

THIS REPORT CONTAINS ASSESSMENTS OF COMMODITY AND TRADE ISSUES MADE BY  
USDA STAFF AND NOT NECESSARILY STATEMENTS OF OFFICIAL U.S. GOVERNMENT  
POLICY

Voluntary  Public

**Date:** 11/6/2016

**GAIN Report Number:**

## Egypt

**Post:** Cairo

### The State and Development of Aquaculture in Egypt

**Report Categories:**

Agricultural Situation

**Approved By:**

Ron Verdonk

**Prepared By:**

Ahmed Wally

**Report Highlights:**

- Egypt's total fish production totaled 1.560 MMT in 2015 versus 1.482 MMT in 2014. The 5.26 percent increase was driven by an 8.2 percent increase in aquaculture production of 1.230 MMT, up from 1.137 MMT in 2014.
- Wild catch amounted to 330,000 MT in 2015, down 4.5 percent from 2014, due to overfishing.
- Egypt's aquaculture industry ranks number 10 worldwide and number two in tilapia production, behind only China.
- By MY2020/21 soybean imports are projected to increase by 181 percent to 3.56 MMT from MY2015/16, driven by aquaculture and Egypt's expanding soy-crushing industry. The surge in demand will benefit traditional suppliers such as Argentina, Brazil and the United States.

## **General Information:**

### **Introduction:**

Globally, aquaculture is a vital industry that provides essential cheap animal protein to a rapidly growing population. According to the *State of World Fisheries and Aquaculture* report, published in 2014 by the Food and Agriculture Organization of the United Nations, fish accounts for almost 17 percent of the global population's protein intake, while the fishing industry supports the livelihoods of about 12 percent of the world's population. As such, the aquaculture industry plays a critical role in world food security.

Significant and rapid development has occurred in the Egyptian aquaculture sector over the past four decades. Egyptian aquaculture expanded rapidly, greatly outpacing traditional fishing activities. As a result of this rapid growth, the industry currently is number ten worldwide in terms of overall production, and number two in tilapia production.

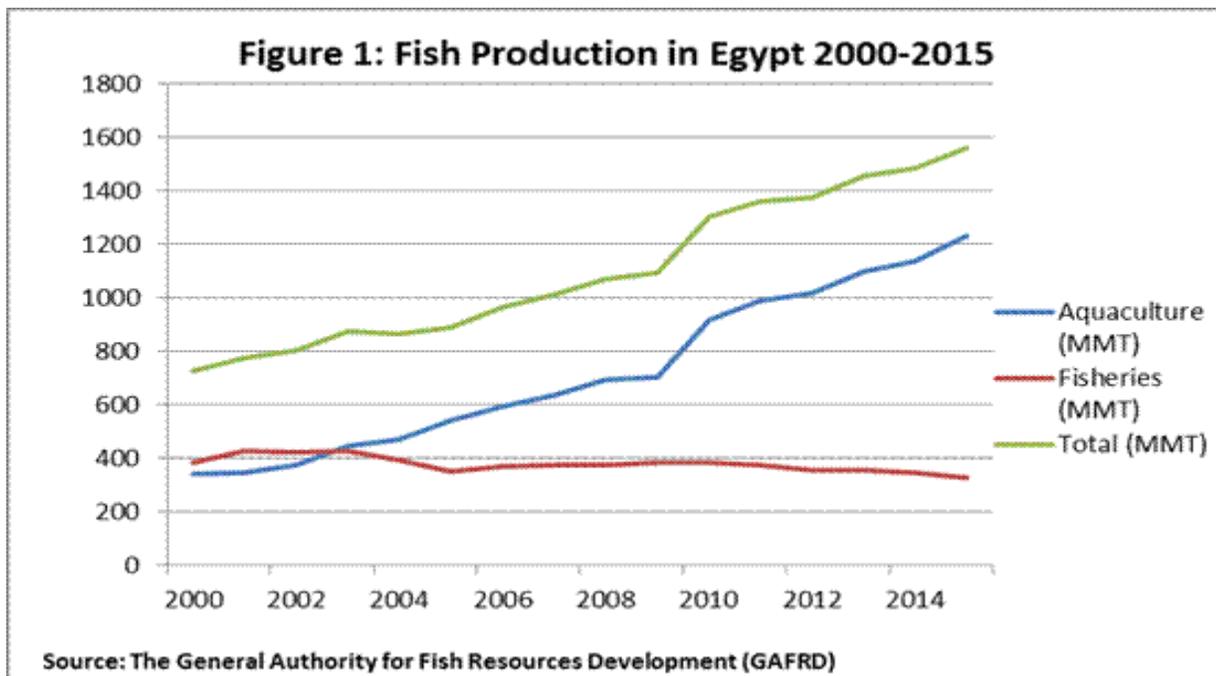
Egypt has the largest aquaculture industry in Africa. The total market value of the industry was US \$2.2 billion in 2015 (1 USD = 8.88 Egyptian pounds). Egyptian aquaculture currently provides almost 79 percent of the country's fish needs, with almost all the output coming from small and medium sized privately-owned farms.

The Government of Egypt believes that both fresh water and marine aquaculture have an important role to play in creating jobs, raising incomes, lifting people out of poverty, as well as promoting healthy diets. The government is set to reveal a number of major projects in marine aquaculture in the months ahead. Experts expect the government-led development projects to be presented to domestic and foreign investors.

