



# Questionnaire-based assessment of Mediterranean fishing ports, Nile Delta, Egypt



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## ABSTRACT

The fisheries sector is a significant contributor to the Egyptian economy. Recently, issues relating to fishing ports have been highlighted in port planning, availability of facilities, management, and environmental issues. Additional problems include Egypt's lack of specific guidelines for planning and design of fishing ports. This paper aims to assess the current status of five fishing ports (both natural and artificial) located along the Mediterranean coast of Egypt. Data were collected via a questionnaire supplied directly to the fishermen. The questionnaire contains two sections that cover information regarding the fishermen and fishing vessels. There are sections to assess the degree of satisfaction of the fishermen regarding economic, environmental, planning, facilities, and managerial issues. 250 fishermen received the questionnaire. The data were analyzed quantitatively and qualitatively. The results confirm that the fishing ports are negatively affected by a number of issues, as well as management deficiencies, resulting in several weaknesses. The main issues include pollution, sedimentation, deterioration of infrastructure, and lack of port facilities. It is recommended that decision-makers should develop monitoring tools and improve infrastructure and services. Recommendations are made for future development to enable the expansion in the fishing industry and improve the sustainability of fishing ports.

## 1. Introduction

Fisheries are identified as renewable resources because the organisms of interest (e.g., fish, amphibians, shellfish, reptiles and marine mammals) normally produce a seasonal biological surplus that with careful management can be harvested without decreasing future productivity [1]. The fertility measure of the fish stocks in the Mediterranean accounts for nearly half of the ocean fertility of this enclosed sea, which is also subject to extensive pollution from the littoral states [2]. This pollution poses serious threats to the marine environment, including the aquatic biology and marine ecosystem, and constitutes a serious impediment to the future economic development of fisheries. Sewage and oil spills pose the greatest and most visible threats, although northern Egyptian coastal waters are also considered to be one of the most polluted zones with heavy metals [3]. Moreover, the growing human population increases the pressure on fisheries due to increased demand for fish [4,5].

Marine fisheries may be considered as the link between fish harvesting and human consumption. The type and size of fishing ports

and related facilities and infrastructure are a substantial influence on the rate at which a country's living marine resources can be exploited [6]. A report issued by the International Labor Office shows that fishing is considered one of the most dangerous occupations [7], with as many as 24,000 fishermen around the world dying every year [8]. Occupational injuries of fishermen are more common than in any other occupation [9]. In an environmental context, accumulated sediment represents a major environmental issue and is a serious obstacle to navigation of fishing boats both at port entrances and in boat handling [10]. Continuous sediment dredging requires substantial resources and impedes fishing boat movements in ports [11]. Traditional management measures have proved inadequate to deal with the problems of resource overexploitation, pollution, cumulative sedimentation and degradation of infrastructure. The sustainability of marine fisheries is also a fundamental issue due to its significant influence on the marine environment. Without careful protection measures and environmental management, many of the hard-won gains of well-intentioned planners will be lost [10]. Efficient fishing ports should provide unloading, handling, marketing facilities and industrial areas where fish can be

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Fig. 1. The Egyptian fishing ports located on the northern coast of the Nile Delta, extending 360 km from Abo Qir to Port Said.

processed, as well as providing services and maintenance facilities for fishing vessels, and their equipment [12].

In Egypt, the fishery sector is considered one of the important sectors in the national economy [13]. Marine fisheries have a history extending back to classical times, although their importance has decreased relative to freshwater fisheries and aquaculture, with the latter accounting for 74% of total fish production in Egypt in 2012 [14]. According to the General Authority for Fish Resources Development (GAFRD) statistics, fisheries production rates in the Mediterranean decreased by 9.09% in 2013 compared to those of 2012 [15], even although, in 1992, the national government issued a decree to prohibit granting licenses for trawling in both the Red Sea and Mediterranean due to the continued growth of the fishing fleet [16].

Egyptian fishing port management falls under the supervision of the GAFRD, which is the main information source for statistical and fisheries information. GAFRD is responsible for administering the fisheries sector, issuing policies and regulations and monitoring the implementation of fishery sector laws. The main fisheries legislation in Egypt is Act 124 of 1983 on Fishing, Aquatic Life and Aquaculture.

The new policies of the Egyptian government aims to increase the focus on fishermen-related issues, where existing fishing ports suffer from many environmental, technical and managerial issues [17]. However, consideration of modern management concepts in planning, organization, management functions, health and safety requirements related to Egyptian fishermen's activities is still somewhat alien to present fishing port administrators and managers.

This research aims to assess the current condition of the existing natural and artificial Egyptian fishing ports located on the Mediterranean coast of the Nile Delta of Egypt. Issues relating to the fishing occupation and its activities are discussed based on the fishermen's views. The results are presented both statistically and descriptively. The descriptive results are categorized to cover economic aspects, environmental issues, planning and facilities, and managerial issues. This research is considered as the first stage in contributing to a better understanding of the existing issues in these fishing ports and identifies the major factors affecting engineering efficiency. In the next stage of the research, possible alternative solutions for each issue will

be assessed using international criteria, policies, and guidelines to prepare specific guidelines compatible with the culture of Egyptian fishermen.

The Egyptian fisheries serve regions totaling over 13 million acres, and may be categorized as marine (Mediterranean and Red Seas), inland (lakes and Nile River) and aquaculture. There are 21 Egyptian natural and artificial marine fishing ports located on the coasts of the Mediterranean, Red Sea and coastal lakes. Only five marine fishing ports (Port Said, New El-Burullus, Elmaadiya in the Mediterranean; and Attaka and Hurgada in the Red Sea) satisfy the minimum requirements regarding infrastructure, facilities and equipment for handling catches [14,18]. Five of the Mediterranean fishing ports, where the majority of the fishermen are located, were selected for the present study. Three (Port Said, New El-Burullus, and Elmaadiya) are artificial fishing ports, while the others (Ezbt Al-Borg and Abo Qir) are natural [14,19]. Natural ports are located in a body of water which is sheltered from the open sea, deep enough to provide an anchorage and suitable for landing catches, while artificial ports are artificial harbours which have facilities designed for fishing purposes by the government. Fig. 1 presents the location of the ports in this study. These are all located on the Nile Delta coast of Egypt extending 360 km from Abo Qir bay to Port Said. The basic information for each port is presented in Table 1, [18].

## 2. Material and methods

The data were collected using a questionnaire. The questionnaire was divided into six sections to gather fishermen's personal data, fishing boat data, and information relating respectively to economic aspects, environmental issues, planning and facilities, and managerial issues. Sections relating to the fishermen and fishing boats were designed as multiple choice questions. The other sections used closed questions based on a rating scale. The rating system used five points ranging from strongly disagree to strongly agree [20]. In addition, the fishermen could comment on any statement, section or on the whole questionnaire. The content of the questionnaires was based on the scientific information available in the literature [21–23], together with guidance

Table 1  
Basic information for the selected Egyptian fishing ports.

Fishing Port	Type	Construction date	Vessels capacity	Water area, m <sup>2</sup>	Land area, m <sup>2</sup>
Port Said	artificial	1986	402	68,810	69,000
Ezbt Al-Borg	natural	–	1500	1,100,000	N.A
New El- Burullus	artificial	2002	229	89,031	214,484
Elmaadiya	artificial	1995	339	52,609	40,468 + 125,453 for second stage
Abo Qir	natural	–	404	62,000	28,000

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