

## THE VARIABLES AFFECTING THE NEEDS OF FISHING KNOWLEDGE OF FISHERMEN IN LAKE BURULLUS, KAFR EL-SHEIKH GOVERNORATE, EGYPT

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### ABSTRACT

The sub-objectives of this study were included as follows: a) identifying some social and economical characteristics of fishermen at Lake Burullus, b) investigating levels of fishermen fishing knowledge needs at Lake Burullus, c) determining variables affecting the needs of fishing knowledge for fishermen at Lake Burullus, and d) identifying some fishing problems at Lake Burullus.

To achieve these objectives a simple random sample of 158 fisherman were taken, it represents 4.1% of the fishermen population. The data were collected by questionnaires through personal interviews. Some statistical methods were used for data analysis such as frequency, percentage, means, standard deviation, correlation coefficient, regression coefficient by using SPSS computer software.

The results indicate that about 92% of the fishermen had a degree ranged between moderate and high of the needs of fishing knowledge (NFK). In addition, there were a negative significant relationship at the level 0.01 between the needs of fishing knowledge for fishermen (NFK) as a dependent variable and fishers ages, fishing experiences, educational levels, boats ownership, general knowledge, attitudes towards fishing profession as independent variables. The most important variables, which affect on the dependent variable (the needs of fishing knowledge NFK), were fishing experiences, educational levels, fishermen ages, general knowledge and boats ownership.

The study shows that the fishing problems in Lake Burullus could be ranked as follows: the wide spread of illegal gears, the wide spread of phragmites sp. Followed by *Eichhrnia crasipes*, absence of the effective control from the government., caching fry from the lake and Boughaz El-Burullus.

**Keywords:** Burullus Protectorate Area, Fishermen, extension, needs, over fishing, knowledge, and environment.

### INTRODUCTION

The extension education process can be considered as a governmental activities in the rural society for rural population (El-Sawy, 1982 and Saleh *et al.*, 2004) so rural extension is considered as one of the governmental tools in order to carry out the development policies in the developing countries (Jones and Rolls, 1982).

The extension aim always helps in increasing food production and environmental conservation. So one of extension's major roles has been respond quickly to new priorities and needs voiced by clientele, when the subject is one that goes beyond the expertise available within a particular region extension responds by combining information networks and designing demonstration projects that generate information and develop techniques applicable to regional areas (Snyder, 1992).

The need can be defined as requirement, want, desire or felt need (Kelsey and Hearne, 1963). In addition, the need defined as a gap between the present case and the desirable case (Leagans, 1961). Extension needs means different things to different people (Pavalko, 1976), these things that people need such as knowledge, skills, adjustment of their negative attitudes can solve their problems. People can reach their desirable requirements and build their abilities by learning. In this sense, extension needs could be considered as an educational content such as knowledge, skills, attitudes or various ways for solving the problems (El-Tonoby and Omran, 1997).

The brackish-water lakes situated at the north of Nile Delta are of particular importance in the fish economy of Egypt. These lakes contribute about 11.16 % of the total fish yield in Egypt. The catch taken from Lake Burullus during 2006 was amounted by about 53,000 metric tons. This catch comprises 48.9 % by weight of the fish caught from northern Delta Lakes (Fish statistics, 2006). Lake Burullus has been declared as a natural area in 1998 has strong potential to become one of Egyptian growth fisheries in the coming decades. It suffers various problems now.

The most serious problem at Lake Burullus is the over exploitation of its fish population (Al-Sayes, 2005). Several methods and gears were used to catch undersized fish of marine and fresh water origins. In addition, the problems related to the water properties and changes in the distribution and fish diversity in Lake Burullus (Radwan, 2004). Also, the widespread of aquatic hydrophytes especially *Phragmites* sp. (El-Karyony and Mohamed, 2007). In addition, the dryness of many parts of Lake Burullus was a major problem, in addition to the problems of production and marketing of fish in the lake. It was observed that, these problems correlated to a great extent to human activities in the Lake, and thus, which required to a good plan to protect such lake.

## **RESEARCH OBJECTIVES**

The sub-objectives of this study were included:

- 1- Identifying some social and economical characteristics for fishermen at Lake Burullus.
- 2- Investigating levels of needs of fishing knowledge for fishermen at Lake Burullus.
- 3- Determining the variables affecting the needs of fishing knowledge for fishermen at Lake Burullus.
- 4- Identifying some fishing problems at Lake Burullus.

