

Catfish Farming Industry Supply Chain Development Programme

A Catfish Industry Development Programme of the MSME Project

PROGRAMME SUMMARY



A pilot project of the Federal Government of Nigeria and the World Bank



Introduction

The Catfish Farming Industry Supply Chain Development Programme in Lagos, Kaduna, Oyo and Abia State is a sub-component of the Micro, Small and Medium Enterprise (MSME) Project, a pilot programme of the World Bank and the Government of Nigeria. This subcomponent aimed to positively impact the supply of operational inputs, training and advisory services for the catfish industry by facilitating the expansion of Nigerian private sector suppliers and helping the catfish industry to adapt to international best practices. It was implemented by Aquaculture Production Technology Ltd., an Israeli firm, in collaboration with a local partner – Quick Projects Ltd. The Programme was implemented over a period of 12 months between May 2007 and May 2008.

Catfish in Nigeria

Fish is a major and growing part of the diet of Nigerians and consumption is growing even faster than that of meat. For example, in 2000 fish production in Nigeria grew by 22 percent while meat production grew by 6 percent. This is resulting in a strong supply response from the fishing industry. According to FAO, between 2002 and 2009, fish production in Nigeria increased by 50 percent, increasing from around 500,000 MT to more than 750,000 MT. However, increased supply has not been able to match increased demand, and Nigeria still remains Africa's largest fish importer with 620,000 MT in 2007.

According to the FAO, aquaculture* production has increased significantly in the last few years in Nigeria (see table), mostly due to increased farmed catfish. In fact, farmed catfish accounts for approximately 50 percent of Nigeria's domestic annual fish production as demand for fresh and smoked catfish has been continued to increase. Tastes and preferences for catfish have been increasing due to availability, cost, consumer preference

Table: Aquaculture production in all of Nigeria

Year	2006	2007	2008	2009
Amount (MT)	84,578	85,087	143,207	152,796

Source: FAO Statistics

Having attracted a very large number of participants in its initial stage, in recent years the catfish industry in Nigeria appears to have undergone a period of rationalisation in which those who were less efficient and capable have withdrawn from the industry. In particular, the large numbers of publicly funded projects have found that, without considerable skill and diligence, catfish farming is a high risk activity and a high proportion of these have closed. In the private sector too, many new entrants, attracted to the industry by its potential for high rewards, have found that the risks **from morbidity to be**. The rationalisation has helped to place the industry on more solid foundations for future expansion and it is now characterised by the presence of some larger commercial farms which use modern, flow through systems are, on average, now profitable, earning reasonable rates of return; and smaller farms, which use earthen pits, though continue to struggle and, on average, are unprofitable.

But although being the largest aquaculture producer in Sub-Saharan Africa, Nigeria continues to produce little compared to its natural potential. On the continent, aquaculture development has been most notable in Egypt, where a combination of tradition, market demand, available and well-managed water resources, marketable prices and private sector initiative has made it the dominant country in Africa in terms of production (99 percent of the regional total) and, in fact, the second largest producer of tilapia after China and the world's top producer of millets.



What has the project done?

Phase One – Analysis

The first phase of the Programme focused on assessing the situation of the catfish industry in four states (Lagos, Kaduna, Oyo & Abia). Over 312 questionnaires were administered to catfish industry stakeholders to collect actual field information on the main characteristics of all relevant stakeholders in the value chain; 42 randomly selected farms were visited to investigate their methods of practice and determine the factors within the value chain responsible for the current state of the industry; and a number of stakeholder and consultative

meetings took place to identify the critical limiting factors for the development of the catfish industry.

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Box: Main findings of farm visits

- 30% of farms have 15-20 ponds; 60% have 1-10 ponds.
- 75% of ponds are concrete; the rest are earthen.
- Concrete ponds were less than 500 m³; earthen were between 500-2,500 m³
- 56% of ponds were without or with few fish; only 25% were full.

As a result of this analysis, the Programme was able to identify Critical Limiting & Influencing Factors (CLIFs), which are defined as “a component of the value chain or a single activity or service comprising it, which affects in a critical way all subsequent value chain components, and affects critically the whole system”.

