



## Scaling-Up Poultry Farmers Skills Need for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State

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### **Abstract**

*This study sought to determine poultry farmers' skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State. Three each of objectives, research questions and null hypotheses were formulated. The population of the study was 280 respondents and stratified random sampling technique was used in selecting a sample of 165 respondents. The instruments entitled Extension Agents Acquired Skills Questionnaire and Poultry Farmers Needed Skills Questionnaire were used for data collection. The instruments were face validated and reliability was done using test-re-test method which yielded a coefficient of .79 using KR21. Mean was used in answering the research questions and findings revealed that poultry farmers needed feeding, health management and egg storage skills for commercial egg production. Independent t-test statistic was used to test the null hypotheses at 0.05 level of significance and the findings of the study revealed that there is a significant difference in the mean responses of extension agents and poultry farmers on feeding, health management and egg storage skills needed for commercial egg production. Based on the findings of the study, it was concluded that poultry farmers needed scaling-up on feeding, health management and egg storage to boost commercial egg production in the study area. It was recommended among others that Agricultural extension agents through the State Agricultural Development Programme should conduct regular seminars and workshops for poultry farmers in Central Senatorial District of Cross River State on feeding, health management and egg storage skills.*

**Key Words:** Scaling-up, Poultry Farmers, Skills need, Commercial Egg production Sustainable National Development.

### **Introduction**

Cross River State is an agrarian State and farmers in the State are involved in both crop and animal production. They cultivate arable crops such as yam, cassava and maize, cash crops like oil palm, rubber, cocoa and cashew in addition to fruit tree crops such as oranges, plantain and banana in large quantities. Bisong and Ogar (2001) observed that farmers are however also involved in livestock production including goatry, piggery, poultry, fisheries, apiculture and heliculture.

Poultry are domesticated birds kept by man for food, sale or as pets. They include fowl, chicken, goose, guinea fowl, quails and turkey among others. Poultry meat is a good



source of high quality protein with a good balance of amino acids. According to Speedy, (2003), it is also rich in Iron, Zinc, Calcium, Iodine and Phosphorus. It is also rich in B-complex vitamins except folic acid, vitamin D, retinol and riboflavin. Chicken egg contains most of the basic constituents of nutritional elements that are important to man. Despite the provision of all these nutritional values, Odunsi, Togun and Oladunjoye (2005) indicated that consumption of poultry products is lower in developing countries than in developed countries. Thieme and Pilling (2010), estimated daily requirement of 65gm to 75gm of total protein out of which 40% or 36gms should be obtained from animal sources. Currently, the estimated percentage of animal protein consumption is about 17gm which indicates a short fall of 48gm to 58gm (Odunsi *et al* 2005). According to Ike (2011), Poultry offers the greatest source of animal protein in terms of quality and quantity in Nigeria and poultry meat and eggs account for over 80% of total livestock output.

Poultry birds can be classified as layers (egg producers), broilers (meat producers), and dual purpose breeds. However, this study focuses on layers husbandry for commercial egg production. Layers are efficient egg producers, which are mostly exotic breeds. They include white leghorn and Rhode Island Red. A laying hen can produce eggs for a number of years, but it is very economical to keep the layers within the age of 18 months. Egg production commences at about 18-22 weeks of age and may rise sharply reaching the peak at about 32-35 weeks of age and may gradually decline at the rate of half the production capacity a week thereafter (Lohnmann, 2006). It is thus a usual routine practice to replace the layers at the age of 18 months. Egg production is divided into two periods namely, the rearing or the growing phase and the productive phase.

Rearing Phase is the first stage and it is of great importance. The period starts from day old to 16 weeks of age. Layers, performance at the production period depends largely on all that happen, that is, proper feeding, medication and care within the rearing period especially the bird's body weight at 16 weeks. Any delay in growth of birds reflects low body weight at 16 weeks resulting in delay at start of lay. Loosli, Oyenuga and Babatunde (1999) argued that productive phase period starts from 140 days and above and may be divided into three stages or phases. Phase I is the period from 22 weeks (point of lay) to 24 weeks of age and during this period, the layer is expected to increase in egg production from zero to approximately 85% production. Phase II is a period from 63 weeks up to 72 weeks. At this stage, the egg production is less than 65%. Phase III: is a period from 63 weeks up to 72 weeks. At this stage, the eggs production is less than 62%. At this period, the birds are said to undergo moulting and so need maintenance to continue production. It is this production shortfall that calls for scaling up to keep its production at the peak to be able to meet the demands for egg. This can be done by considering the various training needs of poultry farmers for egg production. World Health Organization (2016) defined scaling-up as a deliberate efforts to increase the impact of successfully tested innovations so as to benefit more people and to foster policy and programme development on a lasting



basis. This view illustrates that scaling-up is linked with innovations that could expand projects and initiatives that could be sustained.

