

**THE ROLES OF WOMEN IN AQUACULTURE
IN NIGER AND OYO STATES, NIGERIA**

BY

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DEDICATION

This project is dedicated to my dearest husband Mr. A.O. Ekundayo and my lovely children Joshua, and Stephen and Comfort.

DECLARATION

I hereby declare that this project is my own work and has not been presented in any form for another qualification at any University or Institution. This information derived from published or unpublished works of others has been dully acknowledged in this work.

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CERTIFICATION

I certify that this study was carried out by Ekundayo, Marion Toyin in the Department of Water Resources, Aquaculture and Fisheries Technology of the School of Agriculture and Agricultural Technology, as partial fulfillment of the award of the degree of M. Tech. of the Federal University of Technology, Minna.

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ABSTRACT

It is the belief of people that aquaculture is a sole occupation of men but women could be involved. The research was carried out to identify the role women play in aquaculture. Forty-five structured questionnaires prepared and administered to fifty-four (54) women in Oyo State and eighteen (18) women in Niger State. The following age categories were identified; age group less than 20 years accounted for 11.11% of the total respondents in Oyo State while no woman was involved in aquaculture in this age group in Niger State, age group between 20-30 years was also 6 out of 54 which amounted to 11.11% in Oyo State also no women in Niger State; majority of the women involved in aquaculture in both States are within the age group of 31-40 years. Marital status indicated that 77.78% were married in Oyo State while 88.89% were married in Niger State. Single women amounted to 22.22% in Oyo State and 0% in Niger State and 11.11% were widowed. 100% of women involved in aquaculture in Oyo State were Christians while Niger state had 50% Christians and 50% Muslims. 100% of respondents in both States did not have aquacultural training. Women who owned their fish farms in Oyo State were

66.67% and 33.33% did not own their own fish farms while in Niger State 100% of the women own their farms. Profit made from sales of fish per annum by the women made it possible for 66.67% of the women in Oyo and Niger State to be able to maintain their family from fish farming. Women in the two States were actively involved in aquaculture and contribute their own quota to aquaculture development.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Aquaculture

Aquaculture is defined as the rearing of aquatic organisms under controlled conditions. Aquaculture can also be said to be the cultivation of the natural produce of water (such as fish or shell fish, algae and other aquatic organisms). The term is distinguished from fishing by the idea of active human effort in maintaining or increasing the species involved, as opposed to simply taking them from the wild. Subsets of aquaculture include mariculture (aquaculture in the ocean), Algaculture (the production of kelp/seaweed and other algae) and fish farming (the raising of catfish and tilapia in freshwater ponds or salmon in marine ponds), Other species presently farmed in the United States include channel catfish, salmon, bait and ornamental fish, crayfish, shrimp, Oysters and Clam. Other species such as tilapia, hybrid striped bass, red drum, alligators, white sturgeon and aquatic plants are also being farmed on a smaller scale. Aquaculture is the fast growing sector of the world food economy, increasing by more than 10% per year and currently accounts for more than 30% of all fish consumed.

Aquaculture can also be said to be the act of growing aquatic organisms/animals under a controlled conduction, with minimum management services that yield maximum output. It can otherwise be defined as the cultivation of animals and vegetable life in water, this encourages aquaculture in seawater, brackish water and freshwater. It involves the production of not only a wide range of fish, but also oysters, shrimps, frogs, seaweeds and other aquatic plants. Different types of aquaculture requires different scales of inputs and intensity of management.

Fish is an excellent source of dietary protein and has been a cherished food since time immemorial. Throughout the ages, the world's rivers, lakes and oceans have provided a bountiful supply of fish to anyone who cares to cast a net, spear or hook into the water. In recent decades, however, all that has started to change. The planet's human population has doubled within the last 40 years to 6 billion. About 216,000 humans are born each day. compounded with the hi-technology used by commercial fishing fleets and increasing industrial and domestic pollution have resulted to a decline in fish catch and survivability of the ocean, rivers, lakes world wide..

1.2.1 STATEMENT OF PROBLEM

Women do not have access to credit facilities because it is the belief that aquaculture is mainly practiced by men.

1.2.2. JUSTIFICATION FOR THE STUDY

Aquaculture is regarded as a full-time occupation especially for men. But women are also involved in this profession, however women's contribution to aquaculture is often unrecognized and the real benefits from their involvement in the activity are not objectively assessed. The benefits, materials, education and projects are aimed at men. Thus marginalizing the role of women in aquaculture. How do we solve this gender problem, so that these benefits, materials, education, project, credit facilities could also be directed to the women.

The level of women involvement in aquaculture in Niger and Oyo States has not be ascertained thus the justification of this work.

1.2 OBJECTIVES

- (i) To determine the socio-economic status in aquaculture
- (ii) To know what aspect of management practices in aquaculture women are involved
- (iii) To consider the social and economic impact of aquaculture on the women.

CHAPTER TWO

2 LITERATURE REVIEW.

2.1 WOMEN INVOLVEMENT IN AQUACULTURE

The role of women in economic activities of agricultural household in developing countries has received increasingly greater attention from researches and international development agencies in the past decade (Dixon 1982, Castillo 1985 and Roach 1986). Researcher and policy makers are becoming aware that women are actively engaged in many productive activities, which provide added income, and needed services to the household but only few references exist describing the role of women in aquaculture, and fishing activity and in fishing communities and this has also been reported by (Dewes 1982, Kalvathy 1983, Yater 1982).

Improvements in production and lives of fish farmers depend on recognition of the role of women in fisheries and also roles played by women in the well being of their families. Income earned by women usually goes directly to children and household because women are foremost responsible for the maintenance of the family. Most women in fishing communities who are mostly

illiterates have no say in decision making in areas, which affect their lives and people. Participation of women in aquaculture, which affect the living conditions of the populace thus, influences the standard of living of the people.

Only of recent was the important contribution of women farmers in agricultural development programmes came into focus (Wentholt 1989). One of laudable effort being made to improve efficiency and effectiveness in aquaculture is to include women in aquacultural development programmes. However, women have responsibilities different from men. Women are known to combine aquacultural operations with other responsibilities such as child rearing, socialization and home management Wentholt. (1989) reported that women have to be recognized in fish's aquaculture as assets in developing process, more so when they constitute nearly 50 percent of the population. Development programme design that deliberately facilitate the involvement of women benefits them in a number of tangible recognized areas, which women are involved.

