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WORLD MARITIME UNIVERSITY  
MALMÖ - SWEDEN

**SAFETY ASPECTS OF FISHING VESSELS IN PAKISTAN**

by

**QURBAN HUSSAIN**

**ISLAMIC REPUBLIC OF PAKISTAN**

A paper submitted to the Faculty of the World Maritime University  
in partial satisfaction of the requirements for the award



**MASTER OF SCIENCE DEGREE**  
in  
**MARITIME SAFETY ADMINISTRATION**  
**(MARINE ENGINEERING)**

The contents of this paper reflects my personal view and are not necessarily endorsed by the University.

Signature:

A handwritten signature in black ink, appearing to read "Qurban Hussain", written over a horizontal line.

Date: 21 October 1988

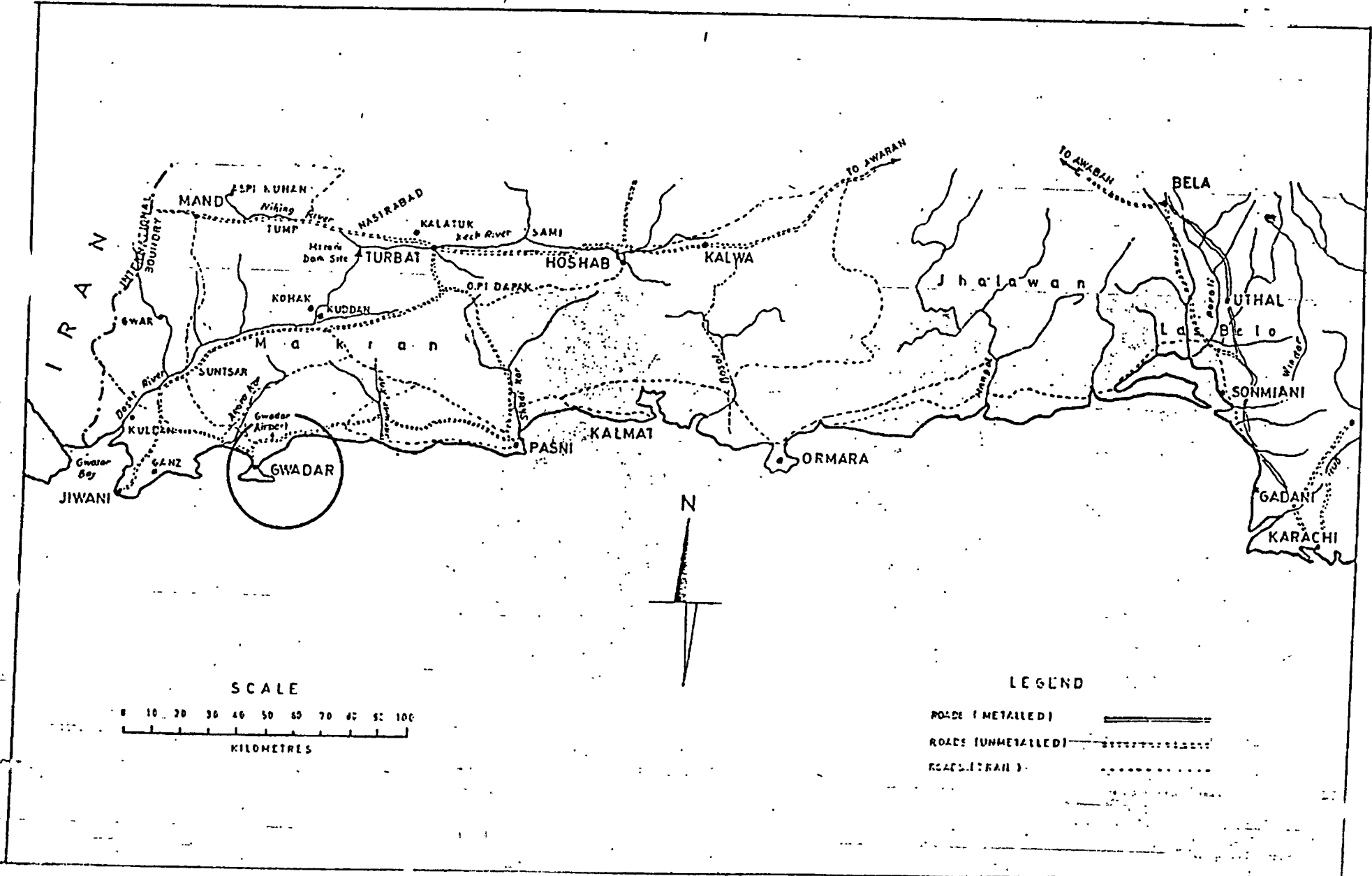
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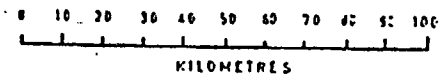
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PAKISTAN



SCALE

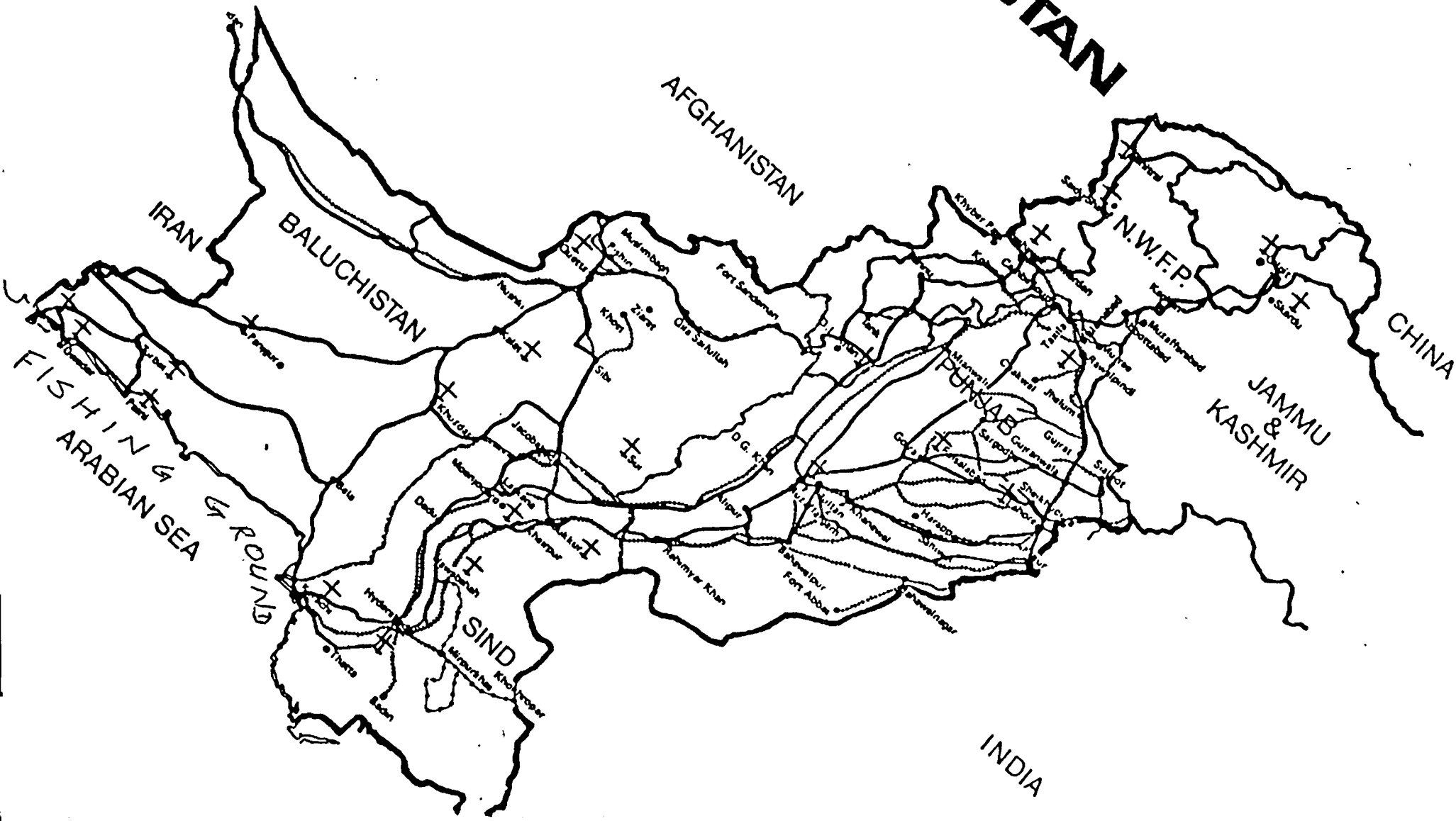


KILOMETRES

LEGEND

- ROADS (METALLED) —————
- ROADS (UNMETALLED) - - - - -
- ROADS (RAIL) ······

# PAKISTAN



## TABLE OF CONTENTS

	<u>Page No.</u>
List of Tables .....	iv
List of Figures .....	v
List of Appendices .....	vi
Abstract.....	vii
Acknowledgement .....	viii
CHAPTER I - INTRODUCTION .....	01
CHAPTER II - GENERAL INFORMATION .....	02
2.1 Geography.....	02
2.2 Species.....	02
2.3 Sea Living Resources .....	02
2.4 The Present Area of Fishing Activities in Pakistani Coastal Waters.....	03
CHAPTER III - HISTORY .....	05
3.1 Cultural History of the Ancient Fishermen and Their Settle- ments.....	05
3.2 The Ancient History of Coastal Fishermen from 326 BC to 7th Century.....	05

	<u>Page No.</u>
3.3 The Social History of the Ancient Fishermen, known as Ichtyophagal.....	07
3.4 History of Ancient Fishermen from the 8th to 19th Century..	09
CHAPTER IV - THE PRESENT CONDITION OF FISHING VESSELS .....	11
4.1 Types of Boats .....	11
4.2 Registration of Fishing Vessels.....	21
4.3 Construction .....	21
4.4 Casualties During Last Five Years.....	21
4.5 National Safety Regulation....	26
4.6 Fleet Development.....	26
4.7 Standards of Knowledge.....	27
4.8 Survey and Certification.....	34
4.9 International Regulation.....	34
CHAPTER V - RECOMMENDATIONS.....	35
Section 1 - Construction .....	35
Section 2 - Fire Protection, Fire Detection.....	52
Section 3 - Fire Fighting Equipment.....	55
Section 4 - Life Saving Appliances.	57
Section 5 - Navigational Equipment.	58
Section 6 - International Regulations.....	60

	<u>Page No.</u>
CHAPTER VI - CONCLUSION .....	61
Appendices .....	63
Bibliography .....	74