The Egyptian Ministry of Agriculture (MALR) maintains a division dedicated to promoting and expanding the Egyptian fish industry. The General Authority for Fish Resources Development (GAFRD) drafts legislation and regulations affecting fisheries. GAFRD also manages farm licensing, aquaculture land use regulations, as well as extension and research services. The organization's stated goal is to enhance the development of aquaculture, increase production, and transfer knowledge to the fish farming community. The GAFRD's current strategy is to raise total fish production by 34.6 percent to reach 2.1 MMT by 2018.

### **Production:**

Total fish production increased by approximately 115 percent from 727,000 MT in CY 2000 to 1.56 MMT in CY 2015 (figure 1). Although the production from wild catch fisheries declined moderately, aquaculture production skyrocketed. Aquaculture's share grew from 47 percent in 2000 to 78.8 percent in 2015 totaling 1.23 MMT in 2015 and is expected to total 1.8MMT in 2018, which will represent 85.7 percent of total fish production, an increase of 600,000 MT or a 50 percent growth from 2015. Concomitant to that production growth, there will be an increase in fish feed demand of around 720,000 MT, of which 302,000 MT will be met by imported soybean meal.



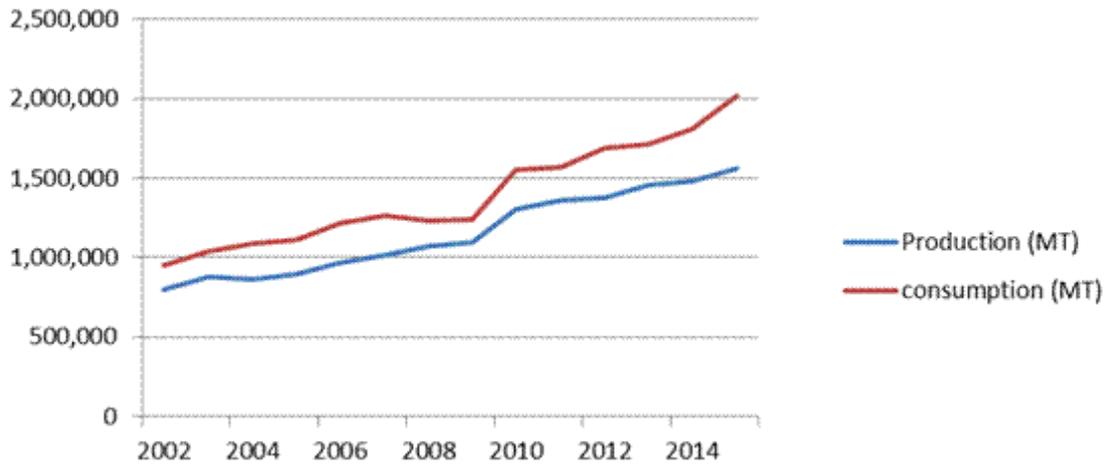
The rise in aquaculture production is mainly attributed to significant expansion in the application of new technologies such as the use of extruded feed, water circulation systems, and improved farm management practices.

Small and medium scale fish farms have intensified their fish production from earthen ponds using these new technologies, rendering farmed tilapia one of the cheapest sources of animal protein available to Egyptian consumers. This semi-intensive aquaculture system is by far the most widely-used fish farming system in Egypt, contributing to 80 percent of total production. Intensive systems in tanks and cages are rapidly developing.

### **Consumption:**

Fresh fish in Egypt is a traditional and key constituent of the Egyptian diet, and the main source of cheap animal protein for much of the lower-income population. Fish consumption exceeded local production by slightly more than half a million tons in the CY 2014 and 2015 (figure 2).

**Figure 2: Fish Production vs Consumption in Egypt 2002-2015**

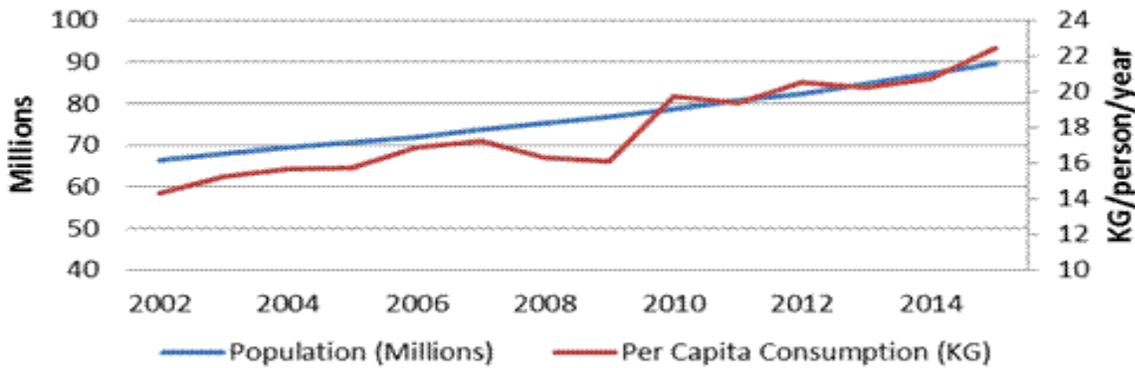


Source: GAFRD and Central Agency for Public Mobilization and Statistics(CAPMAS)

The increase in fish consumption is attributed to an increasing population, expanding domestic supply, as well as some economically incentivized changes in consumer preferences among low-income consumers. Growth in low-cost domestic fish production, improvements in distribution networks and increased importation of inexpensive canned products have made fish more accessible to the lower socioeconomic strata. For higher-income consumers, high-value salt water species are widely available including imported salmon, shrimp, and mollusks like octopus, oysters and mussels.

