# Reality and prospects Libyan fisheries

## " Case Study of the Eastern Region"

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## ABSTRACT

The blue economy is one of the most important opportunities to diversify the structure of the Libyan economy. This research deals with the ability of the Libyan fisheries sector to achieve a competitive advantage. The researcher applied the diamond model of Porter (1985) on Libyan fisheries to identify strengths and weaknesses, as well as to identify future prospects and development potentials for small-scale fisheries. This strategy  includes four interrelated main determinants that affect the sectors' ability to achieve a competitive advantage and create a competitive environment: (factor  conditions, " physical resources - human resources - knowledge resources - capital resources in infrastructure", demand, related and supportive industries, and the company's strategy and structure , and competition) as well as two indirect variables, namely: (opportunities and government).
This research deals with two determinants, namely: " factor conditions , and government." The research adopted a realistic critical approach, and data were collected using the questionnaire tool and structured

interviews conducted by the researcher. The researcher collected data from the eastern region; on the production side from four ports: Benghazi, Sousse, Derna, and Tobruk. The results obtained from the data analysis showed that the government is responsible for the weakness of the fisheries sector because it stands behind the formation of the administration and institutions, and it is solely responsible for setting laws and legislation.The problems and difficulties facing marine resource activities include weak infrastructure, weak support services sector, insufficient databases related to fish stocks, poor infrastructure development, all of which constitute a major factor in any industry, as well as poor use of technology and insufficient databases on fish stocks, in addition to inefficient local market infrastructure, inadequate policy and legislative framework, weak and unstable institutional arrangements, and limited financial allocations. The fisheries sector needs an alliance with the private sector at all stages of production; to create competitiveness in this industry. Some recommendations have been made to promote small-scale fisheries in Libya.

## 1. Introduction

The oil industry has superseded other non-oil sectors, Libya has become a single commodity economy and extremely undiversified (Edwik, 2007; Mazar, 2012). Until there is some diversification strategy over how to manage the oil sector for development, the future

outlook for Libya is distinctly bleak.The following table shows the weak contribution of the productive sectors and manufacturing industries and the dominance of the oil sector on the GDP.

Table 1 GDP Oil, Agriculture, fishing and forestry, Manufacturing,  Services and Construction for some sectors, 1986 -2010 (Million LYD)

| | Oil GDP | Agriculture, fishing and forestry | Manufacturing | Services | Construction | TGDP | % (A) | % (M) |
|---|---|---|---|---|---|---|---|---|
| 1991 | 3104 | 542 | 476 | 1654 | 340 | 8757 | 6.2 | 6.2 |
| 1992 | 2926 | 630 | 555 | 1897 | 459 | 9232 | 6.8 | 6.8 |
| 1993 | 2460 | 709 | 700 | 1684 | 513 | 9138 | 7.76 | 7.7 |
| 1994 | 2893 | 828 | 604 | 1741 | 493 | 9671 | 8.6 | 6.2 |
| 1995 | 3380 | 933 | 743 | 1730 | 478 | 10672 | 8.7 | 7.0 |
| 1996 | 3960 | 1075 | 703 | 2021 | 672 | 12327 | 8.7 | 5.7 |
| 1997 | 4506 | 1267 | 819 | 2304 | 703 | 13800 | 9.2 | 9.2 |
| 1998 | 2786 | 1394 | 779 | 2542 | 713 | 12611 | 11.0 | 6.2 |
| 1999 | 3996 | 1450 | 863 | 2429 | 804 | 14075 | 10.3 | 6.1 |
| 2000 | 7081 | 1438 | 890 | 2666 | 1014 | 17776 | 8.1 | 4.8 |
| 2001 | 6327 | 1392 | 878 | 2901 | 1063 | 17621 | 7.9 | 5.0 |
| 2002 | 12299 | 1349 | 813 | 2859 | 1342 | 24220 | 5.6 | 3.3 |
| 2003 | 18037 | 1376 | 765 | 3406 | 1249 | 30627 | 4.5 | 2.5 |
| 2004 | 26692 | 1439 | 761 | 4286 | 1425 | 40951 | 3.5 | 1.8 |
| 2005 | 39491 | 1554 | 799 | 4682 | 1788 | 55670 | 2.8 | 1.4 |
| 2006 | 49651 | 1604 | 817 | 5174 | 2055 | 67407 | 2.4 | 1.2 |
| 2007 | 54847 | 1685 | 893 | 7040 | 3690 | 77732 | 2.2 | 1.4 |
| 2008 | 70993 | 1958 | 1064 | 8791 | 4853 | 99376 | 2.0 | 1.07 |
| 2009 | 41417 | 2077 | 1156 | 8967 | 4978 | 71513 | 2.9 | 1.6 |
| 2010 | 57197 | 2278 | 1257 | 9146 | 5029 | 89223 | 2.5 | 1.4 |

Source: Mazar (2012)

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A search for solutions to the above economic problem highlights the significance of economic diversification for the Libyan economy (Edwik, 2007; Mazar, 2012). The discovery of natural resources should not be seen as a means to abandon other relevant and important sectors of the economy, a diversified economy increases investment in the economy as more and more sectors of the economy are brought into focus with widening economic activities (Bature, 2013). This study argues for an investment in domestic economic diversification strategy in the non-oil traded sectors, particularly fisheries. For example, agriculture (including fisheries) and other tradable sectors used to sustain Libya's economy but it began a rapid decline due to petroleum development, and over the years, its contribution to GDP continues to shrink from 9.5 per cent in 1962 to 2.5 per cent in 2010 (Mazar,2012;Sheibani, 2008). Unlike agriculture, which directly or indirectly employs more than 70 per cent of labour, oil production accounts for only 0.6 per cent of total employment in Libya (Abuhadra and Ajaali, 2014). As strongly argued by Porter (1998) any sector or industry which participates in the shaping of the structure of the economy must have the competitive advantage to be able to participate effectively in economic growth and development. There are benefits that could arise from developing the productivity sectors including an increase in trade (domestic and foreign), higher