Sustainability can be defined as the practice of maintaining processes of productivity indefinitely (naturally or human made) by replacing the resources used with the resources of the greater value without degrading or endangering natural biotic systems (Offiong, Okon, Ekanem and Agba, 2016). It implies the progressive existence of value or quality of something over a long period of time such that today's usage does not endanger the future. Therefore, sustainable national development means the maintenance of the nation's resources for future use. It is geared towards the enhancement of individuals in the economy and which would also enhance the development of a nation that should be sustained with time. Sustainable National development is that which is geared towards the enhancement of individuals in the economy and which would also enhance the development of a nation and such development should be sustained with time. According to Anyakoha (2010), sustainable national development is a concept of dynamic approach to improving the well-being of people and postulates that there are positive links between three major interrelated areas which are economic, social, and environmental. It is about long term conditions for humanity's multidimensional well-being. The economic objectives include growth, efficiency, and stability in terms of food security. The social objectives include employment, education, security, and health while environmental objectives include national use of renewable and conservative of non-renewable natural resources.

Skills are arts which can be developed with training and practice. It is the act of training received by an individual to become an expert. To acquire a skill an individual must have interest, give time to it, and have value for the skill and be of good conduct. Skills are the ability of an individual to learn and perform certain tasks. They are the acquired habitats of acting, thinking and behaving in a specific pattern, in such a way that the process becomes natural to the individual through repetitions and practice. Elijah (2006) observed that skills have to do with well-established habit of doing something. An individual with skills can be either self-employed or employer of labour and therefore functioning effectively in the society by reducing crimes. Therefore, skills acquisition is the ability of an individual to be trained on a particular task to become expert. Skills need according to Solomon (2008) is a condition where there is a gap between what is and what should be in terms of knowledge, skills, attitude, and behaviour for a particular time. Poultry farmers are individuals who raise or domesticated birds for meat, eggs, feathers, as pets for sale or for consumption (Wikipedia, 2019). They keep the poultry houses clean regularly of fecal matter to reduce the risk of spreading diseases. They provide water and feed to the birds (Izunobi, 2002). They also maintain proper ventilation and temperature in the poultry house.. It is therefore, imperative to scale-up poultry farmers skills for



commercial egg production in the area of feeding health management, and eggs storage to ensure optimal production and availability of eggs for all year round.

Feeding is a process of taking in food for nourishment. Chickens of different ages require different levels of nutrient. There are standard specification for starting, growing and laying chicken feeds to serve as a guide for poultry farmers. The feeds are classified into starting poultry feeds or starter mash which is ration fed to chicks from day old up to the age of 6 weeks. Growing poultry feed or grower mash which is ration fed to growing chicks from 7 weeks to 18 weeks or until laying commences. Laying poultry feed or layers mash is ration fed to chickens after laying commences.

Health is a state of well-being of an organism. If an organism is not in this state, then it is regarded as sick or unhealthy animal. According to Garmen, Parkhurst and George (2002), almost all health problems on poultry farms start from new poultry brought into contaminated pens of previous flocks, or lack of proper sanitation and other good management practices. Diseases prevention and treatment in poultry production should therefore be given top priority. Storage of eggs is done mainly to maintain quality. Since eggs are small, soft, fragile and short-lived, they must be handled with extreme care. Eggs should be cleaned to keep contamination at a minimum level. Egg shells should be cooled and held at 15.4°C or lower and 70% relative humidity which are the optimum storage conditions. Therefore, farmers need the skill to maintain the eggs a little longer by supplementing the storage conditions of eggs with oil treatment of the eggshells (Garmen, Parkhurst and George, 2002).

### **Statement of the Problem**

The urban population growth rate in Central senatorial district of Cross River State has created additional demand for poultry products which justifies the development of commercial egg production. Observation by the researcher shows that there is high demand for eggs without a corresponding supply. Poultry farmers in Central Senatorial District of Cross River State have not met the consumption needs of households in the State. It is therefore not out of place to attribute this low egg production by poultry farmers in Central Senatorial District of Cross River State to dearth of skills among producers. These skills probably include feeding, health management and egg storage. This observed unfortunate situation motivated the researcher to determine skills need of poultry farmers for commercial egg production in Central Senatorial District of Cross River State through this study.

### **Purpose of the Study**

The main objective of this study was to determine the skills need of poultry farmers for commercial egg production in Central Senatorial District of Cross River State. Specifically, the study sought to:



1. Determine the feeding skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.
2. Determine the health management skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.
3. Determine the eggs storage skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

### **Research Questions**

The following research questions were raised for the study.

