

Financial evaluation of fish breeding cages in Altarmeyah district for the season 2016.

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Abstract: *The fish stocks in Iraq are an important source of food security, as well as its nutritional and economic importance. In terms of nutritional importance, fish meat is characterized by its high content of animal protein, fat, many vitamins and various mineral elements. The reason of its economic importance is because it provides an important income, as the trade of fish and its products provides foreign currencies and contributes to improving the trade balance. It also provides employment opportunities for many human resources in different countries. As for Iraq, despite the availability of basic resources such as human, financial and water for the growth and reproduction of various commercially important fish species, it is still one of the poorest countries in the production and consumption of fish. The annual growth rate for river and marine fisheries at the level of Iraq for the period 2000-2016 was 6.8%. Altarmeyah district, north of Baghdad, was selected for a large number of fish breeders. The data were collected through a questionnaire distributed to 30 fish breeders for the 2016 season. Appropriate evaluation criteria were applied. The results showed that the first group included (1-5) cages achieved 63728665 thousand IQD, while the second group, which included 6 and more cages achieved profits reached 18485615 thousand IQD, This means that the first group was the best in this criterion and in the revenue of the invested dinar criterion as it reached in the first group 2.4, while in the second group was 2.1, while the other two criterions, the second group was better as the criterion of salary productivity of the second group reached 11.03 thousand IQD while in the first group reached 4.6, the investment revenue in the second group was 1.51 thousand IQD, while in the first group reached 1.3 thousand IQD, which may be due to the increase in the total costs of the first group.*

Keywords: *fish, financial evaluation, cages breeding.*

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I. Introduction

The fish farming sector is a successful way and has proven successful in developed countries. It is known that the Sumerians are the first to know the breeding of fish, which is an indication of the availability of conditions for the breeding of fish in Iraq. In general, the fish sector in Iraq has developed a lot (1), in terms of nutritional importance, fish meat characterized by a high percent of protein about 24%, and fats containing unsaturated fatty acids and amino acids. As well as containing many vitamins (A, B, C, D, E, F and D) and various mineral elements (phosphorus, sulfur, calcium, sodium and iron) and this makes them important components in the balance of food and health (3). As for the economic aspect, the fish stocks in Iraq are an important source of food security. This sector provides an important income, as the trade of fish and its products provides foreign currencies and contributes to improving the trade balance. It also provides employment opportunities for many human resources in different countries. The global market of fish and its products is expanding and growing rapidly in the field of fish production and trade. With an annual growth rate of 6.6% and a production of 52.2 million tons and a value of 94.2 billion dollars for the year of 2008 (10) while for Arab countries, Egypt is one of the largest producers of fish farms in the Arab world and ranks ninth in the world in 2012. As for Iraq, despite the availability of basic resources such as human, financial, rivers, lakes, dams and marshes which suitable for the fish growth, which encourage farmers to fish production processing in different ways, including fish breeding in floating cages. In recent decades, the production of fish in Iraq has spread in floating cages. This has led to an increase in fish supply and thus an increase in the demand for fish because of its great nutritional value. The study was limited to the province of Baghdad. The district of Altarmeyah, which is one of the districts north of Baghdad with a distance of (50) km. The area of this district is about 192411 donums. In this district there are a large number of fish producers have fields that they established at their own expense more than five years ago because of the return obtained from fish production in floating cages and the low cost of the construction of these cages. also the production in cages is characterized that it does not need to provide special water because it depends on fresh water directly.

Search problem:

Despite the expansion of the fish production and breeding in Iraq in general and in the Baghdad province in particular, but the production is still below the required level and insufficient local need, because Iraq is one of the countries that suffer from the misuse of available resources, which leads to low economic efficiency also the presence of some constraints which has prevented a significant expansion of fish farming in floating cages.

Research objectives:

1. Identifying the economic efficiency and diagnosing the production problems and directing the production units to determine the general interaction to improve the production and raising the fish farming using the floating cages in the study area.
2. Calculation of some economic criteria and indicators to determine the profitability of producers.

