

## Capacity Building Needs of Farmers in Duck Rearing and Marketing for Sustainable Food Security in Benue State, Nigeria

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### Abstract

This study identified capacity building needs of farmers in rearing and marketing of duck in Benue State, for sustainable food security. The study was carried out in Benue state. Three research questions and three hypotheses guided the study. Questionnaire survey research design was used for the study. A population of 96 respondents was studied. A 36-item structured questionnaire named Duck Rearing Capacity Building Needs Questionnaire (DRCBNQ) was used for data collection. The instrument was validated by three experts. Cronbach Alpha reliability method was used to determine the internal consistency of the instrument and a coefficient of 0.81 was obtained. 96 copies of the questionnaire were administered but only 95 were retrieved and data collected were analyzed using mean Improvement Need-Performance Index (INPI). It was found out that poultry farmers needed capacity building in all the 9 items on feeding of duck, needed capacity building in all the 11 items on management of duck and needed capacity building in all the 16 items on marketing of duck. It was therefore recommended that Agricultural extension agents should utilize the findings of this study on the capacity building needs of farmers to organize training and re-training programmes for improvement of capacity of poultry farmers in the entire production operations of duck. Farmers could be motivated to attend training and re-training programmes organized for their capacity building in duck production to be effective and efficient in duck production to meet the demand for duck in Benue State.

**Key words:** capacity building, farmers, duck rearing and marketing.

### Background

Duck rearing is a simple, interesting and lucrative venture. Central Poultry Development Organization (2014) reported that, the domestic ducks are water-fowls. They are raised mainly in region of high rainfall, deltas, riverine areas and coaster districts of the tropics. A number of advanced countries in temperate climates also keep ducks in commercial quantities for meat, eggs and other products.

Meat and eggs of duck (waterfowl) have high nutritional value as human food (animal protein). People eat meat of ducks not only because they like the taste, but also for its high nutritional value in terms of optimal composition of essential amino acids as well as favourable composition of fatty acids, with a high percentage of polyunsaturated fatty acids and a favourable ratio of omega 6 to omega 3-fatty acids (Pingel & Germany, 2011). Duck meat has a unique flavour and a delicious taste. It is economical, quick and easy to prepare and serve.

In Nigeria, local ducks are mostly raised on free range along side with the domestic chickens. Although ducks are hardier and more resistant to diseases and environmental hazards, they are fewer than the chickens basically due to cultural beliefs which tend to portray duck as mystique bird. Ducks does not require elaborate house for their production, they are comparable in meat qualities to chickens and are able to digest fibre protein food relatively more efficiently than chickens (Central Poultry Development Organization, 2014). This is an advantage considering recent emphasis on non-conventional feedstuffs to bring down cost of feed inputs in duck rearing thereby encouraging farmer's participation.

Rearing according to Hornby (2006) is the process of breeding animals or birds and caring for them as they grow. It is the act of taking care of young animals. In this case, rearing is the process of caring for ducklings and growing them to market size. Rearing is an essential aspect of animal production which involves all

activities, resources and efforts geared towards producing a table sized animal for either personal consumption or marketing.

Marketing as opined by Alabar (2007) is a human activity directed at satisfying consumers' needs and wants through exchange transaction in a market. Whalley (2010) maintained that, Marketing is the management process responsible for identifying, anticipating and satisfying customer requirements profitably. It comprises of activities directed at ensuring the flow of goods and services from producer to consumer or user. Marketing in this study, is ensuring that duck products reach the users in the right proportions, safe condition and at the right time. This can be done by the farmers at the farm gate or can be taken to a particular place for marketing. It was observed by the researchers that, in spite of the ease in the rearing of duck, many farmers do not engage in its rearing.

A farmer is a person who owns, works on or operates an agricultural enterprise, either commercially or to sustain himself and his family. According to Christopher (2010), a farmer is an individual whose primary job and function involves livestock and/or crop production. A farmer, according to the Central Bank of Nigeria report (CBN 2009) is a person who engages in Agriculture, raising living organisms for food or raw materials. In the context of this study, farmer is somebody who owns and operates a poultry farm with the primary aim of making money and achieving food security.

Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Food security focused on adequate supply of food and ensuring stability of these supplies through food reserves (FAO 2006). Sustainable food security therefore, is ensuring that all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life which returns on duck production are made to be continuous even for future access. These needs can only be met when farmers possess skills needed for duck rearing.

The level of skills possessed by farmers can be measured only when matched with the standards at which the skills are needed. The standards of performance needed by farmers can be provided by professionals in the poultry production such as lecturers. In the statement of Asogwa, Okoye, and Nongugwa, (2016) a lecturer is a person who has acquired training in teaching methodology and technical aspects of a programme in a university and renders services to students in agricultural education for effective learning. In this study, they are individuals who have acquired training and teaching methodology and technical aspects of animal production and are currently teaching in higher institution.

The recent increase in the demand and consumption of birds (chicken, turkey, duck) in Benue State is a matter of concern. This trend may be as a result of the crises between herdsmen and farmers in Benue State which made the price of beef to rise astronomically beyond the reach of many people. This situation has given rise to the consumption of chicken, turkey and even duck which was neglected for some reasons such as; it is a mystique bird, a dirty animal among others. Duck in Benue State is not commonly reared in large quantities because of low patronage; even those who rear them do on a free range as such farmers did not border to possess skills in its rearing (feeding and management). The raise in the consumption of poultry meat has made consumers go in search of duck to make up for the shortage in supply of poultry meat.

The results of this work could prompt extension workers, government and non-governmental organizations to organize workshops, training seminars for farmers. This can motivate farmers to improve on the current way they rear duck (that is, free range) by switching to either intensive or semi-intensive system of duck rearing; where ducklings can be more secured and better be cared for to grow to maturity. It is therefore necessary to determine the capacity building needs of farmers in rearing and marketing of duck in Benue State, for sustainable food security. Specifically, the study sought to identify capacity building needs of farmers in feeding of duck; management of duck and marketing of duck.

The study attempted to answer the following research questions:

1. What are the capacity building needs of farmers in feeding of duck?
2. What are the capacity building needs of farmers in management of duck?
3. What are the capacity building needs of farmers in marketing of duck?

## **Methodology**

The study adopted questionnaire survey design. This design is suitable for this study because data was collected from a representative sample of the population using questionnaire and the findings were generalized on the entire population of the respondents in Benue State. The population of the study is 96. This is

made up of 59 registered poultry farmers in Gboko and Makurdi Local Government Areas of Benue State and 32 lecturers of animal production out of which 17 were from Akperan Orshi College of Agriculture Yandev, Gboko and 15 from University of Agriculture, Makurdi. The entire population was used for the study due to its manageable size, hence there was no sampling.

An instrument titled: Duck Rearing Capacity Building Needs Questionnaire (DRCBNQ) which was developed from literature review was used for data collection. The DRCBNQ had two response categories of needed and performance. The needed category had response options of Highly Needed, Averagely Needed, Slightly Needed and Not Needed while the performance category had response options of High Performance, Average Performance, Low Performance and No Performance.

Three experts validated the questionnaire; two from the department of Animal Production, and one from the department of Agricultural Education, all from University of Agriculture, Makurdi. Their corrections and suggestions were used to rework the questionnaire. Cronbach alpha reliability method was used to determine the internal consistency of the DRCBNQ. A reliability coefficient of 0.81 was obtained. Two research assistants, one from each of the studied Local Government Areas of the state were employed and educated on how to administer and retrieve the questionnaire. Ninety six (96) copies of the questionnaire were administered to the respondents through face to face contact. After seven days, a total of ninety five (95) copies of the questionnaire were returned.

