The Fishermen's Awareness of the Obstacles to the Sustainable Development for Lake Mariout in Alexandria Governorate

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Abstract

This research aimed to identify the main problems and obstacles affecting the sustainable development of Lake Mariout to obtain a strategy for conservation and development of the lake. The problems and obstacles related to the development in addition to managements of Lake Mariout from the point of view of fishermen's population are divided into three types these are: 1- Problems related to developments and productivity of the lake.2-Problems facing the fishermen besides fishing operations.3- Comprehensive environmental development of the Lake. The main proposed solutions for these problems are expanding the construction of industrial hatcheries, as well as raising the efficiency of hatcheries to strengthen fish stocks in the lake. Activating cooperation between the different bodies supervising the lake. Support and develop applied scientific research in the field of fisheries in the lake. Do not dump sewage in the lake until it is purified. Activate the role of fish extension and make an extension programs for fishermen.

Key words: Obstacles , Sustainable Development , Alexandria .

الخلاصة

يستهدف هذا البحث بصفة رئيسية تحديد أهم مشكلات ومعوقات التنمية المستدامة لبحيرة مريوط ووضع إستراتيجية للحفاظ على البحيرة وتطويرها، وتنقسم المشاكل والمعوقات المتعلقة بتطوير وإدارة بحيرة مريوط من وجهة نظر مجتمع الصيادين إلى ثلاثة أنواع هي: 1- المشاكل المتعلقة بالتطوير وإنتاجية البحيرة، 2- المشاكل التي تواجه الصيادين وعمليات الصيد، 3- التنمية البيئية الشاملة للبحيرة. وكانت الحلول الرئيسية المقترحة لهذه المشاكل هي توسيع بناء المفرخات الصناعية ورفع كفاءة المفرخات لتقوية المخزون السمكي في البحيرة، تفعيل التعاون بين الجهات المختلفة المشرفة على البحيرة، دعم وتطوير البحوث العلمية والتطبيقية في مجال المصايد في البحيرة، عدم تفريغ مياه الصرف الصحي في البحيرة حتى يتم تنقيتها، وتفعيل دور الإرشاد السمكي وتقديم برامج إرشادية للصيادين.

Introduction

The problem of inadequate local production of food is one of the most severity problem faced by planners of agricultural policy at present, requiring studies, programs and strategies in multi directions e.g. economic, political and social to reduce the gap between production and consumption.

In order to handle the problem of food shortage, especially in the field of animal production, Egypt turned to improve the fish sector to try to bridge part of the food gap generally and in the protein gap in particular. The importance of this sector, which contributes with more than 13% of the total agricultural income of fish as more than 1.8 million tons in 2015/2016, which in turn led to an increase in per capita annual fish consumption from 15.2 kg in 2007 to more than 20 kg in 2014, (Elturky, 2016).

In spite of the fact that fish production in Egypt has achieved a big leap, the total fish production represented about 1.8 million tons (1781882) tons in 2016 and the total production of natural fisheries areas in Egypt, 414655 tons in 2016 by 23.26% of Fish production (GAFRD, 2016), it has been found a low productivity of fisheries is observed, although Egypt has a total area of about 14 million acers characterized by varying salinity between fresh, brackish and

saline waters, thus, there are various types of fish living in these different environments (Ministry of Agriculture and Land Reclamation, 2009).

Previously, it is clear that it is important for Egypt to develop its sources of fish either from natural resources or through promotion in addition to developing the investments which directed at various types of aquaculture activities, (Elshami, 2015).

The planning process ,as well as the preparation of an effective strategy to develop the fisheries sector, especially those related to natural fishing areas, should include studies and analysis for the policies to find out The factors affecting the decline in fish productivity, (Elshami, 2015).

Not only the Egyptian Lakes which are located in the Mediterranean basin in the north of Egypt is a great wealth, but it is one of the most fertile natural Lake s in the world in terms of its strategic location in addition to temperate climate, so it is considered as one of the most important sources of fish, (Elshami, 2015).

The problem of fish decline in its natural sources as Egyptian northern lakes are discussed by many authors among them Abo El-Enein (2002); Al-Ghoul (2002), Elsabagh, etal, 2004, Elturky and Khaled 2014; GAFRD, 2015. And sawilm, 2015.