Study importance:

The interest of researchers in the study due to the importance of fish, which is an important source of food for the Iraqi family and the consequent production due to the difference in the number of cages for each breeders to achieve economic profit.

Search Hypothesis:

The research adopts the hypothesis that fish culture with floating cage has a good economic return if it is correctly used in terms of the quantity of fish in each cage and attention to technical and economic matters which affect the quantity of production directly.

Data sources:

This study was based on two types of data:

1. Primary data collected through questionnaire that prepared for this purpose, the sample included 30 producers in the district of Altarmeyah and the data obtained through the interview with these producers.
2. Secondary data obtained from the Ministry of Planning - central organization of statistics.
3. First: A brief on fish breeding in cages:

In recent times, there has been a lot of talk about fish cages floating on the Tigris river and opinions have changed about their fate. Some have asked to keep them with the controls to regulate their work. As it is a technology introduced to Iraq from abroad. As long as the countries use them so far, this is proof that it is a safe way to the environment and free of damage. On the other hand, some asked to remove it in order to protect the water from the pollution of the Tigris River where the analysis of the random water of the Tigris River adjacent to the cage that it does not meet the health specifications because they contain the effects of feed, which is a danger to public health, and by balancing the two opinions, The cages themselves are a good means of fish farming but personal behavior in the management of some of them is wrong and needs to be evaluated and controlled by the concerned authorities and we are concerned in this area to study and evaluate this method in fish farming. The use of cages in fish farming depends on placing a certain density of fish inside the cage and taking advantage of the phytoplankton and fauna found in the water to feed the fish with use of fish feed as supplementary feed to raise the economic efficiency of these cages (11). The idea of fish breeding in cages began in China and spread to Thailand, Indonesia and Japan (2).

The advantages of fish breeding in cages are:

1. A low-cost and highly efficient method of production that can be used by individuals and institutions.
2. the possibility of placing cages in any water surface, such as seas, lakes, reservoirs and waterways.
3. Easy to observe and care and feed the fish inside the cages.
4. The possibility of selling fish to the consumer is fresh and high prices.
5. Ensure that the producer obtains a continuous return through the organization of the breeding process and the provision of suitable marketing quantities throughout the year.
6. Need very little labor.
7. the Utilization of water currents in water replenishment, maintenance of dissolved oxygen and disposal of fish waste without the use of energy in irrigation and drainage operations.
8. Fish farming in their natural environment gives them the opportunity to best growth.
9. The possibility of breeding more than one species of fish in the singular cage.

The fish species suitable for breeding cages in the study area:

Where the experiments have shown that the best species that can be grown in cages are carp (Shaboot) (*Cyprinus carpio*), that is the most common species in the Iraqi table, which characterized by rapid growth and relatively easy adaptation.

Suitable aquatic medium of cages:

The temperature is suitable for warm water fish (26-20°C), as for cold water fish (10-15°C), oxygen rate and pH degree (10-6), and the water is free from pollution. The water depth is less than 1.5 meters and the current speed is (10 -5) cm/sec.

Cage forms:

Common shapes include rectangle, square, ring, triangle and multi-ribs. The material from which the cage is made differs from one country to another according to the available materials and capital for the project. The cages are manufactured from the angles iron coated with a stainless material and a cork-like material that helps float which is made of fiberglass and empty barrels. The nets are nylon and their capacity varies depending on the species, size and age of the fish.

Installation places of cages:

In small rivers, cages are placed in open spaces that allow for the flow and regeneration of water, while in large rivers they are placed in remote protected areas and are anchored in iron supports.

* The reason that the cage is floating about (10-15) cm above the surface of the water to prevent jumping fish from it and then cover the surface of the cage with wooden planks or nylon nets or plastic. Taking into account leaving a slot to put the feed from it.

