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ASSESSMENT OF THE LEVEL OF FARM MECHANIZATION TECHNOLOGY UTILIZATION IN POULTRY PRODUCTION IN KADUNA STATE, NIGERIA

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ABSTRACT

The study was conducted to assess the level of farm mechanization technology utilization in poultry production in Chukun and Igabi Local Government Areas, Kaduna State. Purposive sampling was used to select wards, multi-stage to choose villages and simple random to pick 140 responding farmers. Frequency distribution, percentages and means were the analytic tool used. Majority of the producers (75%) were aged forty years and below. All the producers had formal education. More than half of the producers (65%) were in poultry. About 57% were non-members of cooperatives. The major source of technology (68%) was local market. Majority of the producers (79%) adopted hand tool technologies. A few of the producers (18%) adopted battery cage, (4%) feed mill and (4%) incubator. The benefits of the technologies were 36% proper use of space, 21% easy handling of large flocks, 18% decrease in cost of production. The constraints were 46% inadequate access to capital, 18% lack of electricity and water and 14% poor extension contact. Majority of the producers adopted hand tools and were non-members of cooperatives thus could not enjoy economies of scale. Provision of adequate fund to producers and formation of cooperative were recommended.

Key words: Poultry, chicken, technology and production.

INTRODUCTION

Poultry is the term used to designate the species of birds domesticated to produce meat, eggs, feathers, manure and other by-products. Poultry has been recognized as one of the means to address the problems of malnutrition, food insecurity, low income and poverty (Adene, 2004). It is a profitable venture for livelihood improvement, enhancing subsidiary rural family income and financial empowerment (Akinokun, 1976). Poultry management consists of extensive, semi-intensive and intensive systems. In these systems birds are raised in litter houses, battery cages, wire slatted floors and straw yards (Mairiga *et al.*, 2013). Poultry ventures include poultry production for table eggs, hatchable eggs and meat; poultry processing for livestock feed and poultry services for consultation and marketing of poultry products. Poultry species include chicken, turkey, duck, quail, geese, swan, pigeon and ostrich. Poultry by-products can act as a source of energy, livestock feed, fertilizer, liming components for soil, collagen, gelatine and calcium (Bawa *et al.*, 2012). Poultry production will be a failure without adequate equipment and appliances to manage the birds. The general purpose appliances are used in all the stages of growth of the birds and specific purpose appliances in specific stages (Oluyemi and Roberts, 2003).

Farm mechanization is the development, introduction and use of mechanical assistance in all forms and at all levels of the agricultural production which helps in reducing the cost of production, improving the living standard, economic growth and level of production of the farmers as well as preserving the quality of the

poultry products and byproducts (Abubakar, 2010). Nwuba and Kaul (1986) classified the level of farm mechanization technology into hand tool technology, animal draught technology and engine-powered technology. Constraints to the utilization of technology in poultry production are inadequacy to the access of capital, lack of water and electricity, poor extension contact, lack of input supply, insufficient information and marketing of product (Olaniyi *et al.*, 2008)

Objectives of the Study

The broad objective of the study is to assess the level of farm mechanization technology utilization in chicken production in the study areas. The specific objectives include to:

- determine the socio-economic characteristics of chicken producers;
- examine the sources of farm mechanization technology tools;
- assess the levels of farm mechanization technology ;
- identify farm mechanization technology tools used,
- evaluate the benefits derived from the use of farm mechanization technology and
- describe the constraints to the use of farm mechanization technology in chicken production

Justification of the Study

Deficiency of protein in the meals consumed by the people in the developing countries, Nigeria inclusive has been reported (Ainsworth *et al.*, 2010).

Poultry for chicken production were established with the aim of providing meat and eggs rich in protein that helps in body building, tissue repairs, production of enzymes to immune the body, balancing of water and nutrients in the body (Smith, 1990). Constraints to the utilization of technology in poultry production are inadequacy of access to capital, poor extension contact, lack of input supply, insufficient information, poor infrastructural facilities and marketing of products (Olaniyi *et al.*, 2008). Feeding birds with substandard feed reduces their productivity, health condition and quality (Matanmi, 1977). This study intends to assess the levels of farm mechanization technology utilization in chicken production in the study areas to enhance farmer's productivity, protein intake, reduce the drudgery in farm operations and enrich chicken producers with the best farm mechanization technology tools. Help them in selecting suitable eggs for incubation, high quality breeds that are productive and resistant to common poultry diseases.

