

The Role of Fisheries Resources in Economic Development and Job Creation in Nigeria

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This paper examines into the huge significant contribution those fisheries resources make to employment, nutrition, and trade in the developed and developing world, especially Nigeria. Employment in fishing and aquaculture has grown rapidly over the past few decades. International trade in fisheries products has been shown to have a positive effect on food security in many developing countries, stimulating increased production, generating foreign exchange which can be used for food imports, and enhancing the trade-based entitlements of people engaged in fishing and fish processing. Fish is a very important source of complete protein, also contains considerable amounts of vitamin B, Vitamin E, nutrients like niacin and minerals such as Copper, Iodine, Iron, and Phosphorus and Calcium. Fish make a vital contribution to survival and health of a significant portion of the World's population. Fish alone account for about

35 % of animal protein in Nigeria (Market resources 2009). In rural and fishing communities in Nigeria, fish is known to play a significant role in the diet providing up to 75 % of the total animal protein intake. This paper highlighted the roles of fisheries resources in economic development and job creation in Nigeria. The paper also highlighted the global fisheries and aquaculture production and fish production in Africa and Nigeria. The paper also looks into the creation of job opportunities through the fisheries resource and the constraints that militate against the achievement of rapid development of the fishery sub sector. Among such factors are: Poverty, Government Policies, Climate Change and other related factors. The paper makes conclusion and recommendations that can be able to be implemented in other to improve standard of fisheries resources in economic development and job creation in Nigeria.

Keywords: Fisheries resources; Aquaculture; economic development; Foreign Exchange; Job creation

INTRODUCTION

Fisheries resources are fishery products or output that arises from capture fishery and Aquaculture or Fish farming. Fishing is one of the oldest employments of humankind. Capture fishery comprises resources caught from open Water bodies like Rivers, Lakes, Reservoirs or Dams and Oceans, while Aquaculture or Fish farming is the rearing of fish in an enclosed environment (like Tanks, Ponds, Reservoirs, Dams etc.) which allows free movement, feeding, breeding, and harvesting of fish in a well planned manner. More than 120 million People throughout the World are estimated to depend on fish for all or part of their income, thereby ensuring food security and raising the protein level of the Nation's populace, and improving their welfare (Rabo). Fisheries resources are also known to serve for recreation and international trade aiding foreign exchange and increasing revenue of a country (Godwin, and James). Although fishery resources are known to play vital roles in economic development and job creation in Nigeria, a lot of constraints militate against the fishery subsector. Fisheries, including aquaculture, provide a vital source of food, employment, recreation, trade and economic well being for people throughout the world, both for present and future generations and should therefore be conducted in a responsible manner. Fish and fisheries are an integral part of most societies and make important contributions to economic and social health and well-being in many countries and areas. Fish and fish products constitute a major source of income, food and recreation in the global economy. Fish products originate from two main modes of production: harvesting of wild fish (marine and freshwater) and aquaculture. Fish and fish products constitute a major source of income, food and recreation in the global economy. Fish products originate from two main modes of production: harvesting of wild fish (marine and freshwater) and aquaculture (FAO 2012b). Aquaculture is also the world's fastest-growing food production activity based on animal protein (FAO 2012a).

Today, fish provides more than one billion poor people with most of their daily animal protein. Fish provides nutrients and micronutrients that are essential to cognitive and physical development, especially in children, and are an important part of a healthy diet. As an affordable animal source of protein in some of the poorest countries, fish is the primary source of nutrition, creating growing demand for this staple. However, fish supplies are failing to meet demand and there are major shortages in some critically poor countries where they are needed most.

Globally, more than 250 million people depend directly on fisheries and aquaculture for their livelihoods and millions are employed in fisheries and aquaculture value chains in roles such as processing or marketing. The very poor often rely on fishing as a primary source of income. These small-scale fishers are particularly vulnerable as fish stocks diminish. Increased productivity from sustainable fisheries and aquaculture can be a driver for rural development by mitigating risks to livelihoods and contributing to income generation and employment.

