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HATCHERY STATUS, OPERATIONS, MANAGEMENT AND CONSTRAINTS IN SOUTHWESTERN NIGERIA

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Abstract: **With the global population expected to rise from 6 billion to over 8.5 billion by 2025, the demand for animal protein could potentially double. Consequently, the production of day-old chicks presents a profitable opportunity in the poultry industry. For a nation with over 190 million people, reliance on imported day-old chicks is unsustainable. Hatcheries, or "poultry maternity centers," play a crucial role in this industry by producing chicks for rearing.**

This study assessed the status, operations, management, and constraints of hatcheries in the southwestern states of Nigeria (Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo). Using a multi-stage random sampling technique, respondents were selected from three senatorial districts in each state, totaling 360 respondents. Descriptive statistics, including frequency counts and percentages, were employed for data analysis.

Findings indicated that hatchery owners were predominantly males (100%), aged 31-40 years (58.3%), married (51.6%), with 11-15 years of experience (60.0%), household sizes of 1-5 (73.3%), and tertiary education (80%). Many owners viewed hatcheries as an investment (66.7%), had access to commercial bank loans (66.7%), operated on a small scale (66.7%), and had production capacities of 1,000-10,000 chicks per day (66.7%). They used imported equipment (66.7%) and had hatchers and setters available (93.3%). Awareness of local fabricators of hatchers and setters was high (71.7%), with semi-automation (81.7%) and reliance on public power supply (66.7%) being significant factors (P>0.05).

Electricity supply (68.3%) and finance (65.7%) were major constraints. The study concluded that local machine fabrication, genuine spare parts, stable electricity, access to soft loans, and skilled manpower training are crucial to addressing hatchery challenges in the study area.

Keywords: **Hatchery, status, operations, management, constraints.**

1. INTRODUCTION

Livestock systems occupy about 30% of the planet's ice-free terrestrial surface and represent a significant global asset, valued at least $1.4 trillion (Steinfeld *et al*., 2006). The livestock sector is increasingly organized in extensive market chains, employing at least 1.3 million people globally and directly supporting the livelihoods of 600 million smallholder farmers in the developing world (Thorton *et al*., 2006). In Nigeria, animal agriculture primarily involves poultry, fish, cattle, sheep, goats, and, to a lesser extent, micro-livestock such as rabbits, snails, and recently, cane rats. These livestock significantly contribute to the internal supply of animal protein. Among these, poultry are the most numerous and widely spread across both urban and rural areas in Nigeria (Adeniyi and Oguntunji, 2011).

The importance of poultry to the national economy cannot be overemphasized. It has become a popular industry for smallholders, making a substantial contribution to the country's economy (Adegbulugbe *et al*., 2013). The commercial poultry sector in Nigeria is valued at approximately 80 billion naira ($600 million) and is considered the most industrialized component of the livestock subsector. Over 25 million people are directly and indirectly employed in the commercial poultry industry. An estimated 85 million people involved in rural family poultry production manage assets totaling about 320 billion naira ($2,400 million). The entire poultry subsector contributes over 25% to the agricultural Gross Domestic Product. Both commercial and rural family poultry production attract private investors, though it remains the most fragile livestock component with high associated risks (PTAP, 2011).

The profession has gained greater importance in improving employment opportunities and animal food production in Nigeria. The poultry industry primarily focuses on the production of table meat and eggs. Other branches include chick production (hatchery production), Point of Lay (POL) pullets, and broiler production for frozen food companies (Akinwalere and Oduntan, 2014).

A hatchery is a facility designated for hatching eggs, especially on a commercial basis. It consists of fenced buildings, good access roads, and the necessary inputs/resources for hatchery operations. It serves as the 'poultry maternity center,' where chicks are produced for rearing (Laseinde, 2014). The production of day-old chicks is a profitable enterprise in the poultry industry. An egg, which currently sells for about two hundred naira, can be converted into a fertile egg, hatched, and sold for over one thousand naira by introducing a cock to the hen. Despite its profitability, many hatcheries have closed due to poor returns on invested capital. Presently, over 80% of parent-stock day-old chicks raised in Nigeria are imported at exorbitant prices (Eduvie, 2002). Given current economic realities, this situation is unsustainable, especially with the risk of introducing Avian Influenza and other zoonotic diseases into the country.