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productivity of capital and labour, and better regional economic integration. Achieving a economic diversification, self-sufficient food future, then, requires paying serious attention to Libyan coast with the aim of sustainably utilising the    resources to diversification and increase in national income also close the food gap and be self-sufficient in fish production and consumption. To achieve food security,   and with attendant multiplier effects to the country. Table 2 compares Libyan quantity of fish production with some countries located on the Mediterranean Sea. In terms of the size of Libya's Exclusive Economic Zone (EEZ) and Inshore Fishing Area (IFA) , Libya comes in the first place with 355,590 and 53,243km2 respectively. However, the size of these areas (EEZ and IFA) are not a determinant of quantity in terms of fish production because the data in the table clearly shows that the Libyan fish production is lowest in quantity of fish produced with only 0.086 tonnes/km2. This production figure is lower than in countries with smaller areas EEZ and IFA. This also means that Libya's EEZ has the capacity to provide a stock of factors (fish), but that has not been fully developed as in the case of the above countries mentioned. As Porter (1998) argued, factor conditions, particularly natural capital or endowment, which in this case is the fish, are created and upgraded to make it competitive, rather than relied upon as an inherited factor.

Table 2 contains the volume of fish catches landed by country or territory of capture, 2005 -2011

| | Year | Mediterranean coastline length | EEZ area km² | Inshore Fishing Area (IFA) km² | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2005-2011 | Fish Production Tonnes/ EEZ area km² | Fish Production Tonnes /Inshore Fishing Area (IFA) km2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Libya | 1970 | 355,590 | 53,243 | 27100 | 39216 | 33352 | 25400 | 17712 | 22604 | 48300 | 30526 | 0.086 | 0.57 |
| 2 | Algeria | 998 | 128,842 | 10,463 | 121558 | 142066 | 143155 | 135041 | 123640 | 90639 | 98251 | 118714 | 0.92 | 11.35 |
| 3 | Egypt | 955 | 169,122 | 28,872 | 94705 | 105718 | 113611 | 112870 | 105253 | 98834 | 99764 | 104394 | 0.62 | 3.62 |
| 4 | Tunisia | 1200 | 102,062 | 44,653 | 90940 | 95388 | 89065 | 87921 | 89389 | 87599 | 93945 | 90608 | 0.89 | 2.03 |
| 5 | France | 1703 | 64,547 | 12,377 | 483201 | 480460 | 424519 | 386782 | 355609 | 355836 | 381807 | 409745 | 6.35 | 33.11 |
| 6 | Italy | 7468 | 315,972 | 72,000 | 218234 | 236259 | 205068 | 163273 | 182188 | 167616 | 154428 | 189581 | 0.60 | 2.63 |
| 7 | Spain | 1670 | 132,767 | 28,649 | 814847 | 918458 | 779446 | 889606 | 895143 | 937746 | 969492 | 886391 | 6.68 | 30.94 |
| 8 | Turkey | 2200 | 72,200 | 11,620 | 380381 | 488966 | 589129 | 453115 | 425046 | 445680 | 477658 | 465711 | 6.45 | 40.08 |
| 9 | Morocco | 512 | 18,302 | 4,347 | 45622 | 50524 | 42138 | 35754 | 40581 | 33916 | 26635 | 39310 | 2.15 | 9.04 |
| | Total of fish Quantity | | | | 2466005 | 2540372 | 2333120 | 2452854 | 2523225 | 2373364 | 2440082 | | | |

Figure 1 shows how can fisheries sector contributes to national income, food security, nutrition and with attendant multiplier effects to the country.
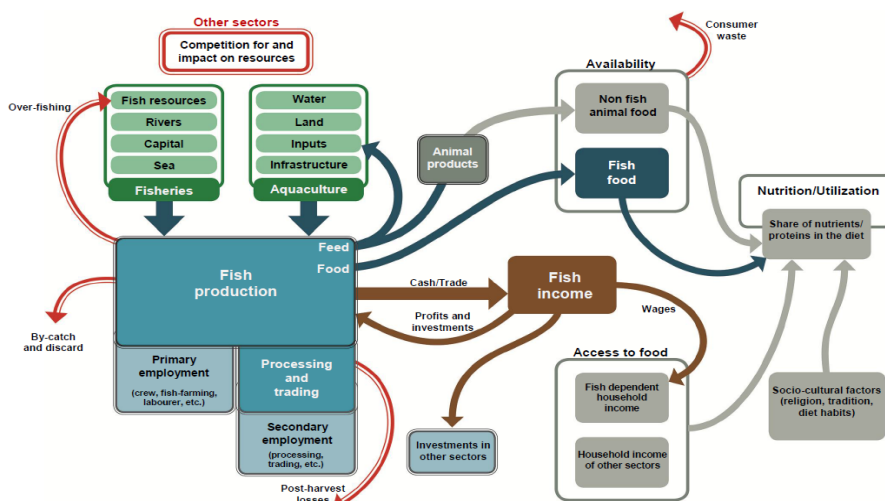
Figure 1: Different pathways of fish contribution to food security and national economy
Source: HLPE (2014:28)

## 2. Research Aim

To explore the strengths, weaknesses and opportunities of the fisheries sector in the eastern region of Libya and its ability to achieve competitive advantage for economic diversification.

## 3.Theory

The theory of competitive advantage (Porter, 1998) stands out as being particularly robust tool that can lead to understanding how to make fisheries productive and competitive. Porter (1998: xi), in his book, The Competitive Advantage of Nations, attempts to answer the question with which he opened his book: "Why do some social groups, economic institutions, and nations advance and prosper?"