Improving the productivity of fisheries and aquaculture is vital to reducing hunger and poverty for millions in the developing world. Sustainable, productive fisheries and aquaculture improve food and nutrition security, increase income and improve livelihoods, promote economic growth and protect our environment and natural resources.

Economic development is a process by which a population increases the efficiency with which it provides desired goods and services thereby increasing per capita level of living and general well-being. So fishery resources are one of the most important aspects for the increasing per capita level of living and general well-being of an individual. The origin of science of economics can arguably be located in the need to study the assessment and causal influences on the opportunities that people have for living well (Sen). Indeed, the ultimate objective of "economic development" and state action in all countries, more especially in developing countries, is the enhancement of human capabilities including the basic capacities of avoiding ignorance, under-nutrition, disease and early mortality, leading a

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fuller, longer life, and being able to participate in decision-making in the community (Sen., Dreze & Sen).

Clarification of Concept

Global fisheries and aquaculture production

The important contribution of fisheries to human well-being is frequently underestimated. Not only do fisheries generate employment for millions, but fish provides vital nutrition to billions and is often essential to the diet of the poor (World Bank, 2010).

The last 15 years have been marked by significant changes (FAO):

- The rapid increase in global aquaculture production;
- Which is, in turn, a response to the rising demand for fish and fishery products;
- A growth in world trade of fish and fisheries products, particularly in value terms; and,
- An overwhelming call for more responsible management, as global consciousness for
- The well-being of our natural resources within their ecosystems.

According to the FAO Capture Database, for Inland and Marine fisheries, the total global capture production in 2011 was the third ever, slightly after 1996 (93.8 million tons) and 2000 (93.5) (FAO).

Of the 145 million tons produced in 2011, about 90 million tons came from capture fisheries. Inland fisheries have shown an increasing trend in recent years and reported a record catch exceeding 11 million tons. For aquaculture, production in both inland and marine waters has continued to increase, and total production in 2011 reached about 64 million tons. (FAO) Aquaculture continues to be the fastest-growing food sector, maintaining a growth rate of almost 7 percent per year (FAO).

Fish farming has been practiced in different parts of the World like Europe, Canada, East Asia, China, Africa and developing Countries like Nigeria (FAO). It has been in practice since the ancient Civilization of Egypt and China. More than 120 Million People throughout the World are estimated to depend on fish for all or part of their income. Worldwide harvest of fishery products has steadily increased to meet the growing global demand for Sea food (Anderson). Over 4000 Aquatic species are harvested Worldwide, 80 % of the World's fisheries are located in the Coastal and Ocean environment and nearly 20 % are found in the inland freshwater fisheries.

Fish Production in Africa and Nigeria

Fish has existed in Africa since 2000BC (Jim) and are known as Tropical fishes. Although fish is not a major staple food in the Savanna and highland zones of Africa where there is a relatively abundance of Livestock as a source of protein, however, in the tropical Forest margins of the West African coast, fish is a crucial source of protein and the dried form, a common condiment. Over 500,000,000 people in developing countries depend directly or indirectly on fisheries and aquaculture for their livelihood (Keith). Principal ground's for marine fishes such as Tuna, Sardines, and Hake are the West African coast from Morocco to Senegal and from Angola and Namibia. The Nile, Niger, Congo, and Senegal River and Lake Victoria, Tanganyika, Malawi and Chad are major source of fresh Water fish. The most common fresh Water catch is the Nile perch. In 1999, African Fishers caught a total of 6.3 Million metric tons of fish, of which 3.8 Million tons were Marine fish. Morocco, Egypt, South Africa, Ghana and Nigeria were the top African Countries in total fish catch; and Morocco, Namibia, South Africa, Senegal and Libya were the highest exporters of fish. Morocco is also the leader in fish processing industries, producing more canned fish, fish oil, and fish meal than any other African country (Newman).