Recently, one of the managers of agricultural programme described women's performance as being more responsive and more reliable than their male counterparts (Wentholt 1989).

Similarly, women involvements not only expand the pool of available talent but also increase group strength since women are generally more centrally located and are more likely to be able or willing to attend group meetings. (Brussel, 1994).

Kotnik (1982) noted that the basic goal for women in fishing communities is to make them equal productive partners and self-reliant participants in the process of improving their own and their family nutritional and living standard. To enable them to realize their full potential as human beings in their own right and as members of their family and community.

In most societies, men have the entitlement to land, select site for pond construction and are regarded as owners of land or ponds. They make decisions concerning the production system they are responsible for harvesting the yield and control the cash income from the selling of fish at the pond site. The production ponds, however, in part depends on time and effort allocated by women and children for pond management and the feeding of the fish at the pond site. They have to collect waste materials from the farm and household left over to be used as compost in fish pond. Women were entitled to harvest some of the fish for family

consumption women usually do not exert control over the yield and income derived from the pond (Brussel, 1994).

There is often a gender division of labour associated with small-scale fishery operations. Women are usually confined to on-shore activities such as processing and marketing. While in some cases, women are often culturally forbidden from fishing, they usually have a central role in the processing and marketing of fish and derive substantial status and income to their households from these activities (Alamu, 1992).

In some Malaysian and Philippine fishing communities, women are involved in such activities as hauling, sorting, drying and marketing of catch (Khan 1983), while in Gabon, a significant number of fishing canoes in the estuary of river Gabon near Libreville are operated by the wives and daughter of the Yoruba owners (Felsing et al. 2004).

Shelly and Costa (2005) noted in Bangladesh, the capability of women in adopting and implementing aquaculture development technologies is well substantiated, although their full potential has yet to be explored. To ensure sustainability of aquaculture, it is imperative to understand women's role in aquaculture. Gender

inequality is deeply embedded in the overall structure and social controls at all levels make women subservient to men.

Various studies show that 43% of rural women are contributing to agriculture and fisheries related activities besides performing their household responsibilities. Rural women are also singularly contributing to seasonal fish drying, processing and many other assorted types of work associated with fisheries. They spend a major part of their day at ponds performing a variety of tasks such as wash, cook, bath, and collecting water for the cattle. After fulfilling their traditional responsibilities in the household, women can simultaneously be involved in pond fisheries activities. This enable their male counterpart to work elsewhere, and women to supplement the family income. In most rural communities, there are essential differences between the economic, social and political roles of men and women. This also holds true for fishing communities. While nature as well as the dimension of these responsibilities may differ from country to country and from community to community, a number of basic features can be identified. Fisheries activities are commonly perceived as men's work. This is also a common phenomenon. However, while there

exist difficulties of different magnitude for women to be fully involved in fisheries, there are also vast potentials for women to contribute meaningfully in the fisheries sector (Shelly and Costa 2005). They also reported that on Bangladesh Land adjacent to the homestead remains water logged for three to six months in a year. These lands are situated close to the rural households. Normally, these lands/ditches remain unutilized. By using a proper method of treatment and cleaning these fallow lands can be prepared for fish cultivation. Seasonal ponds can be economically profitable, as the land becomes fertile with the homestead organic waste and often after inundation of flood water. With nominal investment and labour by the family members, these water bodies could be used for fish cultivation, various species of fish like *puntius Sarana*, *Oreochromis niloticus* can be cultivated in these types of water bodies. The investment is affordable and the work does not require much labour. Women therefore can conveniently embark insuch ventures

Shelly and Costals (2005) reported that Mini-ponds are usually used. These types of ponds provide the ideal conditions for fish cultivation. Ensuring water availability throughout the year

would generate fish cultivation for the entire year. Because they are smaller in size (normally 8 meters in length and 6 meters wide), these types of ponds can be excavated in compounds for the homestead fish farming. Women can undertake fish culture in these ponds in the same manner they would cultivate vegetables in and around the plinth of their homestead. This will help families meet the requirement of fish in their daily diet and also to meet extra family expenses, fish culture in the mini-ponds does not require extensive technology. This kind of activity is inexpensive and can be easily managed. Also in Coastal Bangladesh where shrimp farming is a dominant occupation, women are already actively engaged in many ways. It was found that almost 85% of the women are engaged in fry collecting as it does not interfere with their day to day household work, and helps supplement the household income. The principal source of fry collecting is from rivers and women's access to rivers is unhindered. Moreover, the work is not time bound and therefore women can do it at their convenience. Unfortunately at present, fry collection is being discouraged to protect the aquatic bio-diversity of the area.

Women are also actively engaged in various kinds of work in shrimp farms. In these farms, they do dyke construction and maintenance, liming, harvesting and other farm-related activities. They play an important role at the export level in fish grading, de-heading and packaging. It must, however, be recognized that these services of women are in great demand because of the fact that they are paid much less than men for the same type of work (Shelly and Costa 2005).

2.2 WOMEN AND AQUACULTURE

Felsing *et. al* (2004) reported that the role of women in aquaculture in Southeast Asia cannot be generalized as cultural traditions and local customs play a vital role in determining to what extent women are involved in, or are in control of, aquatic resources. In many Asia cultures, men traditionally have a role that includes decision making, providing for the family and dealing with the outside world, whereas women are responsible for nurturing and maintaining the family. Women have a large involvement in aquaculture when it is for home consumption, rather than commercial.

Their participation in aquatic production generally decreases with increasing intensification. This is more so because men deal with operation, control and maintenance of technological equipment and women are generally excluded from this development. As aquaculture becomes more market oriented and commercialized, there is a corresponding significant decline in women's aquaculture activities and control over resources, including financial capital. For example, in intensive finfish cage or shrimp culture, two of the biggest aquaculture businesses in Southeast Asia, women's involvements are largely limited to that of factory workers in processing plants. Women are generally involved in the management of aquaculture in small water bodies such as backyard ponds, but not in large water bodies, e.g. lakes, reservoirs and along the coast. The gender division of labour in this different water bodies seems to have connections with the gender division by men. For example, in the Philippines, the cultural belief that women bring bad luck to boats effectively restricts their involvement in fishing and most mariculture. On the other hand, in small-scale inland aquaculture, women are reasonably active.