Problem of study:

1- What are problems related to developments and productivity of the lake?
2- What are problems facing the fishermen and fishing operations?
3- What is Comprehensive environmental development of the Lake?

Study Objectives:

The main objective of this study is to identify the problems and obstacles related to the sustainable development of the Lake Mariout in terms of productivity, social besides environmental, the required research results, whether in the form of recommendations or modern technology as well, the main objective can be achieved through three sub-objectives which are: identify on problems related to developments and productivity of the lake, identify on problems facing the fishermen and fishing operations, identify on Comprehensive environmental development of the Lake.

Area of study:

Lake Mariout is located in the south of Alexandria Governorate, north of Egypt, specifically in the northwestern corner of the Nile Delta. It is considered a salt lake, where part of the lake's beaches are drained into arable land (fig. 1).

Fig. 1 Lake Mariout

The lake has shallow water up to eight feet below sea level, Its depth fluctuated between from one meter to one half meters. The area of lake has shrunk over the last 30 years from 50,000 acres to 17,000 then 16,000 acres. The lake is a large area fed by the Nile River branches, but with the progress of time and urban expansion has been drying large areas of the lake for planting in addition to housing construction. The lake threatens to drain the water of agricultural banks and exposed to the random landfill to prepare in addition to preparing for the urban encroachment on the perimeter to build housing and roads. The lake face a real deterioration as a result of pollution; fish wealth is threatened by a decline in production, which in turn will affect the social situation of fishermen, As a result of excessive pollution increased environmental problems in the region, it is some suggestions that have emerged filling the entire Mariout Lake and use of its area by building new housing, and what hinders this is the area of the Big Lake (fig. 2).

Fig. 2 Lake Mariout suffer from pollution.

In spite of the numerous and continuous campaigns launched by the Alexandria Water Police, in coordination with the executive bodies of the governorate to remove the encroachments on the lake, most of which are bulldozing parts of the lake, building buildings besides fences or taking possession of the land on it, They soon return once the campaigns are gone.

Lake Mariout suffers from two major environmental problems: the first problem is the continuous drying which lead to decline in its area, and the second problem is summarized in the contaminated drainages that the Lake receives, whether from agricultural drainage and industrial drainage (GAFRD, 2015).

Research Methodology

The research method included research methodology, research parameters, research fields, research methods, data collection, focus group preparation, data processing and analysis, which consisted of fishermen members of the cooperative associations of fishermen in Lake Mariout, participants in the focus groups in the five ponds, has ranged to attend each group of 8-12 participants, where the total number of fishermen 3000 registered fishermen as a member of the Association according to the statistics of 2016, They were randomly selected from the Association 's records.

First: Research Methodology

In this research, we rely on the analytical descriptive approach by identifying the most important problems and obstacles related to the productive, social in addition to environmental aspects of the research area, which helps to know all the information necessary to understand the

subject of the research, consequently reaching the recommendations that can be used. To verify the validity and stability of the sample was done pretest and then repeat the same test on the same people after a period of time, and it became clear that there are no differences between the answers for the first time and the second time.

Second: Search criteria

All fishery cooperatives were limited to Lake Mariout and distributed to the five major Lake basins through the records of the Western Region of Fisheries and the identification of five groups representing the fishermen working at Lake Mariout in the five basins, the main basin and an area of about six thousand acres, the Southwest Basin and an area of about five acres, the western basin north and an area of about three thousand acres, basin millennial acres and draws its water from the link navigational canal Nubaria, fish farm basin with an area of about a thousand acres.

Third: procedure definitions:

FISHED RESPECTORS: In this research, all registered fishermen in the fisheries cooperatives of Lake Mariout are engaged in fishing in the Lake until the time of the research.

2. Human domain:

The participants in the focus groups, which were carried out in the main basins of Lake Mariout, consisting of five focus groups, ranged in number from 8 to 12. Respondents 3 . Time domain: Data collected during the period from December 2017 to January 2018.

