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The Importance of Aquaculture Production in Africa

Wadah Elsheikh[1*], İlknur Uçak[2], M. Cüneyt Bağdatlı[3]

[1]University of Khartoum, Faculty of Animal Production, Khartoum, Sudan
[2]Nigde Ömer Halisdemir University, Faculty of Agricultural Sciences and Technologies, Nigde, Turkiye
[3]Nigde Ömer Halisdemir University, Faculty of Architecture, Department of City and Regional Planning, Nigde, Turkiye

Abstract

Aquaculture is a significant agricultural endeavor that has the potential to eradicate global undernourishment and provide food security. In Africa, fish farming has witnessed remarkable growth in the past period, especially in Egypt, Nigeria, and Uganda. Given the availability of water bodies, some institutional commitment, and a strong demand for fish, among other factors, these countries have very prospective aquaculture sectors. Despite the enormous potential of the aquaculture sector and the notable successes of some countries, the industry faces a number of obstacles, including low adoption of advanced technologies, a lack of fingerling supply, ineffective management practices, high infrastructure and feed costs, and a lack of knowledge about existing innovations. Therefore, this study is to highlight the importance of aquaculture in Africa and clarify the basic function that it plays in the continent's food security and economic relevance. Moreover, identify the opportunities and challenges faced by this important African business. Africa has significant potential for growth and improvement in the aquaculture sector. Considering the great potential and opportunities in this industry, several African countries have made progress in developing their aquaculture industries. Including aquaculture in regional food systems needs to be a bigger priority in Africa. Furthermore, there is an urgent need for action to address problems affecting the African aquaculture industry and secure funding for sector growth.

Key Words: *Aquaculture Production, Africa*

Introduction

Aquaculture has been around for thousands of years, although it has only lately seen significant global expansion. Although the exact origin of aquaculture activities is unknown, research conducted over time indicates that the practice has been going on for millennia. The first stages of this production may have begun in the Neolithic era, about 4000 B.C., and involved the capture of aquatic creatures in little pools of water so that they would always be available (Rocha et al., 2022). Due to the increased demand for seafood over the past 50 years, aquaculture has become the food industry with the highest rate of growth in the world. More than 50% of the fish food supply in the world is being produced aquaculturally, including finfish, mollusks, and crustaceans (Garlock et al., 2020; Elshelikh, 2021). The worldwide fish supply is expected to reach 204 million tons in 2030, up 25 million tons from 2018 and totally supported by aquacultural production (FAO, 2020). With a projected population of 9.6 billion by 2050, supplying the world's expanding population is already a major concern. Increasing sustainable food production, improving the nutritional value of food produced, and reducing food waste are all important to attain global food and nutritional security in an environment where land and water, two resources essential for food production, are becoming more limited (Kobayashi et al., 2015). Under these difficult conditions, aquaculture is emerging as a vital food production system (Rogers, 2023). Thus, it is evident how crucial aquaculture is to the world's food security.

Aquaculture was introduced to a number of African countries in the early 20th century, and in Kenya, tilapia was successfully raised in standing water ponds throughout the 1920s and 1930s. Later, between the 1940s and 1950s, colonial governments throughout Africa introduced aquaculture as a sustainable food production method with the goals of enhancing rural nutrition, generating additional revenue, diversifying to lower the risk of crop failure, and creating jobs in rural areas. As a result, the government constructed a large number of fish farming stations in the 1950s; by the end of 1950, there were around 300,000 operational production ponds throughout Africa (Adeleke et al., 2020).

The FAO started to lead the development of aquaculture in the area in the 1960s, working in collaboration with governments, donor nations, national and international research institutes, and non-governmental organizations. The main focus of the efforts was on basic research and development to comprehend useful methods for a variety of primarily native species. From the early 1970s to the early 1990s, additional financial and technical help accelerated the growth of aquaculture in the region (Hecht et al., 2006).

Although growth in aquaculture output has been moderate throughout the years, Africa has made some headway. The socioeconomic climate, access to capture fisheries resources, availability of water, and other factors make it

impossible to assess the aquaculture success of African nations only based on GDP contributions or absolute output levels. In addition to other macroeconomic parameters like population size and the endowment of natural resources, it is required to include other metrics that assess the significance of aquaculture as a source of food (Hinrichsen et al., 2022). Therefore, the primary goal of this study is to highlight the importance of aquaculture in Africa and clarify the basic function that it plays in the continent's food security and economic relevance. Furthermore, to provide light on the prospects and obstacles that this significant African industry faces.

