الملخص الإنجليزي

SUMMARY

Fish farming is one of the promising sectors that secures the food need and generates economic benefits of Egypt's economy. The consumption rate of fish in Egypt is 14.2 kg/capita/year which represents 25 % of percent of animal protein consumption. The preference of fish consumption is due to because of their high nutritive values and high digestibility. On the other hand fish production income represents 8.2 % of the total agricultural income, which was 82.5 billion LE in 2005. Aquaculture sector also is approximately 3 million jobs in Egypt.

Marine production decreased year by year because of many factors, over fishing. subsequently the importance of fish farming increased year by year and produced 61.3 % of the total fish production, whereas marine fishery produced 38.7% (595000tons VS 376000 tons in 2006).Other types of fish farming such as, cage culture and rice fields production represent 14.8 % of the total fish production. Therefore, attentions should be paid for fish ponds culture to increase their fish yield.

Fayoum governorate has many fish and water resources such as, Qaroun Lake, Wadi EL- Rayan 1 and 3 and fish ponds in Abshway region. Fish pond in Fayoum produces 32.8 % of the total fish yield, so this study was conducted to evaluate the economic impact of fish ponds in Fayoum governorate throughout many goals such as:

1. The importance of fish ponds in Egypt as a source of animal protein
2. The relationship between the inputs and outputs of fish ponds.
3. Evaluation of the production costs/benefits ratio.
4. Evaluation of the physical and economical efficiency of fish ponds .

This study depended on primary data obtained from survey, which was prepared for fish farmers in Fayoum (104 private fish farms).The secondary data was obtained from the ministry of agriculture, general authority for fish resources development, agricultural economy research institute ,FAO, secretary of Fayoum governorate, aquaculture society in Fayoum ,and many pervious studies related to this topic.

The this study was classified into: introduction and five chapters in addition to Arabic and English summaries. Chapter, was divided to 2 sub- chapters, The first one deals with the theoretical farm explaining the aquaculture concepts, the aquaculture systems in Egypt, the importance of fish ponds in improving the social and economical marketing benefits.

The second sub-chapter deals with reviews of the literatures of the previous studies in fish farming.

The second Chapter sample study includes two sub chapters: the first one deals with presents and describes the study samples selection, in Fayoum farms depending on the area and the numbers of fish farms in Abshway and Rayan regions.

The second sub-chapter with discussed the social and economic properties of sample individuals, add to describes of production input and problems of the obstacles that face. the producing system in Fayoum governorate .

The third Chapter discusses the average productivity of fish farms. The study showed that the average productivity was 2.3 ton/feddan of total sample. The average productivity reached 1.8 ton in Abshway area and 2.9 ton in Rayan. According to category level, the average productivities were 1.8, 2.4, 2 ton for the first, the second and the third category in Abshway and 3.1 ,2.6 ton for the first and the second category in Rayan.

This Chapter showed also the statistical analysis of production functions of fish farms of the study sample

The study shows. that the most influential factors on fish production are the number of fry ,the amount of feed, labor, fuel, Chemical fertilizers, and area. The marginal physical production has reached 0.101, 0.484, - 0.004, 0.001, -0.005 and -0.462.Tons of the above factors. respectively.

By using the double Logarithm function showed that the elasticities production flexibility on the amount of production of fry, feed, labor reached 0.165, 0.614, 0.228 respectively. The Sum of production elasticities (1.007) .

Results of the analyses of the first category of Abshway using liner regression, showed that the most influential factors on fish production were the number of fry ,the amount of feed, labor, area. The marginal physical product were estimated at 0.115, 0.013, -0.002, 2.51 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities of the number of fry, the amount of feed, labor and area were 0.602, 0.171, -1.11, 1.16 Tons respectively, and the sum of partial elasticities reached about 1.93Tons.

Results of the analyses of the second category of Abshway using liner regression, showed that the most influential factors on fish production were the number of fry ,the amount of feed, fuel. The marginal physical product were estimated at 0.080, 0.244, 0.002 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities the number of fry ,the amount of feed, labor and area were 0.602, 0.171, -1.11, 1.16Tons respectively: and the sum of partial elasticities reached about 1.14 Tons.