- 1 What are the feeding skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?
- 2 What are the health management skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?
- 3 What are the egg storage skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?

### **Null Hypotheses**

To guide the study, the following null hypotheses were raised and tested at 0.05 level of significance.

- H<sub>01</sub>:** There is no significant difference in the mean responses of extension agents and poultry farmers on feeding skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.
- H<sub>02</sub>:** There is no significant difference in the mean responses of extension agents and poultry farmers on health management skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.
- H<sub>03</sub>:** There is no significant difference in the mean responses of extension agents and poultry farmers on egg storage skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

### **Methodology**

Survey research design was adopted for the study. The design was considered appropriate for the study, since it solicited information from poultry farmers and extension



agents through the use of questionnaire. The study was conducted in Central Senatorial District of Cross River State which falls within the rain forest region of South South Nigeria. The population of the study was 280 respondents comprising (200 poultry farmers and 80 extension agents). Stratified random sampling technique was used in selecting a sample of 165 respondents (118 poultry farmers and 47 extension agents). Two researchers-developed instruments with 15 items each entitled Extension Agents Acquired Skills Questionnaire (EAASQ) and Poultry Farmers Needed Skills Questionnaire (PFNSQ) were used in generating data for the study. The acquired skills response options were: Very Highly Acquired, Highly Acquired, Moderately Acquired and Lowly Acquired. While the Needed Skills response options included Very Highly Needed, Highly Needed, Moderately Needed and Lowly Needed with corresponding value of 4, 3, 2, 1 for the Acquired and Needed options respectively. The research questions were answered using Mean Improvement Need Index (INI). The weighted means for each acquired skills for commercial egg production was represented by ( $\bar{X}_A$ ) while the weighted mean for each needed skill for commercial egg production was represented by ( $\bar{X}_N$ ). The difference between the Acquired Skills mean and Needed Skills mean, that is, ( $\bar{X}_A - \bar{X}_N$ ) was used to determine the Gap Needed (GN) which yielded positive or negative value. Null hypotheses was tested using t-test at 0.05 level of significance. Where the value  $\bar{X}_A - \bar{X}_N$  was positive (+) it meant that poultry farmers needed high skills because the level is higher than the level of the skills acquired. The instrument was validated by three experts from Vocational Education, University of Uyo. The experts' inputs were incorporated into the final instrument. Test-re-test Reliability Technique was used in determining the reliability of the instrument which yielded reliability coefficient index of .79 when analyzed with KR21.

- (a) Where the value,  $\bar{X}_A - \bar{X}_N$  was positive (+), it meant that poultry farmers highly needed skills training because the level of skills needed was higher than the level of skills acquired.
- (b) Where the value of  $\bar{X}_A - \bar{X}_N$  was negative (-), it meant that poultry farmers needed low skills training because the level needed was lower than the level of skills acquired.
- (c) Where the value of  $\bar{X}_A - \bar{X}_N$  was zero (0), it indicated that, the poultry farmer did not need to acquire skills because the level at which the poultry farmers acquired skills was equal to the level expected.

In testing the hypotheses, where the calculated t-value was greater than the critical t-value at  $P > .05$ , the null hypotheses were rejected and where the calculated t-value was less than the critical t-value at  $P < .05$ , the null hypotheses were retained.

**Results**

**Research Question 1:** What are the feeding skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?

Results of research question 1 are presented on Table 1.

**Table 1:** Improvement Need Index Analysis of the Feeding Skills Need of Poultry Farmers for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State  $n = 165$

S/N	Feeding skills	$\bar{X} A$	$\bar{X} N$	PG $\bar{X} A - \bar{X} N$	Decision
1.	Water supply skill in birds	2.06	3.25	-1.19	SNN
2.	Ration management skill	3.43	1.82	1.61	SN
3.	Contamination prevention skill	3.47	2.02	1.45	SN
4.	Feeders sanitation skill	3.55	1.92	1.63	SN
5.	Feed s formulation skill.	3.77	1.93	1.84	SN
	<b>Grand gap</b>			<b>1.07</b>	<b>SN</b>

*Note:* SN=Skills needed, SNN = skills not needed,  $P = 0.05$

The result presented on Table 1 reveals that feeding skills have the grand Gap of 1.07. This shows that item 2, 3, 4 and 5 were needed by poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State due to their positive gap. On the other hand, item 1 was not needed by poultry farmers for commercial egg production due to its negative gap of -1.19. Since the feeding skills overlap one another, it will be difficult to isolate the negative item during re-training without creating a gap. Therefore, poultry farmers require re-training in all identified five skills but less emphasis will be given to the negative item.