## **MATERIALS AND METHODS**

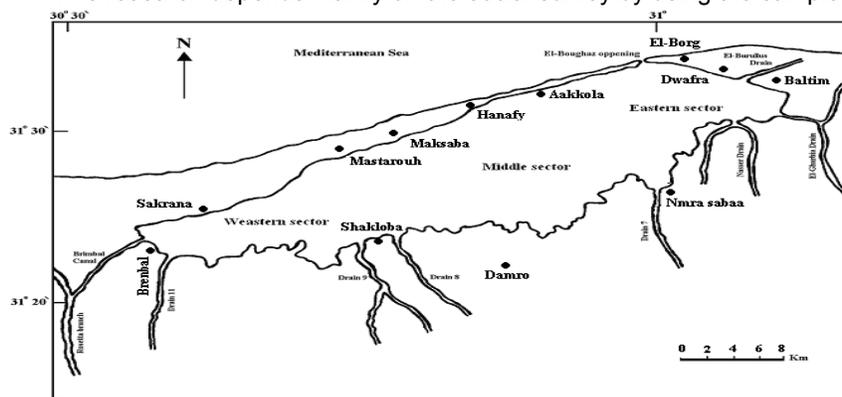
### **- Research area:**

Burullus wetland (i.e. Burullus Protectorate Area) is located along the Mediterranean coast in the northern part of Nile Delta. It is bordered to the north by the Mediterranean Sea and from the south by the agricultural lands of northern Nile Delta and fish farms. Burullus Protectorate Area belongs administratively to Kafr El-Sheikh Governorate in Egypt. It lies in a central

position between the two branches of Nile: Domiat and Rasheed branches. The total area of this protectorate is 460 km<sup>2</sup>, while the area of Lake Burullus is about 410 km<sup>2</sup>. It is located within five districts of the Governorate (from east to west: El-Burullus, El-Hamol, El-Ryad, Sydy Salm and Mytobus), with a total population of 965220 people. Baltim district has the largest population around the lake, mostly concentrated in Baltim city (Shaltout *et al*, 2005).

**- Data sampling:**

This research depends mainly on the social survey by using the sample.



**Figure (1): Location of the study area at Burullus Lake**

A simple random sample was carried out to select 158 fishers from 12 locations at Lake Burullus representing all sectors; these locations are show in Fig. 1, it represents 4.1% of the population (3870 fishermen) during 2008.

**- Data collection and analysis:**

A personal questionnaire prepared and pre-tested to achieve the objective of this study. The data was collected during the period from January 2008 to April 2008. It was collected from the selected sample during the personal interviews. Statistical analysis such as: frequency, percentage, means, standard deviation, correlation coefficient, multiple regression coefficient were used for analysis the data, by using the statistical package for the social sciences (SPSS computer software).

**- Research hypothesis:**

There are no significant relationship between the needs of fishing knowledge among fishermen and the independent variables (fisher age, fishing experience, educational levels, number of children, monthly income of fishing, agric. holding, boat ownership, general knowledge, and attitude towards fishing).

**-Operational definition:**

**The needs of fishing knowledge (NEK):** It can be identifying as the difference between actual knowledge degree of the fishers of some fishing knowledge and the maximum ideal degree of their fishing knowledge. It had been measured by 13 questions about: the benefits of *Phragmites* sp. in Lake Burullus, the damages of *Phragmites* sp in Lake Burullus, breeding

season of Tilapia, the important types of Tilapia in Lake Burullus, Mullet spawning season, breeding place of Mullet, methods of fish preservation, the best way to preserve fish on boat, the fishing by using toxic and explosives substances in Lake Burullus, methods of fishing Alhenchan, the best way to catch Alhenchan in Lake Burullus, types of Alhenchan in Lake Burullus, and the most important violation fishing crafts in Lake Burullus.

The maximum ideal degree that can be obtaining by the interviewee in each 13 questions is 37, while the actual degree is the degree obtained by the interviewee based on the correct answer to the questions.

## RESULTS AND DISCUSSION

### 1- Social and Economical Characteristics of Fishermen:

Results of Table 1 show that 94% of the fishermen were youth, 67% of them had medium and long experiences, 45% of them were illiterates, 59% of them had more than 3 children, 70% had monthly income more than 400 P., 92% of them hadn't agric. holding, 51% of them hadn't fishing boat, 84% of them had degree ranged between moderate and high of general knowledge and finally 25% of them had positive attitude.

