

## SUMMARY

Fish production in Egypt is currently of high importance, as a source of protein that helps greatly in increasing animal protein production especially as red meat prices keep increasing due to population growth and the recent information about large animal and poultry diseases which may affect human health.

In spite of the official efforts toward increasing fish production, there is a gap between the national and the worldwide per capita consumption. This is probably caused by the problems facing fish production and marketing which both limit the expected increase in production and reduce the marketing efficiency.

This study tries to explore the production and marketing of fish in Egypt, in addition to the utilization of production and marketing data from El-Sharkea governorate.

the first chapter is an investigation of studies, research work, thesis and dissertations that were conducted or prepared in relation to the subject of this study. The second chapter investigated fish production through comparison of fish production in different countries throughout the world between 1994 and 1999 where worldwide production amounted to 118.8 million tons out of which 91.42 million tons came from marine and inland water fisheries. Aquaculture production amounted to 27.5 million tons. Ranking of the countries based on their fish production between 1996 and 1998. Showed that. China, Peru, Japan, Chili, Russia, U.S.A, India, Indonesia, Thailand, Norway,

North Korea, and Philippines, ranked first to Twelfth with average production figures of 36.5, 7.2, 6.5, 5.5, 5.5, 5.3, 5.3, 4.4, 3.5, 3.2, 2.6, 2.1, million tons. Egypt ranked 37<sup>th</sup> with an average annual production of 438,100 tons representing 0.4 % of the world production.

Fish production in Egypt increased gradually by an annual average of 22.000 tons. Annual production ranged from 246.000 tons in 1985 to 724.407 tons in 2000 with an average of 400.400 tons. Some natural fisheries contributed to this increase where production from marine fisheries increased by 3060 tons/year on average, which does not correspond to the large area of these fisheries, 11.4 million acres. The Mediterranean contributed to the increase by 6.300 tons while the Red Sea contributed 3.600 tons.

Fish landing from Lake Fisheries has also increased at a rate of 4.060 tons/year. Production from lake burullus, Lake Nassau, Bitter lakes, and Lake Idku increased at a rate of 2.600, 1.300, 270 and 150 tong/year respectively. Production from Lake Manzala, Lake Maryout, Bardaweel Lagoon, Lake Qaroon, Lake Rayan, and Port Fuad Salina decreased at a rate of 20, 170, 200, 400, 400, and 410 tons/year, respectively. Production from the Nile and its branches increased by 3.400 tons/year during the study period. aquaculture production increased by 12.100 tons/year. At the same time, production from rice-fish decreased at the rate 270 tons/year. cages culture increased by 380 tons/year during the siudy period.

The average productivity for the study period in Egypt, 30.0: Tedden/year, was found to be low compared to other

fish-producing countries such as China and Peru. In marine fisheries the average was 8.1 kg/acre/year while annual lake productivity was 138 kg/fedden/year. In the Nile and its branches the annual average was 227.5 kg/fedden/year. Annual productivity from aquaculture for the same period was 545.5 kg/fedden/year for pond culture but dropped to 56.3 kg/fedden/year for rice-fish culture.

Chapter 3 consists of 2 sections. The first dealt with fish farms in Arab republic in Egypt. Variation in productivity may be attributed to soil type especially that productivity of some farms is as high as 1500 kg/fedden/year. Culture systems and levels applied in Egypt in addition to rice-fish culture system are also disellssed. Section 2 was designated for fish farm in Sharkeia governorate regarding location, area and the municipal divisions of the governorate in addition to fish production and the research and service agencies and establishments dealing with the fish production sector in the governorate.

Chapter 4 deals in its two sections with the economics of fish production in Sharkeia. Section 1 is devoted to studying the economics of aquaculture in Sharkeia based upon a random sample of the existing fish farms. A total of 46 private farms were included. 29 of which were in Husineya and 17 in Abu Hammad. Farmes were classified into 3 categories based on their area.

In farms less than 50 acres total cost per acre amounted to about LE 2240/ fedden which breaks into LE 956/acre as fixed cost representing about 42.7% and LE 1284/ fedden as variable cost representing about 57.3%. Fry, labor, and feed represented

the most significant parts of variable cost and amounted to LE 372, 346, and 316/ fedden, respectively, representing 16.6%, 15.4%, and 14.1% of the total cost, respectively. Cost of harvesting, fuel, fertilization, and maintenance was about LE 96, 95, 40, and 19 /fedden, respectively, totaling about 11.3% of the total cost/acre.

