

## Overview of the Status of Aquaculture in Nigeria with Reference to Ekiti State

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**Abstract:** The study critically presents an overview of the state of Aquaculture in Nigeria with particular reference to Ekiti State, South-West, Nigeria. The review of the state which is land-locked, covered a 8-year period between 1996-2003. Searchlights were beamed on fish production vis-a-vis earthen ponds in the 16 local government areas, dams and reservoirs. The dams and reservoirs are all state-owned. There were 7 dams/reservoirs which are located in different parts of the state with a total surface area of 767 hectares, 400 fishermen and an annual yield of 115,877.50 kg. Between 1996, when the state was created and 2003, there was an increase in aquacultural activities in the state as evident in the increase in number of earthen ponds. Within the spate of 8 years, there was a yearly increase of 6.20, 18.58, 23.89 and 48.67%, respectively and 67.25% in the last 3 years (2000-2003) of this review. While the level of aquaculture in Nigeria will appear to have increased, the spate of aquacultural development in Ekiti State has not in anyway caught up with the growing human population and fish demand. Also, this review covered the problems militating against fish culture and proffer possible solutions. It is expected that this will present a baseline for further efforts geared at improving the status of aquaculture in Nigeria and her component states.

**Key words:** Review, aquaculture status, Ekiti State, freshwater fishery, problems, solutions

### INTRODUCTION

Fish (fin and shellfish) supplies over 50% of the total animal protein consumed in developing countries (including Nigeria) but less in developed ones (FAO, 1998). This supply is from artisanal, aquaculture and the industrial sector. However, the over exploitation of the natural fish resources due to the ever-increasing human population and consequent protein demand had made aquaculture one of the means of combating protein malnutrition in developing countries. In view of the aforementioned, aquaculture-farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants are inevitable. This involves the intensive, semi- intensive and extensive aquaculture.

Aquaculture in Nigeria occurs inland and only recently has the coastal region been the focus of development. Artisanal fishermen and fishing communities in Nigeria had for generations practiced traditional methods of fish culture in tidal pools and floodplains (Dada, 1975; Sagua, 1976). These are extensive systems, which do not conform to the modern perspective of aquaculture and do not contribute any significant role to the national economy. Aquaculture production is predominantly an extensive land-based system practiced at subsistence levels while commercial aquaculture

development is yet to become widespread. Whereas, in intensive aquaculture, culture organism are nearly always reproduced in specially designed hatchery kept at high densities and fed several times daily; the compounded feeds are pelletised and nutritionally complete, so that fish production is independent of natural production. (Fagbenro and Adebayo, 2002). The first attempt of fish farming was in 1951, at a small experimental station in Onikan, Lagos (Longhurst, 1961). Modern pond culture started with a pilot fish farm (20 ha) in Panyam, Plateau State for the rearing of Carp, *Cyprinus carpio* (Olaniyan, 1961; Ajayi, 1971). Tilapias, Clarids and Carp are mostly cultured fish in Nigeria (Vanden and Bernaseek, 1990). This is due to their adaptability, fast growth, efficient use of natural aquatic foods, resistance to disease, ease of reproduction in captivity and tolerance to wide ranges of environmental conditions (Fagbenro, 1987). A decade ago, there were over 6.000 homestead concrete ponds, about 6.000 small earthen ponds and 100 commercial farms (73 ha) in operations in Nigeria (Satia, 1990); while, both indigenous and introduced species were cultivated in ponds, reservoirs and cages.

