' heights need improvement for good ventilation, especially Ugwuma farm with 2.1 m as shown in Table 1. According to Ernst (1995) a preferable height of 3.9 - 5.3 m is better for good ventilation and reduction of heat stress.

Disease Control and Waste Management: The five farms have no footbath, but they chlorinate the drinking water for the birds. Amenchim, Ugwuma, Buchi and Good Seed farms practise floor disinfection because of movement of people in the buildings respectively; meanwhile, pelmate farm does not disinfect the floor which can encourage spread of disease.

Also, their waste disposal method is the same with the use of wood shavings for absorbing poultry waste. The bedding material observed is wood shavings for absorbing faecal waste to make the floor easy to clean. Bedding material used also has effect on the quality and performance of birds. However, sand, pine shavings, shredded papers or paper chips, dry straw, rice hulls, maize cobs, corn silage, peat

have been discovered to be better bedding materials than shaving materials, because shavings poorly absorb moisture and easily get contaminated with *Aspergillus*, and *Salmonella* organism (Sa'idu *et al.*, 2008; Charles *et al.*, 2005; Musa *et al.*, 2012; Ibrahim *et al.*, 1992; Asaniyan *et al.*, 2007 and Beri, 2011). In agricultural practice, poultry litter is a mixture of bedding material, poultry excreta, spilled feed, and feathers. The litter has negative effect on the environment from the production of ammonia and greenhouse gases (Meda *et al.*, 2011). Hence, the litter in the five farms is removed by scrapping and bagging for disposal, and made available as manure.

Stocking Density (Floor Space): It was observed from table 2 that the average stock density of layers and broilers is different in all the farms. The stocking density of Good-Seed, Buchi, Pelmate, Amenchim integrated, and Ugwuma farms are 9, 2, 7, 5 and 8 birds/m² respectively. According to FAO (2011), the recommended minimum and maximum stocking density for broilers are 3-4 and 5-6 birds/m² respectively; while the recommended minimum and maximum stocking density for layers are 6-7 and 8 birds/m² respectively. Birds perform better with enough space. It is Buchi and Amenchim Integrated farms that followed the recommended floor space for broilers respectively, while only Good-Seed farm exceeded the recommended stocking density for layers.

Feeders and Drinkers Space: It was observed as recorded in Table 2 that the feeder space of the five farms was at the recommended range of 6-8 and 10 – 20 birds/m² for breeders and layers trough respectively, according to FAO (2011). Also, the water space of the five farms is in accordance with the accepted value of 15birds/m² for breeders. This will help in actualising the potentials of the birds.

Construction Details: The poultry buildings comprise of the lower wall design, the upper wall design, the floor, and the roof structures. There is variation in the number of buildings in each farm. The buildings are either north-south, or east-west in orientation. According to FAO (2011), East-west orientation is better for because it minimizes direct exposure of sunlight to the animals. Also, the space between the buildings is too close, with range of farms 1.8 – 15.0m as shown in Table 1, compared to the recommended value of 30m according to FAO (2011). Each poultry building should have its own feeds and storage equipments, in addition to a

reasonable distance between buildings will reduce the rate of widespread of disease. The observed building components are summarized below:

- i. Foundation and Floor: The foundations of the buildings are made up of concrete and concrete floor. Concrete is the best foundation and floor materials, as it can withstand different loading of building.
- ii. Walls: The lower wall designs were made of masonry blocks, with hexagonal wire mesh for the upper wall design.
- iii. Roofing system: The shapes of the roofs are gable and hip design. Gable roofs are moderate in construction cost, easy to construct, and the most common. The roofs are covered with zinc, as zinc is good for preventing solar radiation, and not permeable to rain.

Some pictures from the farms are shown in the appendix.

3. CONCLUSION AND RECOMMENDATION

In conclusion, poultry farming has been on increase in Isialangwa-South of Abia State. The investment in poultry is investment in the farm structures, facilities and equipments respectively. The building design and adherence to standard specification is very important, in order to ensure that the birds are not exposed to harsh weather condition of sunshine, wind and rainfall, hence, this is the purpose why the current condition of the poultry farms was assessed.

Therefore, urgent necessity is required in the area of footbath by the five farms for prevention of disease, provision of protective clothing and footwear for the staff and visitors, change in the type of bedding material, type of drinkers by utilizing automatic drinkers, adherence to moderate stocking density to prevent spread of disease, deprivation of feeds by the stronger birds and cannibalism, building orientation and spacing respectively. East-West orientation is the best, as it minimizes direct exposure of bird to sunlight, which can cause rise in temperature in the birds (Chia *et al.*, 2014). Also, there is need for improvement in roof design. The roof designs are either gable or hip in Good Seed, Buchi, Pelmet, Amenchim Integrated, and Ugwuma farms respectively. Monitor or Semi monitor roofs although expensive to construct, but is advisable to be chosen for a considerable amount of natural light near the centre of the poultry buildings.

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APPENDIX



PLATE 1:PELMATE FARMS



PLATE 2:UGWUMA FARMS



PLATE 3:GOOD-SEED FARMS



PLATE 4: AMENCHIM FARM