Fish density in cages:

The fingerlings are placed in cages with a high density of up to 500 fish per m³, then gradually transferred and isolated according to growth and increase of fish sizes to reach 100 fish per m³. This varies widely depending on the species of fish and water quality.

Fish feeding in cages:

The fish are fed in cages on a balanced feed and suitable for the size and age of the fish. The feed should be in a floating form to give the fish a chance to catch them. The feed is put in the appropriate quantity for the fish according to the water temperature with 10% of the small fish weight and then the percentage is gradually reduced with increasing the weight of the fish until it reaches 2-3% daily. Feeding is either manual or automatic.

Second: The reality of fish production in Iraq for the period (2016-2000):

The results of table (1) shows that there is variation in the quantities of fishing from the river and marine fish for the period (2016-2000). The quantity average of freshwater fish for the same period is (40.818) thousand tons while the quantity average of marine fishing for the same period was 9.440 thousand tons. The contribution of freshwater fish to marine fish has high contributions as shown in the table, with the highest contribution rate represented in the years (2011.2005.2013.2014). which gave the percentages reached (987.8%, 1979%, 1018% and 2074.7%) for each year respectively, while the lowest contribution percent obtained from 2002 year that reached 54.3% (9).

Table (1) produced quantities of river and marine fish and percentage of river fish to marine fish in Iraq for the period (2000-2016).

years	Marine F	River F	Total	%
2000	15194	12416	27610	81.716
2001	12410	13588	25998	109.492
2002	29524	16015	45539	54.244
2003	2904	18105	21009	623.450
2004	2888	15495	18383	536.530
2005	3101	31560	34661	1017.736
2006	15666	41167	56833	262.779
2007	12745	41697	54442	327.164
2008	6421	41432	47853	645.258

2009	8645	44358	53003	513.106
2010	9490	46381	55871	488.736
2011	2242	46517	48759	2074.799
2012	12927	54936	67863	424.971
2013	5314	105168	110482	1979.074
2014	7721	76272	83993	987.851
2015	6422	39824	46246	620.118
2016	6879	48986	55865	712.109
	160493	693917	854410	
	9440.765	40818.647	50259.41	

Reference: Annual statistical data for the period (2000-2016). Ministry of Planning - Central Organization of Statistics.

The total fishing of river fish for this period reached 693.917 thousand tons, while the total quantity of marine fish reached 160.493 thousand tons. The growth rate is calculated according to the following equation:

$$Y = e^{a+bt}$$

$$\ln Y = a + bt$$

That is :

Y= represents the dependent variable whose growth rate is to be measured.

t = represents the time (number of years).

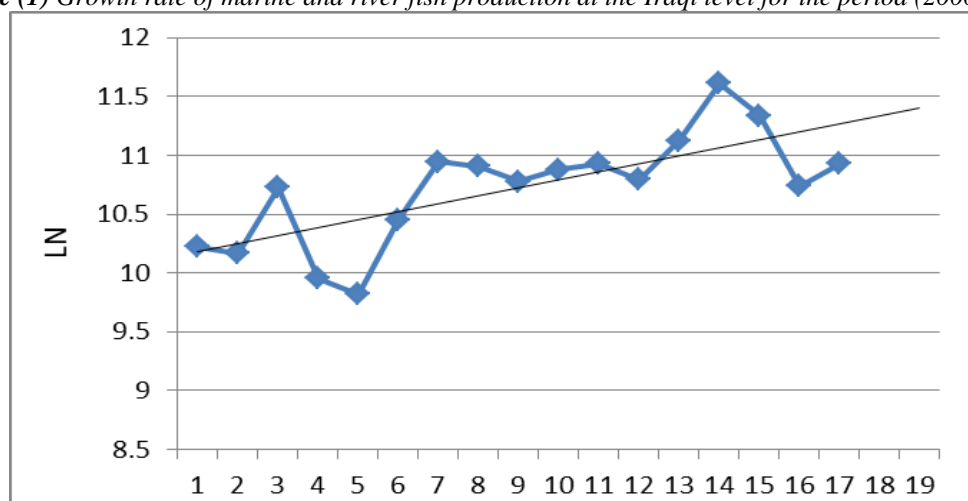
b = represents the slope of the regression equation that represents the growth rate according to the model above.