Competitive advantage theory is built on the assumption that a nation's competitiveness depends on how well human, capital, and natural resources are utilised and the capacity of its industry to innovate and upgrade, which means creating and sustaining superior performance (Porter, 1998). One of the ways that is widely applied to investigate industries competitive advantages is through the use of Porter's diamond model (PDM) (Nan and Lei, 2013). Porter's diamond model consist of four main determinants of national advantage (factor conditions, demand conditions, related industries and industry support and the company's strategy, structure and nature of competition) and two assistant determinants (government and chance).See figure 2.
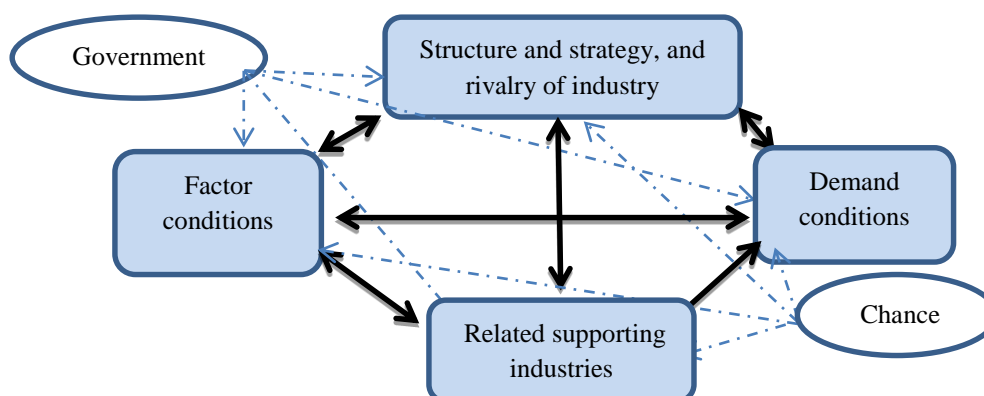


Figure 2: Porter's Diamond Model of Competitive Advantage. Source: modified from Porter(1990; 1998)

1- Factor Conditions

Factor conditions are intended as factors of production, as shown in figure 3:

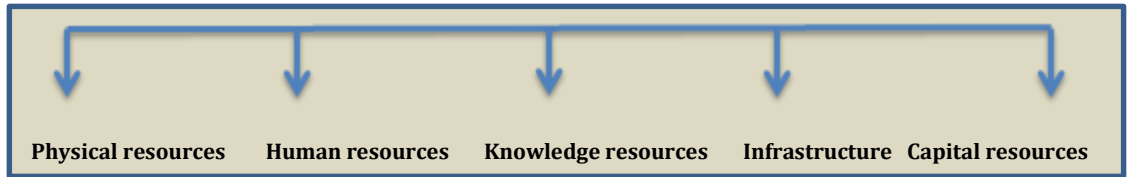| Physical resources | Human resources | Knowledge resources | Infrastructure | Capital resources |

figure 3:  Factor Conditions

2- Demand Conditions ,3 - Related Industries and Industry Support ,4 - Company Strategy, Structure and Nature of Competition , 5- The Role of Government  ,6 - Chance

The model as a system shows that these determinants do not work in a unidirectional manner or individually but operate interdependently and mutually affect each other. Each determinant has common relationships with the others; at every stage each one has an influence on the other, which strengthens or weakens each determinant. Porter's diamond model has been chosen to investigate the fisheries sector in the eastern region of Libya because the model helps policy makers in their practical application of how to develop sectors with competitive advantage over their rivals in global competition. Libyan government cannot own and be responsible for everything as it was in the past.

## 4. Methodology and Methods

3.1     This research adopted a critical realist approach which could explain the current status and explore the factors that affect the development of the fisheries sector in the eastern region of Libya through applying Porter's Diamond Model (see figure 2), based on the three layers: the real, actual, and empirical. The fisheries sector (in the light of the diamond model) was scrutinised under four main determinants (factor conditions, demand conditions, supporting and related industries and the fisheries sector's strategy, structure and rivalry) and two assisting determinants (role of government and chance). As captured by Basden (2004) citied in Klein (2004) "the *real* are the causal mechanisms and structures that produce *actual* events a subset of which then is *empirically* observed".

### 4.1  Analytical techniques

The data was statistically analysed by using appropriate software packages for Social Science (SPSS) software version 19.The key was to identify significant factors that affect fish production.

- Descriptive statistical analysis was used to identify percentages.

- Pearson's Chi -square($\chi^2$) test was used to see whether there is a relationship between some of the quality variables and frequency of fish consumption. A statistical relationship is said

to exist between the variables under consideration if significance is less than 0.05. In addition, Cramer's V statistic was used; this test takes values from a minimum of 0 to a maximum of 1; and the closer the statistic is to 1, the stronger the association between the variables(Field, 2009); Chi-square test was applied by using SPSS software to both production of fish.

## 4.2 The Study Area

## 4.2.1 Selection of the study areas

In terms of the selection of the study areas for the production side, the fieldwork covered four fishing harbours that are located on the eastern region's coastline. These harbours are:  Benghazi, Soush, Derna and Tubruk which are the main ports in eastern region (see figure 4).
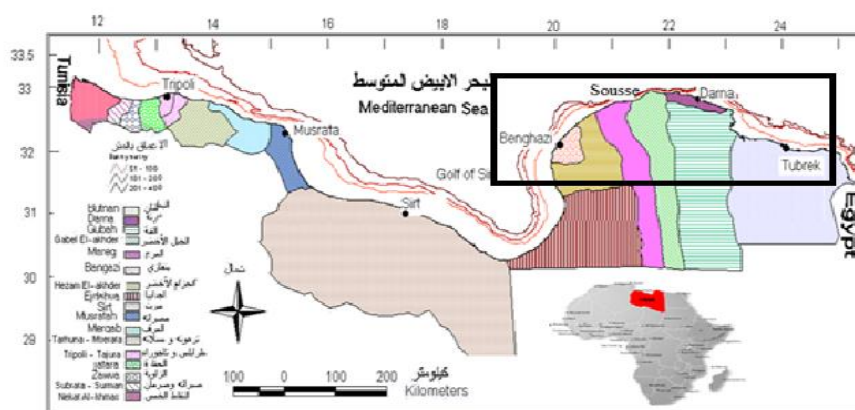