## LIST OF TABLES

		<u>Page No.</u>
Table 1	Marine Casualties .....	22
Table 2	Marine Casualties from 1982 to 1986...	23
Table 3	Loss of Life in Marine Casualties.....	26
Table 4	Total Number of Registered Boats, New Registered Boats, etc. from 1983 to 1987.....	28
Table 5	Five Years of Statistics for the Loss of Property.....	32



## LIST OF FIGURES

	<u>Page No.</u>
Tony Type Boat.....	13
Dhatti Hora Type Boat .....	14
Ekdar Type Boat .....	15
Hora Type Boat .....	16
Hora Type Boat.....	17
Bedi Type Boat .....	18
Line Drawing Bedi Type Boat .....	19
Bedi Type Boat .....	20

## LIST OF APPENDICES

		<u>Page No.</u>
Appendix 1	Nominal Catch of Marine and Inland Commercial Industrial and Subsistence Catch (1984-1985)	63
Appendix 2	Commercial and Industrial Production of Fish (1947-1985)	64
Appendix 3	Local Consumption and Exportable Surplus of Nominal Catch Commercial, Industrial and Subsistence Catch (1984-1985)	65
Appendix 4	Local Consumption of Fish and Shrimps Commercial, Industrial and Subsistence Catch (1984-1985)	66
Appendix 5	Fishing Craft Marine and Inland (1984-1985)	67
Appendix 6	Fishing Fleet of Pakistan (1980-1985)	68
Appendix 7	Mechanized Fishing Crafts of Pakistan (1981-1985)	69
Appendix 8	Fishing Craft Province-wise (1984-1985)	70
Appendix 9	Number of Mechanized and Mechanized Cum Sail Driven Fishing Vessels in Actual Operation on Sind and Baluchistan Coasts (1984-1985)	71
Appendix 10	Fishing Craft (1955-1985)	72
Appendix 11	Fishermen Engaged in Pakistan (1980-1985)	73

## A B S T R A C T

Pakistan is a country with few rivers and lakes which naturally forced its fishermen to fish on the coast which extends some 250,000 Km. along the Arabian Sea. However, the fishing industry, which originated as a cottage industry a few centuries ago, has remained very primitive in design and technology ever since. The only development has been that, in place of poor fishermen, presently richer capitalists have become the owners of the vessels. The operators are still poor and uneducated.

In spite of the fact that a national legislation governing mechanically propelled vessels has been in existence since 1917 modified in 1951, the fishing vessels have continued to remain beyond the scope of this legislation, being constructed as sailing vessels and subsequently installing engines.

This foul play by uneducated fishermen in ill-equipped boats has cost thousands of lives every year and the eventual loss of property.

As no constructional and other safety measures have been enforced, they have remained highly hazardous vessels, particularly in the rough weather conditions of the Arabian Sea.

This calls for urgent action to be taken to frame a comprehensive legislation stipulating adequate safety requirements including training and the certification of crew. Last but not least is the restructuring of the enforcement agencies; that is the maritime safety administration and the coast guard. This is all the more important because the Law of the Sea Convention and the growth of the Pakistan population has widened the scope of the fishing industry and the need for sea food to supplement the protein needs of its hungry millions. This paper aims to stipulate a set of rules applicable to fishing vessels less than 24 m in length.

## A C K N O W L E D G E M E N T S

To produce a work of this sort there is no doubt that enormous help must have been solicited from willing, patient and dedicated persons. I am therefore indebted to all those persons who in one way or another, may have helped me when it was most needed.

I especially wish to acknowledge with sincere thanks the help received from Professor Hansen-Tangen and my department superiors and my colleagues and staff and Mr. Mohzzam from Pakistan fisheries who provided me with information and valuable suggestions.

I am indeed indebted to my government and my department in Pakistan for offering me this unique opportunity to study at the World Maritime University which helped me to further my knowledge in my profession.

I do wish to thank my wife, my daughter and my sons for their patience and understanding and encouragement.

**CHAPTER 1**

**INTRODUCTION**

**CHAPTER 1****INTRODUCTION**

Fishing has been the means of livelihood for a large segment of population all along the coast of the area now constituting Pakistan, for several centuries. With the passage of time the methods, techniques and the tools have improved yet it is still primitive compared to modern methods. In other words there is an urgent need to lay down rules and regulations and to improve the standard of the fishing boats, make them safer and bring to an end the long history of death of fishermen at sea.

Pakistan has been independent for the last 40 years, yet there are no comprehensive rules or regulations regulating the safety standards of fishing vessels.

In Pakistan most of the fishing boats are of wooden construction and around 15 m long. Many of them are mechanically propelled.

This project aims at saving the lives of fishermen, the loss of property and also protecting the environment. At present there are no rules and regulations applied to fishing vessels. Fishermen only register the vessel and start catching. For the safety of the lives of fishermen and security of property and also for protecting the environment there should be some rules for safety, i.e. construction rules for strength and stability, and inspection of safety requirement for equipment, LSA, PFA and Navigation.

It is an obligation of the administration to take care of safety of life, property and the environment and to provide a safe, navigational passage to international shipping. It can only be possible if all craft navigating in the coastal waters are regulated by some national or international rules and regulations for navigation in coastal waters.

**CHAPTER 2**

**GENERAL INFORMATION**

## CHAPTER 2

### GENERAL INFORMATION

#### 2.1 GEOGRAPHY:

Pakistan's coast line is located on the Arabian Sea. It is about 527 nautical miles (964 kilometers) long stretching from Jiwani (Baluchistan province) on the Pakistan-Iran border at 60 degrees 30 minutes E in the north west and ending at Rann of Katch (Sir Creek) on the Sind coast at 68 degrees 10 minutes in the south east of the Arabian Sea. This includes the Makran coast, made of wind swept and surf ridden large bays, and the Sind coast which has a network of creeks and includes the delta of the Indus river.

#### 2.2 SPECIES:

The inshore and offshore waters facing the Arabian Sea are potentially rich in biomass, productivity and fishery resources. There are some 500 species of fishes, e.g. shrimps, lobsters, squids, crab, etc.

#### 2.3 SEA LIVING RESOURCES:

In order to exploit these resources the Marine Fisheries Department, a department attached to the Ministry of Food and Agriculture, Government of Pakistan, was established in 1951. It was also entrusted to achieve the following objectives:

2.3.1 To develop inshore fishery resources, rationally and judiciously, on scientific lines.

2.3.2 To provide infrastructure facilities such as fish harbour jetties, etc. for the establishment of the fish industry.



2.3.3 To mechanize fishing boats and introduce appropriate gear and technology to increase the production of fish and shrimps.

2.3.4 To develop fish processing industries and to promote the export of fish and fishery products.

#### 2.4 THE PRESENT AREA OF FISHING ACTIVITIES IN PAKISTANI COASTAL WATERS:

The main fishing areas in the Pakistani coastal waters are the two provinces which have sea coasts, Sind and Baluchistan as shown in the map. Karachi is the main fishing district in Sind; having a large fishing harbour and also many cold storage for the processing/ storage of fish for export purposes. In Sind province there are some additional fishing villages where fishing activities are carried out, i.e. Ketty Bandar and Bandar Shahpur.

In Baluchistan there are many fishing towns e.g. Sonminai in Las-Bela district, Ormara, Pasni, Gwadar and Jiwani in Gwadar district.

The Pakistan government is now building new fishing ports in Baluchistan province at Pasni and Gwadar to increase fishing activities in Pakistani coastal waters.

As a result of the building of two new fishing harbours the Pakistani fishing fleet will increase and the catch rate of fishing will also increase. This will be a good foreign exchange earner for the country. But with the increase in fishing vessels more traffic violence in coastal waters will occur due to the lack of navigational knowledge of the fishermen. Loss of life of poor fishermen will also occur. At present, in the record of registration there are about 10000 fishing vessels which are registered in Pakistan, out of which

only about 5000 fishing vessels are in operation for catching fish.

**CHAPTER 3**

**HISTORY**

## CHAPTER 3

### HISTORY

#### 3.1 CULTURAL HISTORY OF THE ANCIENT FISHERMEN AND THEIR SETTLEMENTS:

The ancient history of coastal fishermen occupying the area from the southern border of Sind to the Persian Gulf was written in fragments by Arrian, a Greek historian and philosopher who lived from 96 to 180 A.D., Marcious, a Greek geographer from 400 AD and by certain Arabs. The Macedonian generals accompanying Alexander's expedition, and some Arab geographers like Ebn-Hukal and Isthakhri, gave a brief account of the social life of fishermen. Their villages were found all along the coast. They described the people of coastal Makran, whose living was based solely on fish and who remained independent till the ascendancy of the Arabs in the 8th century.

From the 8th century to the 18th century they were ruled by local and foreign powers who maintained the trade of fish from the port of Sonmiani Ormara and Gwadar to other coastal countries of Arab and southern India.

In the 19th century coastal fishermen and their boats were utilised by the British army, especially when they were at war with the ruler of Sind.

#### 3.2 THE ANCIENT HISTORY OF COASTAL FISHERMEN FROM 326 B.C. TO THE 7TH CENTURY:

A glance at the available historical data reveals that the three main districts of the fishermen, as seen on the coast by Alexander the Great during his retreat from India, still exists today with new or modified names which are as follows:

<u>Ancient Name</u>	<u>New Name</u>
Arabil or Kukrala	Karachi
Orea and Oritae	Las-Bela
Gedrosia	Northern Makran
Ichthyophagal	Coastal Makran

Each district was composed of many ancient coastal fishing villages, as is the case today. A few of them are to be found near the same old sites, but the rest were destroyed. At the time of Alexander, Makran was known as Gedrosia and the people living on or near the coast were known as Ichthyophagal i.e. "fish eaters". The region according to Arrian includes the area between the districts of Oritae and Kerman in Persia. In the 6th or 7th century the same country was known as Makran, but the Arabs claim that the name originates from them. The exact meaning of the name is unknown.

The first historical reference to the people of Makran and Las-Bela is found in the writings of Arrian. He described them as Dravidians and divided the population into two district groups, namely: Gedrosian and Ichthyophagal. But whatever may have been the ethnical elements which have amalgamated in the course of time to form the present population of Makran, the majority of them are locally known by the generic term "Baluch", the rest being called "Makarni", descendants of the Ahyssintans.

Herodotus was of the opinion that the present coastal Makran was in the past, Gedrosia and clasified a section of the Ichthyophagal as "Asiatic Ethiopians". The descendants of those Ethiopians may well be the present Makrani fishermen, who are looked upon as the people of "Habshi" (Abyssinia) by the Baluchi tribes. They are found today in every fishing village along the coast and a German Glasser once remarked that the original home of the "Habshi" was in south east Arabia whence a

body of them may very well have passed across the Gulf of Oman to seed their fortune in land so similar in climate and physical conditions to that of their forefathers.

