



## POLICY BRIEF

### REPLICATING EGYPT’S TILAPIA AQUACULTURE SUCCESS STORY IN OTHER AFRICAN COUNTRIES

Egyptian strategy 2023 for fish production is producing 3 Million metric tonnes, Egypt has achieved extraordinary success in developing its tilapia aquaculture sub-sector over the last two decades to a total production of 1.1 million metric tonnes in 2022, and the constituting 61% of national fish supply, 81% of African tilapia

production and ranked as the third largest tilapia producer in the world (Figure 1). African countries with suitable inland water bodies are on the brink of a tilapia aquaculture boom which can be accelerated by learning from Egypt’s experience and expertise.

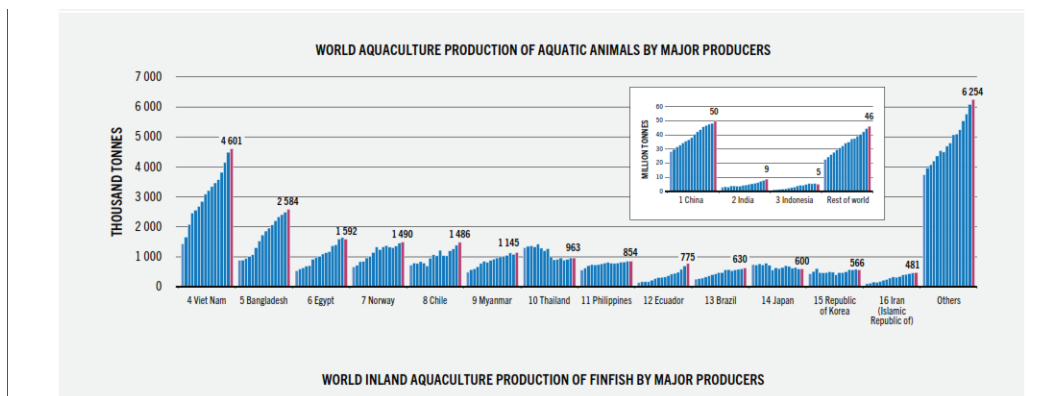


Figure 1: World aquaculture production by major producing countries. From FAO SOFIA Report 2022.

#### Why Egypt Invested in Aquaculture

Egypt prioritised investment in the fish farming sector because it has the lowest investment cost per gram of protein compared to other types of protein. The investment cost of producing the required per capita supply of protein is about 145.15 million dollars for tilapia, compared to a milk protein cost of about 416.3 million dollars, and a red meat cost of 466.6 million dollars. That is, the cost of producing fish protein is equivalent

to one third of the cost of producing milk protein or red meat alike.

The sector is well also suited to investment in small, medium and large and large enterprises and integration into agriculture.

#### Egypt’s Success Factors

Egypt’s tilapia aquaculture sector developed due to a combination of appropriate policies, private sector investment and enabling public sector

interventions such as access to state land. Critical factors promoting the development of the sector included:

1. **Private sector investment.** The sector is characterized by small and medium size enterprises based on an integrated aquaculture - agriculture system.
2. **Initial Government interventions.** The Egyptian government provided catalytic interventions to get the sector going in the 1980s. This included:
  - Assistance to establish hatcheries which supplied quality seed.
  - University level training and research at key institutions such as the Central Laboratory for Aquaculture Research (CLAR), Suez University Faculty of Fisheries, and the MADE Project Training Centre. These institutions provided critical aquaculture skills at all levels to support the development of the sector.
  - An enabling regulatory framework which provided for permits, access to rent state land.
  - Technical assistance such as veterinary services, water quality monitoring, research and feed development.

3. Egypt's Integrated Agriculture-Aquaculture Strategy Based on Limited Water Resources.

The Egyptian sector is characterized by ongoing innovation of production systems, especially climate smart aquaculture to reduce energy, chemical fertilizer and water inputs. This is achieved through systems incorporating solar energy, water reuse and agricultural crop integration which reduces the carbon footprint of the sector.

To ensure the continued growth of Egyptian aquaculture, the government has adopted a national development strategy based on the state's policy to rationalize water use. In large scale projects on 1.5 million acres of land, integrated Agri-Aquaculture is being implemented to promote efficient use of water and to

improve soil quality (Figure 2 a, b). Multi-trophic aquaculture is being promoted in the marine environment (Figure 3).

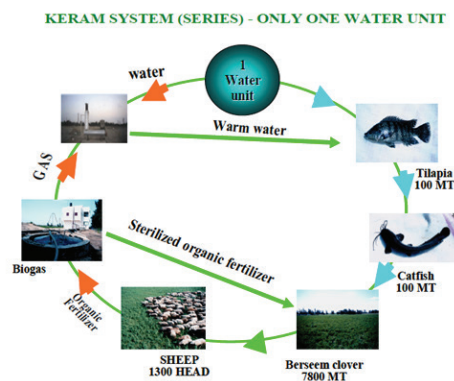


Figure 2.a Egyptian Agri-aquaculture systems. Source: KERAM Integrated Agri-Aquaculture system "KIAAS"; International Irrigation conference, Kyoto, Japan; 2003.

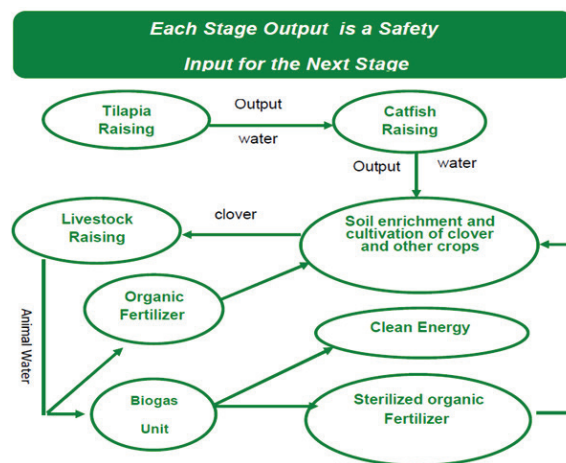


Figure 2.b Illustration of The Egyptian Agri-aquaculture systems. Source: KERAM Integrated Agri-Aquaculture system "KIAAS"; International Irrigation conference, Kyoto, Japan; 2003.