Furthermore, the annual demand for fish in Nigeria is about 1.5 million tonnes (FOS, 1987). Unfortunately, local production is not more than 0.6 million tonnes, this shows a deficit of 0.9 million tonnes (Table 1). In order to fill the

Table 1: Projected fish supply deficit in Nigeria (1989-2000AD)

Year	Projected human population (Millions)	Fish demand (Million tons)	Fish supply (Million tons)	Deficit (Million tons)
1989	106.35	1.17	0.40	0.77
1990	109.07	1.20	0.42	0.78
1991	111.86	1.23	0.43	0.80
1992	114.72	1.26	0.49	0.80
1993	117.66	1.29	0.49	0.80
1994	120.67	1.33	0.52	0.81
1995	123.76	1.36	0.53	0.83
1996	126.93	1.40	0.55	0.85
1997	130.18	1.43	0.56	0.87
1998	133.52	1.47	0.58	0.89
1999	136.93	1.51	0.59	0.92
2000	140.45	1.55	0.61	0.94

Source: Federal Office of Statistics, Nigeria, 1987

Table 2: Nigeria aquacultural production in 2000 (Fagbenro and Adebayo, 2002)

Species	Tonnes
Tilapia ( <i>Oreochromis niloticus</i> , <i>O. niloticus</i> x <i>O. aureus</i> hybrids)	11,363
( <i>Sarotherodon melanocheilus</i> , <i>Tilapia zillii</i> , <i>T. guineensis</i> )	3,025
Mud catfishes ( <i>Clarias gariepinus</i> , <i>C. anguillaris</i> )	6,553
( <i>Heterobranchius</i> spp. <i>Clarias</i> x <i>Heterobranchius</i> hybrids)	2,832
Brackish water catfish ( <i>Chirocentrus niger</i> )	1,515
Carp (Common carp, India carp and goldfishes)	1,280
<i>Heterotis niloticus</i>	654
Mullet	336
Snakehead ( <i>Parachanna obscura</i> )	297
Other fishes	2,921
Total	30,776

\*These values include figures of culture-based fisheries in the floodplains of the extensive coastal inland waters

gap fish is imported. Nigeria is the largest importer of frozen fish in Africa. Annual fish imports bill exceeded N27 billion in the year 2000. The high import bill is affecting the growth of local fishing industry. Hence the balance of trade has been tilted against the country in this regard.

Although the available water surface suitable for aquaculture was estimated in 1985, the total area of production units is 5,000 ha. Hence lack of suitable site is not a constraint to aquaculture development in Nigeria. Nevertheless FAO (1998) ranks Nigeria aquaculture production second in Africa, as Egypt and Nigeria accounts for about 85% of the total aquaculture production in Africa. Nigeria's aquaculture industry produced over 30,000 tonnes of various freshwater and brackish water fish species in 2000 (Table 2). This comprises mainly herbivorous/carnivorous catfishes, cultivated under intensive (commercial) and semi-intensive (artisanal) production systems. With appropriate promotional strategies and if about 25% of the available water for fish farming is placed under cultivation, it is estimated that Nigeria has the capability to produce about 656,915 metric tonnes of fish annually from aquaculture. This will widely bridge the gap between supply and demand as 483,406 ha (Ita *et al.*, 1985).

## MATERIALS AND METHODS

### Study area: Ekiti state-background information and

**aquacultural situation:** Ekiti state was created in 1996 out of old Ondo State with 16 Local Government Areas. The state is situated entirely within the tropics. It is located between longitudes of 4° 45' to 5° 45' East of the Greenwich Meridian and Latitudes 7° 15' to 8° 5' North of the Equator. The State is bounded in the East by Edo State, in the south by Ondo State. It lies in the South of Kwara and Kogi States as well as East of Osun State. This makes the State landlocked i.e. enclosed by land with neither sea nor ocean surrounding for fishing purposes. Hence, the focus of the government was geared towards aquaculture development to increase fish protein intake, health status and working capabilities of the people.

In addition, the state is mainly an up land zone, rising above 250 m above the sea level. The state enjoys tropical climates within two distinct seasons. These are the raining season (April-October) and the dry season (November-March). Temperature ranges between 21 and 28°C with high humidity. The South Westerly winds and the North-east trade winds blow in the rainy and dry (harmattan) seasons, respectively. Tropical forest exists in the South while Guinea Savannah occupies the northern peripheries. By 1991 Census, Ekiti State population was 1,647,822

