

I NVESTIGATION ON FISH CULTURE STRATEGIES AND DISEASES IN FRESH WATER AQUACULTURE (POND) IN AFIJIO-WEST, EAST AND OYO WEST LOCAL GOVERNMENTS OF OYO STATE, NIGERIA

FATIMA AJIBIKE TALIAT

*Biology Department, the College of Education, Lanlate.***ABSTRACT**

The research was carried out purposely to find out the culture strategies and the status of fish diseases in fresh water aquaculture in Afijio-West, Oyo-East and Oyo-West Local governments of Oyo State. Questionnaire interview and participatory rural appraisal tools were conducted interviewed and 60 farmers focus were group discussions were conducted. Monoculture of *Clarias* species was predominantly practiced by most farmers. The most prevalent diseases reported by farmers were white spot disease (48.33%), followed by Furunculosis (25%), Ascites (13.33%) Necrosis (6.67%), haemolytic syndrome (5%) and epizootic ulcerative syndrome (1.67%). Farmers applied some treatments like addition of antibiotics, salt and lime to cure fish diseases. However, consumer can only be protected through production of healthy fish, hence the need to put in place diagnostic laboratory hazard control

Introduction:

Fisheries sector make an important role in the national economy of all nations of the world. Globally fish provide more than 1.5 billion people with almost their enter average per capita intake of animal protein and 3.0 billion people with at least 15 percent of such protein [SOWFA, 2010]. Mohan (2009) reported that the global annual growth rate for aquaculture is 8-10 percent compared to 3 percent for livestock and 1.6 percent for capture fisheries. Nigeria has moved rapidly from aquaculture production level of 250,720 in metric tonnes in 2007 to 85,087

programme and periodic training of farmers on how to prevent and control fish diseases.

Keywords: *Aquaculture, Disease, Diagnostic, Laboratory, Hazard, Monoculture.*

metric tonnes in 2007(FDF, 2007). Nigeria has a growing aquaculture industry with an area of 923,768km² out of the landmass, 112,085km² has sufficient water for fish farming and 696,314km² making 75 percent has moderately sufficient water for fish culture production (Abdullah,2007). There is extensive network of rivers, inland water lakes and lagoons which is estimated at more than 5 million hectares (Eyo, 2003)

Fresh water aquaculture is the fastest growing industry around the world and Nigeria is no exception. Aquaculture production depend upon source of obtaining increased fish production in order to supply and feed the ever increasing population of the world (FAO, 2010). The success of fish culture depend on its proper management, which is connected with understanding the lifecycle of fish and the culture environment in which they live. The aquaculture development is towards increased intensification and commercialization of aquatic production. As aquaculture activities intensify and expand, there is likelihood of increased disease problems. Disease is considered as primary constraint to the culture of many aquatic species, impeding both economic and social development in many countries (Subasinghe Bondad-Rentaso and McGladdery 2001]. Economic losses through fish diseases in Nigeria was attributed to weak human capacity, poorly equipped and non-accredited laboratory, lack of fish diseases reporting intake and fish farmers inability to recognize disease conditions (Adeyemo,2003). In Bengledesh Faruk, Alam, Sanker and Kabir (2004) reported the average economic loss of BDT 20,615 /ha/year to rural fish farmers due to fish disease. Reantaso and Subasinghe (2010) also gave report of \$ 15 million estimated losses due to koi herpes virus in Indonesia, while in South Wales, Australia a production loss of \$ 30 million was reported for white spot and yellow head disease of shrimp. Aquaculture

less in these situations directly threaten the livelihoods of whole community through reduction in food availability, loss of income and employment, with all the associated social consequences

Objective of the Study

In view of the fact that most fish farmers do not have adequate knowledge of efficient fish culture practice and as well lack good understanding of disease issue in their pond, this research therefore examined fish culture practice and disease management problems in pond freshwater aquaculture through field observation

Materials and Method

Study area: The field survey was carried out in three Local Government in Oyo State namely Oyo-East, Oyo West and Afijio-west. These local governments are known for fresh water fish production in Oyo state

Sample and Sampling Procedure

A total number of sixty fish farmer (20/local government) were randomly selected for interview using questionnaire and participatory rural appraisal (PRA). In addition, cross check interview were conducted with agricultural extension officers from Oyo zonal office of Oyo state agricultural development program (ADP), fish seed traders and feed suppliers related to aquaculture

Data collection: Qualitative data was collected from PRA tools including focus group discussion (FGD). A total of six FGD session in three local governments were conducted and at least twelve farmers were present in each group

Results

Table I farmer reason for engaging in agriculture

Reason for aquaculture	No of Respondents n = 60	% Respondents
Income generation	54	90
Food construction	4	6.67
Hobby	2	3.33