### 3.3 THE SOCIAL HISTORY OF THE ANCIENT FISHERMEN, KNOWN AS ICHTHYOPHAGAL:

According to Arrian the Ichthyophagal and Orital obtained fish mostly from the shallow area of beach, the greater part of which was under water at high tide. When the sea receded a few fish were found on the ashore and they abounded in the pools and depressions where the water still remained. Most of fish caught were small but some, caught with the help of nets, were of considerable size. The more delicate kinds of fish were eaten raw as soon as they were taken out of the water, and this is still the custom today.

#### 3.3.1 Nets and Boats:

Nets were made from the bark (fibres) of the palm which they twined into cord in the same way as the fibres of flax are twined. Every net was about 2 stadia (1225 feet) long. In his translation of the works of Arrian, McCrindle says that the condition of the fishermen's boats is the same as was observed by Nearchos at Kophas (Kappas). Nearchos narrated the conditions thus; "the inhabitants were fishermen, possessors of small and wretched boats, which they did not manage with oars fastened to a row-lock according to the Grecian manner but with paddles which they thrust on this side and on that into water, like diggers using a spade. It is a curve made of small planks nailed or sewed together in rude manner with cord made from the bark of date trees and called Kair, the whole being then smeared over with dammer or pitch."

The types of net and boat in use today are no longer those of ancient times but are still of primitive design. They are mostly based on Arab models.

### 3.3.2 The Ancient Houses of Fishermen:

The raw material for the construction of the houses was mostly obtained from the bones of whales which were found frequently on or near the coast. Some whales were extraordinarily large and were sometimes stranded on the coast or left in shallow waters at ebb tide. They were thus unable to escape back to the sea. Occasionally they were thrown onto the coast by violent storms. The fishermen left them as they were for a time on the coast so that the skin and flesh might rot away, leaving the bare bones. Some of the whales were as long as 152 feet. The bones were mainly used in houses by the better class of people. The large bones were used as beams for the sides of the houses, the smaller ones as rafters, and the jaw bones served as door posts. The majority of the fishermen were poor and lived on the marshy ground near the shore in cabins, close and suffocating, made from the hack bones of fish.

Houses of whale-bones no longer exist on the coast. They have been replaced by stone and mud houses. The majority of the fishermen still live on marshy ground or on the sandy coastal tract in close and suffocating mat huts instead of the old cabins made of the back-bones of whales.

### 3.3.3 Sea Fish:

There is an abundance of fish in the Arabian Sea. A small number of them inhabiting the coastal waters, were caught, but other larger varieties, living in the depths

of the sea, may not have been classified as fish by the ancient people. They were described by Arrian and Firdousi in his Shahnama, who gave an interesting account of sea fish as follows:

"They saw lions and bulls in the sea and the bulls were fighting with the lions. Some animals had heads like those of the buffalo whose hands were behind their back and whose feet were in the front. Some had the body of fish and the head of a leopard."

The above quotation seems to be only a poetic expression of the surprise felt by Nearchos and the King of Persia (Keikosru), when they saw the big fishes and sea mammals in the Arabian Sea. On several occasions they were faced with the danger of colliding with sea monsters.

#### 3.4 HISTORY OF ANCIENT FISHERMEN FROM THE 8TH TO 19TH CENTURY:

The invasion of India by Alexander the Great came to an end in 328 B.C. after which the coastal strip now belonging to Pakistan was ruled by Buddhists and Persians. They brought many changes in northern Makran by improving the methods of cultivation. With regard to the activities of fishermen of the coastal area, no account was given by the ancient authors in their available documents. The fishermen may have lived in the same condition as that described by Arrian. When the Arabs had conquered the whole territory in the 8th century and built roads connecting the districts, the fishermen made use of the increased facilities and moved readily from one district to another by camel and by the ships of Arab merchants. They established social and cultural relations, especially with people of the same profession. The flow of trade was regular and many Arab Traders settled in the fishermen's villages. Marco Polo commented on the condition of the fishing population and the fishing trade at the end of the 13th century and



remarked "some of the people are idolaters but the most part are saracens. They live by merchandise and industry, for they are professed traders and carry much traffic by sea" (Saracens is a general name given by the Europeans in the 11th century to all people united by Islam who lived in the southern and eastern countries of the Mediterranean). Thus, most of the people in the fishing villages of the coast were no doubt Muslims and consisted of local people, most of them fishermen, and Arab traders. However, many of the local people today claim that they are of Arab extraction and that their forefathers were forced to migrate from the neighbourhood of Aleppo (Syria) in the 7th century (680-684). Nowadays, Arab traders are not found in the villages; possibly they became either fishermen or farmer in the northern portion of Makran. Their trade passed into the hands of Sindhi Khoja (Ismailia) and Kathiwari merchants.

From about the 15th century to the 18th century this coastal area was under the control of the Moghuls of Delhi and local chiefs. In the early 19th century the influence of the British was gradually increasing and within a 100 years they had brought the whole coast under the control. Fishermen of the Karachi coast were the first who came into contact with the British army officers, who gave a brief account of taxation on fish in Sind. A.F. Baillie writes that from each boat that entered Karachi harbour, if it contained upwards of sixty fish, one sixth was taken as a custom and if it contained less, one fourth. The largest sorts of fish, for instance the varieties of cod fish which were dried and salted for export purposes, had an additional tax imposed upon them.

## CHAPTER 4

### THE PRESENT CONDITION OF FISHING VESSELS

## CHAPTER 4

## THE PRESENT CONDITION OF FISHING VESSELS

4.1 TYPES OF BOATS:

There are various types of boats in the fishing field, but the most common ones are: Tony, Ekdar, Dhatti, Hora, Hora or Gharat Hora, and Bedi boat.

4.1.1 Tony:

A small, dug-out boat originally manufactured in Calicut, south west India. They are used mostly in creeks and are propelled by oars and occasionally a small sail is used. The construction is plank and frame. It is one-man boat with a length of about 6 - 6.5 metres.

4.1.2 Dhatti Hora:

A narrow, double-ended boats built mostly on the plan of Hora (Gharat Hora). There are two types, one dug-out with the upper part planked, and provided with an outrigger (Dhatti) and a balancing plank, the other constructed entirely by planking. The length varies between 9 - 13 metres, the registered tonnage 2 - 2.5; propelled by oars and one sail. It is operated in creeks and in shore waters.

4.1.3 Ekdar:

A double-ended, comparatively narrow boat built on the principle of a "hora" (Gharat Hora), but heavily constructed with a rounded, strong stem and stern timbers. The registered tonnage varies from 4.5 to 6. A balancing plank is used and only one sail is carried.

This type of boat is used on the open surf ridden coast and, as their construction shows, the rounded ends help in pulling them ashore. The name "Ekdar" means that the keel is made up of only one piece of wood. Actually the lower part of the hull is usually a dug-out. The length is about 14 - 15 metres.

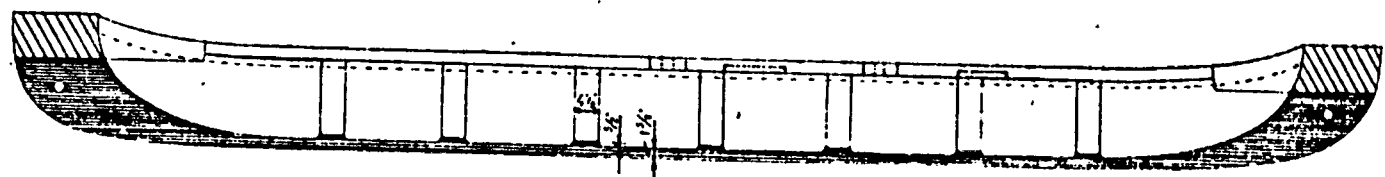
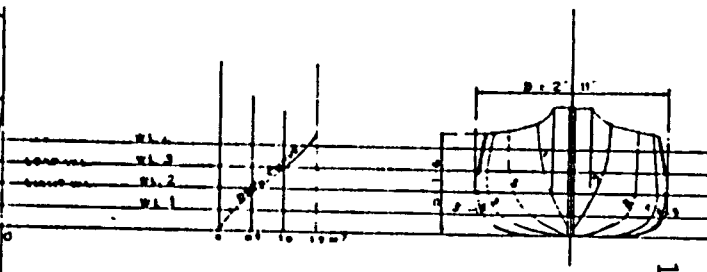
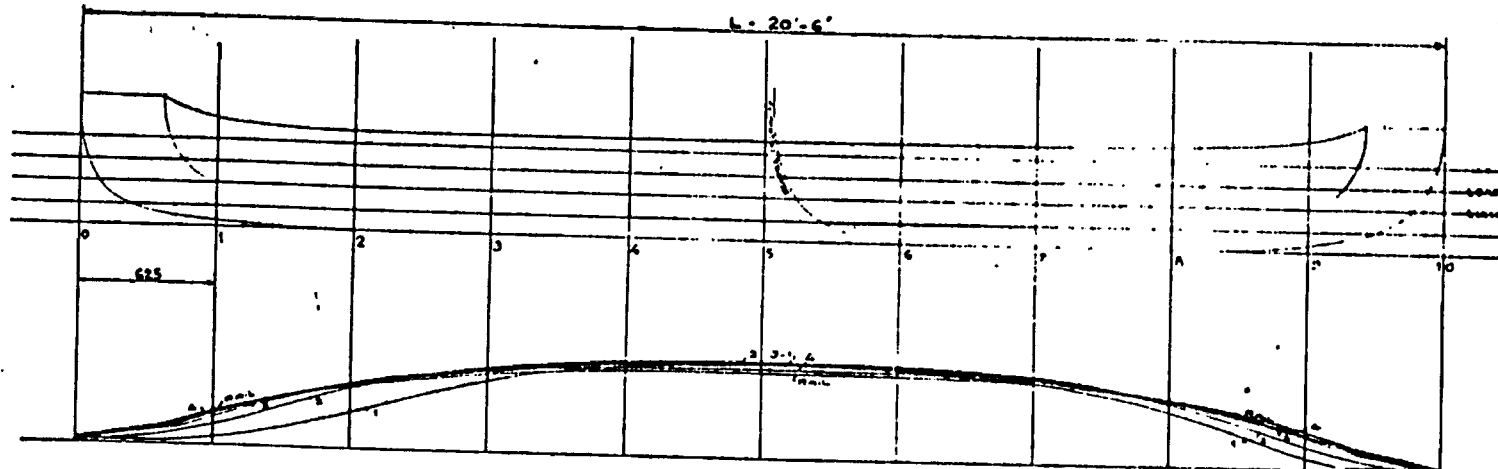
#### 4.1.4 Hora (Gharat Hora):

A long and relatively narrow boat, with a round fore-foot, a vertical stem and a long overhanging stern. The sheer line is almost straight and the hull is full at midship-section having sharp ends. The larger boats are operated in the open sea and the smaller ones near the shore and in the creeks. The capacity and arrangement are much the same as in "bedi boats".