**Research Question 2:** What are the health management skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?

Results of research question 2 are presented on Table 2

**Table 2:** Improvement Need Index Analysis of the Health Management Skills Need of Poultry Farmers for Commercial Egg Production and sustainable national development in Central Senatorial District of Cross River State  $n = 165$ 

S/N	Health Management Skills	$\bar{X}_A$	$\bar{X}_N$	PG $\bar{X}_A - \bar{X}_N$	Decision
1.	Disease symptoms identification skill	3.60	2.50	1.1	SN
2.	Birds isolation skills to ensure birds treatment	3.49	2.32	1.17	SN
3.	Skills for prevention of high mortality	3.64	2.48	1.16	SN
4.	Parasite minimization skills	3.38	2.36	1.02	SN
5.	Disinfectant administration skills	3.11	2.28	0.83	SN
	<b>Grand gap</b>			<b>1.06</b>	<b>SN</b>

**Note:** SN=Skills needed,  $P = .05$

The result presented on Table 2 reveals that health management skills have the grand gap of 1.06. This indicated that all the health management skills are needed by poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State. Item 2 had the highest gap; (1.17). This was closely followed by item 3 with 1.16. Therefore, poultry farmers require retraining in all the identified health management skills to ensure commercial egg production.

### Research Question 3

What are the egg storage skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State?

Results of research question 3 are presented on Table 3

**Table 3:** Improvement Need Index Analysis of Storage skills need of Poultry Farmers for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State  $n = 165$ 

S/N	Egg Storage Skills	$\bar{X}_A$	$\bar{X}_N$	PG $\bar{X}_A - \bar{X}_N$	Decision
1.	Eggs positioning skill	3.49	2.07	1.42	SN
2.	Eggs grading skill	3.62	2.00	1.62	SN
3.	Eggs sorting skill	2.36	3.63	-1.27	SNN
4.	Fresh eggs identification skill	2.17	3.53	-1.36	SNN
5.	Eggs quality maintenance	3.41	2.09	1.32	SN
	<b>Grand gap</b>			<b>0.35</b>	<b>SN</b>

**Note:** SN=Skills needed, SNN = skills not needed,  $P = .05$



The result on Table 3 revealed that storage skills have the grand gap of 0.35. It however shows that items 1, 2, and 5 were needed by poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State due to their positive gap ranging from 1.32-1.62. On the other hand, item 3 and 4 had negative gap, which suggest that poultry farmers already had these skills and as such do need improvement for commercial egg production.

### Testing of Null Hypotheses

The following hypotheses were tested in the study.

**Null Hypothesis 1:** There is no significant difference in the mean responses of extension agents and poultry farmers on feeding skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

Results of research hypothesis 1 are presented on Table 4

**Table 4:** t-test Analysis of the Difference in the mean Responses of Extension Agents and Poultry Farmers on Feeding Skills Need for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State *n* = 165

Feeding Skills	N	$\bar{X}$	SD	df	t-cal	Sig. of t	Decision at 0.05
Extension agents	47	3.24	.669	163	.117	.023	Significant
Poultry farmers	118	2.19	.623				

The result presented on Table 4 shows that the calculated t-value of .117 at 0.05 level of significance and 163 degree of freedom was greater than the sig t of .023. Therefore, the null hypothesis was rejected. This means that there was significant difference in the mean responses of extension agents and poultry farmers on feeding skills need for commercial eggs production and sustainable national development in Central Senatorial District of Cross River State.

**Null Hypothesis 2:** There is no significant difference in the mean responses of extension agents and poultry farmers on health management skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

Results of research hypothesis 2 are presented on Table 5.

**Table 5:** t-test Analysis of the Difference in the Mean Responses of Extension Agents and Poultry Farmers on Health Management Skills Need for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State  
*n = 165*

Health Management Skills	N	$\bar{X}$	SD	df	t-cal	Sig. of t	Decision at 0.05
Extension agents	47	3.45	.833	163	.083	.005	Sig.
Poultry farmers	118	1.96	.784				

The result presented on Table 5 shows that the calculated t-value of .083 was greater than the sig of t (.005) at .05 level of significance and 163 degree of freedom. Therefore, since .083 is greater than .005, the hypothesis was rejected. This means that there was significant difference in the mean responses of extension agents and poultry farmers on health management skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

**Null Hypothesis 3:** There is no significant difference in the mean responses of Extension agents and poultry farmers on egg storage skills need for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.

Results of research hypothesis 3 are presented on Table 6.