Forth: Method of research and data collection:

The focus group discussion was used as a method of dealing directly with the respondents. The number of respondents ranged from 8-12. The discussion was based on a schedule interview prepared in advance to obtain the responses of the respondents covering the goals Five research groups were held for the respondents.

fifth : Preparing focus groups

Five intensive besides semi-structured focus groups were interviewed for a number of concerned and experienced experts on the issues, problems, obstacles and proposals related to the development of Lake Mariout according to the collection of the scientific material to be obtained, which was prepared in advance including the main axes of the study objectives. The objective was to provide a good atmosphere for discussion. The discussion was conducted to avoid the usual extension of the sessions of the focused discussion sessions where the roles were distributed among the members of the research team: Who is running the session? Who registers? Who pays attention? The roles of team members were also exchanged for development and the different skills of the research team were used. Group comments, as well as reactions were recorded with any observation the team saw as the way people think and act in groups is often different from the way they think and act as individuals. Collective grouping is an important means of generating data and allows discussion, dialogue and exchange of information to reach the desired goal, as well as to arrive at specific solutions to problems. The duration of each group discussion session is about one hour and a half.

Sixth: Data processing

The analysis of quantitative data obtained qualitatively or qualitatively depends on the daily review of the information obtained after each focus group agreed on the problems and proposals from their perspective in addition to arranged according to the degree of the most importance, summarized, categorized and linked to the observations collected.

Research Findings:

Based on the objectives of the research to identify the most important problems and obstacles related to the sustainable development of Lake Mariout with its productive, social and environmental aspects, and proposed solutions to these problems. It was necessary to arrange these problems in descending order according to their importance from the perspective of the respondents to serve as a basis for guiding the development of a fish extension strategy for the development of the Lake . Research Findings The most important of these problems and obstacles have been identified in the following:

First: Problems and obstacles related to the development in addition to management of Lake Mariout productivity and suggested solutions

The most important problems and obstacles related to this item and its suggested solution are given in table (1).

Table (1) Problems and obstacles related to the development in addition to management **of Lake Mariout and the proposed solutions from the perspective of the respondents**

Order	Problem / Obstacles	Proposed solutions
1	Weakness of fish stocks and depletion of the Lake continuously.	-. Expanding the construction of industrial hatcheries besides raising the efficiency of hatcheries to strengthen fish stocks in the lake -. Establishment of a bank of genetically pure Nile tilapia to obtain the best fish species
2	Absence of fish stocks assessment studies	-. Support and develop applied scientific research in the field of fisheries in the lake. - The possibility of introducing new species of fish after careful study so as not to affect the rest of the species.
3	The multiple supervision, as well as absence of coordination between them and blurred of objective	-. Coordination between ministries and different administrations concerned with the lake, (Ministry of Agriculture, Irrigation, Environment, Petroleum, Industry, Fisheries besides Local Administration) -. Establishing a scientific center that includes ministries, bodies, institutions and research centers operating in the lake Scientific body
4	Lack of financial resources for Lake development	Providing the necessary financial resources to implement projects concerned with the development of Lake Mariout
5	Optimal utilization of lake resources. Scarcity of research on fish diseases.	-. Support and develop applied scientific research in the field of fisheries in the lake. Selection of specialized cadres with scientific in addition to practical competence when forming any of the different development committees.
6	The weakness of the role of police in protecting, as well as preserving the lake.	- .Providing financial resources and necessary equipment to the police of the territories to do their part. -. The transformation of the water bodies police into a specialized police unit that follows the General Directorate of Water Police and not the Security Directorate, as is the case in the governorates of Cairo and Giza. The
7	-The absence of clear vision for the development of the lake.	Establishment of an integrated central administration, an advisory and researching authority responsible for the development besides management of Lake Mariout and the activate scientific studies.
8	The absence of a valid database that can be trusted.	-. Improve the system of monitoring in addition to recording fish statistics data and making it available to researchers and specialists. -. Create a database to store all data on the lake.

9	Non-implementation of the laws of the protection of water bodies, as well as the weakness of regulatory bodies.	-. Activating the application of the laws of the protection of water bodies in addition to accountability of violators.
10	The spread of favoritism among employees of the (GAFRD) and the police bodies of water for some offenders owners of fishing boats.	Activating the application of the law and accounting for those who are deficient in its application.