MATERIALS AND METHODS

The Study Area

The study was conducted in Chikum and Igabi Local Government Areas of Kaduna State. The coordinates of Kaduna state are 10° 20'N 7° 45'E and 10.33°N 7.75° E. It has a total land area of 48,473.2 sq km, a population of 6,066,512 and twenty three Local Governments Areas (NPC, 2006). Chikum and Igabi are two of Local Government areas in the state. It shared border with the Federal Capital Territory (FCT) Abuja, Kano, Katsina, Niger, Bauchi, Plateau, Nasarawa and Zamfara States. The State has two distinct seasons, the wet and dry seasons. The wet season starts from April to October and the dry season from November to March. The average rain fall in the state was 1,485mm/Annum. The temperature ranged between 28 to 36°C during the humid period and 10 to 23°C in the harmatan period (KADP, 2009). The people living in the areas are predominantly farmers raising poultry chicks and quail, growing crops such as maize, Guinea corn, millet, rice, potatoes, yam, tomatoes, lettuce, sugar cane and ground nuts among others. They equally practice animal husbandry, rearing of fish goats, sheep and cattle.

Sampling Procedure and Size

Purposive sampling method was used to select seven wards from each Local Government areas known with chicken production, multi-stage sampling procedure was adopted to choose five villages from each ward with farmers who were engaged in chicken production and simple random sampling technique was employed

to pick two prominent chicken farmers from each village making the sample size of 140 respondents.

Data Collection

Both primary and secondary data were collected for the study. For the primary data interview and structured questionnaire methods were used to solicit for it. The secondary data was collected from relevant documented literatures related to the study.

Analytic Techniques

The analytic technique used in this study was the descriptive statistics involving, percentages, mean and frequency distribution.

Variables for Measurement

The variables measured were the dependent and independent variables. The dependent variables being chicken and eggs to be produced and the independent variables were the farm technology tools used for the production of the chicken.

RESULTS

Results of the study have shown that 71% of the poultry producers were male while 29% were female exempting gender segregation. The ages of the producers were 11% below 20 years, 64% 21-40 years and 25% above forty. The marital status was 64% married and 36% single. On the level of education 32% had primary education, 39% secondary and 29% tertiary. The major occupations of producers were 65% poultry, 21% civil servants, 7% trading and 4% schooling. Years of experience were 54% ten years and below, 39% eleven to twenty years and 7% above 20 years with a mean of 10 years. On membership of cooperative society 43% were members and 57% non-members. The sources of technology were 68% market, 25% cooperatives and 7% Government. The level of farm mechanization was 79% hand tool and 21% engine-powered. On technology all producers use housing, feeders, drinkers, litter and brooms while 60% used lamp, 56% shovels, 50% buckets, 30% nest, 22% stove, 18% battery cage, 15% charcoal, 10% egg tray, 4% feed mill, 4% Candler, 4% fumigator, 4% carton, 4% egg grader, 4% Debeaker, 4% refrigerator, 4% incubator all these are based on multiple choice. Benefits of the use of the technology in poultry production are 36% proper use of space, 21% easy handling of large flocks, 18% decrease in cost of production, 14% faster operation and 11% reduction of drudgery. The constraints were 46% inadequate access to capital, 18% lack of electricity and water, 14% poor extension contact, 11% insufficient information, 7% lack of input supply and 4% marketing of products.