Nigeria's 2005 fish catch was 579,500 metric tons live weight. Slightly less than half the catch was from inland Waters mainly Lake Chad, the Niger Delta and Kainji Lake. The contribution of the fishing sub sector to gross domestic product in Nigeria (GDP) at 2001 rose from 76.76 billion naira to

162.61 billion naira in 2005 (C B N report 2005). Various species of Catfishes, Tilapia, and Nile perch among others are harvested using small scale and Traditional methods. Sardinellas, Bonga, Shad and Shrimp are harvested from the Atlantic Ocean (Anderson). Also recent data shows that Nigeria produced just over 600,000 metric tons of fish in 2007, consumer demand on the other hand was reported at 266 million metric tons and was met only in part by imports of about 740,000 metric tons that year (Market resources commodity fact sheet, Nigeria harvest vol. 4. 2007). It has also been reported that Nigeria imports 700,000 metric tons of fish per year to cushion the supply demand gap. Fish farming is a vibrant and dynamic commercial sector in Nigeria ripped with investment and employment opportunities. Fish farming as an economic activity was first introduced into Nigeria about 66 years ago with the establishment of a small experimental station at Onikan in Lagos State, Agodi in Ibadan, Oyo State, and an industrial farm (20 hectares) at Panyam in Plateau State by the Federal Government of Nigeria (Ayodele and Ajani). Infact the Aquaculture industry is not new to Nigeria, the first documented fish farm dates back to 50 years. Oladejo states that Fish production is projected to exceed 150 million tons by the year 2010. Eze and Ogbara reported that pond fishery is being practiced in Nigeria in large scale for better augmentation of fish products. While the African catfish *Clarias gariepinus* is widely cultivated in Africa and it is an important commercial mud fish for the Nigerian fishing industry and it is mostly cultivated in various part of Nigeria (Fafioye).

ROLES OF FISHERIES RESOURCES IN ECONOMIC DEVELOPMENT

According to FAO estimates, capture fisheries and aquaculture supplied the world with about 148 million tonnes of fish in 2010 (with a total value of US\$ 217.5 billion), of which about 128 million tonnes was utilized as food for people. Developing countries are already the most important producers of wild capture and aquaculture fish, and will be the source of most future growth in fish production (organization for economic co-operation and development). The importance of fishes can be discussed under the following headings.

- Provision of Employment
- Ensure Food Security and welfare of a nation's population
- Improvement of the nutritional and health status of a nation's population
- Fisheries Resources in International Trade and Foreign Exchange

Provision of Employment

With the increase in fish production, employment in fisheries and aquaculture has continued to increase in many countries. Many people had engaged in fishing and fish farming as a full time occupation (Jim). Employment in the primary capture fisheries and aquaculture production sector has remained relatively stable since 1995 and was estimated to be about 35 million in 2000. More than 120 million people throughout the World are estimated to depend on fish for all or part of their income. While over 500 million people in developing countries depend directly or indirectly on fisheries and aquaculture for their livelihoods (Keith).

Ensure Food Security and welfare of a nation's population

Fisheries and aquaculture contribute significantly to food security and livelihood. According to Godwin, and James, the United Nation's Food and Agriculture Organization (FAO) opined that global production from capture fisheries and aquaculture is the highest fish supply currently on record and remains very significant for global food security, providing more than 15 % of the total animal protein supplies and at least 50 percent of animal protein and minerals to 400 million people in developing countries (Keith). China still remains the largest producer with reported fishery production of 41.6 million tons (17 million tons from fisheries and 24.6 million from aquaculture). The united nation's food and agriculture organization estimated that half of the world's seafood demand will be met

by aquaculture in 2020, as wild capture fisheries are over exploited and in decline. Infact, aquaculture production is becoming an essential part of the world's fish supply. The share of the total world's harvest produced through aquaculture has steadily increase over the past two decades and now accounts for nearly 20% of the world harvest (Anderson). To boost aquaculture therefore, fisheries must depend upon hatcheries where fish reproduction and survival is enhanced to provide the young fish. In Nigeria fish farming is projected to exceed 150 million metric tons by the year 2010 (Oladejo). The availability of an access to fish within a household can therefore be an important determinant of its Members Wellbeing. At the household level, the consumption pattern may depend on the availability of hard currency, the primary activity of the household and social structures and customs of the people (Ahmed and Krishen). Fish serves as an important food for human. Edible tissues of fish are appreciably greater than that in chicken, pig and sheep/goat (Rohan). For example, approximately 65% of the raw weight of finfish is eaten, compared with 50% of chicken and pigs, and 40% of sheep/goat; fish are supported by water, but terrestrial animals and birds require comparatively strong bones so they spend their substantial energy into the growth of the bones, which cannot be consumed as food. The total estimated fish production of the world in 2012 was 158 million metric tons with a per caput consumption around 19.2 kg.