Data collected for the study were analyzed using mean and Improvement Need-Performance Index (INPI) to answer the research questions. The level of skills possessed by the two groups (lecturers and farmers) in feeding, managing and marketing of duck was identified through need gap analysis. Need gap analysis is the mean values of the perceived performances of poultry farmers in duck rearing subtracted from the mean values of their expected performances. The result obtained is the need gap value, which indicates the capacity building needs of poultry farmers in duck rearing and marketing. The need gap value provided basis for capacity building intervention programmes that may be organized for poultry farmers in duck production.

The real limit of numbers was used for decision making. Any item with mean of 1.50 or above was regarded as needed while any item with a mean less than 1.50 was regarded as not needed. The performance category of the questionnaire items was responded to by poultry farmers while the lecturers responded to the needed category. To determine the need-performance gap of poultry farmers, the following steps were adopted.

1. The weighted mean ( $X_n$ ) of the needed scale was determined for each item.
2. The weighted mean ( $X_p$ ) of the performance was determined for each item.
3. The performance gap (PG) was determined by finding the difference between the values of  $X_n$  and  $X_p$ . That is,  $X_n - X_p = PG$ .

The value of NPG of each item indicated the capacity level of the farmers on that item. Where NPG is zero (0), it means that capacity building is not needed for the item because the level at which the farmers performed that item is equal to the level at which the item is needed. Where NPG is negative (-), it means capacity building is not needed for that item because the level at which the farmers performed the item is higher than the level at which the item is needed. Where the NPG is positive (+), it means capacity building is needed because the level at which the farmers performed the item is lower than the level at which it is needed.

## Results

The results of this study are based on questions answered and hypotheses tested and presented in table 1 to 3.

**Research question 1.** What are the capacity building needs of farmers in feeding of duck?

Data for answering research question one are presented in table 1.

**Table1:** Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where farmers needed capacity building in feeding of duck.

SN	Management practices	$X_n$	$X_p$	NPG $X_n - X_p$	Status
1	Provide concentrate feeds to duck in the morning	3.20	0.50	2.70	CBN

	before allowing them out and in the evening before allowing them in				
2	Construct a swimming pool for duck	3.89	2.25	1.64	CBN
3	Provide clean water for drinking and bathing of duck regularly	3.91	2.81	1.10	CBN
4	Provide for duck roughages like napier and carpet grass	3.42	1.03	2.39	CBN
5	Clean the feeding troughs regularly with disinfectants	2.81	1.00	1.81	CBN
6	Refill the swimming pool with water for drinking and bathing	2.99	2.51	0.48	CBN
8	Provide vitamins to boost their appetite for food	3.80	2.32	1.48	CBN
9	Keep duckling indoors to provide feeds and water in other to avoid loss	2.99	0.96	2.03	CBN
	<b>Grand total</b>	<b>3.00</b>	<b>1.49</b>	<b>1.51</b>	<b>CBN</b>

$X_n$  = Mean of Needed,  $X_p$  = Mean of Performance, PG = Performance Gap Value, CBN = Capacity Building Needed

Data in table 1 showed that need-performance gap values of all the 9 items and grand mean ranged from 0.48 to 2.70 and were positive. This indicated that the farmers needed capacity building in all the 9 items on feeding of duck. Generally, the overall mean of needed minus performance responses is 1.51 and was positive. This indicated that the poultry farmers needed capacity building in feeding of duck in Benue State.

**Research question 2.** What are the capacity building needs of farmers in management of duck?

Data for answering research question two are presented in table 2.

**Table2:** Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where farmers needed capacity building in management of duck.

SN	Management practices	$X_n$	$X_p$	NPG $X_n - X_p$	Status
1	Fence duck farm to avoid poachers and predators	3.62	1.04	2.58	CBN
2	Cover the floor with saw dust, wood shaving, rice husk to absorb feces	3.59	2.39	1.20	CBN
3	Observe duck regularly for any sign of disease	3.10	3.00	0.10	CBN
4	Clean duck housing regularly	3.94	3.71	0.23	CBN
5	Isolate sick duck as soon as signs and symptoms are noticed	3.91	2.49	1.42	CBN
6	Treat sick animals with recommended doses of drugs	3.86	3.11	0.75	CBN
7	Observe duck for response to treatment	3.24	2.50	0.74	CBN
8	Cull and bury diseased duck to avoid further infection	3.77	2.09	1.68	CBN
9	Debeak duck to avoid cannibalism and destruction of items on the farm	3.03	3.00	0.03	CBN
10	Separate ducklings from duck after 2-3weeks to prepare for mating	3.49	2.94	0.55	CBN
11	Deworm duck regularly against endo parasites for optimum production	3.81	2.89	0.92	CBN
	<b>Grand total</b>	<b>3.58</b>	<b>2.65</b>	<b>0.93</b>	<b>CBN</b>