The study showed that the total cost per acre in the 50-100-fedden category was LE 2131/ fedden. Fixed cost was LE 931/ fedden representing 43.7% while variable cost was LE 1200/acre representing 56.3% of the total cost. Cost of fry, labor, and feed represented the most significant segment of variable cost averaging LE 365, 316, 295/ fedden, respectively, representing about 17.1%, 14.8%, and 13.8% of the total cost per fedden. Respectively. Other variable cost items including harvesting, fuel, fertilization, and maintenance averaged LE 90, 87, 29, and 17/ fedden, respectively, representing a total of 10.5% of the total cost.

Total cost of an acre in the above 100 fedden category was LE 1921/ fed den of which LE 912 were fixed costs representing 47.5% and LE 1009 were variable costs representing 52.5% of the total cost per acre. The most significant portions of variable cost were fry, labor, and feed costing about LE 326, 275, and 231, respectively, representing about 17%, 14.3% and 12% of the average total cost. Other variable cost items including harvesting, fuel, fertilization, and maintenance averaged LE 87, 74, 8 and 8/ fedden, respectively, representing a total of 9.2% of the average total cost.

Studying the sales and the net returns for the three farm categories showed that while sales in the first category (farms less than 50 acres in area) amounted to LE 3694/ fedden, net returns were LE 1454/ fedden. The return on investment was LE 0.65/pound invested. In the 2<sup>nd</sup> category (50-100 fedden) fish sales was LE 3515/ fedden resulting in a net income of LE 1384/ fedden and a return on investment of LE 0.65/pound. Sales in the 3<sup>rd</sup> farm category were LE 3182/ fedden producing a net return of LE 1262/ fedden and a return on investment of LE 0.66/pound.

The last part of this section discussed the optimum size of a fish farm where cost is minimized through an estimated function of the average variable cost in relation to farm size in Abu Hammad, Husineya, and the entire sample representing Sharkeia governorate. Comparison of the 3 farm categories indicated a big difference in Abu Hammad. The average farm size in that area is 34.79 fedden where the average cost is LE 2168/ fedden. The calculated optimum farm size was found to be about 360 fedden which is estimated to reduce cost to about LE 1989/ fedden and, hence, results in an additional net return of LE 179/ fedden.

In Husineya, the average farm size was 97.98 fedden with an average cost of LE 1800/ fedden. The optimum farm size in that area was, estimated to be about 400 fedden which reduces the cost to about LE 1481/ fedden and produces an additional net return of LE 319/ fedden. Average farm size for the entire governorate was 74.63 fedden with an average cost of LE 1936/ fedden. The optimum farm size for the governorate was

estimated at 300 fedden, which is estimated to reduce the cost to about LE 1391/ fedden and produce an additional net return of LE 545/ fedden.

Section 2 discussed rice-fish culture, its economic importance technical and economic benefits from this practice, and the importance of rice-fish culture in Sharkeia governorate. The additional return due to the application of fish culture in rice fields is also discussed.

The average net return from fish culture in rice fields was LE 235.8, 177.4, / redden in Abu Hammad and, Husineya, respectively. This represents both the return from fish culture, the increase in rice production due to the addition of fish to the field, and the reduction in the cost of rice culture that is caused by the same reason.

Chapter 5 deals with fish marketing in Egypt. The importance of benefits of a marketing system through possessional, spatial and temporal advantages is shown in addition to the marketing services that make them attainable. It was clear that middlemen, especially wholesalers, have a great deal of control over both producers as well as some retailers through the continuous transactions in both directions. Study of marketing channels, improving, the producers' share of the retail price, and freshness of the marketed fish are also discussed. However, the indirect marketing channels are still favorable because of the possessional, spatial, and temporal advantages in addition to the difficulties associated with involvement of producers in the marketing process should they market their fish directly.

The average retail prices of mullets, bagrus (bayad), tilapia, and catfish in the Egyptian market have peaked up at LE 8.83, 6.51, 5.04, and 4.23, respectively. Meanwhile, the price of sardines averaged lowest at LE 2.90 during the period of the study. The high prices may be due to demand on fish as an alternative to meat, the increasing population, and inflation. The total marketing margin for the major fish species was found to be LE 0.886/kg for the study period representing an increase of 19.2% over the producer's price. This is fractionated as 84% for the producer, 4% for the wholesaler, and 12% for the retailer.