The importance of Aquaculture Production in Africa

Out of all the five continents, Africa has had the fastest growth rates in the production of aquatic species since 2001. The largest increase rate, of more than 14% over the preceding decade, was noted in the years 2006–2010. The continent grew at a pace of more than 7% between 2016 and 2018, exceeding both the global average and all other continents, even if the rate decreased in the years that followed. Egypt, Nigeria, and Uganda have contributed significantly to the overall rise in aquaculture output on the continent, accounting for about 91% of the total. Furthermore, Egypt is the world's sixth-largest producer. African countries produce almost exclusively (99%) in inland freshwater systems, mostly for the cultivation of African catfish and tilapia. The remaining 1% of output comes from mariculture, a sector that has received increased attention since the early 2010s (FAO, 2020; Rocha et al., 2022). Along with the advancement of existing methods, new aquaculture production systems including tanks and cages were established. About 6.2 million people are employed in the aquaculture industry in Africa, with a significant proportion of these workers being women who work on large-scale commercial farms (Satia 2016). According to Satia (2017), women are mostly employed in the aquaculture value chain's downstream postharvest and marketing activities. Therefore, the aquaculture industry has a great chance to boost Africa's economy, lower unemployment, and increase food security. While larger-scale investments in Egypt, Nigeria, Uganda, and Ghana are generating significant amounts of fish, Africa's contribution to global aquaculture production is still negligible (about 2.7%). With a cumulative annual growth rate of 15.55%, the region's output increased twentyfold between 1995 and 2018, from 110,200 to 2,196,000 tons (Halwart, 2020).

Aquaculture production increased as a result of the establishment and expansion of small and medium-sized businesses under private sector administration. Additionally, the growth of aquaculture was aided by the establishment of the FAO Special (Adeleke et al., 2020). Several African governments have begun to recognize the significance of fostering a business-friendly atmosphere by implementing measures including accelerating, coordinating, and enacting policy reforms. A few nations have created and implemented strategic frameworks and policies based around aquaculture as a means of directing growth. A few governments have made it easier to provide soft credits and incentives, but land ownership, reasonable loan availability, and adequate input quality and quantity continue to be important obstacles to the growth and intensification of the aquaculture industry (Machena and Moehl, 2001; Jamu & Brummett, 2004; Adeleke et al., 2020). Growing private sector leadership has been observed in a few countries in the production and distribution of important aquaculture inputs, including as feeds and seeds, whereas manufacturers and suppliers of aquaculture equipment are located in other nations (Koge et al., 2018). Economies of scale, lower transaction costs, competitiveness, and support service delivery have all benefited from the establishment of fish farming clusters (Adeleke et al., 2020). Several African nations are currently addressing biotechnological, economic, and institutional obstacles that exist. These obstacles include the lack of national policies to direct the development of aquaculture, unwelcoming investment policies, a lack of connections between farmers, research/technology development and extension, and unfavorable investment climates (Babatunde et al., 2021).

Egypt, Nigeria, Uganda, Ghana, Tunisia, Kenya, Zambia, Madagascar, Malawi, and South Africa are the leading aquaculture producers in Africa. Over the last ten years, there has been a notable surge in the number of these major aquaculture producers. This growth can be attributed to various factors, including the development of capacity in crucial areas, the adoption of good governance, research and development, credit facility accessibility, and most importantly, the encouragement of private sector-led aquaculture development. Investments in competent management, new production techniques, the creation and use of aqua-feeds, and the growth of strong and vibrant producer associations and service providers are all results of private sector-led initiatives (Adeleke et al., 2020). Aquaculture in some countries has issues related to the growth of the industry, especially the scarcity of high-quality seeds and feed.

Globally, aquaculture has contributed progressively to the overall productivity of fisheries and aquaculture (except from algae), rising from 13.4% in 1990 to 49.2% in 2020, a level with capture. Within and across areas, its contribution varies substantially. Estimated at 2196 million tons, or around 2.67% of worldwide aquaculture production in 2018, freshwater finfish production accounted for the majority of Africa's production (Halwart 2020). About 90% of the region's aquaculture production is produced by the top three producers, Egypt, Nigeria, and Uganda (Table 1).

Table 1. Top 10 aquaculture producers in Africa in 2018 (FAO 2020; Adeleke et al., 2020)

Country	Production (metric tons)	Regional share (%)	Global share (%)
Egypt	1,561,457	71.10	1.90
Nigeria	291,233	13.26	0.35
Uganda	103,737	4.72	0.13
Ghana	76,630	3.49	0.09
Zambia	24,300	1.11	0.03
Tunisia	21,756	0.99	0.03
Kenya	15,124	0.69	0.02
Malawi	9014	0.41	0.01
Madagascar	7421	0.34	0.01
South Africa	6181	0.28	0.01