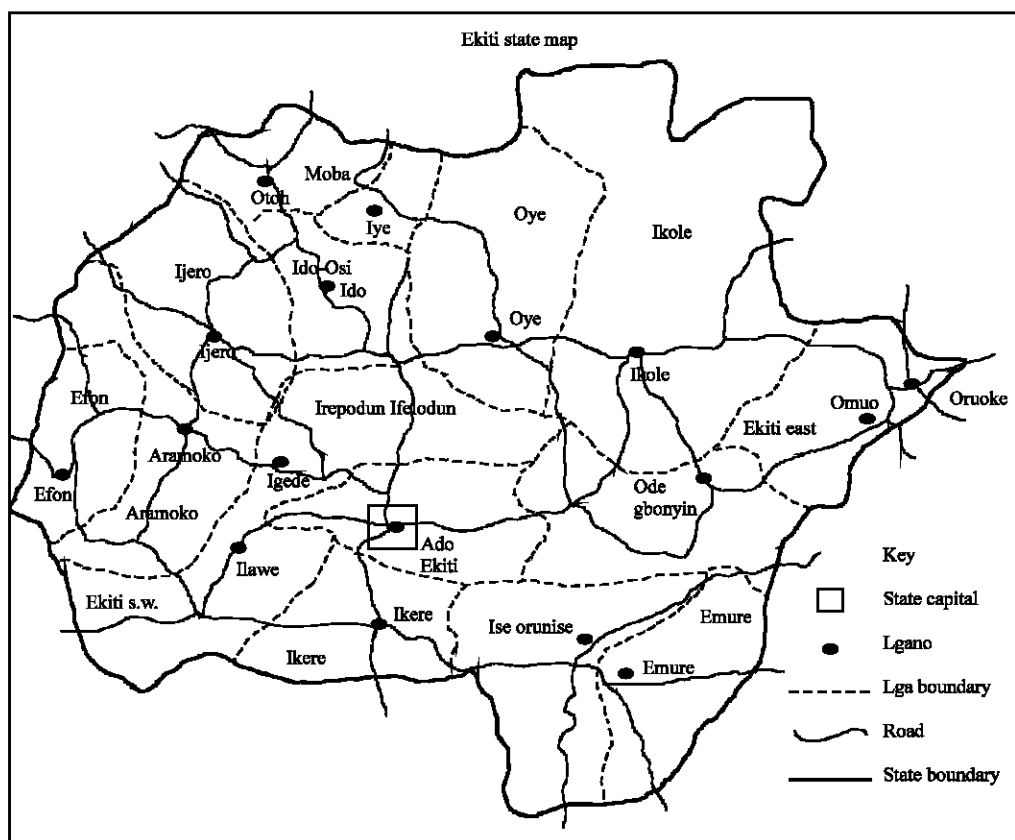


Fig. 1: The map of Ekiti State, Nigeria

while the estimated population on creation on October 1st, 1996 was put at 1.75 million. The fish demand is about 26,325.00 metric tonnes per annum (FDF, 2001). The production from Artisanal fishermen stands at 170.50 metric tonnes annum, while aquatic production (aquaculture) stands at 78.67 metric tonnes per annum, making a total of 249.17 metric tonnes and a shortfall of 26,075.83 tonnes per annum (EKDFS, 2001). This shortage has necessitated the need to intensify more on the state aquacultural practices.

Existing aquacultural policies in Ekiti State are analysed under different sub-headings. These are: inland fisheries edict; production of fish to table size; fish feed production; rivers, reservoir and dams fishing; National stocking campaign; fish seed multiplication and establishment of fish farm estates.

**Data collection (sampling procedure):** The data for this 8-year (1996-2003) review of the aquacultural status of Nigeria; with particular reference to Ekiti State were gathered in two ways: through a statewide visits to fish farms in the 16 Local Government Areas of Ekiti State, Nigeria; and going through the records of the Ekiti State

Department of Fisheries Services (EKDFS), a department of the State Ministry of Agriculture and Rural Development.

Also, contacts were made and questions were asked from fish farmers in the areas visited by the means of a structured questionnaire. The questionnaire focused on the successes, constraints, problems and suggested solutions which can boost the level of Aquaculture in the state and Nigeria at large.