Second: Problems and obstacles related to fishermen populations, as well as fishing operations and proposed solution from Fishermen whose members of cooperative societies for fishermen

The most important problems and obstacles related to the fishing communities and fishing operations and proposals and suggested solution are given in table (2)

Table (2) Problems and obstacles related to fishermen populations, as well as fishing operations and proposed solution from Fishermen whose members of cooperative societies for fishermen

Order	Problem / Obstacles	Proposed solutions
1	The death of fish and fry as a result of the disposal of oil companies, sewage waste, as well as agricultural drainage waste loaded with pesticides.	-The establishment of processing units for industrial and petroleum companies. -Treatment of industrial besides agricultural waste water prior to dumping in the lake. - Preventing dumping of wastewater in the lake.
2	The spread of violent fishing method and the increase in fishing effort.	-. Activating the fishing law and its executive regulations, especially with regard to the openings of mesh nets so as not to cause depletion of the Lake 's resources by over fishing. -. Stop fishing in the breeding seasons of tilapia (15 March to 15 May) to support fish stocks.
3	Non-activation of the laws governing hunting and its executive regulations.	-. Activating the fishing law and its executive regulations, especially with regard to the openings of mesh nets so as not to cause depletion of the Lake 's resources by over fishing. -. Stop fishing in the breeding seasons of tilapia (15 March to 15 May) to support fish stocks. -. Activating the role of the water bodies police to implement laws regulating hunting in addition to protection against infringements and providing mechanisms for implementation
4	Lack of the roles of the cooperative societies of fishermen and failure to fulfill the objectives for which they were established.	-. Activating the role of the Federation of Fishermen and Cooperative Societies for fishermen besides setting a framework to assist them during the fishing cessation periods in the lake. -. Activating the role of the Cooperative Union for water wealth, especially in providing production requirements at appropriate prices.
5	Lack of social, health and financing services for the fishing population.	-. Taking care of social guarantees for fishermen. -. Insurance for their lives against dangers. -. Raising their standard of living -. Facilitate humane livelihoods. -.Providing health care for the scattered and planned fishing populations and providing them with clean water. Provision of places to finance fishing vessels in food and fuel.

6	High cost of fishing equipment, as well as supplies.	-. Activating the role of the Cooperative Union for Water Resources in providing production requirements at suitable prices -. Encouraging investment in projects related to the fishing industry
7	Primitive methods of handling, transporting, preserving and marketing fish.	Expanding the studies of the identification of the optimum, economic and practical methods in addition to the use of modern technology for conservation, circulation and transport of fish to reduce losses.
8	Lack of fishery activity and lack of extension programs for fishing populations.	Establish extension centers to take care of the human development of fishermen and train them and raise their skills by fishing techniques and awareness of the importance of maintaining the ecological balance of the Lake. - Attention to fish studies and research, especially in relation to fishery extension for fishermen.
9	Difficulty in extracting fishing licenses and raising fees.	Facilitate the procedure of obtaining necessary licenses for fishermen and reduce their fees.
10	Weak participation of fishermen in the activities of cooperative societies and in the control of violators for fear of problems between the tribes.	-.The elimination of tribalism. -.Promotion of public interest -.Creating an environment conducive to the holding of fair elections for fisheries cooperatives.

Third: Problems and obstacles related to the comprehensive environmental development of Lake Mariout and proposed solution from the perspective of the respondents:

In order to achieve the goal of the third study, it has been identified the most important problems and obstacles related to the comprehensive environmental development of Lake Mariout and proposed solution from the perspective of respondents: The results are given in table (3)

Table (3) Problems and obstacles related to the comprehensive environmental development of Lake Mariout and proposed solution from the perspective of the respondents:

Order	Problem / Obstacles	Proposed solutions
1	Decreased water levels along the beaches, which lead to a decrease in fish stocks in the Lake.	-.Open the water feeders to raise the water level - Purification of the Lake's water surface from the weeds and water grass.
2	The spread of aquatic plants and grasses greatly affects the environment of the Lake.	-.Conduct detailed studies on the aquatic plants spreading and types and to develop a complete plan for disposal, in order to preserve the amount of water as a result of losses in the expansion of the studies of the ecosystem of the Lake. -.Conduct detailed studies on the natural and chemical characteristics of the Lake and identify its circulation pattern.
3	Increasing the depth of the Lake bottom and the appearance of naturally dried parts of the Lake , reducing the water volume.	Activating the laws and legislations related to the protection of the water environment from pollution as a result of the dumping of industrial, agricultural and human waste
4	Reduce the area of the lake as a result of seizing and filling parts of the lake by mafias of land which led to the elimination of lake resources.	Activating laws and legislations to protect the water environment from dredging and pollution.