This study aims to assess the status of hatcheries in Southwestern Nigeria (Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo), obtain firsthand information on hatchery operations and management from owners, managers, and consumers, provide insights into the demographic characteristics of respondents, investigate the causes of hatchery performance problems, and suggest ways to ameliorate the challenges facing hatchery establishment and maintenance in these areas.

2. MATERIALS AND METHODS

Study area

The present study was conducted in the Southwest geo-political zone of Nigeria, comprising six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo. This region is rich in both natural and material resources, located entirely within the tropics. It is bounded by the Atlantic Ocean to the south, the Niger Delta region to the east, and the Guinea savannah of the Middle Belt to the north. The Southwest region enjoys significant rainfall, averaging about 1500 mm annually, with the rainy season spanning from April to October. Livestock farming in this region includes ruminants, pigs, fish, rabbits, and poultry production. The favorable climatic and vegetative conditions were key reasons for selecting this region for the study. A multi-stage random sampling procedure was employed to select towns in both rural and urban areas within each of the three senatorial districts in the six states. The selected towns in the study areas are Ikole, Omuo, and Otun in Ekiti North; Ado, Iyin, and Igede in Ekiti Central; and Ikere, Igbara-Oke, and Ilawe in Ekiti South of Ekiti State. In Lagos State, the towns are Ikorodu, Ketu, and Owode in Lagos East; Ojoo, Egbeda, and Ikotun-Egbe in Lagos West; and Ikeja, Ilupeju, and Agege in Lagos Central. For Ogun State, the selected towns are Ijebu-Ode, Sagamu, and Ikenne in Ogun East; Abeokuta, Ewekoro, and Obafemi-Owode in Ogun Central; and Ilaro, Ayetoro, and Sango-Ota in Ogun West. Ondo State includes Ikare, Akungba, and Owo in Ondo North; Akure, Ita-Ogbolu, and Igbara-Oke in Ondo Central; and Ile-Oluji, Ore, and Okitipupa in Ondo South. In Osun State, the towns are Erin-Ijesha, Ilesha, and Ile-Ife in Osun East; Ede, Ikire, and Ejigbo in Osun West; and Osogbo, Ikirun, and Okuku in Osun Central. Lastly, in Oyo State, the selected towns are Iseyin, Oyo, and Aawe in Oyo North; Egbeda, Akinyele, and Oluyole in Oyo Central; and Apata, Ido, and Igbo-Ora in Oyo South. These towns were chosen because of the concentration of poultry production in these communities.

Questionnaire Administration

A trial run of the questionnaire was conducted in at least thirty-six hatcheries, evenly distributed across the covered states. This preliminary step was crucial to refine the questionnaires before the actual field survey and to train and familiarize field workers with the operations. Three hundred and sixty well-structured questionnaires, comprising both open and close-ended

questions, were distributed to hatchery owners, managers, and other staff. The questionnaire included 42 questions, divided into three sections: Section A focused on the socio-economic characteristics of the hatchery owners, Section B contained questions related to the expertise and production activities of the hatchery managers, and Section C addressed the technical and commercial aspects of hatchery operations and management.

Methods of Data Collection

Primary data collection in the study employed various methods: rapid appraisal, focus group discussions, individual discussions, and field visits. Meetings and discussions were organized with various workers, managers, and owners of the hatcheries. Additionally, guided discussions and oral interviews were conducted to gather relevant data from the respondents.

Data Analysis

The data obtained from the hatchery owners and managers were coded and subjected to descriptive statistics (means, frequency tables, and percentages) using the Statistical Package for Social Scientists (SPSS) version 16.

3. RESULTS AND DISCUSSION

The results of preliminary investigations on socio-economic characteristics of the respondents in the study area are presented in Table 1. While 74.7% of the respondents were males, 25.26% were females. The gender of hatchery owners in Oyo State was majorly males with 86%, in Ogun State, it was significantly males with 68.6%, in Osun State, 51.6% of the respondents were males, and lastly in Lagos State, it was dominantly (100%) practiced by the males. The results inferred that men overwhelmingly took lead in hatchery business in the study area. This observation can be related to the fact that hatchery operations is a work that requires manpower and agility. Also, most males embark on enterprise like this so as to be able to cater for the needs of their families.