**Table (1): Some social and economical characteristics of the interviewees.**

Variables	Categories	n	%	Mean	St. d.
Fishermen ages	< 31 years	70	44.3	34.23	1.08
	31-50 years	78	49.4		
	> 50 years	10	6.3		
Fishing experiences	Short exp.	52	32.9	23.56	9.80
	Medium exp.	84	53.2		
	Long exp.	22	13.9		
Educational levels	Illiterate	71	44.9	1.72	0.79
	Read and write	67	42.4		
	Medium qualification.	14	8.9		
	High qualification.	6	3.8		
Number of children	Few num.< 3	65	41.1	3.35	2.74
	Medium n. 3-6	67	42.4		
	Many num. >6	26	16.5		
Monthly income of fishing	Low <401	47	29.7	496.83	160.08
	Medium 401-699	89	56.3		
	High >699	22	13.9		
Agric. holding	Haven't	145	91.8	5.09	1.92
	Small ho.	7	4.4		
	Medium ho.	3	1.9		
	Large ho.	3	1.9		
Boats ownership	Not owner	80	50.6	0.65	0.81
	Contributed	64	40.5		
	Lease holder	3	19.0		
	owner	11	7.0		
General knowledge	Low <12	26	16.5	8.48	3.34
	Medium 12-18	114	72.2		
	High > 12	18	11.4		
Attitudes towards fishing	Negative <12	60	40.0	14.16	4.37
	Neutral 12-18	59	37.3		
	Positive > 18	39	24.7		
total		158	100.0		

Source: Calculated from the questionnaires.

## 2-The needs of fishing knowledge (NFK) among fishermen at Lake Burullus:

Fig. 2 reveals that 8.2% of fishermen had low degree of NFK, while 67.7% of them had moderate degree of NFK. Finally, 24.1% of them had high degree of NFK.

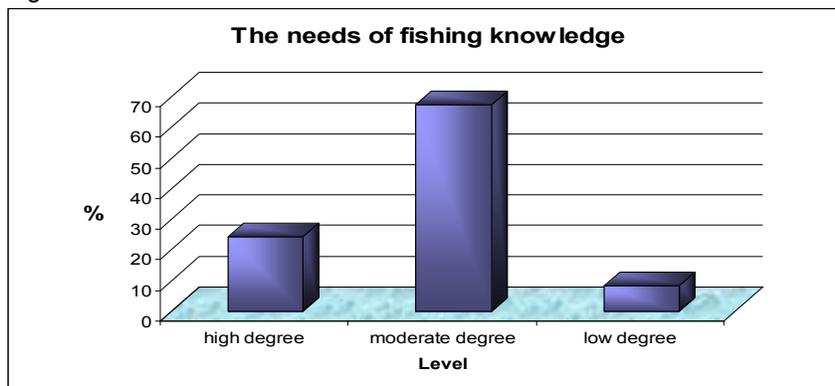


Figure (2): the needs of fishing knowledge for fishermen

The results of table 2 indicates that the most important variables affecting the needs of fishing knowledge (NFK) among fishermen were: the breeding season of Tilapia (91.8%), death of fishes by using toxic & explosive substances at Lake Borollus (88.6%), the benefits of Phragmites sp. in Lake Burullus (74.1%), Mullet spawning season (55.1%), the damages of Phragmites sp. in Lake Burullus (52.5%), types of Alhenchan in the lake (51.9%), and methods of the Alhenchan fishing (49.6%).

In addition, Fig 3 shows that the most important factors of the fishing needs for the interviewees were as follows: Breeding season of Tilapia, fishing by using toxic and explosives substances in Lake Burullus, the benefits of Phragmites sp. in Burullus Protectorate Area, Mullet spawning season and the damage of Phragmites sp. in Burullus Protectorate Area.