Improvement of the nutritional and health status of a nation's population

Fish contains a large proportion of protein therefore it is a valuable body building food. Fish is a very important source of complete protein, it is fresh and tender due to bundles of muscle fibres which are tight together by fibrous materials largely made up of a protein called collagen, therefore an excellent dish for the old and diabetic patients. Fish also contains considerable amounts of vitamin A, B, D and E, nutrients like niacin and minerals such as Copper, Iodine, Iron, calcium, fluorine, magnesium, zinc and Phosphorus . Fish make a vital contribution to survival and health of a significant portion of the World's population. In some Asia's poorest Countries, people derive as much as 75% of their daily protein from fish (Ahmed, and Krishen). Fish alone account for about 35 % of animal protein in Nigeria (Market resources). In rural and fishing communities in Nigeria, fish is known to play a significant role in the diet providing up to 75 % of the total animal protein intake. The nutritional value of fish and meat in terms of both protein and micro-nutrients in child development is well documented (Addis). For instance aiding in bone and teeth formation, also combating malnutrition. Cod liver oil is of high medicinal value in children. Eating deep sea fishes like Tuna and Salmon are highly valued for their cholesterol removing abilities, thereby preventing the condition atherosclerosis In fact, supplementation of omega 3 polyunsaturated fatty acids prevents increase in arterial stiffness especially in post menopause women with coronary artery diseases. They cannot be produced in the human body, but are essential in the diet. These poly-unsaturated fatty acids can help to reduce the cholesterol level in the blood, thus minimize the risk of a heart attack (Rohan). Also vitamin E not only helps in the elimination of cholesterol and prevents inflammation, It also increases the flexibility and fluidity of your blood vessels so that they respond well to any change of pressure (Erkkila, and Cardiovas) thereby reducing the risk of cardiovascular diseases. Atherosclerosis is a condition in which cholesterol, calcium and biochemical waste are deposited as plaques on the inner walls of blood vessels, causing vessels walls to thicken and become rigid and so restricting blood flow and makes blood vessels much more brittle. Fish is low in fat, high in protein and an excellent source of Omega-3 fatty acids. Regular consumption of fish can reduce the risk of various diseases and disorders. Some research findings indicate the following:

- **Asthma:** Children who eat fish are less likely to develop asthma.
- **Brain and eyes:** Fish rich in Omega-3 fatty acids can contribute to the health of brain tissue and the retina of the eye. The IQ level of children whose mother consumed about 340 g fish per week during pregnancy was found higher than non-fish eaters. Similarly, breastfed babies whose mothers eat fish have better eyesight, perhaps due to the Omega-3 fatty acids transmitted in breast milk.

- **Cancer:** The Omega-3 fatty acids in fish reduce the risk of many types of cancers by 30 to 50 per cent, especially of the oral cavity, oesophagus, colon, breast, ovary and prostate.
- **Cardiovascular disease:** Eating fish every week reduces the risk of heart disease and stroke by reducing blood clots and inflammation, improving blood vessel elasticity, lowering blood pressure, lowering blood fats and boosting good cholesterol.
- **Dementia:** Elderly people who eat fish or seafood at least once a week may have a lower risk of developing dementia, including Alzheimer's disease.
- **Depression:** People who regularly eat fish have a lower incidence of depression. Depression is linked to low levels of Omega-3 fatty acids in the brain.
- **Diabetes:** Fish may help people with diabetes to manage their blood sugar levels.
- **Prematurity:** Eating fish during pregnancy may help reduce the risk of delivering a premature baby.