Felsing *et. al* (2004) also said in Southeast Asian countries such as Malaysia and Thailand, women are generally engaged in the marketing and processing of fish. This is different from Southeast Asian countries such as Bangladesh where the purdah tradition restricts women's movement. Hence their involvement is often confined to small-scale home processing and feeding of the fish if the pond is located within the homestead. In many areas in Bangladesh and India, It is culturally unacceptable for women to harvest fish, whereas in Vietman and China, women can be involved in all aspects of fish production In Bali, women are active in fish marketing, but in South Sulawesi, women control marketing completely and women are also involved fish processing.

Unlike middle class households, women from marginal and poorer households and widows cannot afford to follow traditions and culturally imposed restrictions on women's mobility. Hence they are involved in a wider range of activities. In areas where seasonal migration takes men away to the cities, the abundance of female-headed households necessitates women's involvement in all aspects of crop and fish production. Such women face the double burden of having to contribute substantially to income or

food generating activities, while still being, wholly responsible for the care of the family. On the other hand, a handful of more charismatic women have also managed to turn this situation to their advantage on their own initiative by starting up commercially oriented aquaculture operations, e.g. backyard shrimp hatcheries on the Southern Coast of Sumatra, or finfish farming on the east coast of Malaysia (Felising *et al.* 2004).

In Nigeria, just like other African countries fishing is predominantly male job. Women who go fishing do so mainly for subsistence and they limit their activities to streams, lakes and rivers subsequently selling of fish is predominantly women role and processing of fish (Peche 1998) however, in some parts of the country for example around Kainji and Jebba Lakes, women are involved to some extent in all aspects of the fishing industry (Alamu 1991, 1992, 1993; Roder and Alamu 1993, Retteberg *et al.* 1994). Similarly men, mostly do fishing in Kainji lake communities, but due to the expectations on women, they use small nets or traps to catch fish.

2.3 ROLE OF WOMEN IN FISH PROCESSING, STORAGE AND MARKETING

Women use local method of processing which are cheap to preserve fish. In Kainji, processing is primarily by a hot smoke, roasting, cooking and drying of fish. The role of women in traditional fisheries in most countries is on the increase in most African Societies. In Nigeria most women are involved in the post harvest sector while some ethnic groups like the Ijaw, Isoko and Urhobo women combine post harvest activities with capturing of fish (NIFFR, 2000). In early studies on Kainji Lake Oguntoye 1973, Anthonia 1978, Adelemo 1973, Babalola 1976 Alamu and Mdahli 1993), which stated that women feature prominently in post harvest activities in fishing communities like Kainji. Similarly in Burkina Faso women are either involved in fish smoking or marketing (Peche 1993). In some countries, women usually form main force in industrial processing plants. They are preferred because of their social position and demands, which are perceived as being low (Brussel 1994). In traditional fishing communities, the processing and marketing of fish tends to be the exclusive domain of women (FAO, 1988). Processing is often

quoted for creation of employment for women. Processing (including smoking and preservation) can be regarded as an exclusive role of women in many fishing communities. FAO (1988) indicated that immediately the fishing boats lands on the shore, women help to empty the boats and sort, clean and gut the catch. They handle all the processing, which includes smoking, salting, drying, fermenting or a combination of these. Whatever the processing technique women also take active part in packing of processed fish for storage and transportation. Kotnik (1982) indicated that in Tombo, Sierra Leone, 75% of the women in fishing villages are involved in fish processing. Fish marketing forms the greatest single source of income for women in the fishing industry.

Women are also involved in storage of fish. Length of storage by women depend on whether she wants to sell her own product outside the area to increase profit, if she is selling outside the area she keeps the fish for longer period of time to get enough for sale outside the area. Generally, marketing of fish tends to be the exclusive domain of women. Market plays an important role in all economic systems including the traditional agricultural society

(Adelemo 1973). When markets are nearby and easily accessible, fish is marketed fresh, due to the perish ability of fish. Women role in marketing is greatest where trading is traditional and not highly centralized. Through the marketing of fish and he barter trade for resale in their own villages, women actually earn the income for the family.

2.4 ECONOMIC CONSIDERATION OF WOMEN.

The part played by women entrepreneurs in the economy sector is becoming more broad and clear, in the recent times (Peché 1993). Infact, women's income is expected to contribute substantially to the income of the family and to raise the economic level of the home (UNESCO, 1974).

Women's savings according to income and occupational sector or sub-sector is scarce and the importance of self financing of women in consistently underestimated on the other hand, women need credit for many purposes including working capital to cover inputs and labour costs, investments in productive technology, trade and marketing, time saving devices and services to reduce the burden of reproductive tasks and perhaps for group activities (FAO, 1988).

Husband and wife are often separate economic actors, who are independently engaged in income earning activities in order to be able to respond to their gender differentiated financial responsibilities toward the family maintenance. Moreover, the woman might not have capital to buy more fish or to invest in processing devices, (Brussel 1994).

Women may also invest in fishing equipment, but mainly with the aim to secure access to fish. This however, does not necessarily imply that women invest in fishing activities of their own husbands or family.

The role of women as informal bankers to fishermen cannot be over emphasized, women serve as informal banker to fishermen especially those women whose husbands are fishermen. However, this role of women as bankers to fishermen is usually undermined.

2.5 CONSTRAINTS WOMEN FACE IN AQUACULTURE

In Bangladesh, the social norms and customs are greatly influenced by religious interpretation. Women are seduced or conditioned to seclusion for fear that once they gain access to the outside world, men would find it hard to manipulate them further. The activities of women in the social cultural environment of

Bangladesh are primarily domestic in a nature, confined to the four walls of their homes. Women also have limited access to education, skills, resources and opportunities lead to gender inequality in all spheres of women's lives (Shelly and Costa 2005).