## 3- The factors affecting the needs of fishing knowledge for fishermen in Lake Burullus:

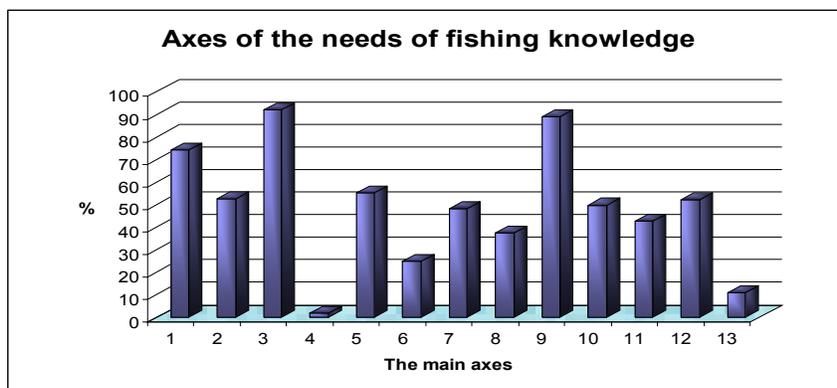
Results of table 3 indicates that there were a negative significant relationship at the level 0.01 between the needs of fishing knowledge for fishermen (the dependent variable) and fishermen ages, fishing experiences, educational levels, boats ownership, general knowledge, attitudes towards fishing profession, and a negative significant relationship at the level 0.05 with fishermen ages variable (the independent variables). Also, all the independent variables explained 25.8 % of the variance in dependent variable.

On the other hand, the results of table 4 show that most important variables affect the dependent variable (the needs of fishing knowledge NFK) were fishing experiences, educational levels, fishermen ages, general knowledge and boats ownership variables. These variables explained 22.9% of the variance in dependent variable.

Table (2): The needs in the axes of fishing knowledge for fishermen.

N	Axes of Fishing knowledge	need	
		n	%
1	<b>The benefits of Phragmites sp. in Burullus Protectorate Area:</b>	<b>117</b>	<b>74.1</b>
	- a safe shelter for wild birds	152	96.2
	- used in the nests and roofing	58	36.7
	- food for the animals	18	11.4
	- used as fuel	123	77.8
	- extraction some chemicals and fertilizers	154	97.5
	- treatment of lake water from some pollution materials	158	100.0
	- raw materials for paper industry	158	100.0
2	<b>The damage of Phragmites sp. in Burullus Protectorate Area:</b>	<b>83</b>	<b>52.5</b>
	- fragmentation the lake to a separated pools	144	91.1
	- prevent the movement of lake water	150	94.9
	- covering a wide areas from the lake	27	17.1
	- impede the free fishing in the lake	18	11.4
	- increase of the bottom silting up in the lake	76	48.1
3	<b>Breeding season of Tilapia:</b>	<b>145</b>	<b>91.8</b>
	May - October	145	91.8
4	<b>The important types of Tilapia in Lake Burullus:</b>	<b>3</b>	<b>1.9</b>
	- Oreochromis niloticus	0	0.0
	- Oreochromis aureus	0	0.0
	-Tilapia zillii	0	0.0
	-Sarthoredon galloesus	10	6.3
5	<b>Mullet spawning season:</b>	<b>87</b>	<b>55.1</b>
	May- December	87	55.1
6	<b>Breeding place of Mullet:</b>	<b>39</b>	<b>24.7</b>
	Salt water	39	24.7
7	<b>Methods of fish preservation:</b>	<b>76</b>	<b>48.1</b>
	-Freezing	40	25.3
	-Salting	106	67.1
	-smoking	158	100.0
	-colding	0	0.0
8	<b>The best way to preserve fish on boat:</b>	<b>59</b>	<b>37.3</b>
	-colding	59	37.3
9	<b>The fishing by using toxic and explosives substances in Lake Burullus:</b>	<b>140</b>	<b>88.6</b>
	- Imprisonment (6 – 24 months)& Fine (500-1000P)	140	88.6
10	<b>Methods of fishing Alhenchan:</b>	<b>78</b>	<b>49.6</b>
	- Set net (Dora)	18	11.4
	-Alsnar Almtaom	67	42.4
	-fixed El-shelb	150	94.9
11	<b>The best way to catch Alhenchan in Lake Burullus:</b>	<b>67</b>	<b>42.4</b>
	-Alsnar Almtaom	67	42.4
12	<b>Types of Alhenchan in Lake Burullus:</b>	<b>82</b>	<b>51.9</b>
	-National	100	63.3
	-immigrant	118	74.7
	-Alddfas	27	17.1
13	<b>The most important violation fishing crafts in Lake Burullus:</b>	<b>17</b>	<b>10.8</b>
	-The ghost (El-Shabh)	16	10.1
	- Set net (Dora)	17	10.8
	- El-Shelb	13	8.2
	-machine Boat	20	12.7

Source: Calculated from the questionnaires.