The results from the study revealed that 50% of the hatchery owners in Lagos State were within the ages of 30-40 years and equally 50% were between 41-50 years of age. In Ogun State, majority (51.4%) of the hatchery owners were between 41-50 years of age while 52.0% of their counterparts in Oyo State were between 41-50 years of age. This implies that the hatchery owners in the study area were within the physical productive age (i.e between ages of 31-40 and 41-60 years). This is an indication that these people can be encouraged for active participation in hatchery operations and management.

Information on marital status revealed that all the hatchery owners in the study area were married, although some few percentage; 14% in Oyo State and 11.4% in Ogun State are now separated from their spouses. With regards to household size, the study revealed that in all the states covered, a significant percentage of the respondents has household size consisting of 1-5 family members; 80% in Ogun State, 73.7% in Lagos State, 73.3% in Osun State and 70% in Oyo State. Thus, this implies that more of household labour than hired labour would likely to be prevalent particularly in the management of the hatchery.

Considering the educational background of the respondents in each state, it was discovered that the educational attainment of the respondents was significant at the tertiary level of education. In fact, the respondents in Lagos State all had undergone tertiary education. This result is a reflection of the high level of educational pursuit in the study area probably due to the early exposure of the people to education via the free education policy that the pre-independence regional government embarked upon. This level of enlightenment can be an added advantage for the respondents in overcoming problems that could be facing the development of the hatcheries in the study area.

The study further revealed that what drives most hatchery owners to venture into hatchery business is to be able to cater for their family needs and other obligations. The study shows a variation in the primary occupation of the respondents. In Osun State (51.74%), Lagos State (47.4%) and Oyo State (48.0%) of the respondents were into farming. Also, 52.6%, 25.0% and 28.0% of the respondents in Lagos, Osun and Oyo States were civil servants. The greater percentage of the respondents who were into farming recorded in this study agrees with the findings of Alfred (2001) and Olayide (1980) who reported that over 70% of rural dwellers are engaged in agriculture for livelihood. The observation may be as a result of the data collection not being limited to rural communities as some urbanites were sampled.

Table 2 depicts the distribution of respondents according to the characteristics associated with hatcheries. The years of hatchery business experiences by the respondents are in this order; 50.0% of respondents in Osun State had between 6-10

years, in Oyo State, 46.0% of respondents (6-10 years), and in Lagos State, 50.0% of respondents (6-10 years), in Ogun State, 60.0% of the respondents (11-15 years), in Oyo State, 42.0% (11-15 years), in Osun State, 18.3% (11-15 years) and in Lagos State 26.3% (11-15 years). In Ogun and Osun States, 11.4% and 5.0% of the respondents had between 16-20 years while 26.7% and 23.7% of the respondents in Osun and Lagos States of the respondents had less than 5 years of experience of hatchery business. The long experience of the hatchery owners had garnered, would have enabled them have the mastery of the intricacies of the business.

The study inferred that most of the respondents ventured into hatchery business because they saw it as a good investment opportunity in Osun State (51.7%), Lagos State (73.7%), Ogun State (71.4%) and Oyo State (28.0%) while for other respondents, they went into hatchery business as a result of unemployment in the country. Findings from the study revealed that myriads of factors influencing the siting of hatcheries in the study area were aggregation of livestock farms and large markets in Oyo State (68.0%), 48.3% in Osun State, 50.0% in Lagos State and 17.1% in Ogun State, presence of infrastructures; 40% in Ogun State and 23.7% in Lagos State and availability of raw materials; 42.9% in Ogun State, 26.0% in Oyo State, 26.3% in Lagos State and 20.0% in Osun State. This could be attributed to the fact that various individual have different resources before they start the business, for instance availability of land.

The financial sources and nature of supports received to run the hatcheries by the respondents is shown in Table 3. From the table, it could be inferred that most respondents in Ogun State (57.1%) and Oyo State (32%) started the hatchery business with their personal savings. However, the case was not so in Lagos State, as most respondents (50%) had access to commercial bank loans to run the hatchery. This could be adduced to the fact that Lagos State is an industrialized area with more opportunities than Ogun and Oyo States. Laseinde (2014) reported that one of the limitations of hatchery business is the cost of establishing and maintaining a hatchery. It is worthy of note that Lagos State had no associations for the hatchery owners and they still had access to commercial bank loans although, in Oyo State, a significant percentage (47%) of respondents recorded no association and as well they claimed no financial assistance when available. Similarly, no hatchery associations was recorded in Ogun State.