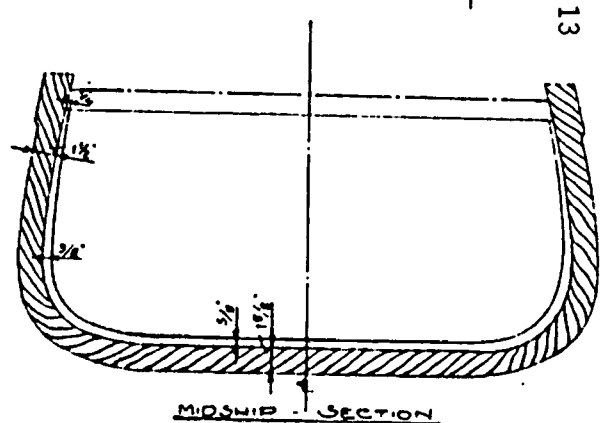
The length is about 11 - 21 metres and the registered tonnage 20 to 35. These boats are mostly propelled by outboard engines/sails.

#### 4.1.5 Bedi Boats:

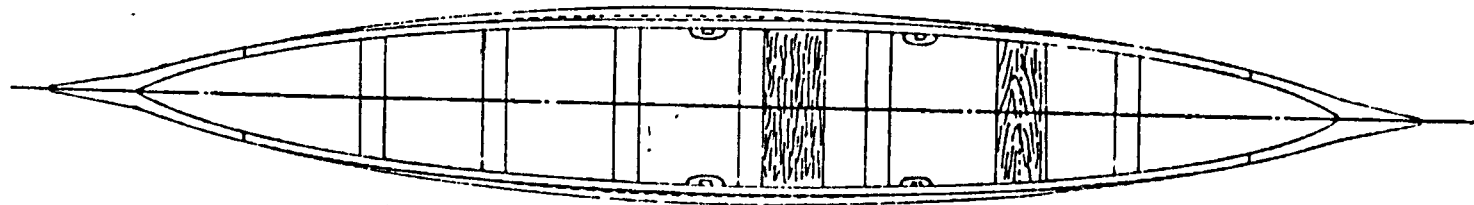
These are large boats with relatively good beams and an over-hanging stem and stern timber. The hull has a full midship-section with a hard bilge, sharp entrance and a transome stern. They were previously operated with sails but are now propelled with inboard engines. The boats have comparatively many inboard fittings, e.g. loose decks to carry one large wooden box for fresh fish and ice; a small hold for cured fish; fresh water tank and space for cured fish, nets and cooking utensils. These boats fish in deep water. They are 11 to 22 metres long and their registered tonnage is 20 to 45. They carry a 12-man crew including a skipper.



LONGITUDINAL - SECTION



MIDSHIP - SECTION

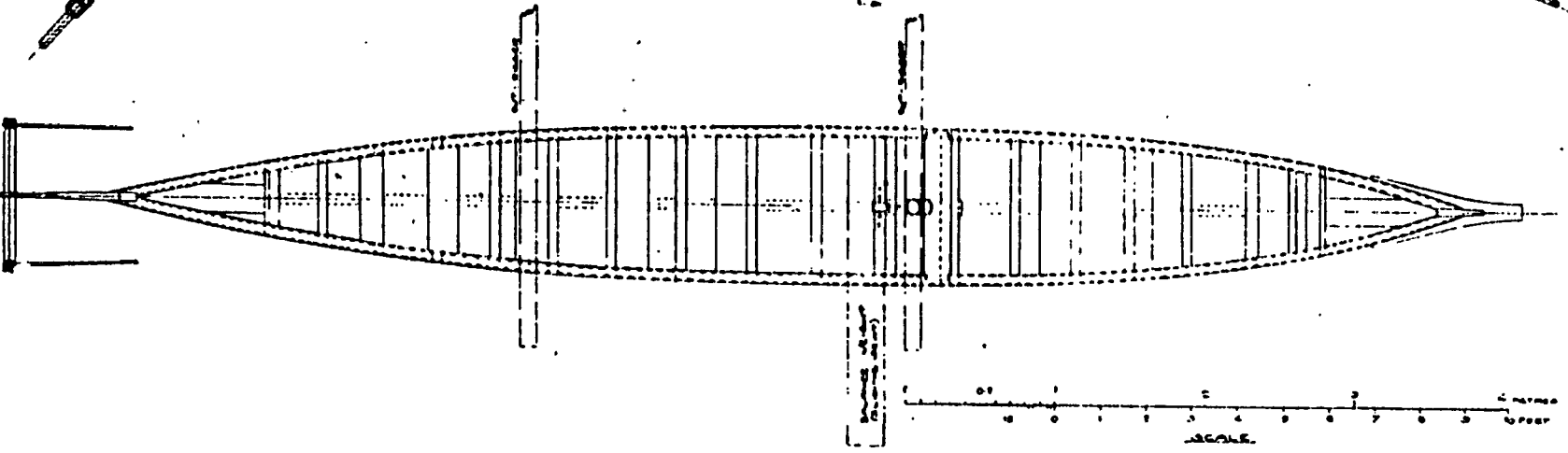
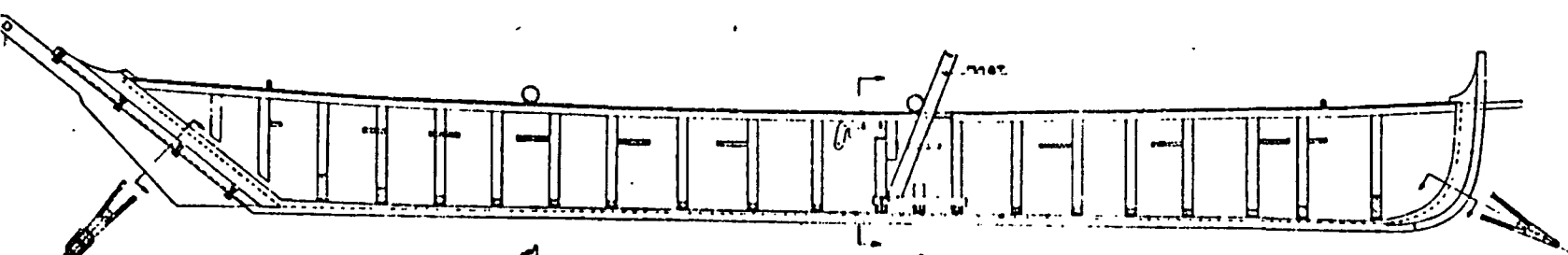
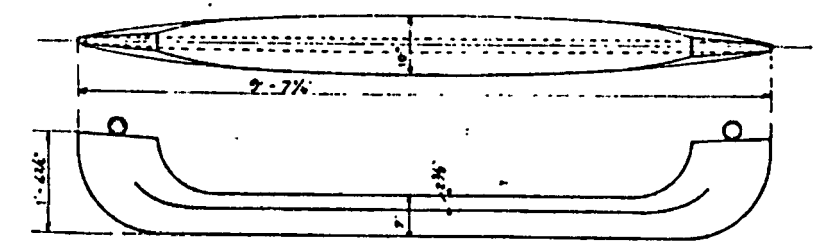
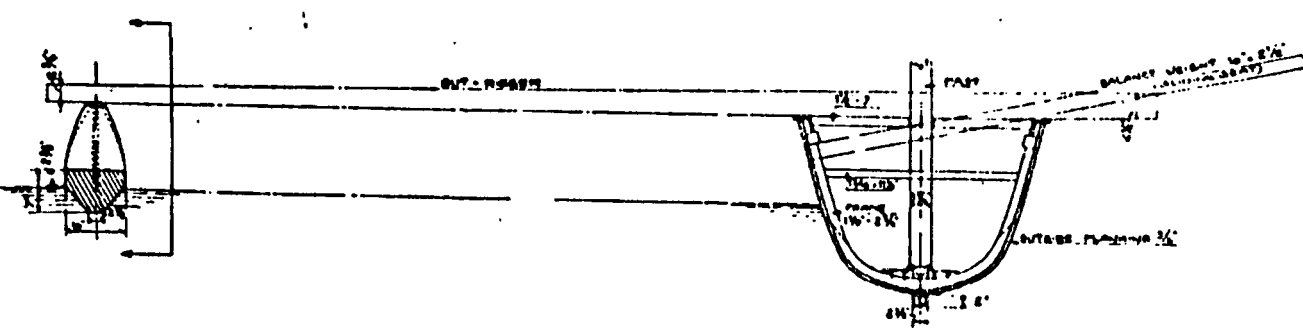
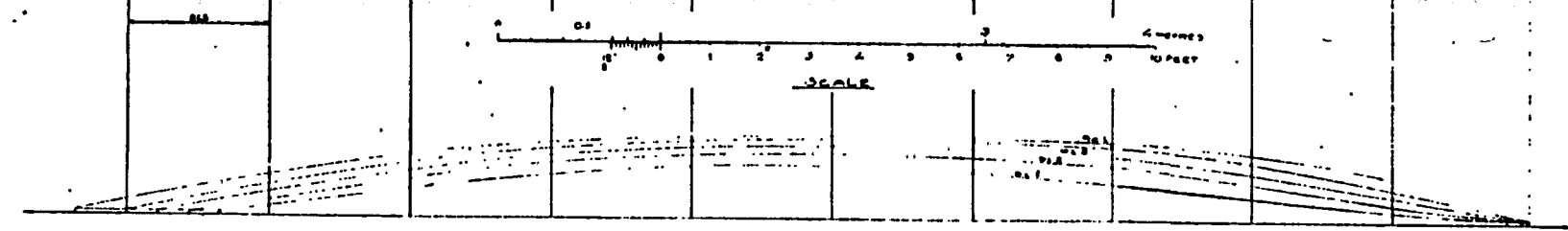


PLAN

PAKISTAN FISHING BOAT  
TYPE "TONY"