Results of the analyses of the third category of Abshway using liner regression, showed that the most influential factors on fish production were the number of fry and the amount of feed, The marginal physical product was estimated at 0.088, 0.451 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities of the number of fry ,the amount of feed were 0.542,0.693 Tons respectively, and the sum of partial elasticities reached about 1.24Tons.

Results of the analyses totality of the sample category of Abshway using liner regression, showed that the most influential factors on fish production were the number of fry ,the amount of

feed, and area The marginal physical product was estimated at 0.032,0.360,0.482 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities of the number of fry ,the amount of feed and area were 0.483, 0.414 Tons respectively, and the sum of partial elasticities reached about 0.897 Tons.

The study of the results of the analyses for the first category of Rayan using liner regression, showed that the most influential factors on fish production were the number of fry ,the amount of feed, labor, fuel . the marginal physical product was estimated at 0.079, 0.459, -0.014, 0.010 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities the number of fry ,the amount of feed, labor and area were 0.533, 0.740, -0.399,0.143 Tons respectively: and the sum of partial elasticities reached about 1.42Tons.

The study of the results of the analyses for the second category of Rayan using liner regression, showed that the most influential factors on fish products were the number of fry ,the amount of feed and chemical fertilizers. The marginal physical product was estimated at 0.067, 0.327, -0.006Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities of the number of fry ,the amount of feed, labor and chemical fertilizers were 0.672, 0.729, -0.387, -0.179 Tons respectively: and the sum of partial elasticities reached about 1.40 Tons.

The study of the results of the analyses for the totality of the sample of Rayan area using liner regression showed the most influential factors on fish products were the number of fry ,the amount of feed, chemical fertilizers and area. The marginal physical products were estimated at 0.127,0.487, -0.006. -1.14 Tons respectively.

By using the double regression Logarithm function it was concluded that the effective factors of production elasticities of the number of fry, the amount of feed and chemical fertilizers were 0.868, 0.766,-0.176Tons respectively, and the sum of partial elasticities reached about 1.63 Tons.

Chapter four includes 2 sub-chapters The first one deals with the production costs, the relative costs for producing 1 ton of fish, and the obtained results which are :

- The total costs for producing 1 ton in total sample in. Abshway and Rayan were 5446, 6086, 5159 LE respectively. However, variable costs were 4504, 4491, 4510 LE respectively, representing 82.7 %, 73.8 %, 87.4 % respectively of the total cost. The fixed cost was 938, 1595 and 648 LE representing 17.2 %,26.2 %,12.6 % respectively of the total cost.

the variable costs were divided into direct costs and indirect costs. The direct variable costs were user ;

1. Feeding costs: it represented 57.4% of the total costs to produce 1 ton of fish and it was 47.1 % or 62.7 % in Abshway or Rayan farms.

2. Costs of fish stocking density: it represented 14.7 % of the total costs to produce 1 ton and it was 14.61 % and 14.9 % in Abshway and Rayan farms, respectively.
3. Costs of labor and workers: it represented 4.4% of (TCPT) and it was 3.7% and 5.7 % in Rayan and abshway farms, respectively.
4. Fertilizers costs: it represented 1.6% of the total costs of producing one ton of fish and it was 2.4% in Rayan farms only.
5. Fuels costs : it represented 1.3 of (TCPT) and it was 0.3 % and 3.2 % in Rayan and abshway farms respectively.
6. Sundries: it represented 1.1 %of (TCPT) and it was 0.8 % and 1.2 % in Abshway and Rayan farms respectively.

The indirect variable costs: it was 131.2 LE/TON representing 2.4% of the total costs of producing 1 ton of fish and it's relative importance was 2.1%. and 2.5 % in Abshway and Rayan farm. respectively.