Figure 4: Map showing Libya's coastal areas for large-scale fishing.
Source: Further modified by the researcher from Antipolis (2002:3)

### 4.2.2 Sample size and characterisation of the study sample

Selecting the sample population of fishing units depended on the type of boat due to the presence of several types of fishing boats, which differ significantly in terms of size, type of fishing, target fish, horsepower, the number of fishermen on the boat among others.  To do this, a stratified random sampling scheme was developed. According to the Marine Biology Research Centre (2008) the number of boats in the eastern region of Libya was 426 boats. Three types of boats were in use: Flouka, Motor (these first two are known as the artisanal fishing fleet) and Jarafat (known as the semi-industrial fishing fleet). These distinctions are defined further by Abukdair and Zargani (2005): In this study, the types of boats are divided into two categories which are: small boats locally known as 'Flouka', (n=264) ranging between 12-48 Horse Power (HP) 62% of the fishing fleet size and large boats known in the study as 'Motor' (n=147) and Jarafat (n=15), while Motor 34% and Jarafat 3%, ranging between 60-250 HP (Table 3).

Table 3:  Type of Fishing Boat in the Eastern region of Libya

| Type of boat | Number of boats |
|---|---|
| Flouka | 264 (62%) |
| Motor | 147 (34%) |
| Jarafat | 15 (4%) |
| Total | 426 (100%) |

Source: Marine Biology Research Centre (2008) - Tajoura - Tripoli

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Israel (2012) stated that at ±7% at precision levels, a sample size of 138 is an adequate representation of population above 425 to 449 .

The researcher merged the larger two types of boats (motor and Jarafat) because there are so few Jarafat boats in the population as indicated by the sample.

Table 4: sample of fishing boats in the study

| Type of Fishing Boat | Population | Issued Sample | Valid (Completed) |
|---|---|---|---|
| Small boat 'Flouka' | 264 | 85 | 77 |
| Large boat 'Motor and  Jarafat' | 147+15=162 | 53 | 34 |
| Total | 426 | 138 | 111 |

Researcher's Own Analysis

In addition, data gathered through interviews, with Expert from  FAO , Agriculture officer, Expert from  Marine Research Centre,  two fishermen, three Fish retailers and fish wholesaler

## 5.      Results and Discussion

## 5.1   Favourable Location, Fish Stocks and Degrees of Contamination in Libyan Waters

Porter (1998:77) states that "Basic factors remain important in extractive or agriculture based industries". Regarding fish production and trade, Libya has a locational advantage."Libya has many outstanding assets that are not fully engaged in its economy one of them its location" (Porter and Yergin, 2006). The geographical

strategic location of Libya played an important role in the transfer of civilisations to Libya in an early era. The Mediterranean Sea served communications and trade as well as proving the cradle of democracy and the welfare state (FAO, 2003).  The location of a country can still be a source of national wealth, and it thus merits attention, especially if a country's location allows it to control lines of communication and trade whether onshore or offshore.

With respect to fish stocks and degrees of contamination in Libyan waters, an over-exploited fish stock is an issue of concern because the fish industry depends directly on fish stocks, and sustainability is vital to fishery development.Hart (1995) states that the theory of competitive advantage is based upon the firm's relationship to the natural environment; it is "composed of three interconnected strategies: pollution prevention, product stewardship, and sustainable development". The findings show that there are insufficient scientific databases in Libya due to a lack of clear focus on fisheries research.Till date, no recent studies estimating the size of fish stocks can be relied on; the last study was undertaken almost 11 years ago, in 2003, and  the survey was of only five days duration, an insufficient length of time in which to estimate the fish stock (Development plan of Libyan Marine Sector, 2006-2010; National Foundation for Maritime Investment, 2005:11).

A literature survey on pollution rates indicates that there is limited information on pollution; the most recent evidence about pollution on the eastern region coast of Libya was published in 2008. Al arifi (2008) divided the sources of pollution on the coastline of the eastern region of Libya into three:

1- Pollution by oil, through shipping operations, discharge of oil at sea by ships and oil tankers, the dumping of oil remnants in tankers into the sea, waste oils from ship incidents experienced by oil tankers and merchant ships (Table 5)

**Table 5:** Rates of pollution in the sea due to oil

| Operations when shipping oil | Incidents of ships | Extracting oil | Oil pipelines | Refineries | A variety of activities |
|---|---|---|---|---|---|
| 49.5% | 20.6% | 5.1% | 0.4% | 11.9% | 18% |

**Source:** Al arifi (2008:273)

Porter (1998:80) states that "the factor-creating mechanisms in a nation are more important to competitive advantage than the nation's current factor pool". The absence of databases or knowledge is a disadvantage factor; however, depending on the concept of selective factor disadvantage in competitive advantage theory, this could be transformed into a source of advantage by activating the role of research centres at universities and government institutions.

## 6. Factor Conditions

### 6.1 Infrastructure of Ports

This survey explored the potential and the facilities of existing fishing ports to collect data and information about landing sites (fishing port) and the components of the fisheries sector in Libya. This research focuses only on the eastern region's harbours. Table 4 shows in detail facilities available in sampled fishing harbours and ports examined in this research. Poor infrastructure and the absence of many facilities in the fishing harbours under study are clear from Table 6. Many essential facilities and services for boats are missing from most of the fishing harbours; for example, engine maintenance facilities, adequate services for boats and the maintenance of fishing gear etc.