DIMENSIONS.		
LENGTH	20'-6"	6.268 METERS
EXTREME BREADTH	2'-11"	0.635 METERS

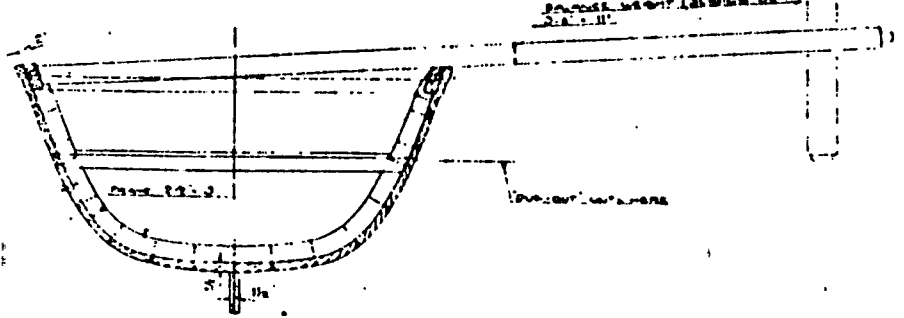
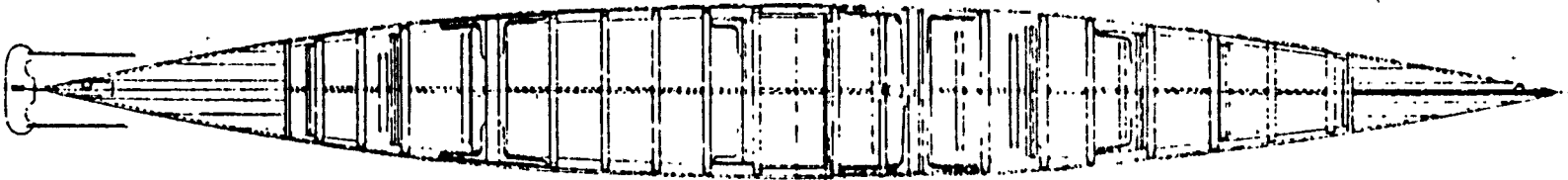
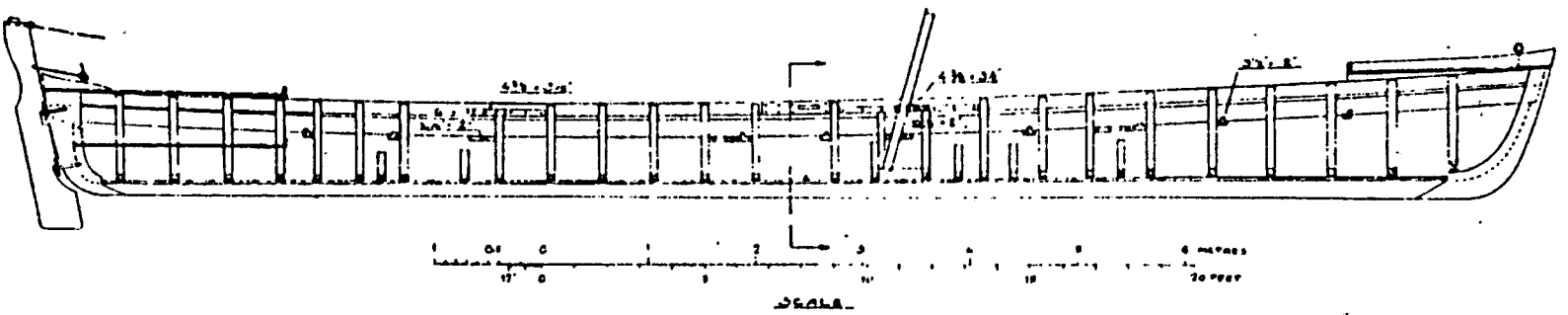
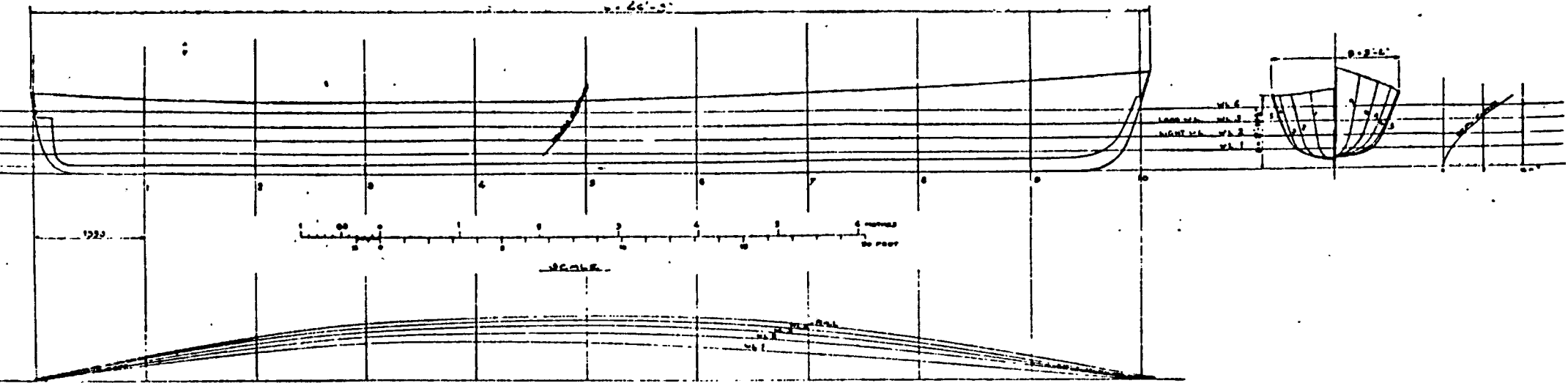
LINES DRAWING  
OF WEST PAKISTAN FISHINGBOAT  
TYPE "DHATTI HORA"



CONSTRUCTION DRAWING  
OF WEST PAKISTAN FISHINGBOAT  
TYPE "DHATTI HORA"

DIMENSIONS:

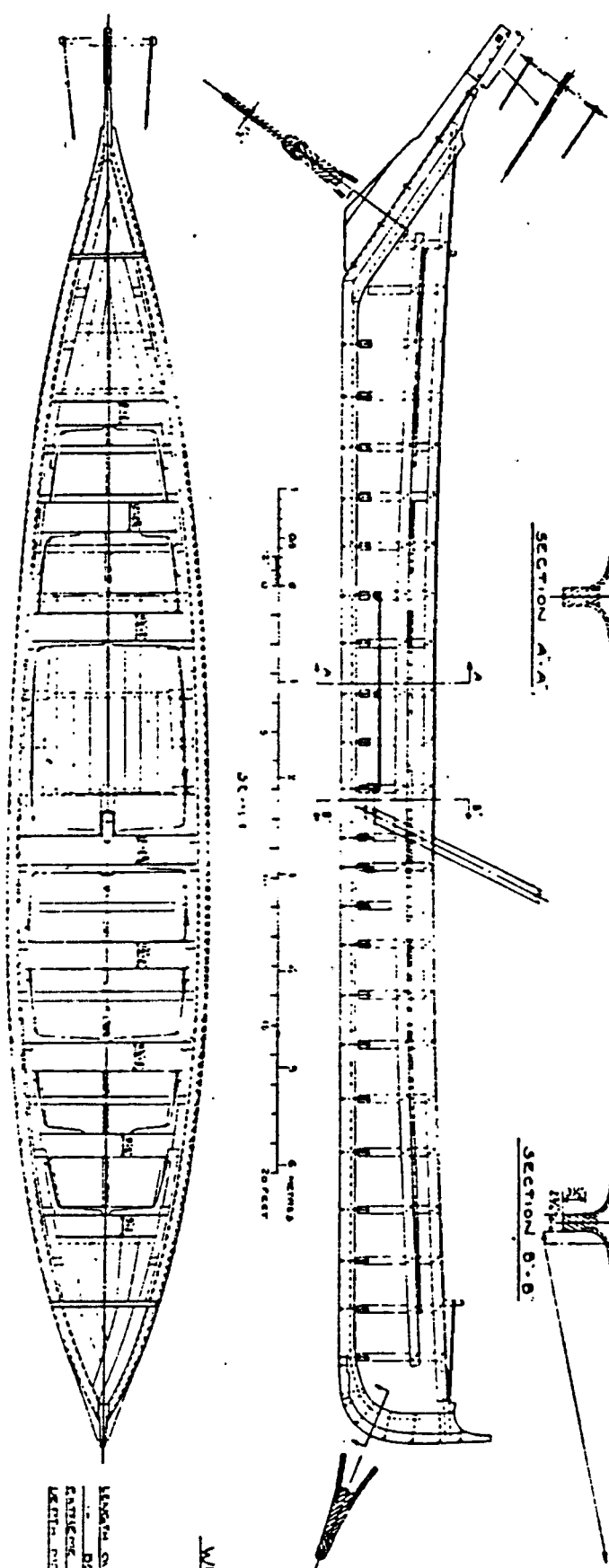
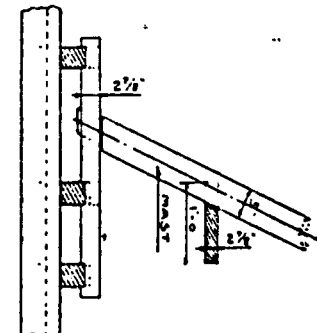
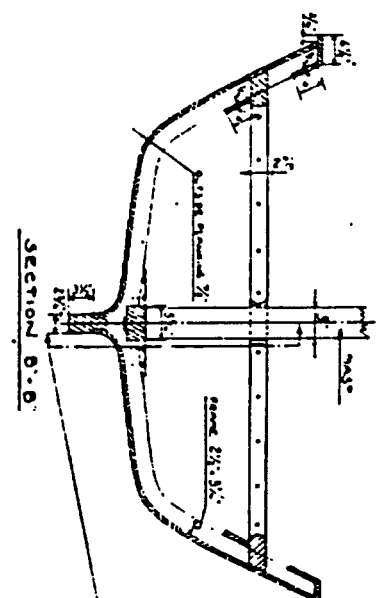
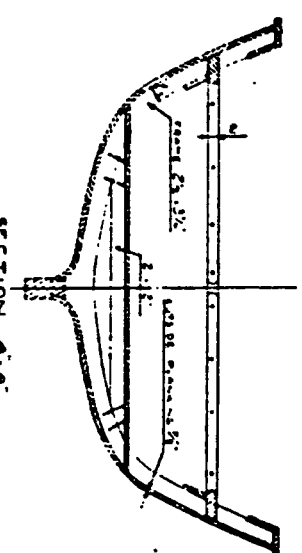
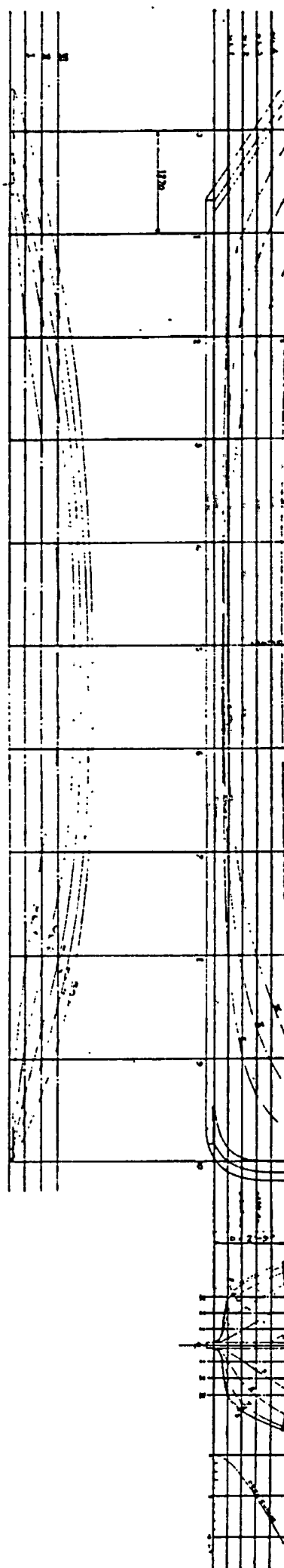
LENGTH OVER ALL	33'-6" = 10.21 meters
DEPTH OVER DECK AT FORECASTLE	2'-4" = 0.76
BATHING DEPTH	2'-0" = 0.61
DEPTH OVER DECK	2'-4" = 0.76