This study revealed that the increase in relative variable costs in Rayan and abshway farms resulted the increase in costs of feeding and fertilizers in Rayan farms because of the intensification of fish and the increase in feed supplementation. whish was necessary. Moreover, the water quality in Rayan farms was poor and there was a lake of abundance of natural food (phyto-zooplankton). Therefore, the addition of organic and inorganic fertilizers was also necessary for growth fish. In contrast, Abshway farms have good water quality and they ere rich in natural food, so, mullets ere stocked with tilapia in order to consume the natural food, especially in the beginning of the culture season.

The increase in fuels costs in Abshway farms is due to the usage of lifting machines to irrigate or drain the ponds. In contrast, Rayan farms do not need lefing machines and the fuels whish one used for air pumps can be used for ponds aeration.

The fixed costs represented 542.9 LE whish represents 10 % of the total costs and it was 8.7 % and 12.5 % for Rayan and Abshway farms respectively. The factor controlling the fixed costs were:

1. Cost of the permanent workers: it represents 4.9 % of (TCPT) and it was 4.2 % and 6.4 % for Rayan and Abshway farms respectively.
2. Maintenance it represented 2.6 % of (TCPT) and it was 2.3 % and 3.0 % for Rayan and Abshway farms respectively.
3. Depreciation : it represented 2.1 % of (TCPT) and it was 1.6 % and 2.1 % for Rayan and abshway farms, respectively.

The indirect fixed costs: it was 395.3 LE representing 7.3 % of the total cost and it was 12.5 % for Rayan farms and 13.7 % for Abshway farms The increase in fixed costs reduced the capability of fish farm to face and challenge the changes in the variable costs.

The factors controlling the indirect fixed costs are:

1. The benefit cost on money capital: it represented 4.0% of (TCPT) and it was 3.9 % and 4.1 % for Rayan and Abshway farms respectively.
2. The cost of farm rent: it represents 3.3 % of (TCPT) and it was 9.6 % of (TCPT) in Abshway farms.

It is noticed that the relative fixed costs reached highest value (26.2 %) at Abshway farms, whereas it was the lowest at Rayan farms (12.6 % of the total fixed costs).This result was due to the increase in some direct costs such as labor, workers, machine maintenance and indirect fixed costs such as, farm rent cost.

The first, the second, and the third grades in Abshway farms. reached 5770, 6135 and 6142 LE, respectively including variable costs (4263, 4550, and 4521 LE respectively) and fixed costs (1507,1085, and 1621 LE respectively),

The direct variable costs represented 71.6 % of the total costs and it was 71.7 % the first and 72 % for the second grade.

The factors controlling the variable costs are:

1. Feeding costs: it represents 47.1 % and it is 46.7 % for the third grade and 48.7 % for the first grade .
2. Costs of fish stocking: it represents14.9 % of the total cost and it is 12.9 % for the first grade and 15.5 % for the second grade respectively.
3. Costs of workers: it represents 5.7 % of the total costs and it is 5.5 % and 6.2 % for the third grade and The first grade respectively,
4. Fuels cost : it represents 3.2 % of the total cost and it is 2.9 % and 3.3 % for the second grade and the third grade respectively.
5. Sundries: it represents 0.8 % of the total cost and it is 0.7 % for the first grade and 0.8 % for the second grade and the third grade respectively.

The indirect variable costs (The benefit cost on money capital) represents 2.1 % of the total cost and they were 2.1 % for the third grade and 2.2 % of The first grade and the second grade.

The fixed costs: they represents 762 LE/TON which represent 12.5 % of the total cost and they are 758 LE/TON representing 12.3 % for the third grade , 767 LE/TON representing 13.3 % for The first grade.

The factors controlling the fixed costs are:

The cost of the permanent workers: it represents 6.4 % of the total cost and it is 6.2 % and 6.9 % for the third and The first grade respectively.

1. Maintenance : it represents 3 % of (TCPT) and it was 2.9 % for the third grade and 3.1 % for the first grade and the second grade respectively.
2. Depreciation: it represented 3.1 % of the total cost and it was 3 % for the third grade and 3.3 % for the first grade respectively.

The indirect fixed costs:

It's 833 LE representing 13.7 % of (TCPT) and it was 12.8 % for the first grade, and 14.1 % for the third grade.