**Analysis of data:** All the data collected from the field (Local Governments) and off-field (EKDFS records) were collated, grouped and analysed using Microsoft Word, Excel and Statistical Package for Social Science (SPSS version 10.00) was used.

## RESULTS

It was observed that all the dams and reservoirs within Ekiti State are state-owned. There were 7 dams and reservoirs which are located in different parts of the state with a total surface area of 767 ha, 400 fishermen and an annual yield of 115,877.50 kg (Table 3).

Table 3: List of Dams and reservoir in Ekiti State

S/No.	Name/Location of Dam	Surface area (ha)	No. of fishermen	Annual yield (Kg)
1	Ado Ekiti	8.80	55	13,250
2	Ayede Ekiti	6.00	23	1,987.5
3	Ero	450,000	102	39,750
4	Egbe	275.2	114	40,750
5	Itapaji	21.5	65	14,575
6	Efon	3.00	28	2,385
7	Ido-Ajinare	2.50	22	3,180
	Total	767	400	115,877.50

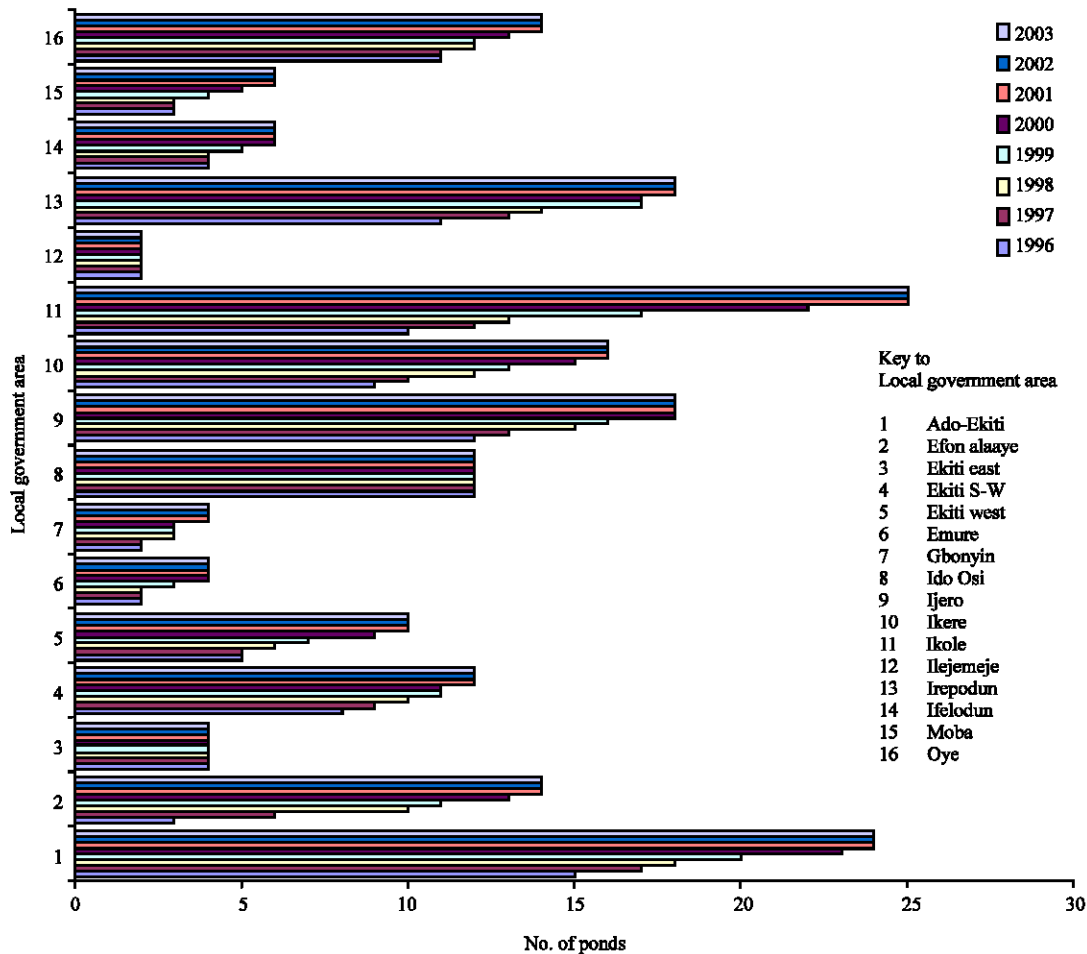


Fig. 2: Histogram showing the Number of Ponds in Local Government Areas of Ekiti State (1996-2003)