**PAKISTAN FISHING BOAT  
TYPE "EKDAR"**

DIMENSIONS:

LENGTH OVER ALL	46'-3" = 14.096 METERS
EXTREME BREADTH	5'-4" = 1.625 "
DEPTH FROM UNDERSIDE KEEL	2'-11 1/2" = 0.839 "



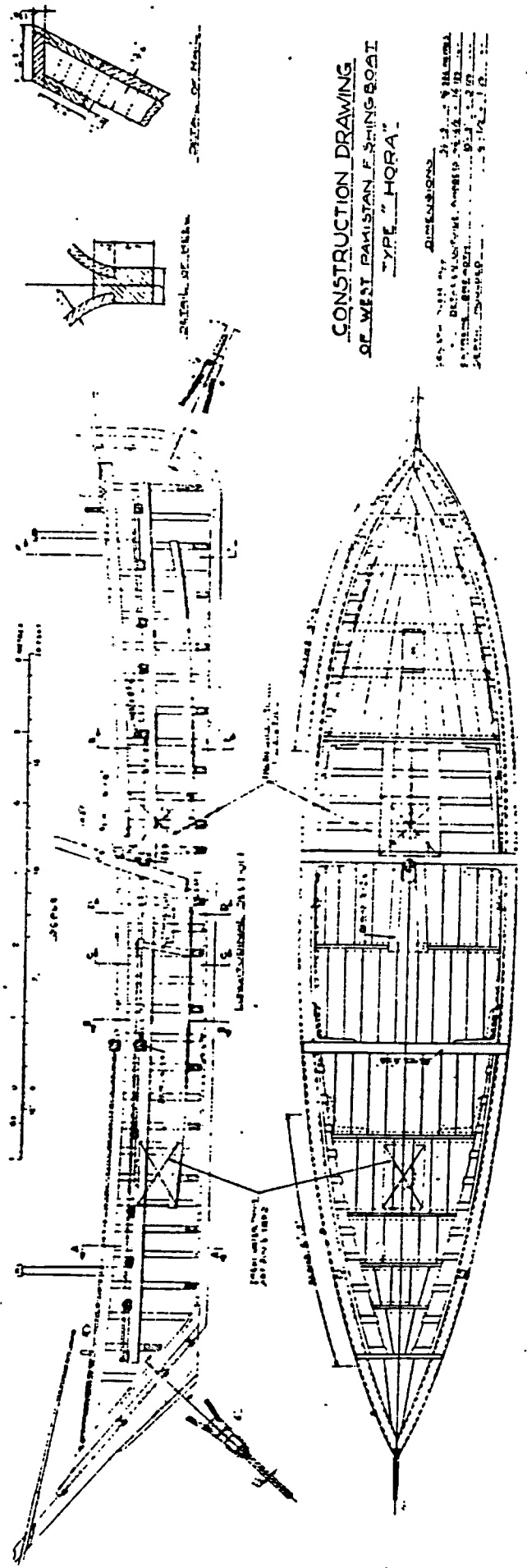
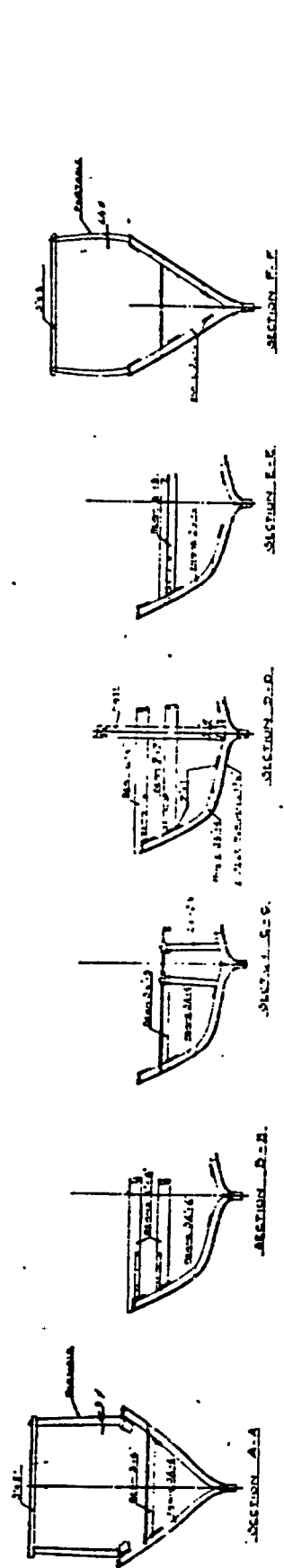
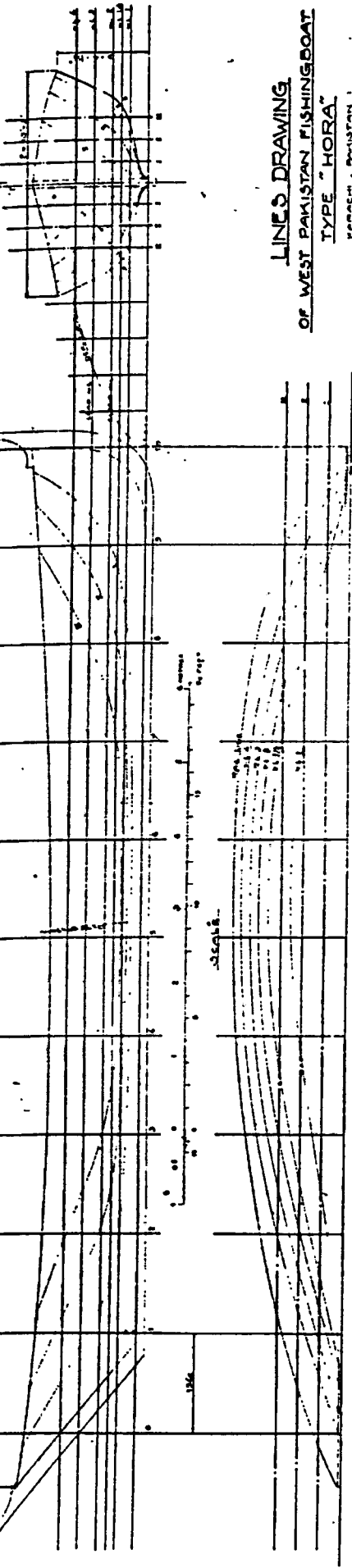
**WEST PAKISTAN FISHINGBOAT  
TYPE "HORA"**

**DIMENSIONS:**  
 LENGTH OVER ALL 48.27' - 14.53 meters  
 BREADTH OUTSIDE BOWERS 42.33' - 13.12 meters  
 BREADTH OUTSIDE 6.10' - 2.00 meters  
 KEEL HEIGHT 2.2' - .70 meters  
 KARACHI, PAKISTAN