Due to increased private sector investment and the Egyptian government's cumulative and constant interventions throughout the years, the aquaculture business in Egypt developed quickly starting in 1998 (Soliman and Yacout, 2016). Consequently, Egypt's aquaculture output increased from 139,389 tons in 1998 to 1,561,457 tons in 2018, accounting for 71% of Africa's total aquaculture production (FAO, 2020). According to Cai et al. (2017), Nigeria has the largest demand for fish in Africa, which has led to the fast expansion of peri-urban commercial aquaculture. The production of aquaculture increased from 20,458 tons in 1998 to 291,233 tons in 2018 as a consequence of the market-driven expansion. The private sector drives the growth of the whole aquaculture value chain, with the Nigerian government tasked with creating a favorable business climate (FDF 2012). Since 2000, Uganda's aquaculture industry has grown rapidly as more people became aware of its potential to combat unemployment, food poverty, and hunger. Consequently, the government's strategic actions and the assistance of development partners boosted the growth of aquaculture (Cai et al., 2017). Between 2001 and 2018, the amount of aquaculture produced rose from 2360 tons to 103,737 tons. Given the notable increase in Egypt, Nigeria, and Uganda's aquaculture production output over the last 20 years, it is important to examine the crucial success determinants of these important regional players. Ghana, Nigeria, Egypt, and Uganda are the top 10 aquaculture producers in Africa, accounting for almost 93% of the region's overall production output (Adeleke et al., 2020).

Challenges and Future Prospects

Although it is expected that aquaculture will grow worldwide, a number of challenges might affect the industry's future. These include issues related to land and water and the conflicts they cause; the availability of feed, seeds, and genetic resources; issues with disease and environmental integrity; the development and adoption of new and improved farming technologies; issues with the market, trade, and food safety; climate change; obstacles to investment capital; and issues that may arise from unregulated and unmonitored aquaculture practices (FAO, 2016).

The aquaculture sector in Africa is generally beset by the following issues: insufficient fish fingerling supply; inappropriate management techniques; high fish pond establishment and feed costs; a low-quality ready-to-eat fish market; a lack of knowledge about available innovations; etc. These limitations may be sociocultural or institutional (Tall, 2017; Adeleke et al., 2020). Aquaculture necessitates expertise in a wide range of production-related fields, including spawning, feed production, pond design, and management. Consequently, a greater difficulty is the lack of knowledge and proficiency in these areas (Edun et al., 2018).

In Egypt, integrated aquaculture is one production technique that is becoming more and more popular, but it faces some challenges. Integrated aquaculture may not be permitted by land contracts, farmers are not allowed to use irrigation water for aquaculture, farmers are generally more comfortable with traditional farming practices than with "risky" ones, and there are a number of other restrictions. Policymakers should take these issues into consideration in order to promote the integration of aquaculture and agriculture (Cai et al., 2017). Significant obstacles to the growth of Egypt's aquafeed business have been noted, including the industry's reliance on feed ingredient imports and ongoing price increases. As aquaculture expands quickly, it is anticipated that the animal feed and aquafeed businesses will compete with one another for raw materials. This might have an impact on feed prices as well as the usage of outdated and compressed feed technologies (El-Sayed, 2014).

The main challenges to the expansion of aquaculture and sustainable cage culture in Nigeria and throughout Africa are the lack of affordable, locally made, premium extruded feeds made from local raw materials. The region's historically low wild fish prices and quality, the lack of processing and routes to developed markets in some countries, the lack of potential investors willing to take on long-term investment risk in Nigeria, and the lack of knowledge in disease identification and management are some additional constraints (Jega, Haque, & Miah, 2018). Additionally, because aquaculture is seen as risky and financially challenging by the rich, it usually fails to draw them to Nigeria. Offshore commerce and fishing are preferred by the rich (Oluwatobi et al., 2017). As a result, the sector's development is discouraged. The primary issue has been the inadequate use of suitable technology. Inadequate financial support, inadequate technology, inadequate technical know-how, unfavorable environmental

conditions, inadequate training, and lack of technical support are some of the factors contributing to aquaculture's lack of information (Abegunrin et al., 2019). Although there is a lot of promise and prospects in this business, many African nations have taken steps to enhance their aquaculture sectors. However, they are still finding it difficult to deal with the various constraints that impact the aquaculture industry. Therefore, we expect that these countries will adopt to address these obstacles and help develop this important sector of the national economy and food security in Africa

Conclusion

Aquaculture was initially introduced to Africa a long time ago, and later developed into a means of achieving food security and livelihoods. In Africa, although they are still struggling to deal with the various obstacles impacting the aquaculture business, they have taken steps to strengthen their aquaculture sectors, and there are many opportunities and possibilities in the industry. Countries like Egypt, Nigeria, and Uganda are setting the aquaculture world standard because they see a bright future. More funding and diversity are needed for aquaculture if it is to maintain its high potential. In order to achieve the goals associated with the development of the aquaculture sector to enhance food security and support the economy, efforts must be made to develop this sector.

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