$X_n$  = Mean of Needed,  $X_p$  = Mean of Performance, PG = Performance Gap Value, CBN = Capacity Building Needed

Data in table 2 revealed that need-performance gap values of all the 11 items and grand mean ranged from 0.03 to 1.68 and were positive. This indicated that the farmers needed capacity building in all the 11 items on management of duck. Generally, the overall mean of needed minus performance responses is 0.93 and was positive. This indicated that the poultry farmers needed capacity building in management of duck in Benue State.

**Research question 3.** What are the capacity building needs of farmers in marketing of duck?

Data for answering research question three are presented in table 3.

**Table3:** Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where farmers needed capacity building in marketing of duck.

SN	Marketing	$X_n$	$X_p$	NPG $X_n - X_p$	Status
1	Survey the market for duck to determine the market value and demand	3.61	2.73	0.88	CBN
2	Sort and grade duck based on body size and weight	3.38	2.40	0.98	CBN
3	Tag prices for each grade based on market survey and demand	3.90	1.99	1.91	CBN
4	Identify distributing channels for marketing of duck	3.73	2.81	0.92	CBN
5	Register with duck producers association to access wider market	2.88	2.17	0.71	CBN
6	Seek promotion strategies for duck products	3.41	2.24	1.17	CBN
7	Advertise duck products locally and through media to attract buyers	3.26	2.70	0.56	CBN
8	Sell products direct to buyers at farm gate or transport the products to the market to sell at better prices	3.94	3.00	0.94	CBN
9	Distribute or sale products to buyers through middlemen	3.45	1.42	2.03	CBN
10	Ensure regular supply of duck products to buyers	3.11	3.03	0.80	CBN
11	keep good relation with customers	3.09	2.94	0.15	CBN
12	Review all the marketing strategies to meet the present condition	3.30	2.60	0.70	CBN
13	Seek out new relationships to meet high demand.	2.88	1.69	1.19	CBN
14	keep appropriate records of sales for expansion and sustainability	3.91	1.03	2.88	CBN
15	Calculate the expenditure and income to balance the profit and loss account	3.00	2.51	0.49	CBN
16	Manage finances obtained from duck production to give room for saving and reinvestment.	3.52	2.10	1.42	CBN
<b>Grand total</b>		<b>3.40</b>	<b>2.49</b>	<b>1.18</b>	<b>CBN</b>

$X_n$  = Mean of Needed,  $X_p$  = Mean of Performance, PG = Performance Gap Value, CBN = Capacity Building Needed

Data in table 3 revealed that need-performance gap values of all the 16 items and grand mean ranged from 0.15 to 2.88 and were positive. This indicated that the farmers needed capacity building in all the 16 items on marketing of duck. Generally, the overall mean of needed minus performance responses is 1.18 and was positive. This indicated that the poultry farmers needed capacity building in marketing of duck in Benue State.



## **Discussion of Findings**

The findings of the study in table 1 revealed that the poultry farmers needed capacity building in all the 9 items on feeding of duck in Benue State, Nigeria. The items on feeding of duck include: construct a swimming pool for duck, provide water for drinking and bathing of duck regularly, provide for duck roughages like napier and carpet grass, clean the feeding trough regularly refill the swimming pool with water for drinking and bathing among others.