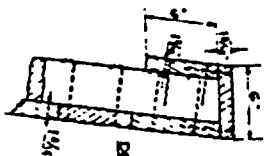
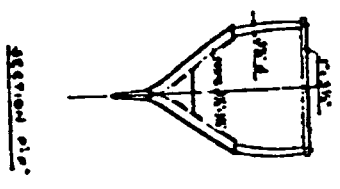
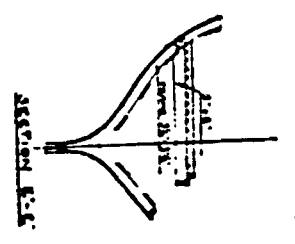
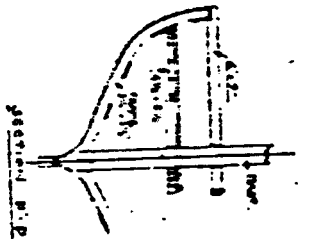
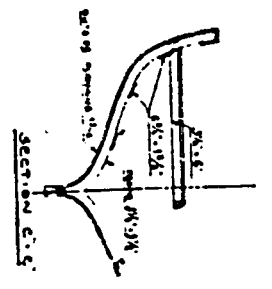
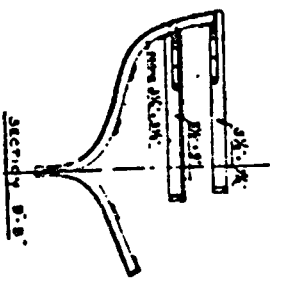
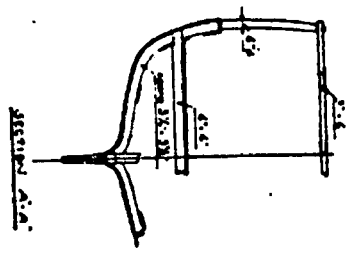
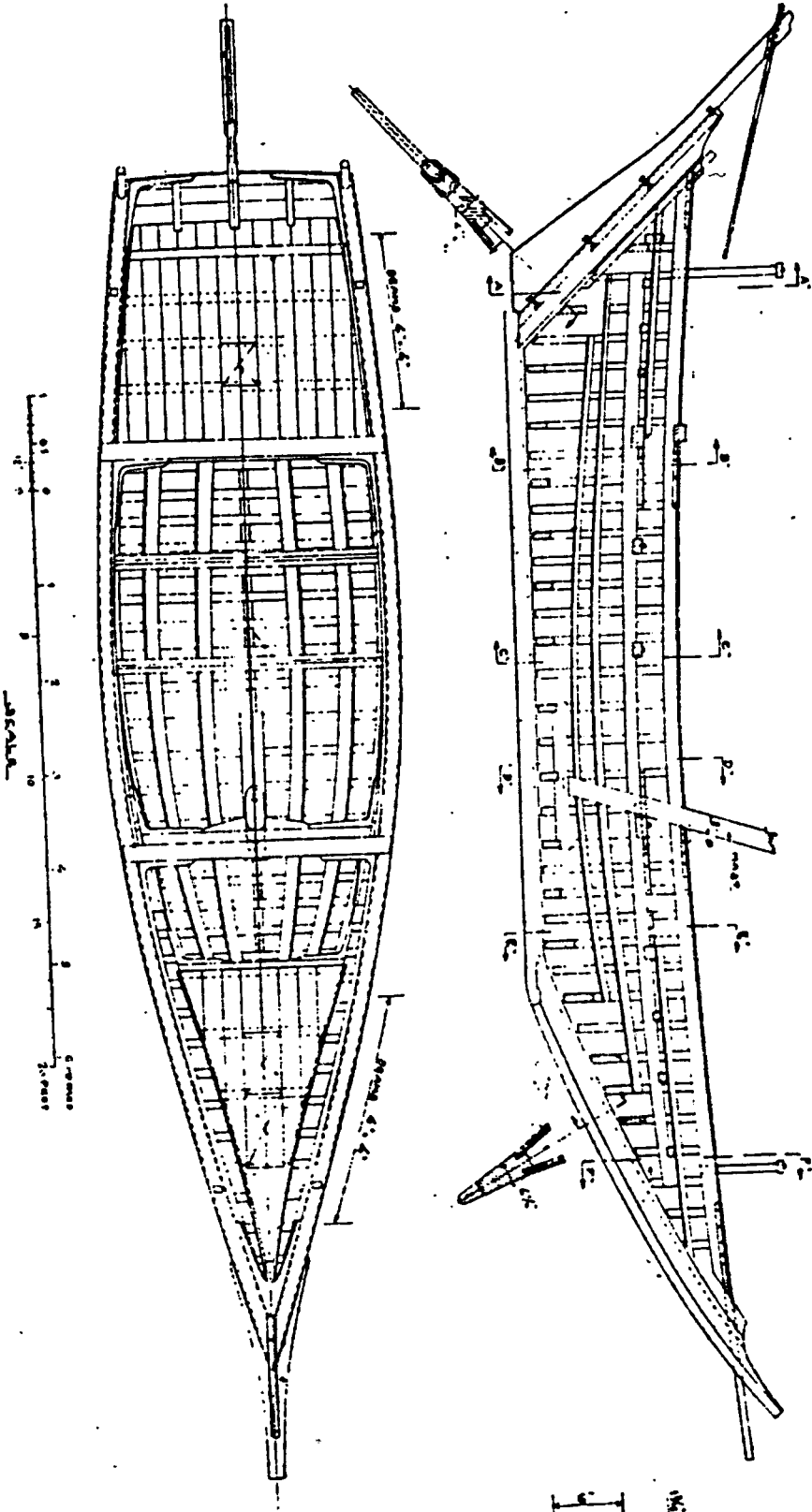


SHORT-DISTANCE FISHING — PAKISTAN FISHING CRAFT

**LINES DRAWING**  
OF WEST PAKISTAN FISHINGBOAT  
TYPE "HORA"  
SHEESH, PAKISTAN



**CONSTRUCTION DRAWING**  
OF WEST PAKISTAN FISHINGBOAT  
TYPE "HORA"  
DIMENSIONS  
LENGTH 21.00 M  
BEAM 3.00 M  
DECK AREA 60.00 SQ M  
GROSS TONNAGE 10.00 TON  
NET TONNAGE 8.00 TON

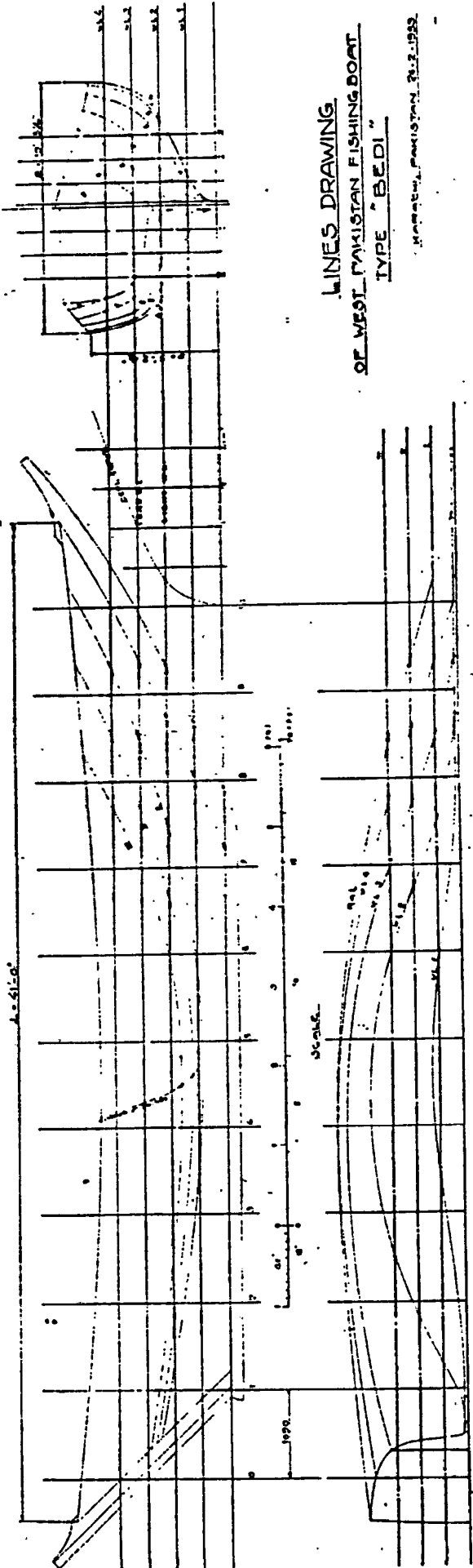


**CONSTRUCTION DRAWING  
OF WEST PAKISTAN FISHINGBOAT  
TYPE - DEED1**

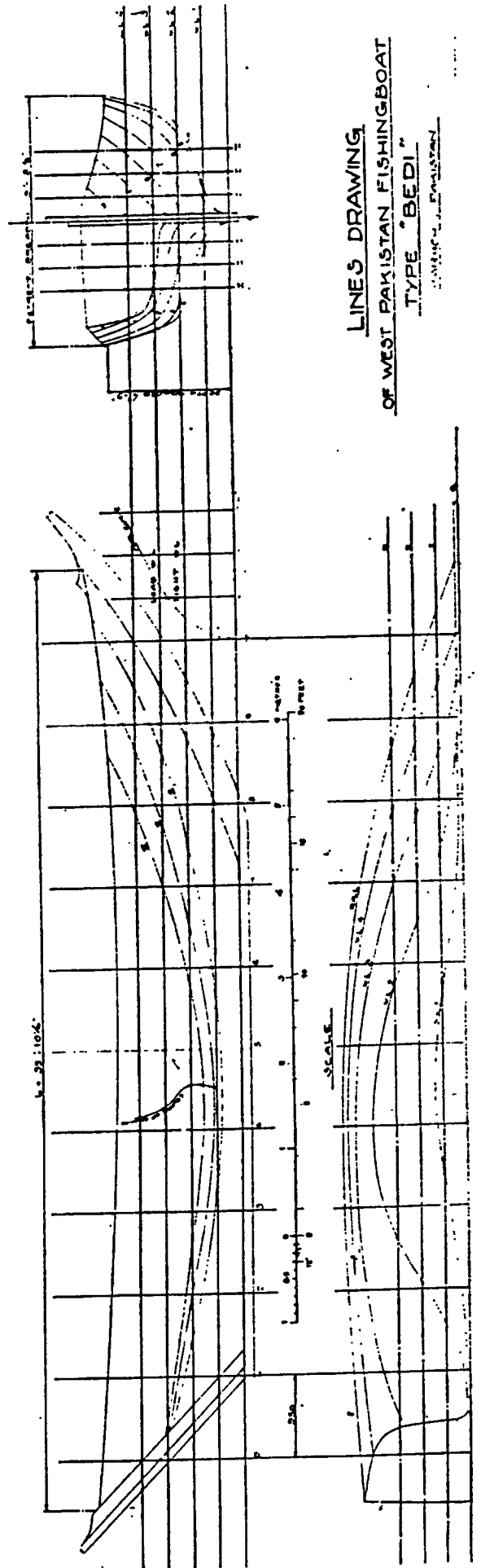
**DIMENSIONS:**  
 LENGTH OVER ALL 30.575 (100 FT) 10000  
 BREADTH OVER ALL 4.275 (13 FT) 13000  
 DEPTH OVER ALL 1.825 (5 FT) 18250  
 DRAFT OVER ALL 1.275 (4 FT) 12750

**MADE IN PAKISTAN**

FISHING BOATS OF THE WORLD — BOAT TYPES



LINES DRAWING  
OF WEST PAKISTAN FISHING BOAT  
TYPE "BEDI"  
KARACHI, PAKISTAN, 26.2.1952



LINES DRAWING  
OF WEST PAKISTAN FISHING BOAT  
TYPE "BEDI"  
KARACHI, PAKISTAN



#### 4.2 REGISTRATION OF FISHING VESSELS:

For the registration of any fishing vessel. The following documents are required:-

- i. Pakistani citizen certificate.
- ii. A written application for registration from the owner.
- iii. The registration fee.

After receiving the above information an official from the mercantile marine department will measure the fishing vessel and enter all the information in the register and then issue the registration certificate to the owner.

#### 4.3 CONSTRUCTION:

At present, all fishing vessels are constructed in a very primitive manner. There are no plans or drawings for the construction of these vessels. Besides there are no inspections or supervision from any competent authority. No quality control and quality assurance is made.

All constructions are carried out at the will of the boat builder or owner of the fishing vessel both of whom are mostly ignorant about safety aspects. They have no knowledge of stability or other safety measures. The present construction design is about 40 years old, when these boats were powered with sails. However, these days most of the larger boats of the Bedi and Hora types are self-propelled with inboard and outboard engines respectively.

#### 4.4 CASUALTIES DURING THE LAST FIVE YEARS:

The Arabian Sea where the Pakistani fishermen operate remains very rough from the month of May until September due to the monsoon. Most of the casualties occur during these months. Casualties also occur at other times of the year, mainly due

to the fact that the boats lack maintenance and no inspection is carried out by the competent authorities.