Most CLIFs in the catfish value chain were related to the design and construction of the production systems, and the production procedures employed in those production systems. More specifically:

- Hatcheries were ill-designed and lacked standardisation in fry production procedures, including sanitation.
- Hatchery producers lacked standard transfer procedures (size, density, oxygen, temperature) and did not apply any price differentiation by size/age.
- Farmers lacked the skills to breed and raise hatchlings to fingerlings.
- Existing production systems (namely the Stagnant Earthen Pond system; the Flow-through system; and the Re-circulating system) failed to deliver the anticipated yields because of an inadequate design of the ponds and tanks to fit a pre-planned production plan.
- Farmers did not control for feed efficiency. They did not recognise the concepts of QFCR (quantitative feed efficiency measure) or cost-FCR (financial feed efficiency measure) and were not able to adjust the feeding rate to maximise its efficiency.
- Water quality management was very poor (no follow up on biomass, DO, pH, Ammonia) and farmers did not control for main pond production indicators (e.g. yields, population growth, size distribution).

Other relevant CLIFs outside of the production side of the value chain were also identified:

- BDS providers in the industry had limited skills and knowledge, lacking the technological basis and means to disseminate best practices in project design, construction and operation.
- Limited access to credit due to poor business plans and lack of experience of banks as to the critical technical-financial features of catfish projects. Aquaculture associations are very weak and are not fulfilling their role as providers of services to catfish farmers and as enablers of public private dialogue.
- The sporadic production output limits marketing options for catfish farmers, who can then only dispose of their product through Mammies, who control the market and dictate low purchase price.

The analyses allowed the programme to identify the problems facing the catfish industry and, after several meetings, agree with all relevant stakeholders on the key interventions required to bring about an enabling environment for the developed of the catfish industry in Nigeria and design a specific plan for their implementation.

Phase Two – Implementation of specific interventions

During phase two, the agreed interventions were implemented either directly by the project's technical team or by the BDS grantees that supported the programme. The interventions that were directly implemented by the project were the following:

1. Develop modules to provide practical guidance (technical and economic) to catfish farmers to establish feasible and sustainable MSMEs and rehabilitate two farms (Gateway Farms in Abia and Plan of Tee Ess in Lagos) to make them part of Best Practice Training.



2. Implement Training of Trainers (ToT) courses to BDS providers on feeding, fingerling production, water quality management, diseases, business and financial arrangements and marketing. A total of 46 BDS providers were trained in Kaduna; 35 were trained in Lagos State; and 57 were trained in Abia.
3. Conduct a specialised training programme for 25 trained veterinarians on fish disease diagnosis, their causes, treatment, control and prevention. This specific intervention was financed with additional resources from the Government of Israel.
4. Develop a module for training loan officers of commercial banks to appraise loan applications from catfish farmers. A total of 57 credit officers of commercial banks and microfinance institutions were trained.
5. Support the establishment of a standards and accreditation system through FISON (Fisheries Society of Nigeria).
6. Provide capacity building to 136 members of aquaculture associations to make the associations more effective in service delivery to members and policy advocacy, including the provision of information on input and output suppliers, prices, and trends in major markets.

Additionally, eleven BDS grants were awarded for projects identified as critical to the different segments of the value chain for a total value of \$359,293. The BDS grantees and their achievements were the following: Check if they all did this!