Since 2002, Egyptian per capita consumption of fish has increased steadily. In that year, consumption was 14.3 kilograms per person. According to official data, that number increased to 22.4 kilograms per person by 2015, representing growth in per capita consumption of 62 percent over this period (figure 3).

**Figure 3: Per Capita Consumption of Fish in Egypt 2002-2015**



Source: GAFRD and CAPMAS

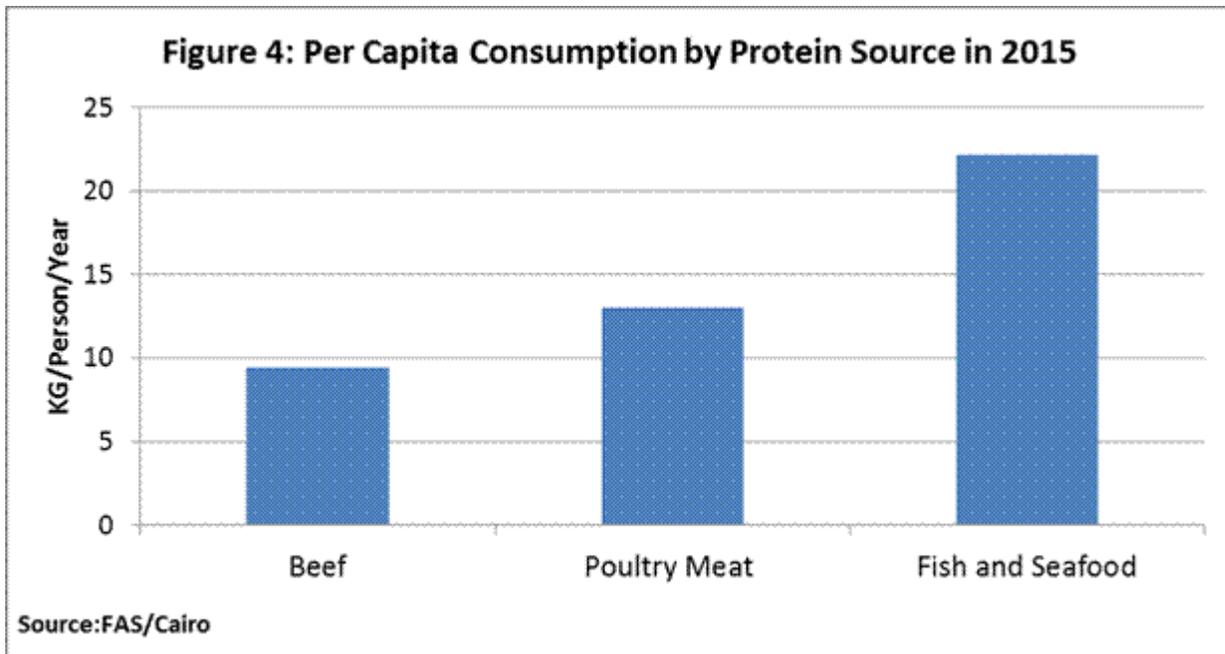
Egyptian fish is mostly sold fresh and producers or wholesalers pack the fresh fish into wooden crates, containing small amounts of ice. The crates are covered using plastic or a tarp for shipment to market. This basic cold storage system does not lower the product temperature to the point where quality can be preserved for an extended period of time.

Wholesale markets face similar challenges in maintaining the product at an adequately low temperature, so quality generally degrades quickly. With such limited cold chain capacity, the fish must be sold within hours of harvest. Fish not sold within a day is routinely sold at a heavily discounted price. In wholesale markets, products are generally sold using an auction system, where a fee is deducted from the sale to pay for the auctioneer's service.

Farmed fish are generally available for market at some supermarket chains, with the larger chains being the most likely to carry fresh fish. Large supermarket chains tend to have the most sophisticated cold chain capabilities, giving them the ability to move higher volumes of product in order to prevent spoilage. In addition to supermarkets, these products are available from outdoor retailers, dedicated seafood shops, and lower-cost restaurants or fry shops. In all cases, the fish are supplied through a limited network of wholesalers and shipped from the farm or market to the point of sale in unrefrigerated trucks. If consumption is to continue to increase, investment in cold chains or value added technology will be necessary.