Recommendations

According to the results of the study it was important to develop some sub-goals to achieve the objective of the development of Lake Mariout, which can be limited to the following items:

- The activation of coordination between ministries, scientific institutions, society organizations related to fish activity which is critical to achieving the development objectives of Lake Mariout.
- Develop and support institutions responsible for human and fishery development in the lake, including university, institutions and training and rehabilitation centers.
- Development of skills, as well as knowledge through fish extension centers and other fields that provide sufficient numbers of skilled and specialized work according to the requirements of advanced fish production patterns and related integrated projects.
- Enhancing the competitiveness of fishery products in domestic and international markets.
- Activating the governmental role in controlling and controlling fishing operations and enforcing its laws within Lake Mariout.
- The necessity of the presence of a specific society responsible for taking care of the issues of fishermen and studying and analyzing their problems related to fishing and marketing.
- The need to reduce the percentage of losses of the catch.
- Encourage and support the advanced manufacturing sector in the manufacture and conservation of fish products to reduce the spread of random practices for the manufacture and conservation of fish production in the informal sector, which is not subject to supervision and official control.
- Investment and exploitation in the conversion, conservation, processing and processing of fish products. Take advantage of the fish waste and turn it into a fish powder, which is one of the basic components for the manufacture of fodder, which is imported from abroad in hard currency.
- Activate and enforce what is in force from the regulations and legislations related to environmental quality standards and standard specifications for re-storing Lake Mariout
- Provide and strengthen information and studies related to Lake Mariout and provide monitoring systems, follow-up and analysis of the productive and environmental variables in the lake which affect their productivity.
- Encourage and finance investments related to the development of Lake Mariout production, social and environmental
- Activating the role of stakeholders related to the fisheries sector, which are confined to fishermen associations, fishermen's union and some local community development associations which are affiliated with the Ministry of Agriculture or the Fisheries Authority in any form of regulation.
- Providing support from senior management for the use of information and communications technology and applying the applied research results for computer science in the production sector in the lake.

REFERENCES

1. Abo El-Enein, Samy Mohamed, Future Economic and Social Prospects of Lake Mariout, Al-Jadid Journal of Agricultural Research, Faculty of Agriculture, Saba Pasha, Volume VII, No. 1, Alexandria, March 2002.

2. Al-Ghoul, Iman Ahmed, A Study of Some Fishing Problems in Bardawil Lake, Egypt, Egyptian Journal of Agricultural Research, 80, (1), 2002.
3. Al-Sabbagh, Saber Abdel-Hamid, Abdel-Gawad El-Sayed Bali, Societal Problems in Fishing Communities around the Berlus and Berdwell Lakes, Mansoura University Journal of Agricultural Sciences, 29 (1), 2004.

4. El turky, Mahmoud Rajab, khaled El-Sayed, The Familiarity of Fishermen with Environmental Pollution and its Relation to their Illegal Fishing and Non-Fishing Practices at Lake Mariout, Alexandria Governorate, Alexandria Journal of Scientific Exchange, March 2014.
5. Elshami, Sana Abdo, The Future of Egyptian Natural Lakes, Assiut Journal of Environmental Studies, Issue 41, January 2015.
6. Elturky, Mahmoud Rajab, Guidance in Developing and Modernizing Fishermen's Society and Fisheries Conservation, Training Course in Fish Guidance, Center for Leadership Development, Cairo, 2016.
7. General Authority for fish Resources Development (GAFRD),Ministry of Agriculture and Land Reclamation, Annual Fish Statistics Book, 2015.
8. General Authority for fish Resources Development, Ministry of Agriculture and Land Reclamation, Fish Statistics Book, 2016.
9. Ministry of Agriculture and Land Reclamation, Sustainable Agriculture Development Strategy 2030, Agricultural Research and Development Council, ARC Press, 2009.
10. sawilm, Mohamed Nasim, Selected Information in Agricultural Extension and Rural Society, Dar Al Nada Press, 2015.