**Fig.( 3 ):** Shows axes of the fishing knowledge needs for fishermen

**Table (3):** Correlation and regression coefficients between dependent variable and independent variables.

Variables	r	B	t-value
Fishermen ages	- 0.220 **	- 0.061	- 1.796 *
Fishing experiences	- 0.268 **	- 0.072	- 2.479 **
Educational levels	- 0.217 **	- 0.406	- 2.354 **
Number of children	- 0.094	0.308	- 2.185 **
Monthly income of fishing	- 0.040	- 0.001	- 0.039
Agric. holding	- 0.62	0.003	- 0.311
Boats ownership	- .224 **	- 0.452	- 2.029 **
General knowledge	- 0.232 **	- 0.147	- 2.232 **
Attitudes towards fishing	- 0.223 **	- 0.132	- 2.789 **

\*\* Significance at level 0.01

\* Significance at level 0.05

R = 0.507

R<sup>2</sup> = 0.258

F = 5.098 \*\*

**Table (4):** The important independent variables affecting dependent variable.

Variables	R	% R <sup>2</sup>	B	t-value
Fishing experiences	0.268	7.2	-0.073	-3.639**
Educational levels	0.373	6.7	-0.646	-2.381**
General knowledge	0.424	4.0	-0.118	-2.646**
Fishermen ages	0.455	2.8	-0.486	-2.228**
Boats ownership	0.478	2.2	-0.132	-2.086**

\*\* Significance at level 0.01

R = 0.478

R<sup>2</sup> = 0.229

F = 9.022 \*\*

From the previous results when we may plan an extension program to develop knowledge and skills of the fishermen and modify their negative attitudes as well as consideration of their long-run experience of fishing in order to enhance their ability of fishing. The study also confirms that education level and general knowledge of fishermen help them to take a right decision in the daily life, improve methods of the communication with others, improve their technical knowledge, and apply such knowledge according their environmental conditions. In addition, the planned program must increase their positive attitudes towards developing fish product in the lake. It is noticeable that the majority of fishermen in the lake are of youth, who are more willing to carry out such planned program.

**4- The fishing problems in Lake Burullus:**

Results of Table 5 show that there are ten problems facing fishermen in the lake, which ranked according to the frequency of fishermen point of view as follows: the wide spread of illegal gears, the wide spread of phragmites sp., and Eichhornia crasipes, Absence of the effective governmental control and good management plan. Also, catching of fry from Boughaz El-Burullus and inside the lake, fishing of small fish, the depletion of fishing income for fishermen, the drainage water discharged (agricultural, industrial, fish farms, sewage water), non-cleaning of Boughaz El-Burullus, mechanical illegal boats and absence of the extension role for awareness of the fishermen.

**Table (5): Some fishing problems in Lake Burullus.**

the fishing problems	n	%
1- the wide spread of illegal gears	138	87.3
2- the wide spread of phragmites sp. and Eichhornia crasipes	134	84.8
3- Absence of the effective governmental control and good management plan.	132	83.5
4- catching of fish fry from Boughaz El-Burullus and inside the lake	124	78.5
5- fishing of small fish	121	76.6
6- The depletion of fishing income for fishermen	112	70.9
7- the drainage water discharged (agric., industrial, fish farms, sewage)	107	67.7
8- non-cleaning of Boughaz El-Burullus manually	102	64.6
9- mechanical illegal boats	98	62.0
10 - absence of the extension role for awareness of the fishermen	76	48.1

Source: calculated from the questionnaires

n = 158

**REFERENCES**

Al-Sayes, A. (2005): Environmental and fishery investigation on Lake Burullus, fishing gears and methods used at Lake Burullus, their effects on fish population at the lake. J. Aquatic Res., 31(1): 410-447.

El-Karyony, I. A. and Mohamed, S. M. (2007): Economic regular analysis patterns of fishing production in Lake Burullus, J. of Agric. Sci., Mansoura Univ. ,Egypt, 32(5): 3849-3857.

El-Sawy, E.M. (1982): A study of requirements of fishery extension work among Edko fishermen in Beheira governorate, Thesis Master, Extension agricultural, Alexandria Univ., Egypt (In Arabic)

El-Tonoby, M. O. and Omran, E. S. (1997): Principles of planning & execution and evaluation of extension agricultural programmers, Publications of Omar El-Mokhtar univ., El-Baydaa, Libya, (In Arabic).

Fish statistics (2006): Fish production, General authority fish resources development, Egypt.

Jones, G. E. and Rolls, M. J. (1982): Progress in rural extension and Community development, Vail Ballot Press Inc., New York, U.S.A

Kelsey, L. D. and Hearne, C.C. (1963): Co-operative extension, Comstock publishing Associates, Ithaca, New York, USA.