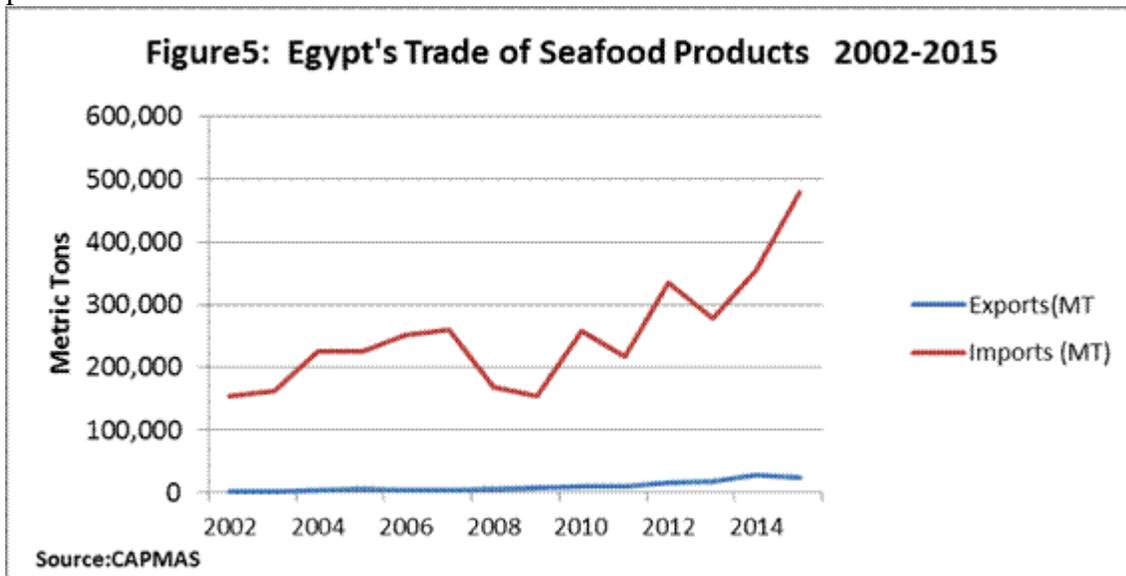
In May 2014 WorldFish partnered with the Environment and Development Group (EDG), an Egyptian consulting firm, to study consumption of fish, red meat and poultry among the resource-poor in Egypt. Their study found that resource strained households consumed twice as much fish as higher-income households. Expenditures on fish represented between 5.4 and 6.7 percent of total food expenditures (El Mahdi et al, 2015) of low income farmers. In the cases studied, total food expenditures per household averaged 70 to 100 USD per month depending on the location.

In terms of consumption patterns, only 16.5 percent of households in the study reported a preference for fish over other animal proteins, nonetheless they recognized that it was the cheapest of the three sources (beef, poultry, or fish). The study found that households purchased twice as much fish as red meat. The relative quantities proved consistent across location and expenditure quintile. The study's findings are consistent with FAS/Cairo's analysis of per capita consumption by protein source, as illustrated in figure 4.



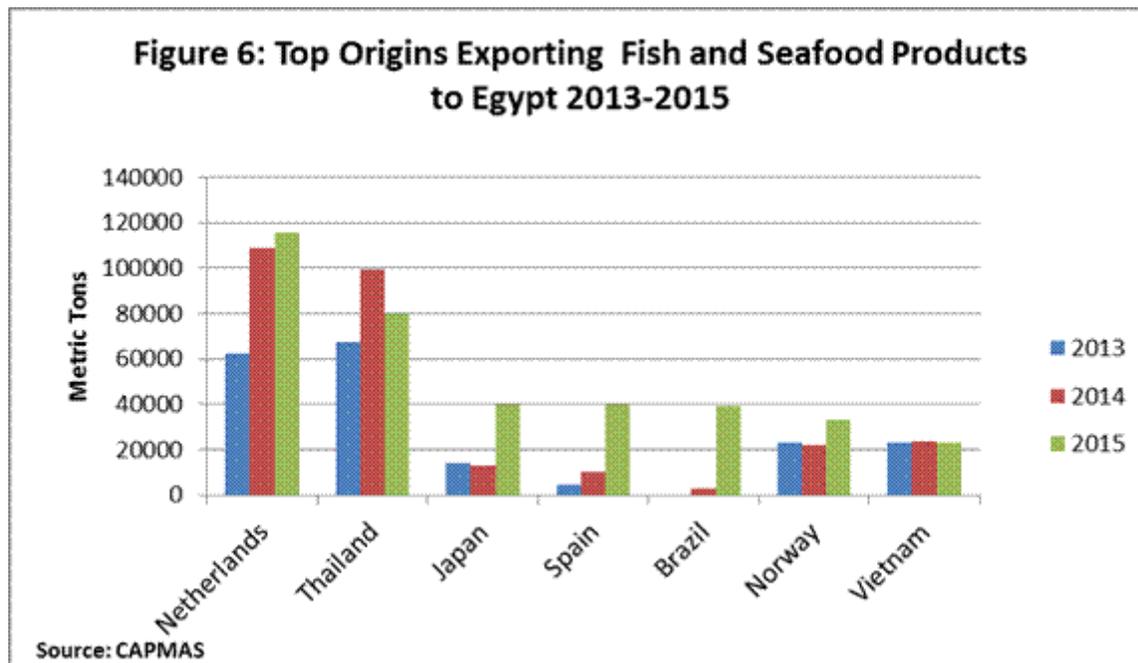
**Trade:**

Egypt exports modest quantities of salt-water fish. As Figure 4 illustrates, exports reached a record of 25,000 MT in 2015. Most of the fish exported are sea bass or sea bream. Conversely, imports have grown significantly in the years since 2009, reaching a peak of 479,000 MT in 2015 (figure 5). The increase in imports is due to, at least in part, an expansion in the number of importers and a retail shift from fresh or wet markets toward supermarket and hypermarket chains that prefer more shelf-stable products.