The annual growth rate of fishing quantity at the level of Iraq during the period (2016-2000) was (6.8%), where the fishing quantities represent the dependent variable. While the **B** coefficient indicates to the growth rate of the fishing quantity, which has a positive value of (0.068) as shown:

$$\ln Y = 10.11 + 0.068t$$

This means that fish production increases by 6.8%, as shown in the following figure:

Figure (1) Growth rate of marine and river fish production at the Iraqi level for the period (2000-2016).



Reference: by the researcher based on Table (1) data.

II. Results And Discussion

The research requirements were met with the required data based on the questionnaire of a random group of producers in the Altarmeya district reached (30) producers. The sample was divided into two groups according to the cages number. The first group included (5-1) cages. While the second group included (6 cages and more) and have used appropriate criterions for agricultural activities and it is represent the basis for the process of evaluating the efficiency of agricultural projects. On this basis, a selection of appropriate evaluation criteria has been selected which are:

1. The criterion of wage productivity = the value of production / wages (12).
2. The criterion of investment return = profits / invested capital (5).
3. The criterion of invested Dinar revenue = Total Revenues / Total Costs (6).

Table (2) Results of the most important criteria used for projects of fish cages in the area of study (thousand dinars).

Criterion or indicator	First group	Second group
Land productivity criterion	4.6	11.03
investment return criterion	1.3	1.51
Profit criterion	63728665	18485615
criterion of invested Dinar revenue	2.4	2.1

Reference: by the researcher based on questionnaire data.

In order to interpret the criteria applied to the two groups, the wages productivity criterion is the most important criterion. The wage is one of the most important economic indicators, which are related not only to the labor market as a balanced price of the labor factor but as part of the production cost and mainly basis in prices determination. Also it is an important indicator of the level of worker income (8). It was found that this criterion is important from the results of the second group, which was the highest (11.03). This means that the second group has the efficiency of using the work element in the absence of disguised unemployment. As for the investment return criterion, it was found that the highest value obtained from the second group amounted to (1.51) which means that there is a high feasibility in fish production. The profit criterion achieved the highest value from first group that reached (63728665) thousand IQD. This reflects the efficiency of the investment of available resources and the increase in the production quantity.

While criterion of invested Dinar revenue. The first group gave the highest value that reached (2.40). This indicates the existence of high efficiency in the use of variable production elements and this means the financial success of the sample research projects. This shows the highly efficient use of variable production factors and this means the financial success of the research sample projects.

In terms of cost items are:

First: The investment costs: The investment costs in the fish farms of the research sample, which included the cost of cages manufacturing and the feed stores building, the total of these costs in the first group reached (17493650) thousand IQD, while in the second group reached (2043750) thousand IQD (4).

Second: the fixed costs: the costs that do not change with the change in production. The items of these costs included family work, capital interest and other equipment costs. The total fixed costs of the first group amounted to 24580360 thousand IQD, while in the second group reached (2043750) thousand IQD.

Third: Variable Costs: The costs of production inputs and their positive relation with production, such as maintenance costs. and the costs of forage, medicines, treatments, transport fees and mortalities which accounts 40% of the total costs. The total variable costs in the first group reached (29397325) thousand IQD, while in the second group reached (919450) thousand IQD.

Table (3) The items of investment costs, fixed and variable of fish cages projects in the study area (thousand IQD).