Laseinde (2014) reported that availability of market for chicks which are the main hatchery product is one of the major functions of hatchery. The study showed that (Table 4) the scale of operation of the hatcheries in Ogun State was medium scale (60%) whereas there is equality between medium and large scale hatchery operations in Lagos State. This can be attributed to the fact that the respondents in Lagos State had access to loans that can support their businesses, although Oyo State had 48% large scale and 52% medium scale hatchery businesses, this could be adduced to the fact that the state had more governmental support than the other states. The distribution of scale of operations of the hatcheries in the study area reflects the general nature of hatchery business, which portrays it as being capital intensive. Thus, when policies are formulated, they should be designed in such a way that they accommodate adequately the small scale hatchery businesses since they constitute a reasonable proportion of those involved in livestock production and value chain enhancement.

The study further revealed (Table 4) that the production capacity of the hatcheries in the study area vary from each of the states, with most respondents in Lagos State being able to produce less than 1000 chicks daily and in Ogun State, between 1000 – 10,000 chicks daily. Meanwhile, Oyo State produces averagely 1000 to 10,000 chicks daily, which is not surprising, considering the number of the hatcheries operating on larger scale in the State.

Information in Table 5 outlines the factors that could bring about successful hatchery performance in the study area. Findings from the study revealed that significantly, a large percentage of respondents had their own breeder's farm for the procurement of raw materials, with Oyo State having 52 %, Ogun State, 48.6 % while 50 % of respondents in Lagos State owned their breeder's farms. The source where the foundation stock is obtained is very important in livestock production. Foundation stocks is better obtained from the government farms or reputable private farms, where improved breed could be obtained, the hatchery owners would remain to be blamed for not obtaining their stocks from the right source, owing to the fact that Nigeria government has liberalized the importation of vital inputs such as the day old chicks and parent breeder stocks since 1998 (Situation Update, 2006).

For hatchery to function optimally well, necessary equipment should be provided. Sequel to this, the information gathered from the study inferred that 76.3 % of the respondents in Lagos State imported their equipment, all the respondents (100 %) in Oyo State, 63.3 % in Osun State and 48.6 % in Ogun State were making use of imported equipment to run their hatcheries. Moreover, all the respondents (100 %) in Ogun State had setters and hatchers in their hatcheries (91.4 %

midsized), 93.3 % in Osun State had hatchers and setters in their hatcheries (86.0 % midsized), 86.0 % in Oyo State and all the respondents in Lagos State had hatchers and setters that were all midsized in the hatcheries. Abeke *et al.* (2011) reported that one problem militating against optimum performance of hatcheries in the country is the problem related to hatchery machines that are imported into the country. Most of the setters and hatchers imported into the country are either obsolete or refurbished junks that break down shortly after installation. Accompanying this is the issue of non-availability of genuine spare parts to service and maintain these machines. Due to the fact that these machines are obsolete, it becomes difficult to obtain spare parts for their maintenance. Also, these imported machines cannot operate effectively under our tropical environment because they are manufactured to function in temperate regions, thereby necessitating the provision of specialized environment that is difficult to sustain.

Findings from the study showed that majority of the hatcheries in the study area were semi-automated. This by implication might affect the productivity of the hatchery. With the advancement in technology, new models of machines are being developed, rendering the older ones obsolete. Hence, the hatchery owners should endeavor to equip their hatcheries with modern equipment.

For the hatchery to function effectively there should be stable electricity supply. Results indicated that most (52.6 %) of the respondents in Lagos State made use of personal generators for electricity supply, this observation could be adduced to the fact that most of the hatchery owners in Lagos State had access to loans which aid their finance. Similarly, 80 % of the respondents in Ogun State were making use of their personal generators to run their hatcheries. However, 54 % of the respondents in Oyo State relied on public power supply to operate their hatcheries, this could be as a result of the support they are getting from the government. This gesture is good, however, provision should be made for standby generator to enhance smooth running of the hatchery. Laseinde (2014) reported that where electricity supply is not reliable, it is very essential to have a stand by generator in the hatchery.