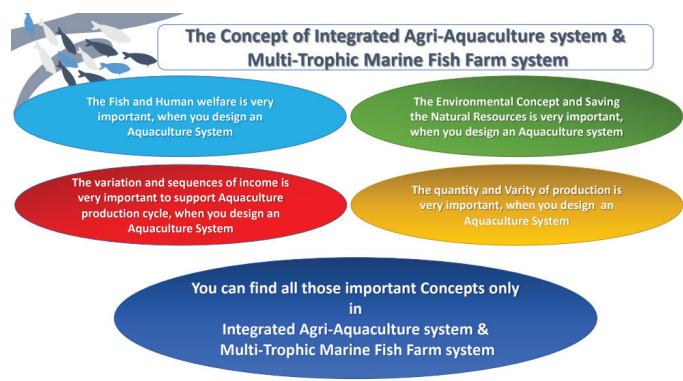


Figure 3. Principles of Egyptian Integrated Agriculture-Aquaculture systems in Fresh water and Multi-trophic Marine Aquaculture. Source: MADE II Project, Elaraby; 2022

#### 4. **An Efficient Feed Manufacturing Sector**

The aquaculture sector is supported by efficient international and local feed manufacturers which produce modern, high quality fish feeds. There has been a significant local and foreign investment in the feed industry in recent years, especially in aqua feed extrusion technology. Total feed production for the tilapia sub-sector was approximately 1.5 million metric tonnes in 2022 by 84 feed factories. 90% of raw materials such as fishmeal, soya and maize are imported, however due to global commodity shortages and price rises, Egypt has begun to cultivate inputs such as soya beans and maize locally.

#### **The African Opportunity for Tilapia Aquaculture Development**

Africa has a huge aquatic natural resource endowment for aquaculture in the form of the African great lakes (e.g Lakes Victoria, Tanganyika and Malawi), dams and major river systems such as the Congo, Volta, Nile and Zambezi. Tilapia production is dominated by cage aquaculture on over 18 water bodies with 263 installations and 20,000 cages.

Africa has a growing fish supply deficit which can only be fully met by the large-scale development of aquaculture. Demand is driven by a rapidly urbanizing population with 60 cities of over one million people. Effective supply by aquaculture requires the establishment of sustainable production facilities and a formalized supply chain to deliver healthy, traceable products.

The African tilapia aquaculture sector is still in an establishment phase and lacks the critical service infrastructure and experienced personnel of the more mature Egyptian tilapia industry.

#### **What Can Be Learned and Transferred from Egypt's Success?**

1. **Integrated production systems.** Sub-Saharan African aquaculture is still dominated by monoculture production systems, while Egypt has developed more profitable and

environmentally efficient integrated systems.

2. **Climate smart aquaculture.** Egypt is a leader in climate-smart aquaculture based on integration with agriculture, energy efficiency, water reuse and adaptation to local conditions.
3. **Private Sector Driven Development.** The Egyptian tilapia boom was primarily private sector driven supported by key interventions from the state.
4. **High quality seed production.** Egypt provided funding and support for investment in hatcheries and genetic selection to stimulate the growth of the sector.
5. **Investment in Aquaculture Skills.** Egypt invested early in tertiary training institutions to provide high level aquaculture skills as well as aquaculture vocational skills at all levels to support the projected growth of the sector.
6. **Reduced production costs.** Egypt has significantly reduced production costs through the implementation of integrated aquaculture-agriculture systems, farming 'best practices', economies of scale in feed production and services.
7. **Product certification.** Egypt has established seafood certifications systems for aquaculture products such as global gap, British Retailer Council (BRC) and a certified Egyptian food safety international qualification. This expertise for certification, monitoring and audit can be shared to establish public sector certification facilities and on-farm protocols for product export.
8. **Aquafeed manufacture.** Egypt has a large aquafeed manufacture industry with the capability to facilitate the establishment of feed manufacture infrastructures in other African countries.
9. **Egypt is Africa's natural technical partner for developing tilapia aquaculture in the rest of Africa.** For example, Egyptian feed manufacturers now have investments in a number of African countries and Egyptian aquaculture consultants are involved in projects to promote integrated and intensive tilapia farming systems.

## **Recommendations;-**

1. AU-IBAR coordinate with Egypt to provide the know how technology transfer to the Member State by ;-
  - Covering the on-job training cost for farmer in Egyptian farm.
  - Select Member states and install the pilot project in at least 3 countries with cooperation with Egyptian experts, Egyptian institutes and practical training centers.
2. AU-IBAR coordinates with Member states to make awareness meeting for private sector to transfer the Egyptian success story to their Countries.
3. Member States can put in their strategy the Agri-Aquaculture system to produce the feed row material to make self-sufficient from animal feed.
4. Member States encourage the investors by delivering some incentives to following the Agri-Aquaculture system for reducing the cost of fish production and produce much type of proteins with the same drop of water which means serve the natural resources and make a smart climate system.
5. The integrated Aquaculture system can be used as a way of life in various forms of fish farming, whether in fresh water - salt water - fish ponds - fish cages, in order to reduce the cost of production so that the cost of production is distributed over multiple types of outputs and thus is reflected in the cost, which It contributes to achieving food security for citizens on the African continent at affordable prices.