Leagans, J. P. (1961): Programme planning to meet people needs Extension education in community development, Government of India, New Delhi, India.

Pavalko, R. M. (1976): Sociology of education, F. E Peacock Publishers, INC., Itasca, Illinois, USA.

- Radwan, A. M. (2004): Evaluation of water quality in Lake Burullus, Egypt. J. of Aquatic Biol. & fish, 8(3): 15-33.
- Saleh, S. M; El-Tonoby, M. O; Azmy, S. M. (2004): Agricultural extension: it principals and it applications, Alexandria center for book, Alexandria, Egypt. (In Arabic)
- Shaltout, K. H., Khalil, M. T. and Sodany, Y. M. (2005): Lake Burullus (Burullus Protectorate Area), Egyptian environmental affairs agency, Publication of National Biodiversity, Uni. No. 13.
- Snyder, F. L. (1992): Aquaculture opportunities, Journal of Extension, 30(3).  
[http://www.joe.org/joe/1992\\_fall/a7.html](http://www.joe.org/joe/1992_fall/a7.html)

### المتغيرات المؤثرة على الحاجات المعرفية الصيدية لصاندي الأسماك ببحيرة البرلس, بمحافظة كفر الشيخ, مصر

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يستهدف هذا البحث بصورة رئيسية التعرف على العوامل المؤثرة على الاحتياجات المعرفية الصيدية لصاندي الأسماك ببحيرة البرلس بمحافظة كفر الشيخ, وذلك من خلال: التعرف على بعض الخصائص الاجتماعية والاقتصادية لصاندي الأسماك ببحيرة البرلس, وتحديد مستوى الاحتياجات المعرفية الصيدية لهم, وتحديد العوامل المؤثرة على الاحتياجات المعرفية الصيدية لهم, والتعرف على بعض المشاكل الصيدية التي تواجههم ببحيرة البرلس.

وتحقيقاً لأهداف البحث تم اختيار عينة عشوائية بسيطة قوامها ١٥٨ صياداً بنسبة ٤.١ % من مجتمع الصيد ببحيرة البرلس, وجمعت بيانات البحث باستخدام الاستبيان بالمقابلة الشخصية, هذا وقد تم استخدام النسبة المئوية, والمتوسط الحسابي, والانحراف المعياري, ومعامل الارتباط البسيط, ومعامل الانحدار البسيط والمتعدد.

وتلخصت أهم النتائج في:

- حوالي ٩٢ % من المبحوثين كانوا ذوي درجة احتياجات معرفية صيدية تراوحت بين المتوسطة والمرتفعة.
- تبين وجود علاقة عكسية عند مستوى معنوية ٠.١, بين درجة الاحتياجات المعرفية الصيدية وكل من سن المبحوث, والخبرة الصيدية, والمستوى التعليمي, وملكية القارب, والمعارف العامة للصيد, والاتجاه نحو مهنة الصيد.
- اتضح أن أهم المتغيرات تأثيراً على تفسير التباين في درجة الاحتياجات المعرفية الصيدية هي الخبرة الصيدية, والمستوى التعليمي, وسن المبحوث, والمعارف العامة, وملكية القارب, وأثرت بنسبة قرابة ٢٣%.
- تمثلت أهم المشاكل الصيدية ببحيرة البرلس في: الاستخدام الواسع لحرف ومعدات صيد غير قانونية, والانتشار الواسع والسريع للنباتات المائية خاصة نباتي البوص وورد النيل, وغياب الرقابة الحكومية الفعالة, وصيد الأسماك الصغيرة والزريعة من البحيرة وبوغاز البرلس.
- وبناءً على ذلك يوصي هذا البحث: بتخطيط برنامجاً إرشادياً لمعالجة أوجه النقص في معارف صاندي الأسماك ببحيرة البرلس, وضرورة تفعيل الرقابة الحكومية الصارمة على حركة الصيد بالبحيرة, واستخدام الوسائل العلمية والفنية للتخلص من النباتات المائية بالبحيرة, والتطهير الدوري لبوغاز البرلس, ووقف مصادر مياه الصرف ببحيرة البرلس.

قام بتحكيم البحث

كلية الزراعة – جامعة المنصورة

كلية الزراعة – جامعة الأسكندرية

أ.د / إبراهيم أبو خليل أمين سعفان

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