Majority of farmers (90%) engaged in aquaculture purposely to generate income for their sustainability while few farmers (6.67%) engaged in fish culture to feed their family and a hobby

Table II: Pond type in the study area

Pond Types	No of Respondent n = 60	% Respondents
Earthen pond	43	71.67
Concrete pond	7	11.67
Plastic tank	8	13.33
Plastic drum	2	3.33
Iron drum	0	0

Most farmers (71.67%) utilized earthen pond while some use concrete and plastic tanks and none use iron drum

Table III: source of water for fish culture

Water source	No of Respondent n = 60	% Respondents
Perennial stream	49	81.66
Seasonal stream	4	6.67
Well/Borehole / Rainwater	7	11.67

Most farmers (81.66) set water from perennial stream while few ones make up of bore hole,

Table IV: Culture system practice by fish farmers

Cultural system	No of Respondent n = 60	% Respondents
Clarias cum tilapia polyculture	11	18.33
Clarias monoculture	32	53.33
Tilapia monoculture	1	3.33
Hetero-clarias monoculture	8	13.33
Hetero-clarias cum clarias polyculture	07	11.67

Majority of farmers (53.33%) practiced clarias monoculture, while some culture clarias cumtilapia (18.33) only Hetero-clarias and clarias

polyculture (11.67%). Only one farmer (3.33%) practiced Tilapia monoculture.

Table V: Pond Management System

Pond Management System	No of Respondent n = 60	% Respondents
Intensive	02	3.33
Semi-intensive	58	96.67
Extensive	-	0

Most farmers (96.67%) in the study area practiced semi-intensive pond management system.

Table VI: Fish Pond Ownership

Ownership	No of Respondent n = 60	% Respondents
Owned	17	28.33
Leased	43	71.67

Most farmers (71.67%) rent pond on annually bases while some farmers (28.33%) owned the pond.

Table VII: Farmers Perception of Aquaculture.

	No of Respondent n = 60	% Respondents
Aquaculture is a profitable venture	34	56.67
Aquaculture is very risky venture	5	8.33
Aquaculture is only profitable for large-scale farmers	21	35

Majority of fish farmers (56.67%) is of the opinion that aquaculture is a profitable venture especially for large-scale farmers (56.67%)

Table VIII: Problems encountered by fish farmers.

Problems	No of Respondent n = 60	% Respondents
Inadequate water supply	3	5
Poor quality water	2	3.33

Costly fish seed	8	13.33
Costly fish feed	7	11.67
Poor quality fry/fingerlings	2	3.33
Theft	2	3.33
Predation	3	5
Diseases	11	18.33
Poor market	4	6.67
Lack of government fund	9	15
High interest rate on bank loan	9	15

Most problems listed in table VIII were encountered by fish farmers with the exception of water quality, predation and theft

Table IX: Disease Recognition by farmers

Type of Disease	No of Respondent n = 60	% Respondents
Furunculosis (<i>Clarias</i> sp)	15	25
Ascites (<i>Clarias</i> sp)	8	13.33
Necrosis syndrome (<i>Clarias</i> sp)	4	6.67
Haemolytic syndrome (<i>Clarias</i> sp)	3	5
White spot disease (<i>Clarias</i> sp)	29	48.33
Epizootic ulcerative syndrome (<i>Tilapia</i> sp)	1	1.67

The most common disease problems were listed in table IX. Majority of farmers reported White spot (48.33%) and furunculosis (25%) of *Clarias* sp while a farmer (1.67%) reported epizootic ulceration in *Tilapia* fish only.

Table X: Effect of fish disease problems.

Response	Positive Response %	Negative Response %	No Response %
Reduction in market price	72.65	20.21	7.14
Reduced household income	67.14	18.72	14.14
Increased debt	86.26	11.96	1.78
Bury the diseased fish	79.58	16.22	14.20
Consume the diseased fish	4.59	84.62	10.79

Most farmers were affected by the disease outbreak as shown in table X, which, automatically leads to increased debt.

Table XI: Fish disease treatment adopted by farmers.

Treatment	No Respondents n=60	of % Respondents
Draining of pond water completely	6	10
Addition of iodized salt to pond water	8	13.33
Liming the pond	9	15
Adding antibiotics to pond water	26	43.33
Seize feeding	4	6.66
Stop fertilizing the pond	2	3.33
Remove diseased fish from pond	5	8.33
No treatment	-	0

The most common response was addition of antibiotics. However, 10% drained water completely, 13.33% added iodized salt, 15% added lime, 6.66% stopped feeding, 3.33% stopped fertilizing and 8.33% removed the fish.

Discussion

In the present study, most farmers engaged in aquaculture purposely to generate income for their sustainability. The farmers cultured their fish species in earthen ponds because of its fertility and natural mineralization which promotes fast growth of fishes. Perennial water sources encouraged twice culturing of fishes annually. It was revealed in this study that pond cultural was dominated by monoculture of clarias species because of its resistance to diseases, fast growth and heavy weight at the harvesting period.