The findings of the study in table 2 revealed that the poultry farmers needed capacity building in all the 11 items on management of duck in Benue State, Nigeria. The items on management of duck include: treat sick animals with recommended doses of drugs, observe duck for response to treatment, remove and bury diseased duck to avoid further infection, debeak duck to avoid pecking of others and destruction of items on the farm, separate chicks from mothers after 2-3weeks to prepare for mating among others.

The findings of the study in table 3 revealed that the poultry farmers needed capacity building in all the 16 items on marketing of duck in Benue State, Nigeria. The items on marketing of duck include: ensure regular supply of duck products to buyers, keep good relation with customers, review all the marketing strategies to meet the present condition, seek out new relationships to meet high demand, keep appropriate records of sales for expansion and sustainability among others.

The findings of the study were in line with the view of Isiwu, and Ibeh (2014) in a study on capacity building needs of lecturers of agricultural education in colleges of education in teaching farm land survey and farm stead planning in South East Nigeria, where it was found that lecturers of agricultural education in southeastern Nigeria needed capacity building in 24 items on planning for farm survey and farm stead making, 20 competencies in the use of facilities in teaching the content of climate change, 6 competencies in teaching pedagogy to students.

The findings of this study were also in conformity with the submission of Usoro and Ufot (2013) on capacity building needs of TVET lecturers in collaborative technique for teaching pre-service teachers: A case study of college of education Afaha Nsit, Akwa Ibom State, Nigeria, where it was found that, TVET teachers need re-training in all identified maintaining relationship techniques but less emphasis will be given to the four maintaining relation technique that were negative, TVET teachers need retraining in all the achieving the task technique but less emphasis to the only negative items identified among others. The findings of the study were also in agreement with those of Umar, Ishaya and Yaduma (2013) on improving capacity building of electrical and electronic education students for sustainable development through school-industrial cooperation in technical institutions in North Eastern Nigeria, where it was found that, the respondents agreed on all the items on school-industrial activities that will improve school-relation for capacity building, the respondents strongly agreed on all the items on electrical and electronic base skills that can link school and industry for capacity building among others.

The findings of the study were also in line with the report of Mojekwu (2010) in the study on work skills required by secondary school graduates for success in yam production and processing enterprise in Anambra State where it was found that 9 skills were required for planning for yam production, 18 skills in planting of yam, 14 skills in management of yam field, 10 skills in harvesting and storage of yam, 54 skills in processing of yam into various forms and 9 skills in marketing of yam and yam products. The findings are also in conformity with the submission of Ukonze (2010) on the identification of vegetable production skills needed by instructors in University for effective teaching of vegetable crop in Enugu State where it was found that, 16 vegetable production skill items in planning, 18skills in vegetable production management and 7 skills in marketing were identified as needed by instructors.

The implication of this finding is that the professional experience of the respondents did not influence their responses on the capacity building needs of farmers in rearing and marketing of duck in Benue State. The findings of the authors cited above help to add validity to the result of this study.

Therefore, the researchers added capacity building needs of farmers in rearing and marketing of duck to the existing body of knowledge in duck production.

## **Conclusion**

The rise in the consumption of chicken, turkey and even duck which was neglected for some reasons such as; it is a mystique bird, a dirty animal among others. Duck in Benue State is not commonly reared in large

quantities because of low patronage; as such farmers did not border to poses skills in its rearing. The rise in the consumption of poultry meat has made consumers go in search of duck because of the shortage in supply. In order to cope with the rise in demand for duck in Benue State, farmers need capacity building in duck rearing and marketing since they possess skills in rearing other poultry animals. Hence, the researchers were triggered to identify the capacity building needs of farmers in rearing and marketing of duck in Benue State. It was found out that farmers needed capacity building in 9 items on feeding of duck, 11 items on management of duck and 16 items on marketing of duck in Benue State.

Therefore, it was recommended that;

1. Agricultural extension agents should utilize the findings of this study on the capacity building needs of farmers to organize training and re-training programmes for the capacity building of poultry farmers in rearing and entire production of duck.
2. Farmers should attend training and re-training programmes organized for their capacity building in duck production to be effective and efficient in duck production to meet the demand.

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