Shelly and Costal (2005) also reported that a recent study by ILO showed that women's contribution to the world economy is 66% but they enjoy only 10% of the total wage. It is absolutely unfortunate to see that property owned by women is only about 1%. It is a total disproportionate contrast in view of women's contribution to the wealth accumulation of nations. In the case of holdings on personal property, it is men who hold the ownership title. Men lease common property resources like khas land and men lease water bodies out to groups, usually cooperatives formed and run. The law does not prohibit women to own or possess these resources but discriminatory attitudes bar women's access and ability to take control of these common property resources.

Literacy rate of women is well below the national level besides education, women's access to research findings has also been neglected from the application point of view. It is often seen that almost all research takes place to benefit men rather than

women. For example, a particular testing on farmers is done only with men. A particular research methodology is designed in such a way where the man remains the center focus. Women's involvement and their needs in farming or farming related activities remain ignored.

The vast majority of training sessions and extension services are conducted by men. Women are unable to take advantage of such programmes because women and men outside the family are not encouraged or even prohibited to socialize with one another. Too often, when training and extension services offered, they are geared to the needs and interests of men rather than women. Training is normally held in places where it is difficult, if not impossible for women to attend. In cases of distribution of new technologies, there is hardly any scope for women to avail of new technologies as they are hardly or never considered as potential practitioners of such innovations. Women enter the labour market without sufficient education or skills.

Shelly and Costal (2005) reported that in Bangladesh, women are considered legal minors and thus do not have access to credit without the signature of a father, husband or brother.

Without title to land or control of other assets, the women have nothing to put up as collateral and so are not eligible for many types of loans and are viewed by money – lending institutions as credit risks. Most poor rural women engage in subsistence farming, and these institutions find it difficult to believe that loans given to these women can be repaid. In addition, since women tend to take out smaller loans than men, the higher administrative costs involved is given as an excuse to avoid lending to them. Women find it difficult to leave the home to travel to bank. The lack of education and experiences in financial matters is a further construct. Cooperatives and other associations through which credit is channeled to farmers tend to be exclusively reserved for men. So, poor women, who are more in number than poor men, are faced with the choice between going without and turning to the informal credit sector.

Felsing *et al* (2004) also said women in Asia generally have limited access to formal credit as compared to men, largely because they rarely own property, which can be used as collateral, further, they have lower literacy, less exposure to official institutions, and are victims of bank managers' prejudice, while on

effective access to credit and socio-cultural support makes it relatively easy for men to start small and large scale commercial activities. If this situation is to be reversed, if poor women are to have a little chance to improve their lives, then they must have access to credit, as it is often said, is a vital catalyst for development.

Balakrishnan (1992) also reported that due to lack of capital organization, bargaining power and access to transport and markets small-scale fish financially stronger often-male traders force vendors and traders out of business. The small vendors usually women are left with the trading of fish from remote sites, not attractive for whole sale or development programmes, because the production is too small to intuate services and transport costs are too high to justify marketing, women's savings according to income and occupational sector or sub-sector is scare and the importance of self finance of women is consistently, under estimated. On the other hand, women need credit for many purposes including working capital to cover inputs and labour costs, investments in productive technology trade and marketing time saving devices and services to reduce the burden of

reproductive tasks and perhaps for group activities and also said credit may not be the only or even the major constraint for small enterprises run by women. Access to fish production, to inputs for fish processing like fuel wood, salt, ice to construction material, to twines for mending net and to improved technologies, knowledge and training determine the efficiency of enterprises. Equally crucial are access to transport and market outlets , marketing facilities, shelter, sanitation, and child care centers and the mechanism of price setting, competition amongst market women. He also services for women still emphasized domestic skills rather than fisheries related, agriculture and artisanal skills, though all are relevant and need to be combine. Also access to land and water, ponds are usually situated far from home and the keeping of livestock overnight near the ponds for manuring is unacceptable because of theft.

Shelly and Costa (2005) noted that since the movement of women is traditionally restricted, it is quite difficult for them to travel to distant areas to purchase necessary ingredients like fertilizer, fingerlings and feeds that are required for the projects they have undertaken. Normally, the ingredients are available in

places far from their houses and a women is unable to ravel the distance to get the needed materials. In the such cases, women are again dependent on men.

Women are generally under represented in cooperatives and thus lack the support and economic power that such collective enterprises can offer. Besides, men tend to hold the vast majority of leadership positions. Women therefore, have little or no say in many areas which affect their lives, and little chance to develop leadership and decision-making skills. In our social system, men make decisions of an important nature. In the case of pond fisheries projects, men usually decide about stocking, harvesting, marketing, and finally on the utilization of the income from the project although women often play a major role in nurturing and harvesting. Even for the products that come from the initiatives of women, men make major decisions, as women are not linked with markets. Economically, women have always been involved in production although their share in consumption as well as control over capital and cash has always been nominal and neglected.

Felsing *et al* (2004). Reported that many factors contribute to the restriction of women's access to information. Presently, extension is organized on the assumption that the family is an

altruistic institution and there is an unrestricted flow of information for the benefit of all concerned members . Extension efforts tend to be directed solely at male members of the community. Extension agencies generally regard men as the heads of households or find it easier and faster to teach men. Further, childcare and other household duties often prevent women from attending meetings, and cultural factors may inhibit them from leaving home or the local area for training courses. In most South and some southeast Asia countries, the female literacy rate is much lower than that of men, further limiting the access of women to extension and training materials. He also added that most government aquaculture extension agencies are less of gender sensitive, and make no particular effort to reach woman. One of the constraints in reaching women, in aquaculture extension is the shortage of women extension workers. Within aquaculture and other 'technical' areas, the number of women extension workers is generally much lower than in areas such as health and childcare. In countries such as Bangladesh and India, religion cultural norms, purdah and women's restricted mobility limit the interaction between male extension workers and a women fisher.

Felsing *et al* (2004) also reported that access to large water bodies such as lakes, reservoirs and rivers are another issues of concern. Women are disadvantaged in gaining access to these water bodies because it requires contact and connection with local official structures, which are highly male – dominated. The distance of these water bodies from the homestead also prevents women from attending to aquaculture activities frequently.

CHAPTER THREE

3 MATERIALS AND METHODS

3.1 MATERIALS

A structured questionnaire were prepared containing, 45 questions related to the general personal data of the respondents and their participation in aquaculture including profit made (Economics consideration). The questionnaires were administered to only women involved in aquaculture.