Table 1: Socio-economic characteristics of the poultry farmers

Variable	Frequency	Percentage
Sex		
Male	100	71
Female		40
29		
Total		140
<u>100</u>		
Age		
Below 20	15	11
21 - 40	90	64
Above 40	35	25
Total		140
<u>100</u>		
Marital Status		
Married	90	64
Single	50	36
Total		140
<u>100</u>		
Level of Education		
Primary	45	32
Secondary	55	39
Tertiary	40	29
Total		140
<u>100</u>		
Occupation		
Poultry	95	68
Civil servant	30	21
Trading	10	7
Schooling	5	4
Total		140
<u>100</u>		
Years of Experience in Poultry Production		
1 - 10	75	54
11 - 20	55	39
Above 20	10	7
Total		140
<u>100</u>		
Membership of Cooperative		
Members	60	43
Non – members	80	57
Total		140
<u>100</u>		

Table 2: Sources of Technology used in Poultry Production

Source	Frequency	Percentage
Government	10	7
Cooperatives	35	25
Market	95	68
Total		140
<u>100</u>		

Table 3: Level of Farm mechanization Technology Utilization in Poultry

Technology	Frequency	Percentage
Hand tool		110
79		
Engine-powered		30
21		
Total		140
<u>100</u>		

Table 4: Mechanization Technology Tools used in Poultry Production

Equipment	Frequency	Percentage
Feeders	140	100
Drinkers	140	100
Litter	140	100
Housing	140	100
Candler	5	4
Fumigator	5	4
Battery cage	25	18
Carton	5	4
Feed mill	5	4
beaker	5	4
Refrigerator	5	4
Broom	140	100
Lamp	84	60
Shovel	78	56
Bucket	70	50
Stove	31	22
Egg tray	14	10
Charcoal	21	15
Nest	42	30
Incubator		5

4

Multiple

choices

Table 5: Benefits Accrued from the use of Technology in Poultry

Benefit	Frequency	Percentage
Proper use of space	50	36
Easy handling of large flock	30	21
Decrease in cost of production	25	18
Faster operation	20	14
Reduction of drudgery	15	11
Total	140	100

Table 6: Constraints to the use of Technology in Poultry

Constraints	Frequency	Percentage
Inadequate access to capital	65	46
Lack of electricity and water	25	18
Poor extension contact	20	14
Insufficient information	15	11
Lack of input supply	10	7
Marketing of product	5	4
Total	140	100

DISCUSSION

Majority of the respondents were males thus, the need to encourage females to participate in poultry production as predicted by the work of idrisa *et al* (2010) on the reasons women lagged behind in agricultural production. Majority of the poultry producers were youth in their active period whose performance was significant in the socio-economic development of the society (Nwafor, 2010). The sampled producers were literate capable of using technical information to improve their practices and enhance the living standard of the community (May and Aikman, 2003). The mean of the years of experience was ten which could have molded the producers to adopt the appropriate technology in their production as experience is the best teacher (Ronald, 2000). Majority of the respondents were poultry producers who enjoyed the financial benefits of the business in line with the study of Adene (2004) on

poultry health and production. Majority of the producers were not members of cooperative societies as such could not enjoy credit facilities, economics of scale and efficient marketing strategies (Hermida, 2000). Most of the producers purchase their production technology tools from the market at exorbitant rate without any subsidy from the government to encourage them (Beverly, 2000). The major constraints to the use of technology in poultry production were lack of access to capital, electricity and water (Olaniyi *et al.*, 2008).

CONCLUSION

Results of the study have shown that poultry producers used farm mechanization technology tools and majority were using hand tools sold in the local markets and could not reap the benefits of proper use of space, handling larger stocks, reduction of drudgery and cost of production as well as faster operations.

Most of the producers were not members of cooperative society and could not reap the benefits of good marketing strategies, procurement of inputs and credit. The constraints to the use of technology tools in poultry production were inadequate access to capital, lack of electricity and water, poor extension contact, insufficient information, lack of input supply and marketing of products.

RECOMMENDATION

Based on the results of the study it has been recommended that adequate funds should be made available to poultry producers to boost their

production to meet the protein deficiency in our diets and food security targets. Electricity and water supplies should be improved to meet the demand of the poultry producers. Effective extension contacts with the research organizations and farmers for the production and adoption of the appropriate technology tools should be encouraged, technical information necessary for poultry production should be made available to producers. The formation of cooperative societies to solicit for loans, inputs supply and market outlets for better prices is inevitable.

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