Of the imported seafood origins in CY 2015, the Netherlands was the top supplier of fish and sea food products at 115,350 MT, followed by Thailand with 79,926 MT, and Japan with 40,096 MT (figure 6). The greatest quantity of imported fish and seafood, on average from 2013 to 2015, were whole frozen

fish, which represented 74 percent of imports, followed by frozen shrimp at 10 percent, frozen fillets at 9 percent, and canned seafood products at 7 percent.



### **Fish Feed Industry in Egypt:**

Currently, 73 privately-owned feed mills provide 90 percent of aquaculture feed, producing both conventionally pelleted feeds (80-85 percent) and extruded feeds (15-20 percent). Eighty-five percent of aquaculture feed is formulated with 25 percent crude protein.

The most common recipes for fish feed production use soybean meal at 30 to 40 percent and fish meal at 5 to 22 percent, although the latter is increasingly displaced due to its high cost. Annual growth in the fish farming sector is currently estimated at five to seven percent, which is driving higher production of high quality feed.

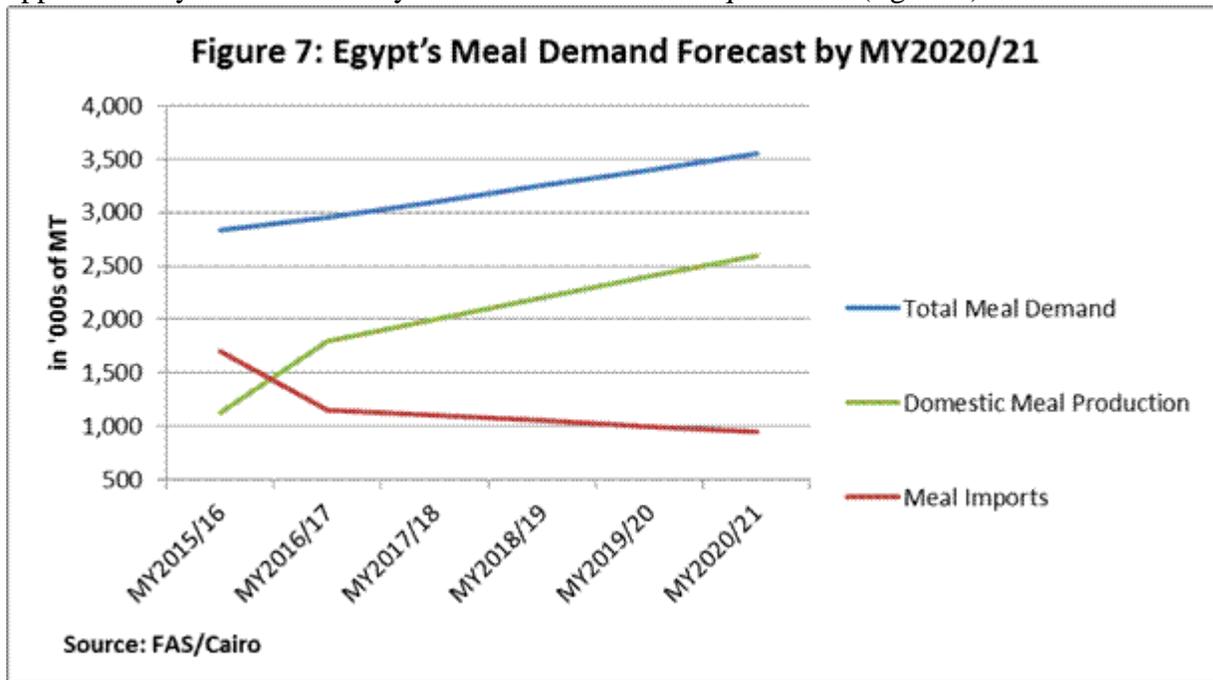
The feed industry estimates that aquaculture feed market demand will exceed 1.5 MMT annually by 2020. To meet the increase in feed required, significant investments in aquaculture feed are taking place. Two of the largest feed producing companies are Skretting's Nutreco, which recently tripled its annual tilapia fish feed capacity to 150,000 MT, followed by Aller Aqua which is doubling its marine feed production in Egypt to reach 150,000 MT by 2017. Aller Aqua is the only company that produces shrimp feed in addition to fish feed.

The public sector runs nine mills, producing an estimated 10 percent of total fish feed production.