3.2 METHOD OF DATA COLLECTION.

The study covered Niger and Oyo State. Women involved in aquaculture in both states were interviewed with questionnaires. There are 33 Local Governments in Oyo State and 25 Local Governments in Niger State. Women involved in aquaculture in both States were located with the use of Extension workers, workers in the Ministry , and people that supplies fish seed from both State.

There was a preliminary survey to locate women involved in aquaculture in both States. The structured questionnaire were administered to only women involved in aquaculture in Oyo and

Niger states. Thus 54 and 18 respondents were got from Oyo and Niger State respectively.

3.3 METHOD OF DATA ANALYSIS

The information obtained were analyze and results presented inform of tables, percentages, figures such as bar charts and pie chart and also statistical analysis's using chi-square.

The formula is $\sum \frac{(O-E)^2}{E}$

Where O is observed

E is expected

Expected = $\frac{\text{Column total} \times \text{row total}}{\text{Grand total}}$ Grand total

CHAPTER FOUR

4 RESULTS

4.1 AGE DISTRIBUTION OF THE WOMEN.

The result shows that women in both Oyo and Niger States aged between 31-40 years are more actively involved in aquaculture which accounted for 44.44% and 55.56% of the total respondents respectively. It is also shown that in Niger State there is 0% for ages below 20 years and also between 20-30 years while in Oyo State 11.11% of the women were below 20 also 11.11% were between 20-30 years as shown in Table 1.

TABLE 1: AGE

BIODATA	OYO		NIGER	
	No of respondent	%	No. of respondent	%
<20	6	11.11	0	0
20-30	6	11.11	0	0
31-40	24	44.44	12	66.67
40 above	18	33.33	6	33.33
Total	54	100	18	100

4.2 MARITAL STATUS OF THE WOMEN

The result of data collected on Marital status that 77.78% of women involved in aquaculture in Oyo State were married and 22.22% were singles while in Niger State 88.89% were married and 11.11% were widowed as shown in Table 2.

TABLE 2: MARITAL STATUS

Marital status	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Married	42	77.78	16	88.89
Single	12	22.22	0	0
Widowed	0	0	2	11.11
Total	54	100	18	100

4.3 RELIGION OF THE WOMEN

The information on Table 3 indicated the number of women who were Christians, and Moslem and traditional. 100% of women in Oyo State were Christians while in Niger State 50% of the women were Moslems and 50% of were Christians. In both State 0% are traditional.

TABLE 3: RELIGION OF RESPONDENTS

Religion	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Christian	54	100	9	50
Muslim	0	0	9	50
Traditional	0	0	0	0
Total	54	100	18	100

4.4 TRIBAL COMPOSITION OF THE WOMEN.

The data collected showed in Table 4 shows that 96.35% of the women in cooperative in Oyo State were Yorubas while other tribe namely Urohobos accounted for the remaining 3.70%. While in Niger State, 16.67% of the respondents were Igbos and 83.33% were from other tribes which include, Nupe and Idoma.

TABLE 4: TRIBAL COMPOSITION

Tribal Composition	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yoruba	52	96.30	0	0
Hausa	0	0	0	0
Igbo	0	0	3	16.67
Others	2	3.70	15	83.33
Total	54	100	18	100

4.5 EDUCATIONAL STATUS OF THE WOMEN.

The result of the educational status of respondents is shown in Table 5. The percentage of respondents with secondary education and above amounted to 100% in both States.

TABLE 5: EDUCATIONAL STATUS OF THE WOMEN.

EDUCATIONAL STATUS	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Primary	0	0	0	0
Secondary and above	54	100	18	100
Total	54	100	18	100

4.6 AQUACULTURAL TRAINING RECEIVED BY THE WOMEN

The percentage of women without aquacultural training amounted to 100% as shown in Table 6.

TABLE 6: AQUACULTURAL TRAINING

Aquacultural Training	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	0	0	0	0
No	54	100	18	100
Total	54	100	18	100

4.7 FISH FARMS OWNED BY WOMEN.

Table 7 indicated the number of women that own fish farms. In Niger State 100% of the women owned their own fish farms while in Oyo State 66.67% of women owned their own fish farms while 33.33% worked for others who owned the fish farms.

TABLE 7: OWNERSHIP OF FISH FARM

Aquacultural Training	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	36	66.67	18	100
No	18	33.33	0	0
Total	54	100	18	100

4.8 FISH BREEDING AS PRACTISED BY THE WOMEN

In Oyo State 33.33% of women were involved in fish breeding while 66.67% did not breed fish while in Niger State 100% of the women are not involved in fish breeding as shown in Table 8. However, statistical analysis showed insignificance, $P > 0.05$. women are not involved in fish breeding as shown in

TABLE 8: BREEDING RESPONSES

BREEDING RESPONSES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	18	33.33	0	0
No	36	66.67	18	100
Total	54	100	18	100

4.9 FEEDING OF FISH AS PRACTISED BY THE WOMEN

100% of women in Niger State were involved in feeding of fish while in Oyo State 88.89% were involved in feeding and the remaining 11.11% were not involved in feeding of fish as shown in figure 1.

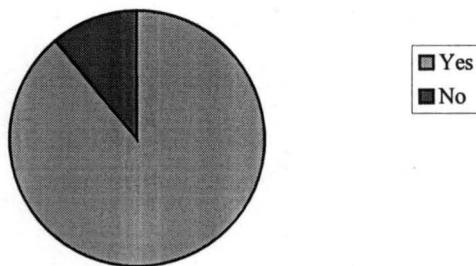


Fig. 1 Pie chart showing percentage total of women involved in feeding of fish in Oyo state

4.10 SORTING OF FISH AS PRACTISED BY THE WOMEN

In Oyo State, 66.67% were involved in sorting of fish and 33.33% were not involved while in Niger State 33.33% were involved in sorting and the remaining 66.67% were not involved in sorting of fish. This result is shown in Table 8. Statistical analysis indicated $P < 0.05$ significant.

TALE 9: SORTING RESPONSES

SORTING RESPONSES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	36	66.67	6	33.33
No	18	33.33	12	66.67
Total	54	100	18	100

4.11 FISH HARVESTING AS PRACTISED BY THE WOMEN

100% of the women in Niger State were not involved in harvesting of fish while 78.78% in Oyo State were not involved in fish harvesting only 22.22% that were involved in harvesting as shown in Table 9 statistical analysis indicated $P < 0.05$ significant.