In term of the number and mode of hunting for the personnel working in the hatcheries, findings revealed that 32 % of the hatcheries in Oyo State had less than 5 workers and they were employed through employment agencies. 71.4 % of the hatcheries in Ogun State had between 11 – 15 workers and 17 % of these hatcheries got their workers through direct contact with these employees. Moreover, 50 % of the hatcheries in Lagos State had between 11 – 15 workers and 52.6 % of the respondents recruited their workers through employment agencies, this is a pointer that Lagos State is more business oriented than Oyo and Ogun States. The maximum number (11-15) of personnel working in the hatcheries in the study area obtained in this study agrees with the report of Laseinde (2014) who opined that in any ideal hatchery, a minimum of 15 personnel should be on ground for effective performance.

Information in Table 7 gave an overview of perceived constraints in hatchery establishment and management in the study area. As shown in the table, the major challenges confronting hatcheries in Lagos State were finance (47.4 %) and power supply (52.6 %) while in Ogun State, 65.7 % of the major challenges to hatchery operations was the epileptic power supply and this could be attributed to the fact that the hatchery owners in this state were using generators to power their hatcheries. Also, 66.0% of the hatchery owners in Oyo State gave electricity supply as the major constraints facing hatchery operations in the state. This observation corroborates the report of Laseinde (2014) who stated that factors such as the cost of establishing an hatchery, scarcity of trained personnel, scarcity of spare parts, possible under-utilization of hatchery facilities, weather, electrical power distribution, mechanical fault in the machines and prevalence of some hatchery borne diseases as limitations of hatchery business.

Findings from the study further revealed that majority (73.7 %) of hatchery owners in Lagos State, 80.0%, 78.3% and 72.0% in Ogun, Osun and Oyo States adopted and executed biosecurity in their hatcheries. This is very critical point because the hatchery is one of the greatest areas of disease risk in the whole cycle of poultry operations (Jordan, 1990). The hatchery is a very sensitive and highly technical/specialized aspect that needs careful handling and effective sanitation hygiene. This is because it is prone to contamination by pathogens as the humid warm and substrate (eggs) needed for the growth of germs are available. The greatest level of microbial air examination in a hatchery occurs at hatching when dust, fluff and bacteria spread airborne and circulate throughout the hatchery (Gehan, 2009).

The main motive of embarking on any business venture is to make profit. The results emanating from the study inferred that all the hatchery owners in the study area found hatchery to be a profitable venture and are willing to continue in the business.

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Table 1: Socio-economic characteristics of the Respondents in the study area (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	**186**
Sex (%)							
Male	- -	38(100%)	24(68.6%)	03(100%)	31(51.6%)	43(86.0%)	139(74.7%)
Female	- -	- -	11(31.4%)	- -	29(48.3%)	07(14.0%)	47(25.26%)
Age (yrs)							
21-30	- -	- -	03(8.6%)	- -	04(6.7%)	03(6.0%)	10(5.38%)
31-40	- -	19(50.0%)	10(28.6%)	03(100%)	35(58.3%)	04(8.0%)	71(38.2%)
41-50	- -	19(50.0%)	18(51.4%)		21(35.0%)	26(52.0%)	84(45.2%)
51-60	- -	- -	04(11.4%)	- -	- -	17(34.0%)	21(11.3%)
Marital status							
Married	- -	38(100%)	31(88.6%)	03(100%)	57(95.0%)	43(86.0%)	172(92.5%)
Separated	- -		04(11.4%)			07(14.0%)	11(5.9%)
Household size							
1-5	- -	28(73.7%)	28(80%)	- -	44(73.3%)	35(70.0%)	135(72.6%)
6-10	- -	10(26.3%)	07(20%)	01(33.3%)	08(13.3%)	07(14.0%)	33(17.7%)
Greater than 11	- -	- -	- -	02(66.7%)	08(13.4%)	05(16.0%)	15(8.1%)
Education							
No formal education	- -	- -	- -	- -	04(6.7%)	04(8.0%)	08(4.3%)
Primary school	- -	- -	04(11.4%)	01(33.3%)	04(6.7%)	03(6.0%)	12(6.5%)
Secondary	- -	- -	28(80.0%)	- -	48(80.0%)	43(86.0%)	157(84.4%)
Tertiary	- -	38(100%)	03(8.6%)	02(66.7%)	07(6.7%)	- -	09(4.8%)
Occupation							
Farming	- -	18(47.4%)	07(20.0%)	01(33.0%)	31(51.7%)	24(48.0%)	81(43.5%)
Civil servant	- -	20(52.6%)	07(20.0%)	- -	15(25.0%)	14(28.0%)	56(26.1%)
Trading	- -	- -	21(60.0%)	02(66.7%)	07(11.7%)	03(6.0%)	36(19.5%)
Others	- -	- -	- -	- -	07(11.7%)	09(18.0%)	16(8.6%)