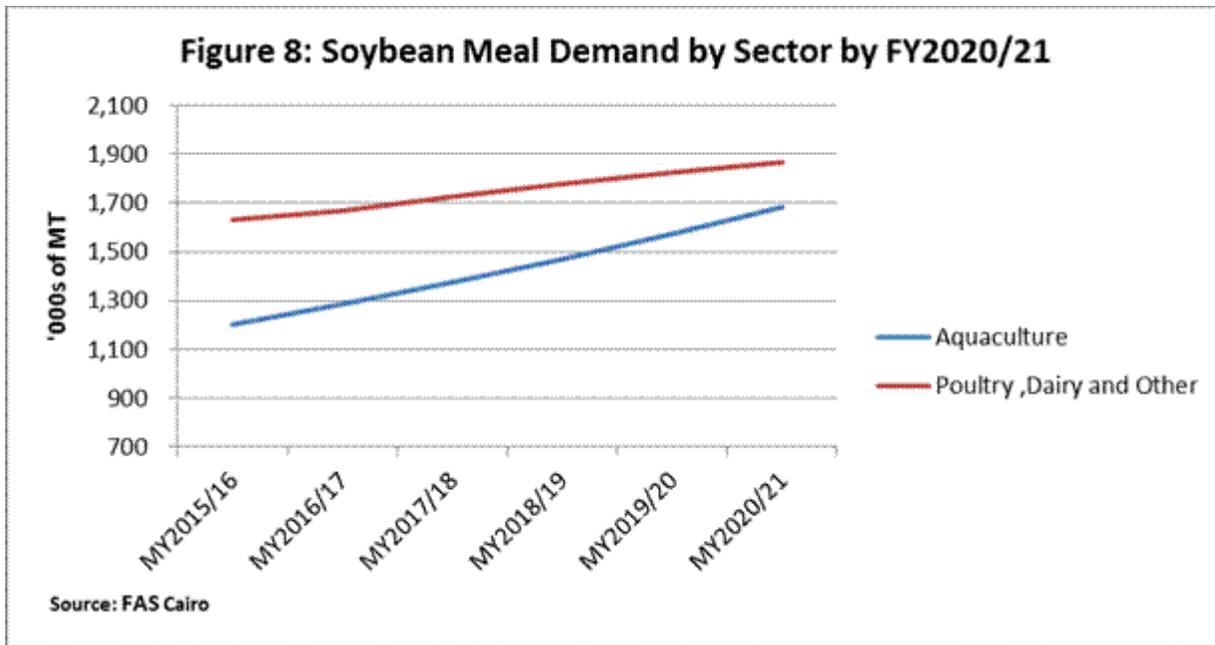
Public feed mills produce only conventional pelleted feed containing 25 percent crude protein and none are equipped to produce extruded feeds.

The main protein sources used for fish feed production in Egypt are soybean meal (included at 28.8–43%) corn (17.3-24 %) and fish meal (8–12%). Egyptian production levels of major feed ingredients currently used for animal and aquaculture feed production do not meet local demand.

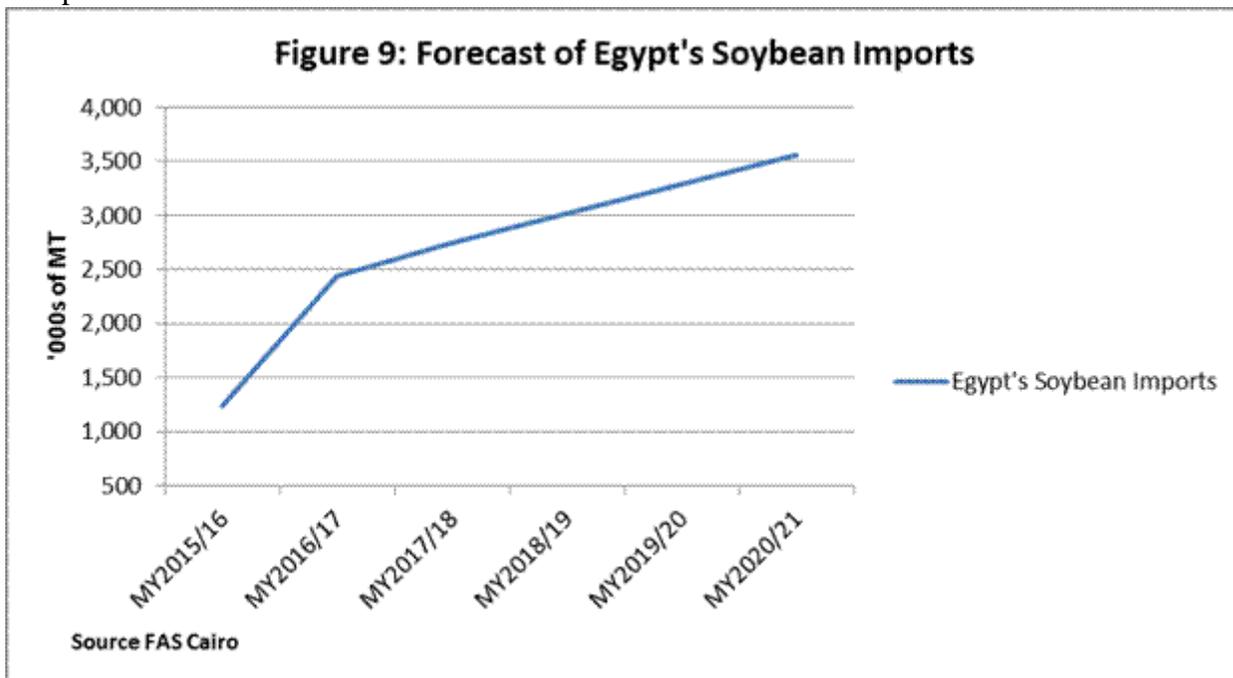
Current domestic crush capacity of soybeans is estimated at 8,000 MT per day compared to 3,000 MT a decade ago. Due to increasing animal feed demand, the soybean crush capacity is expected to increase to 15,000 per tons over the next five years. Soybean meal is the major protein source in Egyptian aquaculture. In MY2015/16 Egypt’s soymeal demand amounted to 2.85 MMT out of which approximately 1.2 MMT of soybean meal was used in aquaculture (figure 7)