TABLE 10: FISH HARVESTING

FISH HARVESTING	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	12	22.22	0	0
No	42	77.78	18	100
Total	54	100	54	100

4.12 TYPE OF FISH REARED.

100% of women in Niger State reared catfish only while 88.89% of the women in Oyo State reared catfish only and 11.11% reared catfish and Tilapia as shown in Table 11.

TABLE 11: TYPE OF FISH REARED

TYPE OF FISH REARED	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Catfish	48	88.89	18	100
Tilapia	0	0	0	0
Catfish/Tilapia	6	11.11	0	0
Total	54	100	18	100

4.13 POND FERTILIZATION AS PRACTISED BY THE WOMEN

Figure 2 indicated that 66.67% of women in Oyo State were involved in pond fertilization and 33.33% were not while 33.33% women in Niger State were involved in pond fertilization and 66.67% were not involved pond fertilization.

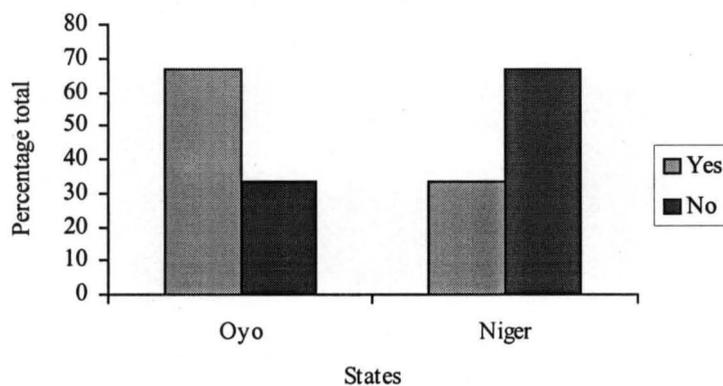


Fig 4: Bar chart showing percentage total of women involved in pond fertilization

4.14 LIMING OF POND AS PRACTISED BY THE WOMEN

66.67% of women in Oyo State were involved in liming of the pond and 33.33% were not involved while in Niger State 33.33% were involved and 66.67% were not involved as shown in Table 12.

TABLE 12: LIMING RESPONSES

LIMING RESPONSES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	42	66.67	6	33.33
No	12	33.33	12	66.67
Total	54	100	18	100

4.15 FISH PROCESSING AS PRACTISED BY THE WOMEN

Table 13 shows that 100% of the women in Niger State were not involved in fish processing while in Oyo State only 22.22% were involved in fish processing and 78.78% were not involved.

TABLE 13: PROCESSING RESPONSES

PROCESSING RESPONSES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	12	22.22	0	0
No	42	78.89	18	100
Total	54	100	18	100

4.16 FEED PRODUCTION AS PRACTISED BY THE WOMEN.

100% of the women in Niger State were not involved in feed production while in Oyo State 44.44% were involved in feed production and 55.56% were not as shown in figure 3. Statistical analysis indicated $P < 0.05$ significant.

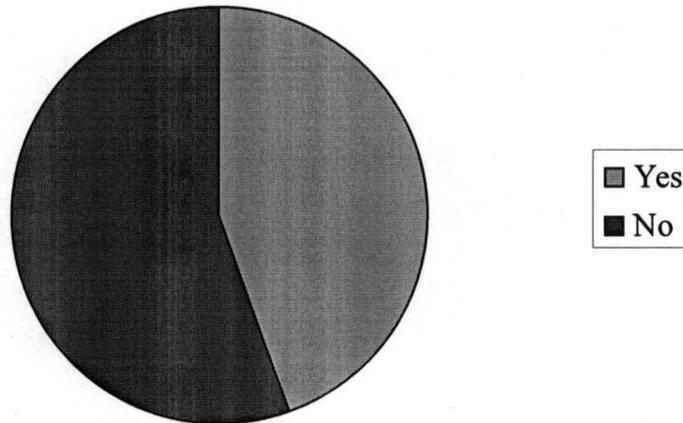


Fig. 5: Pie chart showing percentage total of the women involved in feed production in Oyo state

4.17 PROBLEMS FACE BY THE WOMEN

100% of the women in both States were faced with one problem or the other.

The problems faced by the women ranged from non-availability of fish feed, tedious to change water from the tanks, non-availability of water, difficulty in raising fry to fingerlings

stage this could be attributed to lack of technical know-how, Alga problem in the pond, fish not growing to required size because, they don't know the type of to grow, they grow what ever is given to them by suppliers who are ready to exploit them, some of them also complained of fish being carried away by flood, Bigger fish eating smaller ones, attack from predators (birds), lack of fund for expansion, lack of effective feeding due to the distance of the fish farm to the home of the fish farmers. They are also exposed to thieves, people also buy fish on credit and refuse to pay and a times inadequate rainfall.

TABLE 14: FACED WITH PROBLEMS

FACED WITH PROBLEMS	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	54	100	18	100
No	0	0	0	0
Total	54	100	18	100

4.18 MARKETING AS PRACTISED BY THE WOMEN.

100% of the respondents in both states were involved in marketing as shown in table 15. They markets their fish at the farm site fresh.

TABLE 15: MARKETING RESPONES

MARKETING RESPONSES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	54		18	100
No	0		0	0
Total	54	100	18	100

4.19 ABILITY TO SUPPORT FAMILY

Table 16 indicated that in both States 66.67% can support their families from aquaculture while 33.33% cannot support their families.

TABLE 16: ABILITY TO SUPPORT THEIR FAMILIES

ABILITY SUPPORT THEIR FAMILIES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	36	66.67	12	66.67
No	18	33.33	6	33.33
Total	54	100	18	100

4.20. PROFIT MAKING OF THE WOMEN:

Table 17 indicated that in Niger State 33.33% of the women made profit range between N100,000 to N210,000 per annum and 66.67% cannot say precisely how much profit that was made while in Oyo State 11.11% made profit range of N210,000 to N300,000 per annum, 11.11% made profit range between N410,000 to 500,000 per annum, 11.11% operate at a loss in the first year and the remaining 66.67% could not say precisely how much profit was made per annum. Statistical analysis indicated $P < 0.05$ significant.