**Table 6:** Infrastructure of Fishing Harbours in the Sample Study

| Landing site | Fishing port of Benghazi | Port of Susah | Port of Derna | Port of Tobruk |
|---|---|---|---|---|
| Permanent | √ | √ | √ | √ |
| Seasonal | - | - | - | - |
| Model Site | harbour | harbour | harbour | harbour |
| Type of Boat | Flouka + Motor+ Jarafat. | Flouka + Motor | | Flouka + Motor |
| Storage Units | Available | *Not Available* | *Not Available* | *Not Available* |
| Landing site | Fishing port of Benghazi | Port of Susah | Port of Derna | Port of Tobruk |
| Syndicate | Available | Available | Available | Available |
| Cooperative Societies | Available | Available | Available | Available |
| Training Centre | *Not Available* | *Not Available* | *Not Available* | Available |

| | | | |
|---|---|---|---|
| Office of Fishing | Available | *Not Available* | *Not Available* | Available |
| Facilities and Services for Boats | *Not Available* | *Not Available* | *Not Available* | Available |
| Engine Maintenance | *Not Available* | *Not Available* | *Not Available* | Available |
| Selling Engine Parts Cooling | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Landing site | Fishing port of Benghazi | Port of Susah | Port of Derna | Port of Tobruk |
| Maintenance of Fishing Gear | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Places to Provide Fishing Gear | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Shops for the Sale of Food | Available | *Not Available* | *Not Available* | *Not Available* |
| Cafes and Restaurants | Available | *Not Available* | *Not Available* | *Not Available* |
| fuel | Available | *Not Available* | *Not Available* | *Not Available* |
| Fresh Water Supply | Available | Available | *Not Available* | *Not Available* |
| Supply of Electricity | Available | *Not Available* | Available | *Not Available* |
| Refilling the Ice | Available | *Not Available* | Available | *Not Available* |
| Ice on the Boat | Available | Available | Available | *Not Available* |
| Boxes to Keep the Fish | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Fish Handling Place | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Ice Stores | Available | *Not Available* | *Not Available* | *Not Available* |
| Place for Cooled Fish | Available | *Not Available* | *Not Available* | *Not Available* |
| Drainage Facilities | *Not Available* | *Not Available* | *Not Available* | *Not Available* |
| Place for the Sale of Fish | Available | *Not Available* | Available | *Not Available* |

**Source:** Salem, Al Zgozi (2007)

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This is a hindrance to the development of fisheries in Libya in general and in the eastern region in particular, because infrastructure is the backbone of most economic activities. The fishery infrastructure in the study area is weak and this is one of the major barriers that limit Libya benefiting from the fisheries sector. The fishery in the study area needs a considerable development of infrastructure. Fisheries infrastructure directly or indirectly affects the efficiency of human resources and the productivity of the fishing boats, and thus impacts on the process of production and marketing. Directing investments to establish modern infrastructure, whether in the harbour or ports or transport and marketing, will build foundations for the development of the fisheries sector because there are international standards that must be met in the infrastructure of fishing ports. Such projects, through the construction of roads, lines and means of transmission and distribution suitable for the fish, will increase the quality of the final product. More importantly, this will allow Libya to enter into international fish trade agreements, thus making the fishery sector competitive. In addition, competitive advantage can be achieved through the supply chain mechanism. However, findings show that the supply channels are random in the fish market; the supply and distribution systems are uncoordinated and inefficient. There is no particular system for the flow of fish from the fishermen to the consumer

There is a relationship between the type of fishing boat used and the total annual fish production. It shows from Table 8.4 below that the result of the Chi-square test indicated that on the whole, the relationship between the type of fishing boat and the total annual production quantity can be considered as the strongest compared withthe other variables in the test. Test of significance showed that $P=$ .0001 and Cramer's V= 0.501 suggesting a moderate association between the types of artisanal fishing boats and fish quantity; statistically, it is significant.In addition, Table 7 illustrates the test of significance result and shows that while $p=0001$, Cramer's V= 0.335, suggesting an association between the number of the fishermen and fish quantity that is statistically significant. In summary, the Chi square test was used to examine these factors in relation to fish quantity. The results confirmed that there is a statistically significant correlation between fish quantity and type of boat and number of fishermen working on the boat. This simply means that where there is enhanced fishing equipment with the right (trained) personnel, fish catch most likely increases.

**Table 7:** Factors Influencing Fish Quantity in the Eastern Region of Libya

| Dependent Variable | Independent Variables | Relationship between Dependent Variables and Independent Variables Chi-Square Cramer's V | |
|---|---|---|---|
| Total Annual Production Quantity (tons) | Type of Fishing Boat | $p = .0001$ | 0.501 |
| | Number of Fishermen | $p = .0001$ | 0.335 |

**Source:** Field work

### 6.2.    Knowledge Resources and Fishing Technology

Porter (1985:164) states that "technological change is one of the principal drivers of competition. It plays a major role in the industry's structural change, as well as in creating new industries". According to the development plan of the Libyan marine sector 2006-2010, the target to be achieved in this period is to increase the refreshing rates and technological development in the activities of the marine sector (National Foundation for Maritime Investment, 2005:32). However, there is a lack of personnel training in modern methods of fishing to achieve sustainability of this wealth and to keep it from attrition: this should be one of the important aims of the government plans. GR1 also demonstrated that the weakness of fish production is due to lack of use of the latest fishing technology. In addition, the quantities of fish production in Libya in general are low compared to those in

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neighbouring countries. Some participants attribute this shortage in fish production to the use of primitive means in production and to the absence of modern technological means. Many of the participants – fishermen - in this study emphasised that the methods of fishing they use are traditional, such as the use of Alsartma and Alsnar nets. The modern methods and technologies of fishing do not really exist in the fishing processes on the eastern coastline of Libya. Data from the questionnaire survey also support these findings. Based on the responses, 82.9 per cent (92 subjects out of 108) of the fishermen in the sample maintain they do not use any modern or technological method. Only 14.4 per cent (16 subjects out of 108) say they use some of the equipment and devices mentioned above. The responses also showed that there is failure to maintain fishing areas, which are considered among the most important components of the infrastructure of the fisheries marine environment, due to the use of illegal fishing methods such as explosives. It was found that 15.5 per cent of the fishermen use dynamite in fishing, even though it is illegal. In relation to the findings that came out of the human resources discussion, figure 5 summarises factors affecting workers performance and fish catch productivity.
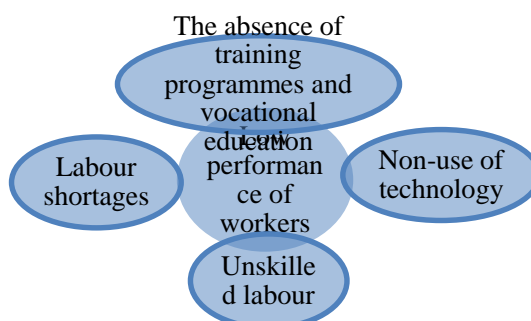
**Figure 5:** Factors affecting workers' performance on small-scale fishery in the eastern region of Libya.