- *Agricultural Business Concepts* developed a computer programme that simulated the actual processes of catfish farming and production to allow trainers and farmers to vary production parameters such as pond size, feed quality, feed intensity and stocking density while observing the effects on profitability, strengthening the farmers' ability to manage risks. (Mr. Ekundayo Mejabi/Managing Director).
- *Centre for Agriculture and Rural Development (CARD)* trained 100 women and youth on fish processing and marketing, and provided them with multi-purpose dryers and chorkor smoking kiln. (Chief Ekaete E. Udong/Executive Director)
- *Fisheries Society of Nigeria (FISON)* received support to implement a registration and certification program for fish stakeholders; introduce quality control measures (HACCP) in catfish farming supply chain management; and launch the "Fish Network Magazine". (Deaconess Foluke O. Areola/President)
- *Gateway Farms* provided on-farm central fish farming training and practical demonstration of best practices to catfish farming stakeholders. It provided technical support and business advisory services to 180 catfish farmers on water quality management, catfish hatchery management, feeds compounding practices, grow-out practices, processing and packaging, disease management and control, record keeping, basic financial management and marketing. (Mr. Chika S. Nnamani/CEO)
- *Hills Global* trained 180 catfish farmers in Lagos State on the technical and business financial management services aspects of catfish hatchery including hatchery construction, hatching, growing catfish fries to fingerlings, packaging catfish fingerlings for transportation, disease management and control, record keeping, basic financial management and marketing. (Engr. Austine Ede-Nnamani/CEO)
- *Icecool Contracts* facilitated the website design, development and hosting of the Catfish Farmers Association of Nigeria to improve its interaction with current and potential members, customers, stakeholders and site visitors. (Mr. Destiny Amana/Managing Director)
- *Mitboaf Ventures* provided 80 catfish farmers in Lagos State with technical knowledge on the construction



and management of Self-Powered Closed Water Recirculating System including how to use the system for hatching, growing catfish fries to fingerlings, and growing fingerlings into table size fish. (Mr. Paul Okparaji, CEO)

- *Novat Consulting* improved the capacity of 180 catfish farmers from Lagos, Abia, Kaduna and Oyo States to enable easy identification, treatment, control and management of fish diseases. (Dr. Nuraini Olawunmi Funsho/CEO)
- *Premier Packs & Gardens (PPG) Enterprises* provided technical training and advisory support services to 80 catfish farmers in Kaduna State on basic pond construction and management, hatchery and fingerling production, basic business and financial planning and record keeping. (Mr. Haruna Kazzah/CEO)
- *Skodak Agro Industrial Projects Nigeria* provided training and advisory services to 70 catfish farmers in Oyo State on the production and management of fish feeds and business management. (Mr. Bunmi Oyefeso/CEO)
- *Tee Ess Integrated Farms Nigeria* supported the publication of a specialized quarterly journal called "Aquaculture Best" and provided 120 catfish farmers with technical and business management training on water quality management, catfish hatchery management, feeds compounding practices, grow-out practices, processing and packaging, disease control and management; record keeping and accounting, and marketing and customer relations. (Mr. Babatunde Sanni/CEO)



What is the expected impact of the project?

The activities carried out during the implementation of the Catfish Industry Programme have paved the way for the advance in the catfish industry. The programme facilitated the development of industry standards for the inputs and services through demonstration and dissemination practices, improved co-ordination, and increased the incentive for adding value throughout the value chain. More specifically, the programme:

- Helped increase farmers' yields as they applied the lessons provided by the programme. Anecdotal evidence suggests that farmers who received training have benefited from increased yields. For example, Mr. Ameachin Eze at Enugu and Zainb Farms Akute indicated that yield rates from catfish breeding had increased three fold since training as they were better able to manage their hatchlings to marketable juvenile size; and Tee Ess Farms reported a fourfold increase in production of market size fish as from July 2008.
- Incentivised the rehabilitation of catfish farms. Although the programme only supported the rehabilitation of two farms to use as training locations, the demonstration effect led to other farms realising their need to improve. As a result, another 6 farms in Kaduna; 8 in Abia State and 2 in Lagos State reported commencement of the rehabilitation of their farms.
- Helped develop the BDS industry for catfish. At the end of the programme, around 140 trainers and consultants had acquired best practice skills and knowledge to support the design, construction and operation of catfish farms. Indeed, a competency and skill assessment was undertaken before and after the training and concluded that skills had increased by over 20 percent thanks to the intervention.
- Strengthened the capabilities of FISON and CAFAN to provide services and policy advocacy to its members. For example, the programme supported CAFAN to develop a mechanism for price control in markets, process bulk purchase of materials to cut cost and influence Lagos and Kaduna State in establishing special catfish trading markets.