The factor controlling the fixed costs:

1. The cost of farm rent: it represented 9.6 % of (TCPT) and it is 8.9 % and 9.8 % for the first and the third grade respectively.

2. The cost benefit on money capital: it represents 4.0 % of (TCPT) and it were 4.1 % for the first and the second grades and 4.2 % for the third grade.

The study showed also that the costs skeleton and the relative importance of costs to produce 1 ton of fish (TCPT) at different farms classes in Rayan farm:

The average of (TCPT), the first and the second grades reached 5158, 5222 and 5113 LE, respectively including variable costs (4510, 4580 and 4461 LE respectively) it represents (87.4 %, 78.7 %, 78.2 %) of (TCPT) and fixed costs (648, 642 and 652 LE respectively).It represents (12.6 %, 12.3 %, 12.8 %) of (TCPT).

The direct variable costs represent 84.9 % of the total cost and they are 84.7 % for the first grade and 85.2 % for the second grade.

The factor controlling the direct variable costs:

1. Feeding costs: it represented 62.7 % and it was 61.9 % for the first grade and 63.9 % for the second grade.
2. Costs of fish stocking: it represented 14.6 % of the total costs and it was 13.7 % for the first grade and 15.1 % for the second grade respectively.
3. Costs of labors: it represented 3.7 % of the total costs and it was 3.6% and 3.8% for the first and the second grades respectively,
4. Costs of fertilizers: it represented 2.4 % of the total costs and it was 2.3 % and 2.6 % for the first grade and the second grade,

5. Sundries: it represented 1.2 % of the total costs and it was 1.2 % and 1.3 % for the first grade and the second grade,
6. costs of fuels: it represented 0.3 % for all the grades,
7. the indirect variable costs reached 131.4 LE/ TON and it represented the costs benefit cost for money capital and it was 2.5% for the second grade and 2.6 %for the first grade.

The direct fixed costs: it represented 446 le/ton representing 8.7 % of the total costs and it was 449 LE/ TON representing 8.6 % for the first grade 444 LE/ TON representing 8.7 % for the second grades .

The factor important the fixed costs were:

1. The cost of the permanent workers: it represented 4.2 % of the total costs and it was 4.1% and 4.3% for the second and the first grades.
2. maintains : it represented 2.3 % of (TCPT) and it was 2.2 %, 2.4 for the second and the first grades.
3. Depreciation: it represented 1.5 % of (TCPT) and represented 1.6 % for all grades.

The indirect fixed costs: it was cost benefit on money capital 202 LE/TON of (TCPT) it represented 3.9 % of (TCPT) and it was 3.7 %, 4.1 % for the first and the second grades.

Section 2 from this chapter discussed the relationship between the cost of producing 1 ton fish as an independent factor and the productivity one Fadden as an dependent factor.

- The obtain result revealed that the increase in fish production by 10 % increased the costs by 6.2 % and it was 5.2 % for Rayan farms.

- For farms classes in Abshway farms, the increase in production by 10 % increased the costs by 3 % for the second grade 3.5 % for the third grade. Also the regression factor was non- significant for the first grade.
- In Rayan farms, the increase in production by 10 % increased the cost by 6.6 % for the first grade and 8.2 % for the second grade.

Chapter 5 included 2 sub- chapters the first one was deals with discussed and the measurements of production and economical efficiency in fish production farms..

Firstly: Measurements of Physical Efficiency:

(1) Fish productivity: the study showed the average of fish yield per Feddan reaches 1.895 tons. It was 1.82 ton/Fadden in Abshway and 2.766 ton / Feddan in Rayan farms. This result was due to the fish intensification of fish in Rayan farms.

(2) The quality of produced fish: most of farms in Abshway cultured mullets with tilapia ,but in Rayan farms ,the tilapia size was larger than those in Abshway farms , The 1st class farms produced higher fish sizes of tilapia, whereas The 2nd class farms produced mullet, In Rayan farms the fish quality was higher in 1st class farms.