## 7.	Capital Resources and Investment in Fish Wealth

Fish quantity is affected by the level of investment. Capital invested in any industry is of great importance in the support and development of the industry. However, according to the 2006-2010 development plan of the Libyan marine sector, the investments allocated to the activity of marine wealth in general was not appropriate to the potential of this activity and what it can contribute to development and food security (National Foundation for Maritime Investment, 2005: 3-4). In 1972-2005, it constituted only 0.55% of the total budget allocation plans for Libyan economic and social development (National Foundation for Maritime Investment).

## 8.3	Related Supporting and Complementary Industries

As a result of lack of infrastructure, fishermen sometimes face the accumulation of production at certain seasons of the year. The

findings that came out of the analyses from respondents of key factors influencing related supporting and complementary industries are summarised in figure 6.



Figure 6 : Key factors influencing the related supporting and complementary industries in fisheries.

Porter believes that once supplier industries are able to possess an international advantage, the downstream value chain could benefit from in many ways, such as access to cost-effective inputs. A fast-pace innovation within the entire fisheries could have been achieved with joint problem solving or transmitting of information from the suppliers to materials or equipment to fishers. As the Libyan case has shown all the above benefits, including new methods and the opportunity to apply new technology, are not stimulated due to the dearth in the industries and activities related to fisheries. If Libya

continues to have related industries which lack competitive advantage, the possibility for achieving sustained success in fisheries can prove a herculean task.

## 9. The Role of Government in Fisheries

### 9.1 Economic and Political Influence

The findings from the interviews show how the political and economic situation of the government is reflected in, and indirectly affect, the fisheries sector. This can be seen in four aspects related to the structure and strategy of the fisheries sector, which are: institutional instability and widespread corruption; poor management of small-scale fisheries; unsuitable policies and legislation; and lack of government investment. the economic and political situation of the Libyan state is shaped by the overwhelming role played by government in the economy, which is a command economy. See figure 7.
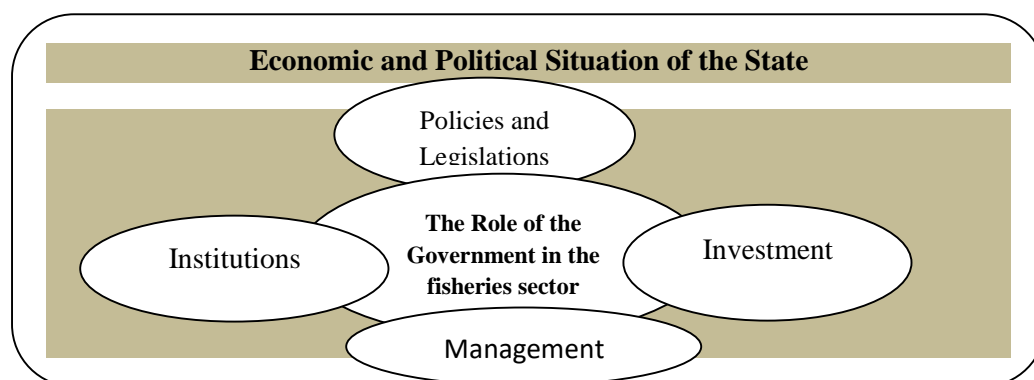


Figure 7 Government's role in the Libyan fisheries sector

## 9.2    Corruption

Increasing concerns about corruption, especially in the oil industries, is also leading to greater interest in the governance of fisheries. Corruption and negligence in the monitoring of the assets and the funds of the state in Libya in general could be attributed to the weakness of the institutions. Some participants pointed out that public projects in the fishing industry often suffer from financial corruption and negligence. Meanwhile, some respondents highlighted the way deposed government officials have played a decisive role in hampering other sectors. Their argument was based on administrative failure, which creates instability, and in turn corruption throughout the entire system. The findings showed that administrative and financial corruption is one of the reasons for the lack of success of any project that supports fish marketing or that is related to investment in this vital resource. The above situation means that these companies might register simply to obtain loans from the government and only pretend to be working in the fishing industry when essentially they are not present on the ground. There is evidence of negligence and corruption. Some pointed out that the private sector is much less prone to corruption and private fishing enterprises are more efficient and successful.

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### 9.3    Poor Management of Fisheries

The findings indicated that the ways in which fisheries sector is managed in Libya is unclear as a result of institutional instability. Public institutions have been constantly undergoing restructuring processes in a supposed bid to undertaken new functions in accordance with the development plans. This has strongly constrained the overall development of the sector and weakened the capacity of some institutions by creating unstable policies on activities and problems of staff motivation. With regard to poor management, the fisheries sector has passed through several stages:

1) Centralised administration phase   ,2) Transitional phase:   , 3) Local administration phase.

Changes in administration have a negative impact on both the economic and environmental aspects of the marine fisheries. In addition, the findings of the current study confirmed that there is a wide gap between government policy and those working in the fisheries sector. Also , there is lack of investment in fisheries resources

In addition , from the results of the analysis, the researcher noted that all the representatives of the government, experts at the marine research centre and many of the fishermen agree that the laws and regulations applicable to the fisheries sector are unsuccessful and need to be modified to promote the marine fishing industry and the sector as a whole.

