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## Survey of functional and non-functional fish hatchery in Jigawa State, Nigeria

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### Abstract

*This study was conducted in the five emirate zones of Jigawa. The number of functional and non-functional fish hatcheries were investigated in the state. The results showed that there were 35 fish hatcheries in the state, and private ownership (57.14%) dominate the government ownership (42.16%), all with less than 100,000 fingerlings production annually. The study also indicate that out of the 35 fish hatcheries 15 were found to be functional in operation and 20 are found existing but not functional in operation. Based on the field survey, all the respondent are of the opinion that the level of production and number of functional hatcheries in the state are low. Recommendations were made on how to improve hatchery operation that could help to boost aquaculture development in the state.*

**Keywords:** Jigawa, fish hatchery, functional, non-functional.

### Introduction

Fish is a rich source of animal protein and its culture is an efficient protein food production system from aquatic environment (Olanrewaju et al., 2009). There is no doubt that fish production through aquaculture in Jigawa state is at its infant stage. Much attention been directed towards increasing fish production through aquaculture in Nigeria, because of the economic and nutritional importance of fish to the populace. However, it is often negligible in Jigawa state because of certain constraints which fish seed scarcity is inclusive (Adamu et al., 1993).

Fish seed is the most important component of fish culture and for this to be available in abundance, there is need for well functioning fish hatcheries. A dependable source of quality fish seed (Fingerling) is a fundamental prerequisite for large scale development of fish culture. Although, fish seed could also be collected from the wild the system is seasonal. Unreliable, laborious and above all the viability of such seed cannot be assured (Olanwaju et al., 2010). One of the major factor that affect all attempts to culture fish at suitable level in Nigeria is scarcity of fish seed, therefore, the best way of getting fish seed is through hatcheries. Fish hatcheries according to Madu (2004) are the bedrock upon which true and sustainable fish farming can be built. Hatcheries can be owned and operated either by government or private interest. Omitoyin (2007) acknowledged that fingerlings are the major input for successful aquaculture and many farms are engage in fingerling production in Nigeria. however, the supply of fingerlings is yet to meet the demands. The need to boost fish production and for the state to maintain its leading role prompted this research work. The study was undertaken at the 5 emirate zones to determine the number and the status of fish hatcheries in Jigawa state. The results are to form the framework for aquacultural development and intervention.

### Materials and Methods

**Study Area:** Jigawa is one of thirty-six states that constitute the Federal Republic of Nigeria. It is situated northwest of the country, between latitudes 11°N to 13°N and longitudes 8°E to 10.15°E. Kano state and Katsina state border Jigawa to the west, Bauchi state to the east and Yobe state to the north-east. Jigawa is a rural and agrarian state where majority of its peoples earn their living through farming that relies heavily on rainfall using traditional implement, the state is blessed with large expanse of Agriculture land rivers and floods plain suitable for crops livestock's and fish production out of the 2.24 million hectares total land area about 1.6m hectares are estimated to be cultivable during the rainfall season, while about 30,8000 hectares of the landmass is cultivable during the dry season through irrigation (JGSMANR 2010). Jigawa has 27 LGAs, namely: Auyo, Babura, Birniwa, Buji, Dutse, Garki, Gagarawa, Gumel, Guri, Gwaram, Gwiwa, Hadejia, Jahun, Kiyawa, Kafin Hausa, Kaugama, Kazaure, Kirikasamma, Maigatari, Malam Madori, Miga, Ringim, Roni, Sule Tankarkar, Taura and



Yankwashi, which are grouped into five emirate councils.

**Sampling site and procedure:** Field survey was conducted in the 5 emirate zones of the Jigawa state. The five emirate areas are: Dutse, Ringim, Gumel, Kauzare and Hadejia the survey was carried out with the aid of structured questionnaires, visual observation and oral interview with both the fisheries personnel and fish farmers in all the local government areas in each zone. 270 questionnaires were produced with a target of 10 questionnaires for each local government in the five emirates. They were only administered to existing fish farmers, and 112 questionnaires were retrieved to reveal the require information.

Secondary data were obtained through literature review based on published research works. Information was also retrieved from Ministry of agriculture and natural resources, Jigawa state. Data collected were subjected to simple statistical tools such as percentages, etc., and presented in graphs and tables.