(3) Feed conversion ratio**:** the mean FCR was 1.62 kg had for 1.0kg fish and it was 1.68 in Rayan and 1.48 in Abshway farms The optimum FCR(1.44) was obtained at the 1st class farms in Abshway whereas, it was 1.56 at the 2nd class farms in Rayan farms.

(4) Labor productivity: the production of 1 ton fish needed 50.3 and 27.9 work day in Abshway and Rayan farms, respectively. The addition, in Abshway farms the production of 1 ton of fish needed 51.55, 50.6 and 49.55 work day in the first, the second and the third grade farms, respectively. Moreover it needed 29.4 and 27.0 work day for the first, and the second farms, respectively in Rayan .

Secondly: Measurements of Economic Efficiency:

All economical standards (on the level of localities or items) were positive, meaning that fish farmers gaining net positive profit either per farm, feddan or per ton. They cover all costs and also could increase their production and consequently their profit.

Producer profit

The obtained results showed that producer profit / ton was about 34.87 % of selling price and the producer share in Abshway region was lower than in Al –Rayan region, where the producer profit / ton in Abshway region was 31.51% of selling price, while this ratio in Al –Rayan region was 36.49 %. Thought Abshway region have the highly price fishes of mullet family, where the average ton price was 8885 L. E were the average ton price in Al –Rayan region was 8123 L. E, but Al –Rayan region has an advantage concerning economic efficiency than Abshway region where the net profit / feddan was 8198.5 L. E and the net profit / kg was 2.96 L. E., where in Abshway region the net profit / feddan was 5109.3 L.E and the net profit / kg was 2.79 L. E. With respect to the different grades, it was obtained that the producer share was 30.06 as a minimum level for the third grade

and 35.06 as a maximum level of the first grade in Abshway region, while these ratios in Al –Rayan region were 36.8 and 36.1 for the second and the first grade, respectively.

Percentage of net profit of total costs

It was obtained that the average profit / invested pound was 0.54 with a minimum level of 0.46 in Abshway region farms and a maximum level of 0.58 in Al –Rayan region farms. With respect to the different grades, it was 0.44% as a minimum level for the third grade, 0.54% as a maximum level of the first grade in Abshway region, while in Al –Rayan region, it was 0.57% for the first grade and 0.58% for the second grade.

Total profit / pound paid as salaries

Average total profit / pound of salaries on the level of different locals was 241.14 LE with a minimum value of 177.1 LE in Al –Rayan region and a maximum value of 292.2 L.E in Abshway region. Concerning the different grades, it was 171.8 LE.as a minimum value for the first grade and a maximum value of 178.8 L E for the third grade in Abshway region. For Al – Rayan region, this value was 281 for the first grade and 301 LE for the second grade.

Total profit / pound paid for feeds

The average profit per pound paid for feeds was 2.68 LE with a minimum value of 2.51 L.E in Abshway region and a maximum value of 3.1 in Al –Rayan region. Concerning the different grades, it was 3.1 L E as a minimum level for the second and the third grades and a maximum value of 3.2 LE for the first grade in Abshway region. In Al–Rayan region the

minimum level of the first grade was 2.44 L E while the maximum level was 2.56 L.E.

Capital returning period

The average value of this period was 3.09 year with a minimum value of 3.5 year in Abshway region and a maximum level of 2.99 year in Al–Rayan region. With respect to the different grades, it was 3.7 year as a minimum level for the third grade and a maximum level of 2.9 year for the first grade in Abshway region. In Al–Rayan region this period was 2.96 year as a minimum level for the third grade and 3.01 year as a maximum level for the second grade.

Capital profit

The average capital profit was 31.7 %with a minimum level of 28.3 % in Abshway region and a maximum level of 33.4 % in Al–Rayan region. With respect to the different grades, it was 26.8% as a minimum level for the third grade and 34 % for the first grade in Abshway region. In Al–Rayan region this value was 33.2 % as a minimum level for the third grade and 33.7% as a maximum level for the first grade in Al –Rayan region.

Economic Impact Of Aquaculture For Fayuom Governorate

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