Majority of farmers practice semi-intensive culture system in order to maximize their profits. Most farmers acknowledged aquaculture as a profitable venture provided no disease occurrence and if practiced on a large-scale.

The present research found out that fish farmers encountered some problems on their farms which seriously affected their fish trade. One of such problems is a variety of fish diseases that occurred in freshwater aquaculture. The most prevalent diseases are white spot and frunclosis diseases of clarias specie in Afijio West, Oyo-East and West Local Government of Oyo-state, Nigeria. Similar result was reported by Agbede (2012) on research carried out in Ogbia and Venegoa Local Government Area of Bayelsa State.

The epizootic ulcerative syndrome (EUS) was reported by a farmer that practiced Tilapia monoculture in freshwater pond. This observation was related to the result of Faruk et al (2004) in Northern part of Banglalesh.

The diseases reported by farmers was found to be prevalent and is due to the lack of awareness on fish disease sign and symptom recognition, lack of reporting places and as well no efficient laboratory from where the farmers can seek advice and other support services. As a result of these, farmers cannot prevent nor diagnose these mentioned diseases on time and hence lead to huge loss resulting from fish mortality. In the present study, farmers apply some treatments. The most common treatment adopted by farmers were addition of antibiotics, followed by the use of lime, iodized salt and draining of pond water completely. Faruk et al

(2004b) reported some farmers use only lime while others used combination of lime and salt for treating diseases in freshwater ponds.

Conclusion

Fish production from freshwater ponds forms the major position in total aquaculture production in Nigeria. The present study revealed that culture strategy by farmers varied considerably in the study area. Monoculture of *Clarias* specie dominated. The investigation report valuable information on disease encountered in fresh water pond aquaculture and farmers lack awareness about preventive and control measures of fish diseases. Therefore, to develop a sustainable fish health policy in the country, there is need for proper funding, establishment of disease diagnostic laboratory and periodic training of farmers on effective preventive and control measures on fish diseases.

REFERENCES

- Abdullah A. Y. 2007. Evaluation of Land based Fresh Water Fish Farming Potentials in Nigeria: An approach through the use of Geographic Information System (G.I.S.). PhD Thesis. University of Abuja. Nigera
- Adeyemo, A. O. 2013. Effective Fish heath Management Strategies Nigeria. A review International journal of Plant and Animal Science Vol. 1 (1) pg. 001 – 004
- Agbede, S. A. 2012. Healthy Fish Farmers. An Inaugural lecture delivered at the University of Ibadan. Ibadan university Press.
- Eyo, A. A. 2003. Fundamental of Fish Nutrition and Diet Development. An Overview on fish feed Development and Feeding Practices in Acquaculture. FISOU/NIFFR/FAO- NSPRS pp. 1-33
- FAO, 2010. State of the World Aquaculture. Fisheries Department. FAO Fisheries Technical Paper 500, 21 – 26
- Faruk, M. A. R. 2004. Stateust of Fish disease and health management practices in rural freshwater acquaculture of Bangladesh. Park. J. Biol. Sci. 7(12) 2092 – 2098.
- Faruk, M. A. R., Akin, M. J., Saker, M. M. R. and Kabir, M. B. 2004b. Status of Fish disease and health management practices in ruralo freshwater

- aquaculture of Bangladesh. Pakistan Journal of Biological Sciences, 7(12), 2012 – 22098
- Federal Department of Fisheries 2007. Statistical Report: Federal Ministry of Agriculture and Water Resources Publication Abuja.
- Mohan, C. V.. 2009. Health: National Strategies for aquatic Animal Health Management, Featured Article in The Fish Site. Network of Aquaculture Centres in Asia-Pacifia.
- Sheikh Aftabuddin, M. Nural Islam, Mohammad Abdul Baden Buyain, M. AbdulManman and M. Mahbub, Akam 2016. Fish Diseases and Strategies Take By the Farmers In Freshwater Aquaculture At Southwestern Bangladesh. Bangladesh Journal of Zoology. 44 (1) 111-122
- SOWFA 2010. State of World Fisheries and Aquaculture. FAO Rome
- Subasinghe, R. P., Bondad-Reantaso, M. G. and McGladdery, S. E. 2001. Aquaculture Development, health and wealth. In R.P. Subansinshe, P. Bucro, M. J. Philips, C. Hough, S. E. McGladdery and J. R. Arthur (Eds.) Aquaculture in the Third Millenium. Technical Proceeding of the Conference on Aquaculture in the Third Millenium, Bangkek, Thailand. NACA, Banskek and FAO, Rome pp. 167-191