**Table 6:** t-test Analysis of the Difference in the mean Responses of Extension Agents and Poultry Farmers on Egg Storage Skills Need for Commercial Egg Production and Sustainable National Development in Central Senatorial District of Cross River State  
*n = 165*

Egg storage Skills	N	$\bar{X}$	SD	df	t-cal	Sig. of t	Decision at 0.05
Extension agents	47	2.69	.860	163	4.00	.006	Significant
Poultry farmers	118	2.66	.782				

The result presented on Table 6 shows that the calculated t-value of 4.00 is greater than the sig of t of .006 at .05 level of significance and 163 degree of freedom. Therefore, the null hypothesis was rejected. This means that there was significant difference in the mean responses of extension agents and poultry farmers on egg storage skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State.



## Discussion of Findings

Result of research question one revealed that there was a gap between feeding skills acquired by extension agent and poultry farmers. This finding was in line with the finding of Ojo (2003) who found that poultry farmers lack technical efficiency for egg production. To bridge this gap in skills, poultry farmers need re-training in feeding skills such as feed formulation skills in birds, ration management skill, contamination prevention skills and feeders sanitation skills with less emphasis on water supply in birds since it showed a negative gap which indicated that poultry farmers already acquired that skill to an acceptable degree to prevent feed contamination thereby promoting rapid growth and development. When poultry farmers are equipped with adequate feeding skills, commercial egg production will be facilitated.

Also, the result of hypothesis 1 showed that there was significant difference in the mean responses of extension agents and poultry farmers on feeding skills need of poultry farmers for commercial egg production and sustainable national development in Central Senatorial District of Cross River State. This finding agrees with Ohajianya, Onu, Eyia, Uykoha, Ben-Chendo and Ibje (2013) who found that poultry farmers are not fully technically efficient in application of feeding and health management skills. It therefore follows that for poultry farmers in Central Senatorial District of Cross River State to produce eggs in commercial quantity, their feeding skill must be upgraded to meet global best practices.

The result in research question 2 revealed that there was a gap in skills acquired by extension agents and health management skills needed by poultry farmers. This finding agreed with the finding of Charles, Anthony, Stanley and Abdufarah (2013) who found that poultry farmers have inadequate skills on feeding, health management and egg storage skills. To bridge this gap, poultry farmers in Central Senatorial District of Cross River State needed training in the entire health management skills. These include skills in disease symptoms identification, birds isolation, prevention of high mortality, parasite minimization and disinfectant administration skills. Re-training poultry farmers on these skills will help them reduce diseases infestation and high mortality rate thereby having more eggs for commercial purpose. The result of hypothesis 2 indicated that there was a significant difference in the mean responses of extension agents and poultry farmers on health management skills need for commercial egg production indicating lack of modern disease management skills which would have been needed for commercial egg production. This finding is in line with Ebewore (2013) who found that poultry farm attendants were incompetent in the tasks examined such as disease management and debeaking skills.

The result of research question 3 indicated a skill gap between extension agents and poultry farmers in Central Senatorial District of Cross River State. This finding is in agreement with Ojo (2003) who found that poultry farmers lack technical efficiency for egg production and storage. The result of hypothesis 3 indicated that, there was a



significant difference in the mean responses of extension agents and poultry farmers on egg storage skills need for commercial egg production in Central Senatorial District of Cross River State. This finding corroborated the finding of Williams (2007) who found that psychoproductive skills are needed in poultry production. To bridge this gap, poultry farmers need re-training in egg storage skills to enhance commercial egg production. Skills in egg positioning, egg grading, eggs storage, fresh eggs identification and eggs quality maintenance were therefore needed and through training, poultry farmers will be equipped with skills to avoid eggs spoilage due to poor storage.

### Conclusion

Based on the findings of this study it could be concluded that, feeding, health management, and eggs storage skills presently possessed by poultry farmers in Central Senatorial District of Cross River State if not upgraded by training may lead to low egg output. This low output may leave cross Riverians with no option than to buy eggs from neighboring States at exorbitant price.

### Recommendations

Based on the findings of this study, the following recommendations are made:

1. Cross River Agricultural Development Programme through the Agricultural Extension agents should conduct regular seminars and workshops for poultry farmers in Central Senatorial District of Cross River State on feeding and health management skills.
2. Cross River Agricultural Development Programme through the Agricultural Extension agents should carry out enlightenment campaigns geared towards sensitizing poultry farmers in Central Senatorial District of Cross River State on the need to adopt egg storage skills to ensure commercial production of eggs.
3. Cross River State Ministry of Agricultural through the information unit should produce flyers on feeding, health and egg storage skills for poultry farmers in Central Senatorial District of Cross River State.

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