### 10. Recommendations

The following figures   are some practical recommendations that enable the marine wealth sector in general to reach the level of competitive advantage:

1- Figure, 6 is a demonstration of the possible scenario for solving the problems of fisheries infrastructure.
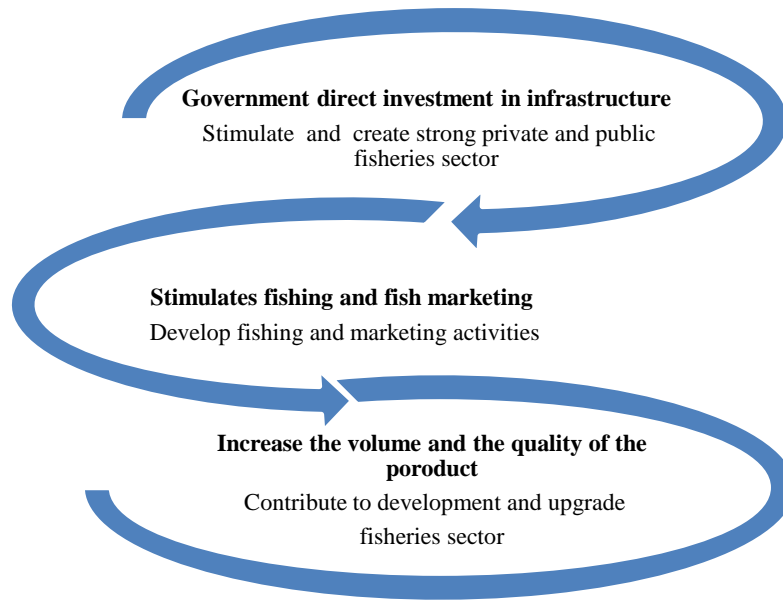
**Government direct investment in infrastructure**
Stimulate and create strong private and public fisheries sector

**Stimulates fishing and fish marketing**
Develop fishing and marketing activities

**Increase the volume and the quality of the poroduct**
Contribute to development and upgrade fisheries sector

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**Figure 6:** Proposed solutions for infrastructure in light of PDM

2- As Figure7 depicts, running such a research centre produces expertise in this field, in line with what Porter termed 'factor creation'.
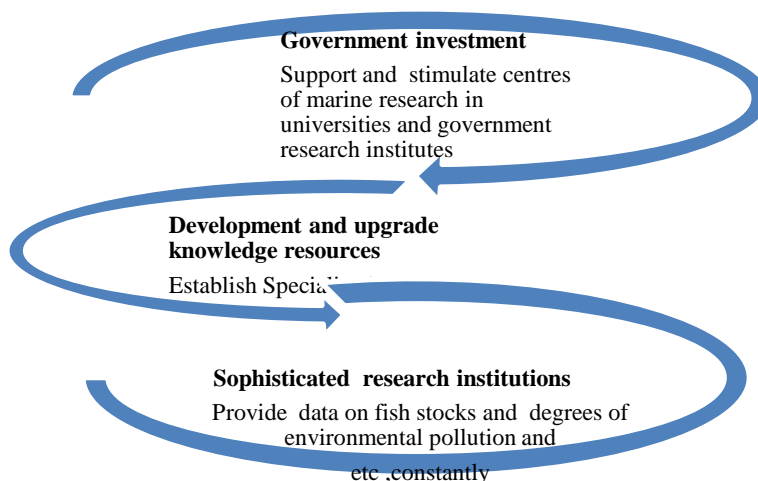
**Figure** 7**:** Proposed solutions to develop the factor of knowledge resources in the light of PDM**.**

3- the government's role varies according to the nature of the state or society of investment in factor-creation (see figure **8**). The fishing career needs particular education and training from institutes and colleges specialising in the fishing industry.
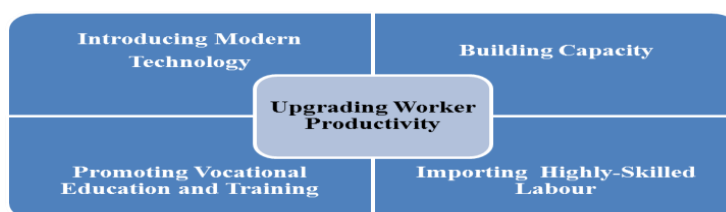


**Figure 8 :**Proposed solutions for human Resources in light of Porter's Diamond Model

## 11. Conclusion

As shown in various sections of the research, it has been clear that Porter's model has proven suitable for the development of the fisheries sector in the Libyan economy because the determinants  have provided the opportunity for assessing  the factors affecting fisheries development. The research findings have also shown that government has contributed in great extent to the current situation of the fisheries in Libya. The Libyan government has consistently influenced (directly or indirectly) each of the determinants under the study  in negative way. As a result of the findings in Libya - a resource-rich developing country bedevilled with the resource curse – the model needs some adjustment to factor in the crucial role of government that is required at this stage of fisheries development.  Based on the findings from this model, suggestions for policy making were made because of the active role government plays in both economic and industrial development, especially as Libya is undergoing structural reforms and strategy nowadays.

The role of government in PDM is an indirect variable which has an indirect impact, as an external determinant. However, in the Libyan fisheries sector the government role should be positive, direct and central. There are a number of reasons why: the industry is still a novice and the fisheries sector still needs to be taken care of, and be

supported directly by the government. One could argue that the extraordinary weakness of government institutions and the dearth of social programmes make it less likely that the government will apply any different approach in the fisheries sector. However, some protective measures need to be in place to strengthen and enhance the activity of fishermen and fish traders (for example, in price policy, buying some of their produce, raising taxes on imports etc) to support the industry and make it work, and at the same time government should have an interest in building a strong private sector. The Libyan government can deliberately create policies to encourage fisheries in the face of a booming oil sector. This will bring down domestic costs of production and distribution to further encourage diversification; in the long run this means that the surplus can be exported. This is not inconsistent with the promotion and development of the private sector, which should be a major goal of the government through its support for the development of the fisheries sector.

