

Aquaculture in Africa: Current Status and Conjectural Assessing of Potential of its Coastline (Land Side) for Aquaculture in Future



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Abstract

In 2020, Africa (except Egypt and Nigeria) had about 400 thousand tonnes of products by aquaculture. But, hypothetical studies show that this amount can be increased to 1,500 thousand tonnes if 1% of the length of the African coastline is dedicated to aquaculture. It is sufficient for one serving of protein food for 5 billion people (300 g raw aquatic product for one serving). The results of this research are hypothetical and differ from the existing reality, but these data show that African coasts have a high potential for aquaculture development. Countries that are developed in the field of aquaculture ought to help Africa in the development of the aquaculture industry.

Keywords: Africa; Aquaculture; Development; Food Poverty

Introduction

Poverty in some regions of Africa is one of the most obdurate features of the world economy. Since the industrial revolution, this has been the world's poorest and also its most slowly growing region. Also, their gross domestic product is low [1]. In Africa, more than 140 million people are facing with hungry crisis [2]. Therefore, Africa needs ways to produce more food. The popularity of fishery products is increasing because of their palatability and nutrition. According to a report from the Food and Agriculture Organization (FAO) of the United Nations, the global production of fishery products has continued to grow over the past decades and exceeded 167.5 million tonnes in 2020. Africa's share of aquatic production (catching and aquaculture) is 11 million tonnes in 2020. It is equivalent to 6.56% of global production. Africa's portion of aquaculture (cultivation) is 2.35 million tonnes in 2020. It is equivalent to 1.92% of global production [3].

More than half of the world's population lives within 60km of the shoreline and in Africa trends in population growth indicate that these numbers could rise to 75% by the next century. Coastal and marine areas are uniquely situated to support a variety of

activities and to serve diverse human needs for nutrition (Fishing, Aquaculture, etc.), transport, recreation, oil and energy. Ninety percent of the world's fish catch comes from the continental shelf and upwelling regions, and at present, approximately 10% of the world's total animal protein supply comes from the sea. The Eastern African coast and marine areas have some of the world's richest ecosystems containing extensive coral reefs, lagoons, estuaries and mangrove forests. The seashores of Somalia, Kenya, Tanzania, and Mozambique are rich in marine habitats and in sheer numbers of marine plant and animal species. Within this tropical belt are found extensive mangrove forests, vast stretches of seagrass beds, and several hundred km of sandy beaches, limestone cliffs, lagoons and diverse coral reefs. These ecosystems support a wide diversity of plants and animals and economic benefits derived from the coastal and marine environments are essential for a large part of the population in the countries of this region. The west and central African coastline stretches for approximately 8,000km and is characterized by marked diversity. The climate ranges from desert-like in the north - the Sahara - through a humid tropical belt, which contains two of Africa's

largest rivers, the Niger and Congo, to desert again in the south - the Kalahari. The coastal zone ranges from dunes through marshy delta lands and mangroves to rias with steep cliffs. The continental shelf also varies markedly in width from some 70km in the Gulf of Guinea to about 4 km off Angola and Zaire [4].

The development of aquaculture is a strategy to fight hunger and provide food for humans. Fishery products are delicious, nutritional and healthy foods, and their popularity in today's market is growing. They consist of suitable proteins for humans [5]. The amount of aquatic production depends on several farm management factors such as the type of aquatic organism, number of stockings (extensive, semi-intensive and intensive), aeration, feeding and etc [6]. The amount of production for Shrimp, milkfish, black bass, golden shiners and goldfish have been reported as 2250, 4000, 2590, 1100 and 1700Kg/ha respectively [7]. Also, it reported for freshwater crayfish, marine mussels raft, carp in pond, shrimp in pond, sea bream in cage, sea bass in cage and eels as equal 90, 10000, 900, 6000, 15000, 15000 and 60000 Kg/ha respectively [6]. However, the production of aquatic animals (finfish and shrimp) can almost reach 5000 Kg/ha on average in the controlled condition of farms.