Furthermore, between 1996, when the state was created and 2003 (the upper limit of the review), there was an increase in aquacultural activities in the state as evident in the increase in number of earthen ponds established yearly across the state. Within the spate of 8 years, there was a yearly increase of 6.20% (1996/1997), 18.58% (1997/1998), 23.89% (1998/1999), 48.67% (1999/2000), respectively and 67.25% in the last 3 years (2000/2001; 2001/2002 and 2002/2003) of this review (Fig. 2).

## DISCUSSION

### Identified problems and solutions

#### Problems militating against aquaculture development:

There are problems of militating against the growth, smooth running and expansion of the aquacultural development. Without resolving these constraints, aquaculture in Nigeria would not achieve its expected targets. These problems include: Poor policy formulation and implementation (enforcement); inadequate and

untimely funding of fisheries projects and researches; lack of reliable data for effective planning; scarcity and high cost of fishing inputs; ineffective extension officer; misplaced priority, as more emphasis is placed on the industrial and artisanal fisheries sub-sector at the detriment of aquaculture; low level of budgetary allocation to Agriculture and in essence, the fisheries sub-sector; lack of modern biotechnology, processing and storage techniques and equipment; lack of skilled fisheries personnel and trained experts; inavailability of fish seeds i.e., effective hatcheries; lack of fish feed industries; lack of finance to prospective fish farmers such as creditors and loans in cash or kind; lack of patronage and promoting of the status of fish farmers i.e., level of private of fisheries; non-involvement of the local government (grassroots sector) in the policy making of fisheries; problems of land ownership, communal crisis, waterweeds, pollution, pilfering and management in aquaculture business, etc.

**Suggested solutions to aquaculture development:** To achieve self-sufficiency in fish production on a sustainable basis, production from the aquaculture sector must be re-engineered. Hence, strategies for aquacultural development should include: Establishment of fish farms/estates by the tiers of government; support and strengthen the fisheries related associations; adopt and innovate advances in biotechnology towards rapid increase in fish production; promote the establishment of fish feed industries and better utilisation of useful and cheaper agro-industrial by-products i.e., integrated fish farming systems; establishment of fish seed centres for fingerlings and broodstocks nation wide; promote the participation of the private sector in aquaculture; encouraging, financing and facilitating researches in aquaculture; promoting local export rather imports; creating enabling avenue for credits and loans fish farming; promoting fisheries association and cooperative societies; articulating fisheries policies vis-a-vis aquaculture e.g. the National Stocking campaign; secure equitable percentage of the annual budget in agriculture, to reflect the sub-sectoral importance of fish (aquaculture); consolidate and improve existing training programmes designed for appropriate capacity building to enhance professionalism and develop skilled manpower, such as fisheries secessionists; establish an up-to-date fisheries information network system (data bank); reducing or abolishing import duties on fishing input i.e., subsidies or duty free.

## CONCLUSION

Essentially, aquaculture development in Nigeria is government driven, though considerable contribution is being recorded recently in the private fisheries sub-sector. However, despite these efforts and unreliable fisheries statistics, aquaculture in Nigeria can be described as fairly well developed. Hence much need to be done or improved upon. Fisheries resources can be better harnessed and explored sustainably to contribute significantly to the animal production sub-sector of the economy (Fagbenro *et al.*, 2002).

In conclusion, Aquaculture potentials of Nigeria have not been fully optimized, however, with better planning incentives and commitment, it will deliver and thus, fish importation will be drastically reduced or eliminated. The challenge before Nigeria at this moment is to ensure that aquaculture takes its rightful place in the forefront of fish production to ensure national food security in the nearest future.

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