Chapter 5 discussed the economics of fish marketing in Sharkeia. Marketability of fish farm products depends upon the location of the farm relative to main cities and towns. Study of price indicators shows that prices are affected by the value of the good to the consumer, its production and marketing cost, market demand, the expected profit, in addition to the nature of the marketing channels, the purchasing ability of the consumers, and the nature of the commodity regarding competitiveness of the market and storage requirements.

Price based on farm-gate prices of the 4 size, and hence price, grades of the studied species; tilapia, mullet, catfish, bayad, and carp was estimated. For tilapia, price/ton was LE 7.515, 6.004, 3.796, and 2.033, respectively, for the 4 size grades where the coefficient of variability was 3.99%, 12.49%, 20.72%, 14.84%, respectively.

Wholesale prices were LE 8,268, 6,315, 4,103, and 2,371, respectively with a C.V. of 5.5%, 12.72%, 17.69%, and 10.88%, respectively. Retail prices were LE 9,613, 7,000, 4,944, and

2,944, respectively with a C.V. of 4.39%, 7.08%, 9.92%, and 9.90%, respectively.

Farm-gate prices of mullet were LE 9,161, 7,467, and 5,998, respectively for the three size grades with a C.V. of 3.54%, 11.74%, and 14.20%, respectively. Wholesale prices were LE 9986, 780, and 6408, respectively for the 3 size grades. Retail prices were LE 11298, 9065, and 7444, respectively with a C.V. of 7.97%, 8.24%, and 9.65% respectively. Catfish prices were LE 3752, 4239, and 5016 for farm-gate, wholesale, and retail prices, respectively with a C.V. of 12.94%, 3.48%, and 5.82%, respectively. Farm-gate, wholesale and retail prices of Bayad were LE 5380, 5989, and 7452/ton, respectively, with C.V. values of 24.06%, 15.2%, and 10.8%, respectively. Carp prices were L.E. 3483, 3747 and 4460/ton for the three marketing stages, respectively, with C.V. values of 15.02%, 8.76%, and 6.33%, respectively.

Price variation and marketing margins of the above species indicate a minimum producer's share of 87.73% and 69.05% of the wholesale prices for grade 4 and grade 2 tilapia, respectively and a minimum 82.38% of the retail price. The overall marketing margin relative to the retail price for in the 3 stages was 17.62% for grade 2 mullet and 19.42% for grade 3. Producer's share of wholesale price was 88.52% of the wholesale price of catfish and 72.2% of retail price of carp. Marketing margins ranged from 21.91% of the retail price of carp and 27.8% for bayad.

As an indication to efficiency of the marketing system, it was found that wholesalers' share of the value added ranged

from 26.79% in the, case of grade 3 tilapia to 35.87% in the case of grade 1 tilapia.. Retailers' share on the other hand ranged from 64.13% in the case of grade 1 tilapia to 73.21 in grade 3 tilapia. Cost of marketing services represented 7.64%, 15.81%, 12.29%, and 14.54%, of the value added for grades 1-4 tilapia, respectively. Marketing efficiency factor was 92.90, 86.35, 89.06, and 87.31, respectively for the 4 grades.

Wholesalers' share of the value added for mullet ranged from 20.93% for grade 2 to 38.58% for grade 1. Retailers' share ranged from 61.42 for grade 1 to 79.07 for grade 2. cost of marketing services was 7.95%, 10.08%, and 10.56%, respectively, for grades 1-3, respectively. Marketing efficiency factor was 92.64, 90.84, and 90.45, respectively for grades 1, 2, and 3, respectively.

Wholesales' share of the value added ranged from 27.04% for carp to 38.49% for catfish. Retailers' share ranged from 61.51% for catfish to 72.96% for carp. Cost of marketing services represented 9.07%, 7.15%, and 14.43%, respectively for catfish, bayad, and carp, respectively. Market efficiency factor for the 3 species was 93.33, 91.69, and 87.39, respectively.

The study was concluded with a field investigation of the problems and obstacles facing the marketing system in Sharkeia. The major problem was the unannounced wholesale prices. Other problems like the lack of cooperatives, unpaved roads to the farms, and the absence of a known fish-market place in the governorate were of equal importance to one another.