TABLE 17: PROFIT MAKING

PROFIT MAKING	OYO		NIGER	
	No of respondent	%	No. of respondent	%
PROFIT MAKING				
N100,000 – 200,000	0	0	6	33.33
N200,010 - 300,000	6	11.11	0	0
300,010 – 400,000	0	0	0	0
400,010 – 500,000	6	11.11	0	0
LOSS	6	0	0	0
Cannot Quantify	36	66.67	12	66.67
Total	54	100	18	100

4.21 CREDIT FACILITIES

100% of the respondents did not have access to credit facility as shown in Table 18.

TABLE 18: CREDIT FACILITIES

CREDIT FACILITIES	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	0	0	0	0
No	54	100	18	100
Total	54	100	18	100

4.22 WOMEN INVOLVEMENT IN COOPERATIVE SOCIETY:

100% of the respondents as shown in table 19 were not involve in cooperative society in both state.

TABLE 19: THE WOMEN INVOLVEMENT IN COOPERATIVE SOCIETY:

The women involvement in cooperative society:	OYO		NIGER	
	No of respondent	%	No. of respondent	%
Yes	0	0	0	0
No	54	100	18	100
Total	54	100	18	100

CHAPTER FIVE

5 DISCUSSION, CONCLUSION AND RECOMMENDATION

5.2 Discussion

The length of time one has lived can determine his societal role as well as job placement. There are the aged, young and children. By the International Labour Organization (ILO) standard, the active working age range is between 15 to 45 years. Going by this standard, majority of the respondents in both States fall within the active working age group. Also in both States women that are less than 20 years were few and this could be attributed to the fact that our young ladies are more interested in white collar jobs.

High percentage of women involved in aquaculture in both States can be attributed to the fact that their husbands were also interested in aquaculture as reported by felsing *et al.* 2004..

It is important to also note that religion is not a factor to aquaculture because there is no religious or traditional taboo to fish consumption, marketing or even aquaculture activities in general.

Education is the intellectual and moral training acquired to equip one to become a productive member of the society. In this

context, that majority of the women in both States who were involved in aquaculture were not illiterates because education had been described as the liberation of man/woman from the restraints and limitations of ignorance and dependency.

This study indicated that those who did not own fish farms are singles while the married and widowed own their own fish farms. The widowed involved in aquaculture can be attributed to the fact that those women wanted to free themselves from burden and pain from absence of their husbands and engaged themselves in aquaculture. Also high percentage of married women involved in aquaculture can be attributed to the fact that their husbands are also interested in aquaculture as reported Alamu (1991).

100% of the women were without aquaculture training, there is however no technical know. The women involved in aquaculture in both States only developed interest in aquaculture without technical know how and they suffered many things in the hands of those who assisted them in pond construction, daily routine, fish breeding, fish feed production and even marketing of the fish.

Few women involvement in fish breeding in both States could be attributed to the fact that they were not knowledgeable in aquaculture, they lacked the technical know who and as such buy fries as fingerlings because they don't know the difference and as a result loss must of the fish.

Majority of the women involved in feeding of fish, which is a typical role of women, this can be attributed to the fact that as women were involved in preparation of food and feeding the family. Few women were not involved in feeding of fish because of the distance of the fish farm to fish farmer's home as reported by Brussel 1994.

Few percentage of the women involved in fish harvesting could be attributed to the fact that harvesting of fish could be tedious to women as reported by Felsing *et al.* (2004).

Most of the women could not specify the species of the catfish reared in ponds because they were not knowledgeable in aquaculture and they buy or collect anything they bring to them as fish, only few women could specify the type of fish as *Clarias gariepinus*. Most of the women were involved in monoculture and not polyculture. Most of the women did not know that young

Tilapia can serve as food for the catfish and they spent more money on fish feed which a times are not even available.

The women involved in fish processing used smoking method of processing, which is the traditional method of fish processing. This could be attributable to the fact that smoking of fish could be done along side with other domestic activities. Higher percentage of respondents not involved in fish processing could be attributed to the fact that they rear catfish and prefer selling them fresh rather than smoking which might not be pleasing to the consumers and customers because catfish taste better when prepared fresh as reported by Oguntoye 1973.

High percentage of women involved in marketing of fish could be attributed to the fact that fish could be marketed with other products and produce such as provisions, farm produce, livestock and food items as reported by Adelomo 1973 and Peche 1998.

High percentage of women were not involved in feed production because of lack of technical know how. Few percentage involve get little idea from people while other buy feed which a times might not be available as when available, it is very expensive.

5.2 CONCLUSION

This study was carried out to analyse the role of women in aquaculture in Oyo State and Niger State. Efforts were made to probe the activities of women in aquaculture.

This study has shown clearly that women are mostly involved in selling of fish from their own fish farms. Thus women contribute to aquaculture development through the role they play in post harvest activities.

Women do play a considerable role in feeding of fish, sorting, counting, harvesting and making substantial contributions to aquaculture. Aquacultures in turns enrich the livelihoods of women while making a different in their position within the society.

Aquaculture benefits women through an increase in income and improvement in nutrition. With more control over aquaculture activities, women gain control over their own lives and improve their socio-economic status both within the household and the society.

Profits usually made by some women involved in aquaculture is sufficient for them to maintain their family, despite the fact that most women do not have the technical know how.

This implies that, if women involved in aquaculture had the technical know how they could make greater profit, thus improving their standard of living and the family thus alleviating poverty in the nation.

5.3 RECOMMENDATION

Women involved in aquaculture should be encourage to have formal education in aquaculture so that they will be no longer fall into the hands of people that exploit them.

Efforts towards organizing women involved in aquaculture into cooperative society should be intensified. The types of societies should include fish marketing cooperative society, fish processing cooperative society, fish breeders cooperative society, and fish feed producers. The cooperative societies should be multi-purpose as possible and be responsible for assisting the members by Government and NGOs. Organizing women into cooperative will be able to give the following support to women involve in aquaculture. It will assures availability of credit facilities at reasonable interest rates, women could also be assisted with inputs such as fishing gears, it also ensures promotion of members, this will also assist in improvement in quality of fish

products and ensure stability of price for the benefits of fish producers as well as consumers.