Fig. 1: Map of Jigawa state showing local government areas.

**Results and Discussion**

The study indicates that most of the respondents were males (97.32%). Majority (31.25%) were within the age range of 40-49 years. 30-35% were within the age range of 30-39 years. While 23.22% were within the age range 50-59 years and (15.18%) were within the age range of 20-30 years. According to Usman (2009), the economically active age group is between 31-50 years. Therefore, 84.82% was in the economically active age group. 88.4% was married while 11.6% was single; 100% was muslim. 61.6% had higher education and 16.07% had primary education, while 10.73% had secondary schooling, and 11.6% had no formal education. Majority of the respondents, 45.55%, were civil servants and 17.85% were fish farmers, and 36.6% were full-time fish farmers.

The study also showed that there were 35 fish hatcheries in Jigawa state. And majority of them had no operational names; however, few were very organized with operational name. And out that 15 were found to be functional but not to a commercial standard and 20 were found existing but not in functional operation. And 77 farms did not have any fish hatchery.

In this study, findings showed that private ownership (42.16%) dominate the government ownership (57.14%) with all of them with less than 100,000 fingerlings annually. Majority of the hatcheries (55.35%) used open market to source for brood stock while 35.72% used existing farms and 8.93% used wild fishes as their source of brood stock. Most hatcheries on several occasions experienced failure in production and stunted growth of fingerlings, and however these may have been as a result of wrong source of brood stock, resulting in total closure entail of aquaculture.

In Jigawa, respondents were of the opinion that hatcheries are the bedrock to which sustainable fish farming can be built and attests to the fact that the demand for fingerling in the state is still more than the supply, this also indicate a great ready market for fingerlings, as aquaculture is becoming an alternative and important component of rural livelihoods, due to increasing population pressures, environmental

Table 1: Personal characteristics of respondents

Age	Frequency	Percentage
20-30	17	15.18
30-39	34	30.35
40-49	35	31.25
50-59	26	23.22
<b>Gender</b>		
Male	109	97.32
Female	3	2.68
<b>Marital status</b>		
Single	13	11.6
Married	99	88.4
Divorced	0	0
<b>Religion</b>		
Muslim	112	100
Christian	0	0
<b>Educational background</b>		
Higher education	69	61.6
Primary education	18	16.07
No formal education	13	11.6
<b>Fish hatchery</b>		
Functional	15	13.4
Non-functional	20	17.85
Nil	77	68.7

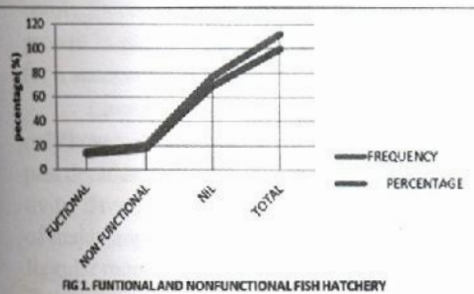


FIG. 1. FUNCTIONAL AND NONFUNCTIONAL FISH HATCHERY

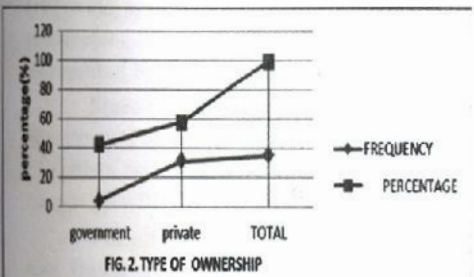


FIG. 2. TYPE OF OWNERSHIP

becoming an alternative and important component

degradation and loss of access that limits catches from the wild.

### Conclusion and Recommendation

Fish hatchery has a notable role to play by supplying adequate quantity and quality of fish seed for pond stocking in order to achieve full potential of aquaculture in Jigawa. The number of the fish hatcheries also need to be increased and as well the level of operation. Some of the problems faced in hatchery operation include the poor source matured brood stock and retardation in growth and low survival caused by high mortality brought about by sudden fluctuation of weather and infections. Based on the mentioned problems, the State, federal government and other stakeholders should collaborate and establish functional hatcheries where farmers can obtain viable fish fingerlings. Hatchery operations should embark on training to acquire the knowledge of fish induced breeding and hatchery management.

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