The income from the sale of cultivated baitfish per hectare in 1997 in Arkansas, USA was equal to 4600\$US [7]. Price marketing of aquatic animals for 1Kg in China market were 4-5.6\$ for black bass, 1.5-1.7\$ for common carp, 1-4\$ for pacific oyster, 7-10\$ for scallop, 9-12\$ for Japanese eel, 2-3.8\$ for channel catfish, 10-12\$ for Tilapia and 8-12.4\$ for white leg shrimp [8]. However, it can suppose that the aquatic animals can sell for about 5\$/Kg on average. Africa is the world's second largest and second-most-populous continent. Africa's area is 30.37 million Km² and its population is 1.393 billion in 2021 [9]. The length of the coastline of Africa is about 30000Km [10].

Method (Estimating Aquaculture Potential)

In this article, at first, it was explained how much aquatic animal may be harvested from one hectare of a farm and how much it costs? Then, it was calculated the approximate length of the coastline of Africa. Then, we try to estimate how many aquatic animals can be harvested from the 1% length of the coastline of Africa. Certainly, the entire coastline of Africa is not suitable for aquaculture. We estimated that only 1% of the African coast would be capable of establishing aquaculture farms. It is assumedly percent. Then, based on assumptions, we tried to see how much aquatic animal could be harvested from the coastline of Africa. How much does it cost? How much protein is produced by it? How many people may feed it? Then, we compared our result with the current aquaculture production in Africa. It is hoped that this article will be a way to fight food poverty and develop aquaculture in Africa.

Result

Africa's coastline is about 30000Km [10]. If only one percent

of the length of the coast of Africa is suitable for aquaculture and fish breeding. Therefore, it can be estimated that the length of such an area will be almost 300km. Also, if the width of the area dedicated to fish farming reaches 10km. Therefore, the area will be 3000Km². However, it can be expected that 300000 hectares of area will be suitable on the coast of Africa for aquaculture. Probably, our estimate is lesser than real, and it was believed that Africa has more suitable areas for aquaculture.

It is supposed that: 1. At least 1% of African coastal land is suitable for aquaculture. It is equal to 300000 hectares. 2. It was claimed almost 5000Kg of aquatic animal were produced in each hectare. The result of this article is based on estimation, and it needs more study to find the real potential of Africa for the aquaculture industry by practical research on the coastline of each country of Africa. However, if 300000 hectares of African coastal lands are allocated to aquaculture and it was assumed to harvest 5 tonnes of aquatic products from each hectare. Therefore, Africa will be able to produce 1500000 tonnes (1.5 million tonnes) of aquatic products per year. Based on this finding we decided to evaluate its cost and its potential as food for Africans. If suppose that the price of each Kg of aquatic product is equal to 5\$. Therefore, 1.5 million tonnes of aquatic products are costing as equal as 7.5 billion US dollars. On the other hand, it was supposed that there is need 300 g of raw aquatic product to make one serve of proteinaceous food for 1 man. Therefore, 1.5 million tonnes of aquatic products will be adequate to make 5 billion servings of food for hungry people. In other words, it will be adequate to make 35 serving food for 140 million hungry people.

Discussion

Africa's share of aquatic production is 11 million tonnes in 2020. It is equivalent to 6.56% of global production [3]. On the other hand, about 17.5% of the world's population are in Africa [9]. Aquaculture in Africa (except Egypt & Nigeria) reached 396700 tonnes in 2020 with 14.5% growth in comparison with 2019 [3]. Our speculative calculations show that only the coastlines of Africa (No inlands) have the potential to produce 1500000 tonnes of aquatic products per year, so according to our estimate, aquaculture in Africa is capable to develop at least 3.7 times more than the year 2020. This is even though in our calculations, we allocated only 1% of the length of African coasts to aquaculture, if this percentage increases more than 1%, African coasts will be capable of developing aquaculture more than 3.7 times. We think that more than 1% of the coastline of Africa is suitable for aquaculture.

Conclusion

The growth and development of the aquaculture industry can be one of the possible solutions to fight poverty and hunger in Africa and increase income of the Africans. Coastal areas of Africa can have great potential for aquaculture. African coasts should be studied more carefully, and its potentials should be exploited more.

The lack of information and awareness about coastal and marine processes and ineffective management are at the heart of the aggravated situation along the coast. In the United Nations Conference on the Environment and Development (UNCED), protection of the coastal and marine environments to ensure sustainable use of its natural resources was at the top of the agenda for action. Under Chapter 17 of I Agenda 21, coastal states were urged to “commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction” [4]. Therefore, rules of sustainable development must observe for aquaculture development on the coastline of Africa. This requires adequate research by fisheries organizations.

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