## REFERENCES

ABU KHADIR, A. and AL ZARQAANI, M. (2005). The Study of Economic and Social Indicators of Fishing Units Operating Water Libyan, First Phase. Marine Biology Research Centre, Tajoura, Tripoli, Libya

ABUHADRA D.A. and AJAALI, T.T., (2014) Labour Market and Employment Policy in Libya. ETF, working together learning for life.

AL-ARIFI, M. (2008). Fish Production in the East of Libyan Coast: Geographical Potential and Barriers. 1st ed., Tripoli, General Counsel of Culture.

BASDEN, A. (2004). Bhaskar's Critical Realism- Comparison with Dooyeweerd. [online]. Last accessed 6/8 2012 at:

http://www.dooy.salford.ac.uk/ext/bhaskar.html#klein

Bature, Nakah(2013) The Dutch Disease and the Diversification of an Studies. IOSR Journal Of Humanities And Social  Economy: Some Case Sep. - Oct. 2013), PP 06-14). Science (IOSR-JHSS) Volume 15, Issue 5.

 Edwik, A. (2007). Oil Dependency, Economic Diversification and Study of Libya. PhD Thesis. UK: University of  Development: A Case Salford

HART, S. L. (1995). A Natural-Resource-Based View of the Firm. Academy of Management Review, 20 (4), 986-1014.

HLP REPORT (2014) Sustainable fisheries and aquaculture for food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome

ISRAEL, G. D. (2010). Determining Sample Size. Institute of Food and Agricultural Sciences (IFAS), University of Florida, Gainesville.

Mazar, A., (2012). Libya Hopes and Missed Opportunities. 1st ed., Beirut, .Institution for Studies and Publishing Lebanon. Arabic.

MARINE BIOLOGY RESEARCH CENTRE (2008) Framework of Marine Resources sector components of the survey. Marine Biology Research Centre. Tajura –Libya.

NAN, Liu Xiao and LEI, Cao (2013) The Rapid Development of Chinese Heavy Truck Industry: Adapted Porter's Diamond Model Study. Uppsala University Department of Business Studies.

NATIONAL FOUNDATION FOR MARITIME INVESTMENT (2005). The Development Plans of the Libyan Marine Sector (2006-2010), Tripoli, Libya

Porter, M. (1985). Competitive Advantage: Creating and Sustaining Superior ..Performance. New York: The Free Press

PORTER, M. (1998). The Competitive Advantage of Nations with a New .Introduction, 2nd ed., London, Macmillan Press Ltd

PORTER, M. and YERGIN D. (2006). National Economic Strategy. An Assessment of the Competitiveness of the Libyan Arab Jamahiriya. The General Planning Council of Libya. United Kingdom

SHEIBANI, Gamal (2008) How to Attract Foreign Direct Investment to Invest In Housing In Libya. PhD. University of Salford, Salford, UK

**مصائد الأسماك الليبية – الواقع والآفاق**
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# المستخلص

يعد الاقتصاد الأزرق من أهم الفرص لتنويع بنية الاقتصاد الليبي، ويتناول هذا البحث قدرة قطاع الثروة السمكية الليبي على تحقيق ميزة تنافسية، وقامت الباحثة بتطبيق نموذج الماس لبورتر (1985) على مصائد الأسماك الليبية؛ لتحديد مواطن الضعف والقوة، وتحديد الآفاق المستقبلية، وإمكانات التنمية لمصايد الأسماك الصغيرة. في هذه الإستراتيجية أربعة محددات رئيسة مترابطة تؤثر في قدرة القطاعات على تحقيق ميزة تنافسية وتهيئة بيئة تنافسية: (ظروف العامل "الموارد المادية- الموارد البشرية- الموارد المعرفية- موارد رأس المال في الهياكل الأساسية"، والطلب، والصناعات ذات الصلة والداعمة، وإستراتيجية الشركة وهيكلها، والمنافسة) فضلًا عن متغيرين غير مباشرين، هما: (الفرص والحكومة). تناول هذا البحث محددين، هي: "ظروف العامل والحكومة"، وقامت الباحثة بجمع بيانات من المنطقة الشرقية في جانب الإنتاج من أربعة موانئ هي: ميناء بنغازي وميناء سوسة وميناء درنة وميناء طبرق، واعتمد البحث نهج الواقعية النقدية، وجمعت البيانات بأداة الاستبانة والمقابلات المنظمة التي أجرتها الباحثة، وبيَّنت النتائج المستخلصة من تحليل البيانات أن الحكومة مسؤولة عن ضعف قطاع الثروة السمكية؛ لأنها تقف وراء تشكيل الإدارة والمؤسسات، وهي المسؤولة الوحيدة عن وضع القوانين والتشريعات، ومن المشاكل والصعوبات الرئيسة التي تواجه أنشطة الموارد البحرية ضعف الهياكل الأساسية، وضعف قطاع خدمات الدعم، وعدم كفاية قواعد البيانات المتعلقة بالأرصدة السمكية، وضعف تطوير الهياكل الأساسية، وكلها أمور تشكِّل عاملًا رئيسًا في أية صناعة، فضلًا عن ضعف استخدم التكنولوجيا، وعدم كفاية قواعد البيانات المتعلقة بالأرصدة السمكية، وعدم كفاءة البنية التحتية للسوق المحلية، وعدم ملاءمة إطار السياسات والتشريعات، وضعف الترتيبات المؤسسية وعدم استقرارها، وقلة المخصصات المالية. إن قطاع المصائد يحتاج إلى تحالف مع القطاع الخاص في جميع مراحل الإنتاج؛ لخلق القدرة التنافسية في هذه الصناعة، وقد وُضعت العديد من التوصيات للنهوض بمصائد الأسماك الصغيرة في ليبيا.