- Helped improve best practices in the industry by developing new standard regulations and an accreditation system. As a result of the programme, FISON published guidelines for standards in the industry and commenced induction processes to its members to help them achieve minimum standards. This is likely to have a significant impact on the yields (and incomes) of catfish farmers.
- Allowed for the modification of the curriculum of veterinary doctors in Nigerian Universities. The curriculum development team of the National Universities Commission of Nigeria (NUC) participated in the training workshops for veterinary doctors on fish diseases and control, and decided to commence including the curriculum on fish diseases and control in the training of veterinary doctors in Nigerian universities.

Overall, the programme was able to increase employment opportunities in the industry. Anecdotal evidence suggests that the programme was able to create about 2,000 direct and indirect new jobs. Some success stories are the following:

"Engr. Austine Ede-Nnamani of Hills Global Project, a trainee, secured a contract with Addax Petroleum Company, a multinational oil company, to establish two community-based fish farms in Imo State. He is to recruit and train the personnel to manage the farms. A minimum of 270 jobs would be expected to be created for this project."

"Chief Ignabi Okiriko, trainee at Aba, Abia State, was awarded a contract to design, supervise and execute the construction of a 36 ton/year grow-out farm in Ogbo-Ovuru Village, Mbaise, near Owerri Airport. The project employed 8 staff in October 2009."

"A trainee at Aba, Hon. Okezie Ihetu, negotiated with National Poverty Eradication Programme in Abia State, on establishment of catfish farms and training for rural population in all the 17 local government councils in Abia State. This is expected to generate at least 12 jobs per local government with a total of 204 new jobs in Abia State."

Lessons learned and recommendations

After the implementation of the programme, a number of lessons and recommendations have been identified. The most relevant are:

- It is important to support the building of demonstration farms that conform to best practice principles adapted to the local conditions, so that they can serve as training ground for consultants, farmers and extension service experts. In fact, the farms could become semi-independent by supplying seed-fry to farmers and selling fish to the market as part of its budget, and could be a place for R&D in aquaculture.
- Further interventions are needed to encourage good quality fish feed production in Nigeria as it still remains one of the major bottlenecks for developing the catfish industry.
- The catfish farmers' skills and knowledge gap is still significant and sustained support is going to be required to address it because of the long overdue dependency of the industry on outdated traditions and simplistic fish farming and value chain practices. More specifically, training programmes should focus on the quantitative aspects of project design, construction and operation.
- Cooperation among different aquaculture associations and cooperatives is still limited as unhelpful rivalries still exist. More support is needed to create an environment for collaboration, co-existence and synergy.
- Access to finance for aquaculture projects still remains an issue. New interventions should target banks' divisional heads, top managers and policy initiators as they are the ones who decide on the loan and industry lending policies of banks.



The Micro, Small and Medium Enterprise (MSME) Project (2005-2011) is a pilot programme of the World Bank and the Government of Nigeria. It is being implemented by the Nigerian Investment Promotion Commission (NIPC) through a Project Management Unit (PMU) managed by Nathan Associates London Ltd. and Development Associates Nigeria.

The MSME project was designed to improve performance and employment levels of MSMEs in selected non-oil sub-sectors within three States in Nigeria (Abia, Kaduna and Lagos), although some interventions extended to Cross River and Oyo States. The project aims to achieve increased private sector investment for MSME development by demonstrating how a combination of investment climate reforms, improved access to finance and business development services can transform the rate of growth of MSMEs in Nigeria.

Following international best practices and lessons learned, the project mainly targets those intermediaries that provide services to MSMEs, such as financial and business development support, rather than directly targeting the businesses themselves. In addition, the project aims to improve the business investment environment through policy reform and promoting public private partnerships. This will ensure that MSMEs are able to recap the benefits of the project even after the project is finished.

The MSME Project includes the following components: access to finance, investment climate, business development services and public private partnerships.

Executing Agency



**Nigeria Investment
Promotion Commission**

Project Managed by



**Nathan Associates
London Limited**



Development Associates