Costs items	First group	Second group
Investment costs	17493650	2043750
Fixed costs		
other equipment costs capital interest	1062500 23517860	165625 735560
Total	24580360	901185
Variable costs		
maintenance costs	2705000	425000
feed costs	40190	24000
medicines costs	2565000	470000
transport fees	1825	410
mortalities	310	40
Total	29397325	919450
Total costs	71471335	3864385
Total Revenues	135200000	22350000
profits	63728665	18485615

III. Conclusions

1. The results of the evaluation criteria showed that the efficiency of the work (absence of disguised unemployment) was high, especially for the second group, because of the characteristics of this group by calculating the wage productivity criterion.
2. Lack of government support for fish cage breeders in the study area, and this is reflected in the number of cages in this district. However, most breeders have only one cage.
3. High efficiency was observed in the use of variable input elements, especially in the first group, and may be due to the low number of cages of the producers in the study sample. This is proven by the criterion of invested Dinar revenue.

IV. Recommendations

1. The State should provide financial support for agricultural projects, especially fish production projects in governorates and regions that have a comparative advantage in fish production, especially cages breeding method, in order to encourage farmers to expand their projects.
2. Directing agricultural policies to serve the objectives of increasing the productivity of local resources (land, labor, capital, water) for this sector through increasing the production and use of modern and efficient technologies which used worldwide, such as floating or fixed cages or integrated agriculture and continuous guidance using these methods for production and at low costs.
3. Increase the number of feed factories and support them because feed costs constitute a large proportion of the variable costs of fish producing and breeding in the country.
4. Spread veterinary and economic awareness among fish breeder.
5. It is necessary for institutions related to this sector, for example the Ministry of Agriculture / General Authority for Fish stock Development, to carry out its main tasks in order to develop this sector by holding seminars and training courses and intensifying awareness campaigns to educate local producers and investors about the importance of this sector and the use of correct methods in breeding and fish production.

References

- [1]. Al-dulaimi, M. A. H; F, A. Mahmood and A, H. Obaied. 2004. estimation and analysis of the of production costs functions of fish projects in Babil governorate, 2001, and measurement of profit maximization in it, *Al-Anbar Journal of Agricultural Sciences*, vol. 2, No. 2, Pp. 469- 474.
- [2]. Ali, I. H. 2015. Estimation of economic efficiency of eggplant Farms (Diyala Governorate. Study case), *Iraqi Agricultural Science Journal*, Vol 46, No. 4, p. 602-610.
- [3]. Ali, I. H. et al.2012. The role of farm size in achieving economic efficiency.University of Karbala.Second Scientific Conference - college of Agriculture.Pp32.
- [4]. Al-izzi, J. M. H; A, Ali and A, Abdul-Fattah, (2002), Openness of Investment in Fish Projects and their Rate of achieving Revenues, *Journal of Agricultural Sciences*, Volume 33, No. (1).
- [5]. Al-izzi, J. M. H; F, M. Awaed. 2000. the importance of rates of return on capital owned in the implementation and growth of projects, *Journal of Agricultural Sciences*, Volume 31, No. (4).P 561-573.
- [6]. Al-Omari, M. W; H, W. Mahmood. 2013. The factors affecting the productivity of workers and wages in the Jordanian transformative industries sector, *Jordanian Journal of Business Administration*, Volume 9, No. 1, p. 80-83.
- [7]. Annual statistical collections for the period (2000-2016) Ministry of Planning and central organization of statistics.
- [8]. Arab Organization for Agricultural Development, Arab Agricultural Statistics Yearbook (2010).
- [9]. Donald ,J.andw.Malone . 1981.Introduction to Agricultural Economics. Mac Millan Publishing co.p 39.ss.
- [10]. Hyman, D.N.1997.Economic.Fourth edition Published by McGraw.Hill Higher E ducation Companies inc.New York Press.USA.P:412.
- [11]. Ibrahim, A. A.. 1982. Evaluation of the project of the vegetables production in greenhouses in Alrashideya area. master thesis . college of Agriculture - University of Baghdad.Pp165.
- [12]. Qasim, A. F. 2011. Study of the impact of agricultural management on the production of field crops in the new lands. Council of Arab Agricultural Economies 3 (1).

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