Further, it is observed that different fishes are used as Ayurvedic medicines which help in the treatment of duodenal ulcers, skin disease, night blindness, weakness, loss of appetite, cough and cold, bronchitis, asthma, tuberculosis, etc. (Rohan)

Fisheries Resources in International Trade and Foreign Exchange

Fish products are among the most widely traded foods, with more than 37 % (by volume) of world production traded internationally (FAO). Godwin, and James, reported that international trade in fish production has increased to a new record of US \$55.2 billion, continuing the last decade accounting for over 4% annual growth in fisheries trade. The net export trade from the developing countries increased from \$10 billion in 1990 to \$18 billion in 2000. The increasing demand for sea food has led to a complex global system of trade in the fisheries products. Japan is the largest importer (Anderson). Some fishery products exported by countries include-dried fish, fresh or ice fish, canned fish products; Salmon roll (eggs) and sea urchin roll and shrimps. Others include useful leather and polishing materials and oil made from the skin of some cartilagenous fishes (e.g chondrichthyes like dog fish shark).

Nigeria in the last decades has exported an average of 1500-2000 tons of shrimps annually and 5 tons of smoked fish alone. The peak was at about 14,700 tons in 1992 with exploitation of foreign water arising from bilateral fishing rights agreement being reached with our friendly nations. Through this, a lot is being earned as foreign exchange which is used for national development. An average revenue of about 2.6 billion is been realized from issuance of industrial license in 1992 alone, the estimated aggregate investment in sea fishing crafts an gears at 1992 is about 4.0 billion (Ayodele, and Fregene).

AQUACULTURE AS A MEANS OF JOB CREATION

The aquaculture value chain is a conglomeration of activities linked together to stimulate the various segments of aquaculture in such a way that the products and byproducts are processed into its final stage for end users or consumers. It is called a value chain because the various activities that lead to getting fish on the table of consumers are linked together to add value to each other in the process of production or farming. For instance fish farming is not just an activity related to the fish farmer alone, it involves a lot of people and professions who under normal circumstance would not have teamed together in the process of fish production. There are people who will never eat fresh fish. The fresh fish dryer has added value to the fresh fish farmer who now makes it possible for those who would not have bought fresh fish to buy them at the dry state. This in turn gives profit or value/ increased turnover to both the farmer and dryer. The value chain can be listed as, hatchery farmers, fish fry nursery farmers, growers of table size fish, middle men who buy farmed fish and sell to retailers. Other members of the value chain include fish feed and drug sellers, feed and drug formulation/production factories, cereal farmers, fish dryers and sellers, consultants in fish farming, plumbers, restaurants/hotel

operators, fish farming for recreation and sports and aquaculture engineers, pond builders and fabricators of equipments and tools. Aquaculture indeed is a veritable avenue for job creation. Growth in aquaculture has transformed production and trade of fish products. To ensure that this transition in fisheries sustainably improves food and nutrition security, policies that recognise and safeguard the diversity and complementarity of roles played by capture fisheries and aquaculture are needed (Belton, B.).

Constraints to Development of Fishery Resources

Although fishery resources are known to play vital roles in national development, a lot of constraints militate against the achievement of rapid development of the fishery sub sector. Among such factors are:

Poverty

The skills involved in fisheries are multi-disciplinary and poverty has remained a major constraint to fishery resources development (Binjin). Ahmed and Krishen also stated that fishing communities are frequently identified as being among the poorest of the poor of the world, characterized by over-crowded living conditions, inadequate social services, low level of education and lack of skills and assets, particularly land that would permit a diversification of their livelihood. Similarly, Oabokaba opined that most of the fishermen and fish farmers in Lagos state were illiterates and depend mostly on local creditors or middle men for finances. Furthermore, Madfadyen and Coccoron observed that in developing countries, millions of people live in small scale fishing communities. While it is acknowledged that not all small scale fishers can be assumed to be poor, a large proportion of them are and remain so despite the effort of non-governmental organizations, donor agencies, national and local governments and the communities themselves.

Government Policies

Most government policies are aimed at accelerating growth through technological and infrastructural development, and markets led economic policies but are not focused on improving living conditions of the poor, hence the continued level of poverty in small scale fishing communities of the world. This sub sector, therefore, requires a wholistic concern.