Table 2: Hatchery Characteristics (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	
Hatchery Business Exp							
Less Than 5 Years	- -	09(23.7%)	03(8.6%)	01(33.3%)	16(26.7%)	06(12.0%)	35(18.8%)
6-10 Years	- -	19(50.0%)	07(20.0%)	02(66.7%)	30(50.0%)	23(46.0%)	81(43.5%)
11-15 Years	- -	10(26.3%)	21(60.0%)	- -	11(18.3%)	21(42.0%)	63(33.9%)
16-20 Years	- -	- -	04(11.4%)	- -	03(5.0%)	- -	07(38.2%)
Years of experience in Hatchery Management							
Less Than 5 years	- -	09(23.7%)	03(8.6%)	01(33.3%)	29(48.3%)	06(12.0%)	48(25.8%)
6-10 Years	- -	19(50.0%)	07(20.0%)	- -	20(33.3%)	23(46.0%)	69(37.1%)
11-15 Years	- -	10(26.3%)	21(60.0%)	02(66.7%)	08(13.3%)	21(42.0%)	62(33.3%)
16-20 Years	- -	- -	04(11.4%)	03(5.0%)	- -	- -	07(3.8%)
Reasons for Hatchery Business							
Unemployment	- -	10(26.3%)	10(28.6%)	- -	19(31.7%)	20(40.0%)	59(31.7%)
Investment opportunity	- -	28(73.7%)	25(71.4%)	02(66.7%)	31(51.7%)	14(28.0%)	100(53.8%)
Poor chicks in owner's farm	- -	- -	- -	01(33.3%)	03(5.0%)	16(32.0%)	20(10.8%)
Others	- -	- -	- -	- -	07(11.7%)	- -	07(3.8%)
Reason for choosing Hatchery site							
Aggregation of livestock farms and large markets	- -	19(50.0%)	06(17.1%)	01(33.3%)	29(48.3%)	34(68.0%)	89(47.8%)
Presence of Infrastructure's	- -	09(23.7%)	14(40.0%)	- -	03(5.0%)	- -	26(13.9%)
Availability of Raw Materials	- -	10(26.3%)	15(42.9%)	02(66.7%)	12(20.0%)	13(26.0%)	52(27.9%)
Others Reasons	- -	- -	- -	- -	16(26.7%)	03(6.0%)	19(10.2%)

Source: Field survey, 2022.

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Table 3: Financial Management of the Hatchery (n=187)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**47**	**27**	**03**	**60**	**50**	
Financing of the Hatchery							
Personal savings	- -	09(23.7%)	20(57.1%)	01(33.7%)	34(56.7%)	16(32.0%)	80(42.8%)
Family funds	- -	- -	- -	- -	07(11.7%)	11(22.0%)	18(9.6%)
Government grants	- -	19(26.3%)	04(11.4%)	- -	04(6.7%)	16(32.0%)	43(22.9%)
Grants from NGO/Religion and Other organizations	- -	- -	- -	- -	03(5.0%)	04(8.0%)	07(3.7%)
Commercial Banks Loans	- -	19(50.0%)	03(8.60%)	02(66.7%)	12(20.0%)	03(6.0%)	39(20.9%)
Support from the Government							
Yes	- -	- -	- -	01(33.3%)	17(28.3%)	30(60.0%)	48(25.7%)
No	- -	- -	27(100%)	02(66.7%)	43(71.7%)	20(40.0%)	92(49.2%)
Nature of support received from the Government							
Financial	- -	- -	- -	01(33.3%)	23(38.3%)	- -	24(12.8%)
Technical	- -	- -	- -	- -	22(36.7%)	- -	24(12.8%)
Tax Reduction	- -	- -	- -	02(66.7%)	12(20.0%)	- -	14(7.5%)
Other means	- -	- -	- -	- -	03(5.0%)	- -	03(1.6%)
Existence of Hatchery Associations							
Yes	- -	- -	- -	01(33.3%)	06(10.0%)	03(6.0%)	10(5.3%)
NO	- -	47(100%)	27(100%)	02(66.7%)	54(90.0%)	47(94.0%)	177(94.6%)

Source: Field survey, 2022.