It is also recommended that a population of women involved in aquaculture be taken just like the population of men were taken and whatever aid that is to be given to the women should be given to them directly. Also population will help in the distribution of fishing inputs such as fishing gears, feed and fertilizers.

Credit facilities should also be targeted to women involve in aquaculture. Also banks can be encouraged to give credit facilities to women in aquaculture with little interest.

Government should assist in pond construction to save women from the hands of people that exploit them in the name constructing pond which must often a time they themselves do not have the technical know how. At time they end up constructing bad ponds after extorting huge some of money from them.

Government should also assist through the use of extension workers on how feed can easily be obtained.

Also inputs should be made available at all times such as fertilizers, lime, feed and fishing gears.

There should be provision of extended training facilities for development of human resources in the public and private sectors.

Workshops and meetings should be organized to create awareness on gender equality in the community and among people working for aquaculture development. Successful cases of women's involvement in aquaculture can be emphasized. Integrated aquaculture with livestock and rice should be encouraged.

There should be recruitment of female extension staff. This will enable most women to be involved in aquaculture and thus contribute to aquaculture development.

Women should be involved in technology development and technological designs to ensure that they are suited to women's needs and physical capacity in order to facilitate their activities in aquaculture.

All these recommendations will help to produce healthy children and also poverty could be alleviated from the country. Also these women could be self-reliant supporting their family and also giving help to their communities. Fish which is also a source of protein which also contains all the essential amino acids required for growth, maintenance and repairs of worn-out cells, will be supplied to the nation at large in the public and private sectors.

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APPENDIX I

**DEPARTMENT OF WATER RESOURCES
AQUACULTURE AND FISHERIES TECHNOLOGY
SCHOOL OF AGRICULTURE AND AGRICULTURAL
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TECHNOLOGY, MINNA.**

Questionnaire for women involved in aquacultural activities in
Niger and Oyo State.

Name:.....

Tow/village:.....

Serial

Number:.....

General Information.

1. Age

Less than 20 years

20-30 years

31-40 years

over 40 years.

2. Family Status:

MarriedSingleDivorced.....widowed.....

3. Religion: ChristianMoslem.....Traditional.....

4. Tribe Hausa.....Yoruba.....Igbo.....
Other (specify).....
5. Level of literacy: Primary.....Secondary Education
.....Non-above
6. Have you received any training in aquaculture?
Yes..... No.....
7. Do you own a fish farm? Yes..... No.....
8. If yes how many ponds do you have
9. Are you involved in fish breeding? Yes... No.....
10. Do you have an hatchery unit? Yes... No.....
11. If no where do you get fingerlings?
12. Are you involved in feeding of fish? Yes... No.....
13. Are you involved in sorting of fish? Yes... No.....
14. Are you involved in counting of fish? Yes... No.....
15. Are you involved in fish harvesting? Yes... No.....
16. Do you rear fingerlings for sell? Yes... No.....
17. Do you rear juveniles for sell? Yes... No.....
18. Do you rear grow-outs? Yes... No.....
19. What type of fish do you grow?
20. Do you keep breeders? Yes... No.....

21. Are you involved in pond fertilization? Yes... No.....
22. Are you involved in liming of pond? Yes... No.....
23. Do you process fish? Yes... No.....
24. If yes in what ways?
25. Are you involved in fish selling? Yes... No.....
26. If yes where do you sell?
27. Do you produce feed? Yes... No.....
28. If yes what type do you produce
29. If no where do you get your feed?
30. Are you involved in fishing gear making? Yes... No.....
31. Do you practice any other type of farming or other
agricultural activities Yes... No.....
32. If yes what type?
33. If no why?
34. How did you obtain your working capital

Personal savings	1
From husband	2
From parents	3
From contribution	4
Credit facility	5

Others (specify)

6

35. Do you belong to cooperative society? Yes... No.....
36. What type of problems do you encounter?
37. What is the cost of fingerlings?
38. What is the cost of Growers?
39. What is the cost of breeders?
40. What is your selling price (cost per kg)
41. What is your average income from fish farming per annum
42. Other sources of income
43. Are you able to maintain your family and every other responsibilities from your income from the farm
44. How many employees do you have?
How do you maintain them and pay them?

APPENDIX II: LIST OF FISH FARMS

Zozo Fish Farm, Saukala Huta, Munu Fisheries, Ibeto Close Tunga Low Cost, Sidi Fish Farm Barkin Sale, J. Magagi Fish Farm, Mrs. Ajeuge Fish Farm, Aliyu Fish Farm, Chanchaga Fish Farm, Mrs. Abdullahi Fish Farm, Mrs. Tunde Fish Farm, Matunbi/Shikroro Fish Pond, Twins Fish Farm Water Side Fisheries in Niger State.

Richland Fish farm and Intergrated Offatdo, Lagelu Local Government Ibadan, Toyin Farm, Lalupomn, Fundex Farm Ile-Igbon Lagelu Local Government Area, Oluwasegun Fumi Farm, Technical Area Ejioku, Zartech Fish Farms, A.Y. International Farm, Erumu, Ten-Ten Fish Farm Lalupon, Gbemex Fisheris Aba Edun, Toks Fish farm Saw-Mill Area, Lasfun Integrated Farm Nigeria Limited , Hope farm Nigeria Limited, Alakie Ibadan, Omolola Farms Investure Erumu, Caocao Fish Farm, Asemo Fish Farm Egbeda, Gizzy Fish Farm, Coperate Integrated Farm Ido, Canaan fish farm and integrated orita Ajara, Olaolu farms Nigeria Limited, Alade-Owo Village, David and David Fish farm, Lomeona Fish farm Yawiri Akobolourin , Deftos farm Akobo, kajola fish farm, able venture fish farm moniya, tropical

aquaculture product (JAP) Aba-Onidudu, Sindaham fish farm Akingbile, mummy Tomiwa fish farm eniosa okobo oju irin, bimdok fish farm along Lagos Express Road, Ibadan, Oke Farms Nigeria Limited Orita Ajara Village and forth man fish farm Aleshinloye, and Zarita fish farm all in Oyo State.