Climate Change

Climate change is modifying fish distribution and the productivity of marine and fresh water species. This has impact on the sustainability of fisheries and aquaculture and the livelihood of the communities that depend on fisheries. The effect of sea level rise due to flooding means the coastal fishing communities are in the front line of climate change. While changing rainfall pattern and water use impact negatively on inland (fresh water) fisheries and aquaculture, Keith states that the increase in green house gas emission (GHGE) has led to changing rainfall patterns, rising ocean temperature and acidification, which has radically altered aquatic ecosystem. For example, marine organisms such as shrimps, oysters, or corals find it difficult to form their shells, and coral reefs which provide habitat for millions of fish species are known to die, thus the entire marine food web is being altered. As a result, the distribution, productivity, and species composition of global fish production is changing, generating complex and inter related impacts on breeding and nursery areas for fish. The impact of climate change can be addressed through adaptation and mitigation. For example, the restoration of mangrove forest can protect shore lines from erosion and provide breeding grounds for fish. Several international agencies including FAO and World Bank have programmes to help countries and communities adapt to global warming by developing policies to improve the resilience of natural resources through assessment of risk and vulnerability by increasing awareness of climate change impact and strengthening institutions such as for weather forecasting and early warning systems. The World Development Report; development and Climate Change Chapter 111 shows that reducing over capacity in fishing fleets, rebuilding fish stocks and reducing green house gas emission can both improve resilience to climate change and increase economic returns from marine capture fisheries by U S Dollars 50 billion per year. Other constraints to fisheries include absence of a comprehensive man power development and training programme for all cadre of people in the fishery

subsector as fish farming requires proper knowledge of aquaculture, site selection and management skills. Culturing of fish in a pond may have problems which can cause a setback to fish production. For instance, inability of the farmer to monitor oxygen level, prevent predators, monitor water quantity, infestation by parasites are some of the Setbacks. Deficiency due to lack of essential elements like Vitamins and Minerals, environmental problems caused by change in acidity and alkalinity of the pond water and water quality should also be Considered (Arrigon, Binjin). Furthermore, by catch, where low graded and unsuitable fish stock are caught, over harvest and indiscriminate fishing leading to over exploitation and extinction of our aquatic species like Swordfish, Blue fin, Salmon, many flat fishes, barriers across rivers which often have negative impact on the natural fish population and contribute among other factors to diminished abundance, leading to disappearance of some fish species (Garcia and Newton).

CONCLUSIONS

The aim of this paper is to analyze the impact of fisheries resources on the economic growth and job creation in Nigeria. Fisheries and aquaculture provide livelihoods for hundreds of millions of people. Sustaining the capacity of world fisheries to provide food and jobs requires sensible and effective management. Governments intervene in fisheries to the benefit of commercial fishers and others in society. Fisheries resources also play a vital role in foreign exchange, contributing to country's GDP. Fisheries resources improve the economic status of fish farmers thereby reducing the level of poverty among fish farming households and in the society at large.

RECOMMENDATIONS

The following recommendations derived from the study are intended to improve the

fisheries situation in the sector which includes:

- Community-based aquaculture: Successful community participation in the allocation of leases requires equitable distribution of benefits and strong leadership to benefits the community.
- The fisheries sector has a considerable contribution to make to the country's economic development and there is no doubt that it presently operates well below its maximum potential. In order to optimize the development of the sector, new and well defined policy guidelines with clear strategies need to be implemented and updated as conditions in the fisheries sector change. Any policy decision that is taken by government must be carefully implemented and closely monitored by the implementing agency.
- In a drive to further diversify the fisheries sector, government should actively encourage the setting up of joint ventures to diversify the fishery and increase the economic returns.
- An attempt should therefore be made to reach a compromise with all stakeholders but
- Whatever the decision reached it should not interfere with the objective of resource
- conservation and/or fisheries management.
- Nigerian governments should appreciate the water bodies that abound in the country and should strive to optimize the social and economic potentials of sustainable fisheries development.

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