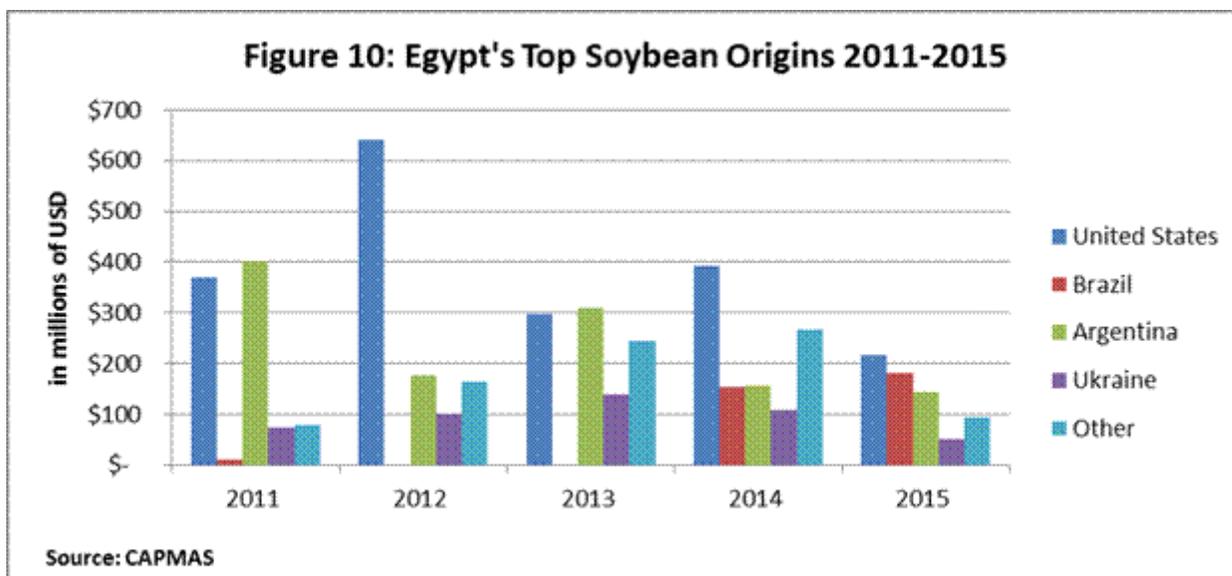
By MY2020/21, aquaculture will account for 67 percent of the total growth of soybean meal demand from MY2014/15 (figure 8).



Aquaculture will be the key driver for soybean demand, which is all imported as Egypt does not produce soybeans, as well as the increase in the country's crushing capacity, which is slated to double by MY2020/21. Soybean imports in MY2020/21 are forecast at 3.5 MMT (figure 9) an increase of over 181 percent from MY 2015/16.



The surge in demand will be a boon to soybean exporters such as Argentina, Brazil, Ukraine and the United States, which have been the suppliers of soybeans to meet Egypt's demand. (figure10).



## **OTHER TYPES OF AQUACULTURE**

### **Integrated Aquaculture and Agriculture in Reclaimed Lands:**

In recent years the Government of Egypt has undertaken efforts to reclaim marginal or desert land for agricultural production. On those reclaimed lands, aquaculture has grown rapidly. A large number of reclaimed land owners have established fish farms and nurturing facilities using ground water. Currently, this desert aquaculture includes over 120 farms scattered over seven governorates. At least 110 of these farms specialize in the production of tilapia. The twenty largest farms have a combined capacity of 8,000 to 10,000 MT per year. The remaining farms combined produce around 10,000 MT per year, for a total of 20,000 MT of desert fish production.

### **Marine Aquaculture:**

Marine species represent only 14.5 percent of the total Egyptian aquaculture, with total salt water production reaching around 178,000 MT in 2015. Among the marine species, mullet is by far the most produced at 129,000 MT in 2015, or 10.5 percent of total aquaculture production. It remains a key species in Egyptian marine aquaculture because of its low feed intake, and is in high demand by Egyptian consumers. Other marine species produced are European seabass, gilt-head sea bream, meagre, and shrimp.

Private firms make up the majority of Egyptian marine aquaculture producers. Most producers (86

percent) raise fish using earthen ponds, while a smaller percentage (13 percent) use cages. A limited number of producers use concrete ponds and raceways. The bulk of marine aquaculture production (81 percent) is located in Damietta Governorate, on the Mediterranean coast at the northeast corner of the Nile delta. The neighboring governorates of Port Said, Alexandria, and Suez account for the remaining 19 percent of marine aquaculture.

Since 2014, the Government of Egypt has made marine fish farming a priority, actively pursuing development projects to this end. The stated goal of these projects is to increase fish production to bridge the gap between production and consumption, reducing unemployment and providing citizens with healthy diets at a reasonable cost.