Table 4: Motivators to Hatchery Business (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	
Roles of Associations in Hatchery Business							
Financial support	- -	38(100%)	35(100%)	01(33.3%)	09(15.0%)	07(14.0%)	90(48.4%)
Technical support	- -	- -	- -	- -	- -	- -	- -
Capacity building	- -	- -	- -	- -	08(13.3%)	03(6.0%)	11(5.9%)
None	- -	- -	- -	02(66.7%)	43(71.7%)	40(80.0%)	85(45.7%)
Patronizers of the Hatcheries							
Hatchery owner's farm	- -	- -	- -	01(33.7%)	10(16.7%)	06(12.0%)	17(9.1%)
Local Livestock Farmers	- -	- -	23(65.7%)	- -	28(46.7%)	40(80.0%)	91(48.9%)
Commercial chicks for the public	- -	- -	12(34.3%)	02(66.7%)	22(36.7%)	04(8.0%)	40(21.5%)
Scale of operations							
Large scale	- -	19(50.0%)	07(20.0%)	01(33.3%)	19(31.7%)	24(48.0%)	70(37.6%)
Medium scale	- -	- -	21(60.0%)	- -	37(61.7%)	26(52.0%)	84(45.2%)
Small scale	- -	19(50.0%)	07(20.0%)	02(66.7%)	04(6.7%)	- -	32(17.2%)
Production capacity							
Less than 1000 chicks daily	- -	19(50.0%)	06(17.1%)	01(33.3%)	15(25.0%)	14(28.0%)	55(29.6%)
1000-10,000 chicks daily	- -	09(23.7%)	25(71.4%)	02(66.7%)	22(36.7%)	19(38.0%)	77(41.4%)
Above 10,000 chicks daily	- -	10(26.3%)	07(11.4%)	- -	23(28.3%)	17(34.0%)	57(30.6%)

Source: Field survey, 2022.

Table 5: Indices to Successful Hatchery Performance (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	
Sources of Raw Materials							
Hatchery owners breeder farms	- -	19(50.0%)	17(48.6%)	02(66.7%)	34(56.7%)	26(52.0%)	98(52.7%)
Contract supplies	- -	10(26.3%)	07(20.0%)	- -	15(25.0%)	10(20.0%)	42(22.6%)
Neighbouring breeder farms	- -	09(23.7%)	11(31.4%)	01(33.3%)	11(18.3%)	14(28.0%)	46(24.7%)
Sourcing for the equipment							
Imported	- -	29(76.3%)	17(48.6%)	02(66.7%)	38(63.3%)	50(100.0%)	136(73.1%)
Local fabricators	- -	09(23.7%)	18(51.4%)	01(33.3%)	22(36.7%)	- -	50(26.9%)
Availability of the Hatchers and Setters							
Yes	- -	38(100%)	35(100%)	02(66.7%)	56(93.3%)	43(86.0%)	174(93.5%)
No	- -	- -	- -	01(33.3%)	07(6.7%)	07(14.0%)	12(6.5%)
Type of setters adopted							
Giant size	- -	- -	- -	- -	03(5.0%)	18(36.0%)	21(11.3%)
Medium size	- -	38(100%)	32(91.4%)	02(66.7%)	53(88.3%)	25(50.0%)	150(80.6%)
Small size	- -	- -	03(8.6%)	01(33.3%)	04(6.7%)	07(14.0%)	15(8.1%)
Awareness on the existence of the local fabricators							
Yes	- -	29(76.3%)	17(48.6%)	02(66.7%)	43(71.7%)	43(86.0%)	134(72.0%)
No	- -	09(23.7%)	18(51.4%)	01(33.3%)	17(28.3%)	07(14.05)	52(27.9%)

Source: Field survey, 2022.

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Table 6: Structures and Infrastructures in the Hatchery (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	
Level of Automation in the Hatcheries							
Fully automated	- -	19(50.0%)	21(60.0%)	- -	3(5.0%)	26(52.0%)	69(37.1%)
Semi-automated	- -	09(23.7%)	07(20.0%)	02(66.7%)	49(81.7%)	14(28.0%)	81(43.5%)
Not automated	- -	10(26.3%)	07(20.0%)	01(33.3%)	08(13.3%)	10(20.0%)	36(19.4%)
Source of power							
Public power supply	- -	18(47.4%)	07(20.0%)	01(33.3)%	40(66.7%)	27(54.0%)	93(50%)
Hatchery owner generator	- -	20(52.6%)	28(80.0%)	02(66.7%)	20(33.3%)	23(46.0%)	93(50%)
No of personnel in the hatchery							
Less than 5	- -	10(26.3%)	03(8.6%)	01(33.3%)	15(25.0%)	16(32.0%)	45(24.2%)
6-10	- -	- -	07(20.0%)	- -	21(35.0%)	06(12.0%)	34(18.0%)
11-15	- -	19(50.0%)	25(71.4%)	16(26.7%)	16(26.7%)	25(50.0%)	91(48.9%)
16-20	- -	09(23.7%)	- -	- -	08(13.3%)	03(6.0%)	20(10.8%)
Sourcing for the personnel							
Radio/TV Advertisement	- -	09(23.7%)	04(11.4%)	01(33.3%)	06(10.0%)	- -	20(10.8%)
Employment Agents	- -	20(52.6%)	07(20.0%)	- -	20(33.3%)	32(64.0%)	79(42.5%)
Social media	- -	09(23.7%)	07(20.0%)	- -	11(18.3%)	- -	27(14.5%)
Direct contact with employee	- -	- -	17(48.6%)	02(66.7%)	23(38.3%)	18(36.0%)	60(32.3%)

Source: Field survey, 2022.

Table 7: Perceived Constraints to Hatchery Establishment and Management (n=186)

States	EKITI	LAGOS	OGUN	ONDO	OSUN	OYO	Overall mean
Sample size	**00**	**38**	**35**	**03**	**60**	**50**	
Constraints							
Finance	- -	18(47.4%)	12(34.3%)	- -	19(31.7%)	13(26.0%)	62(33.3%)
Power supply	- -	20(52.6%)	23(65.7%)	02(66.7%)	41(68.3%)	33(66.0%)	119(63.9%)
Raw materials	- -	- -	- -	01(33.3%)	- -	- -	01(0.5%)
Market	- -	- -	- -	- -	- -	04(8.0%)	04(2.2%)
Adoption of Biosecurity							
Yes	- -	28(73.7%)	28(80.0%)	01(33.3%)	47(78.3%)	36(72.0%)	140(75.3%)
No	- -	10(26.3%)	07(20.0%)	02(66.7%)	13(21.7%)	14(28.0%)	46924.7%)
Profitability of the hatchery							
Yes	- -	38(100%)	35(100%)	02(66.7%)	60(100%)	47(94.0%)	182(97.8%)
No	- -	- -	- -	01(33.3%)	- -	03(6.0%)	04(2.2%)
Willingness to continue in hatchery business							
Yes	- -	38(100%)	35(100%)	01(33.3%)	56(93.3%)	46(92.0%)	176(94.6%)
No	- -	- -	- -	02(66.7%)	04(6.7%)	04(8.0%)	10(5.4%)

Source: Field survey, 2022.

4. CONCLUSION

The business of hatching eggs is not as popular as raising poultry, which is understandable since more people engage in chicken farming. Setting up a medium-scale poultry farm is easier than establishing a medium-scale hatchery, as the latter requires more technical expertise and financial investment. Despite these challenges, commercial poultry farming cannot thrive without hatcheries to supply the necessary chicks.

The results of this study revealed that the socio-economic characteristics of hatchery owners and operators vary significantly across different states in Southwest Nigeria. Additionally, the challenges faced by hatchery operators differ based on location. Factors contributing to hatchery underperformance include issues with hatchery machinery, financial constraints, and power supply problems, among others.

However, with focused efforts to revive struggling hatcheries, Nigeria has the potential to become self-sufficient in producing day-old chicks. Notably, Ekiti State lacks any hatcheries, forcing poultry farmers there to rely on neighboring states for chick supplies, which increases production costs and reduces profitability. It is recommended that the government and interested private stakeholders address this issue by establishing viable hatcheries in Ekiti State to support local poultry farmers.

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