The major marine aquaculture projects that the GOE is currently undertaking are:

### **1.The National Project for Marine Aquaculture in the Suez Canal:**

- Projected production: 150,000 MT/year
- Markets: 40 percent for the local market and 60 percent for exports to the EU
- Area: 4,000 basins spread on 2,100 hectares (ha)
- First stage: 1,380 basins are in trial phases
- Species: European sea bass, sea bream, mullet, lott and shrimp

### **2.Gilion Lake Project in Kafr El Sheikh:**

- Area: 7,857 ha that includes 453 basins for marine species, 626 basins for shrimp, 186 incubators, hatchery lab and an industrial zone. The industrial zone will encompass a feed mill with a capacity of 180, 000 tons annually and an ice production factory.
- First stage includes 1,141 ha of basins for shrimp and marine species
- Species: European sea bass, sea bream, mullet, lott and shrimp

### **3.The National Project for Developing East Port Said:**

- Area: An area of fish farms was built in Balouza area; over an area of 80 million square meters, producing 50,000 MT of fish annually and providing work for seven thousand citizens.
- First stage includes more than 100 cages for intensive marine fish farming.
- Species: European sea bass, sea bream, mullet, lott and shrimp

### **Concluding Remarks:**

The development and expansion of modern aquaculture began in Egypt four decades ago. Since that time Egyptian aquaculture has witnessed a spectacular and rapid development. This increase has been such that the country is now number ten worldwide in aquaculture production and number two in tilapia production, becoming an important contributor to Egypt's food security and economy.

Aquaculture's growth will drive soybean demand up significantly, by 181 percent by MY2020/21 to 3.5 MMT. Traditional suppliers will capitalize on this development, especially the United States as crushers have shown preference for U.S. soybean meal and, by extension, U.S. soybeans due to the quality of cooking oil derived from this raw material. Despite doubling its soy-crushing capabilities in the next five years, Egypt will continue to rely on approximately one million tons of annual soybean meal imports to meet its animal feed needs.

Nonetheless, there are a number of rising challenges that could potentially affect Egyptian fish farming. These issues must be addressed to ensure that the industry continues its current trajectory.

Challenges faced by stakeholders operating in the sector are:

- The major element of fish production cost is fish feed. Over the last ten years, the cost of feed has increased by more than 300 percent, while fish market prices increased only 150 percent for the same period. Most feed ingredients like corn and soybean are imported and, hence, influenced by the availability of foreign exchange and non-science based protocols and plant quarantine restrictions that hinder the trade of such ingredients.
- Lack of processing facilities, packing and freezing capacities, which result in an inability to access export markets or capitalize on seasonality.
- Inconsistent cage culture policy and poor sanitary controls limit marketing abilities and affect the quality of fish.
- Outdated laws and difficult licensing procedures force many operators into the informal economy.
- Sectoral organizations and cooperatives lack capacity to provide business support and marketing tools.

## **Appendix: I – Egyptian Legislation Related to Aquaculture:**

### **Agriculture/Aquaculture:**

#### ***1-Minister of Agriculture Decree No. 303/1987 concerning issue of executive regulation for Law No. 124/1983***

The decree regulates fish farms including procedures, fees, competent authorities for issuing licenses and time for submitting documents and complying with all required conditions.

#### ***2-Minister of Agriculture Decree No. 447/2012 concerning amendment of the executive regulation of fisheries and aquaculture law, issued by Decree No. 303/1987***

The decree includes amendments to regulation of fishing and added some conditions and controls for fishing craft in internal lakes.

#### ***3- Presidential Decree No. 190/1983 concerning establishment of GAFRD.***

The decree lays out the functions of GAFRD, the composition of its board and their responsibilities, and funding resources of the authority.

#### ***4- Presidential Decree No. 456/1983 concerning specification of water surfaces where fishing is developed and overseen by GAFRD.***

The decree specifies the water surfaces under supervision of GAFRD and it stipulates that aquaculture land specified by the Minister of Agriculture will be under control of GAFRD.

***5- Minister of Agriculture Decree No. 446/1983 concerning oversight of GAFRD on fish resources companies.***

The decree gives GAFRD the right to monitor and control fishing companies.

***6-Minister of Agriculture Decree No. 2655/2003 concerning prohibition of use of the hormone of 17 alpha methyl testosterone to produce unisex tilapia.***

The decree prohibits use of hormone 17 alpha methyl testosterone to produce unisex tilapia in government owned and private hatcheries to protect consumers from the residues of the hormone in fish.

**Aquaculture Cooperatives:**

***1-Law No. 123/1983 concerning aquatic cooperatives***

The law regulates the work of aquatic cooperatives which are overseen by GAFRD.

***2-Minister of Agriculture Decree No. 181/1984 concerning issue of executive regulation for Law No. 123/1983***

This is the executive regulation for the law concerning aquatic union cooperatives specifying procedures to establish fisheries cooperatives.

**Water / Aquaculture:**

***1- Law No. 124/1983 concerning fishing and regulation of aquaculture. This is the main legislation regulating fishing in general and aquaculture in particular.***

The law specifies fishing licensing requirements and fishing and aquatic fees. The law stipulates aquaculture requirements. It prohibits establishment of fish farms except in fallow land not suitable for agriculture and decrees that it could only use water from lakes or nearby canals. It prohibits use of fresh water except in hatcheries established by the state.

The land specified for aquaculture is determined by a decree from the Minister of Agriculture and Land Reclamation, where violating farms will be demolished at the expense of the violator.

***2- Law No. 48/1982 concerning protection of the River Nile and water channels from pollution***

The law prohibits disposal in the water channels of solid, liquid, or gaseous wastes from real estate, shops or commercial, industrial, or touristic establishments or from sanitary drainage, without a license

from the Ministry of Irrigation.

***3-Minister of Irrigation Decree No. 92/2013 concerning amendment of executive regulation of the law for protection of water and canals from pollution, issued by Decree No. 402/2009***

The decree relaxes restriction for aquaculture discharge in canals.