These casualties result in substantial loss of life and property.

Statistics of casualties showing the loss of lives and property are shown in Tables 1, 2, and 3. Incidentally, most of these casualties could be controlled if not totally avoided, if boats were surveyed annually and all the essential safety equipment placed on board. It is unfortunate that even after 40 years of independence no satisfactory rules have been framed and properly enforced, particularly for self propelled fishing vessels.

TABLE 1 - MARINE CASUALTIES

Month	1982	1983
January	2	2
February	2	2
March	1	1
April	1	1
May	3	2
June	3	4
July	1	2
August	2	5
September	2	2
October	3	2
November	2	NIL
December	2	NIL
TOTAL	24	23

TABLE 2 - MARINE CASUALTIES

Annual cases of accidents of boats/craft/ships due to grounding, wrecked and other hazards the coastal sea during the last five years.

<u>Year and Month</u>	<u>Cargo Boats</u>	<u>Fishing Craft</u>	<u>Ships</u>
<u>1982</u>			
January	-	1	1
February	-	1	1
March	-	-	1
April	-	1	-
May	1	1	1
June	-	1	2
July	-	-	1
August	-	1	1
September	-	1	1
October	-	2	1
November	-	2	-
December	-	1	1
TOTAL	1	12	11
<u>1983</u>			
January	-	1	1
February	-	1	1
March	-	-	1
April	-	1	-
May	-	2	-
June	-	3	1
July	-	-	2
August	1	2	2
September	-	1	1

TABLE 2 (CONT'D)

<u>Year and Month</u>	<u>Cargo Boats</u>	<u>Fishing Crafts</u>	<u>Ships</u>
<u>1983 (Cont'd)</u>			
October	-	1	1
November	-	-	-
December	-	-	-
TOTAL	1	12	10
<u>1984</u>			
January	1	-	-
February	-	-	-
March	-	1	-
April	-	-	-
May	-	1	1
June	-	1	1
July	-	1	1
August	-	2	-
September	-	1	-
October	-	1	1
November	1	-	1
December	-	-	1
TOTAL	2	8	6
<u>1985</u>			
January	-	1	-
February	-	1	-
March	1	-	-
April	-	1	-



<u>Year and Month</u>	<u>Cargo Boats</u>	<u>Fishing Crafts</u>	<u>Ships</u>
<u>1985 (Cont'd)</u>			
May	1	-	-
June	-	1	-
July	-	-	1
August	-	2	2
September	1	1	-
October	-	-	2
November	-	2	-
December	-	1	1
TOTAL	3	10	6

1986

January	-	1	1
February	1	1	-
March	-	1	1
April	-	1	1
May	1	1	-
June	-	1	1
July	-	3	2
August	-	4	1
September	1	3	1
October	-	3	2
TOTAL	3	18	10

TABLE 3 - LOSS OF LIFE IN MARINE CASUALTIESS H I P S:

16.01.1983	2	M.V. "SEA GULF"
06.05.1983	1	M.V. "AOUNALLAH"
05.06.1983	1	M.V. "SARFARAZ RAFIQI"
30.05.1985	1	M.V. "SAFINA-E-ABID"
25.11.1985	1	M.V. "SAFINA-E.ABID"
03.11.1986	1	M.V. "MULTAN"

L A U N C H E S:

August	1984	1	"AL-ROSHAN"
January	1986	4	"AL-SATTAR"
June	1986	5	"AL-HASHIMI"

4.5 NATIONAL SAFETY REGULATIONS:

There exists a national legislation for mechanically propelled inland vessels (Act 1 of 1917) which was modified in 1951. Under this rule all such vessels had to have an annual inspection and certificate of registration. However, the problem is that most of these fishing vessels are constructed as sailing vessels, thereby remaining outside the purview of this act and engines are subsequently installed. Since there are no strict enforcement measures, they continue to ply.

4.6 FLEET DEVELOPMENT:

Pakistan's fishing fleet is increasing at the annual rate of 5

to 10%, at present. All the newly constructed boats are mostly mechanically propelled with inboard or outboard engines. In Table 4 the newly constructed fishing boats and the total number of registered fishing boats are indicated.

In the early days the fishing business was carried out mostly by poor local fishermen. At that time they used to fish mostly in creeks or in the bays and closed waters and these boats were sailing boats. However, now-a-days, due to the export of fish, as well as an increase in local consumption, and enhanced governmental support for the fishing industry in the form of tax exemption and interest free loan, etc. rich business men have entered into this business. Massive capital has been invested in the fishing industry. As a result the growth of fishing vessels has increased tremendously as indicated earlier.

#### 4.7 STANDARD OF KNOWLEDGE:

Presently there are no qualified crews on board the fishing vessels. Pakistan has ratified COLREG 72 and SOLAS 74/78, but in Pakistani waters not a single fisherman knows about these conventions. They are not familiar with COLREG. None of these vessels carry any life-saving appliances (not even life jackets). While engaged in fishing they do not show the fishing lights which makes a navigational hazard for the international sea traffic. It is also dangerous for the fishing vessels themselves.

At present there are no training institutes for fishermen which could educate the fishermen for their own safety and safety of property and the environment.

Most Pakistani fishermen are uneducated and unqualified. Table 5 shows 5 years of statistics for the loss of the property mainly due to unqualified personnel on fishing vessels.

TABLE 4

DATA OF BOATS: STATEMENT SHOWS THE HALF-YEARLY BASIS OF REGISTRATION OF MERCHANDISED AND NON-MERCHANDISED BOATS UNDER THE COASTING VESSELS ACT XIX OF 1838.

	1983-1984		1983-1984		Grand Total	Actual No. in Service
	July to December, 1983	Actual No. in Service	January to June 1984	Actual No. in Service		
	No. Reg. During the Year	Grand Total Reg.	No. Reg. During the Year	Grand Total Reg.		
1. Total No. of merchandised boats registered at Karachi.						
a. Passenger Launches	5	577	9	587		168
b. Cargo Boats	-	-	-	-		-
c. Country Craft	-	939	-	939		015
d. Fishing Boats	165	8318	258	8577		3573
2. Total No. of non-merchandised boats registered at Karachi.						
a. Passenger Boats	-	165	-	163		073
b. Cargo Boats (Commercial) Sailing Harbour Craft	-	782	-	782		144

Source: Principal Officer, Mercantile Marine Department, Government of Pakistan, Karachi District

TABLE 4 (Continued)

**DATA OF BOATS:** STATEMENT SHOWS THE HALF-YEARLY BASIS OF REGISTRATION OF MERCHANDISED AND NON-MERCHANDISED BOATS UNDER THE COASTING VESSELS ACT XIX OF 1838.

	1984-1985					
	July to December, No. Reg. During the Year	Grand Total Reg.	Actual No. in Service	January to June No. Reg. During the Year	Grand Total Reg.	Actual No. in Service
1. Total No. of merchandised boat registered at Karachi.						
a. Passenger Launches	3	590	171	8	598	179
b. Cargo Boats	-	-	-	-	-	-
c. Country Craft	1	940	016	-	940	016
d. Fishing Boats	160	8738	3733	164	8903	3897
2. Total No. of non-merchandised boats registered at Karachi.						
a. Passenger Boats	-	165	073	-	165	073
b. Cargo Boats (Commercial) Sailing Harbour Craft	-	782	144	1	783	145

Source: Principal Officer, Mercantile Marine Department, Government of Pakistan, Karachi District

TABLE 4 (Continued)

**DATA OF BOATS:** STATEMENT SHOWS THE HALF-YEARLY BASIS OF REGISTRATION OF MERCHANDISED AND NON-MERCHANDISED BOATS UNDER THE COASTING VESSELS ACT XIX OF 1838.

	1985-1986					
	July to December, No. Reg. During the Year	December, 1985 - Grand Total Reg.	Actual No. in Service	January to June 1986 No. Reg. During the Year	Grand Total Reg.	Actual No. in Service
1. Total No. of merchandised boats registered at Karachi.						
a. Passenger Launches	80	606	187	07	613	194
b. Cargo Boats	-	-	-	-	-	-
c. Country Craft	-	940	016	-	940	016
d. Fishing Boats	229	9133	4126	246	9380	4332
2. Total No. of non-merchandised boats registered at Karachi.						
a. Passenger Boats	-	165	073	-	165	073
b. Cargo Boats (Commercial) Sailing Harbour Craft	-	783	145	-	783	145

Source: Principal Officer, Mercantile Marine Department, Government of Pakistan, Karachi District

TABLE 4 (Continued)

**DATA OF BOATS:** STATEMENT SHOWS THE HALF-YEARLY BASIS OF REGISTRATION OF MERCHANDISED AND NON-MERCHANDISED BOATS UNDER THE COASTING VESSELS ACT XIX OF 1838.

	1986-1987					
	July to December, No. Reg. During the Year	Grand Total Reg.	Actual No. in Service	January to June 1987 No. Reg. During the Year	Grand Total Reg.	Actual No. in Service
1. Total No. of merchandised boats registered at Karachi.						
a. Passenger Launches	09	622	203			
b. Cargo Boats	-	-	-			
c. Country Craft	-	940	014			
d. Fishing Boats	321	9702	4693			
2. Total No. of non-merchandised boats registered at Karachi.						
a. Passenger Boats	01	166	074			
b. Cargo Boats (Commercial) Sailing Harbour Craft	02	785	147			

Source: Principal Officer, Mercantile Marine Department, Government of Pakistan, Karachi District

TABLE 5 - FIVE YEARS OF STATISTICS FOR THE LOSS OF PROPERTY

By value in Rupees of properties lost due to the handling of craft by unqualified persons.

<u>Year</u>	<u>Cargo Boats</u>	<u>Fishing Trawler</u>	<u>Hora</u>	<u>Bunker Barge</u>
<u>1982</u>	16,000.00	8,000.00	3,000.00	
			3,000.00	
			3,000.00	
	16,000.00	8,000.00		
			3,000.00	
		8,000.00		
TOTAL	32,000.00	24,000.00	12,000.00	
<u>1983</u>		8,000.00	3,000.00	
	16,000.00		3,000.00	
			3,000.00	
			3,000.00	
	16,000.00	8,000.00		
			3,000.00	
			3,000.00	
		8,000.00	3,000.00	
TOTAL	32,000.00	24,000.00	21,000.00	
<u>1984</u>	16,000.00		3,000.00	
			3,000.00	
		8,000.00		
		8,000.00		
		8,000.00		
TOTAL	16,000.00	24,000.00	6,000.00	



TABLE 5 (CONT'D)

<u>Year</u>	<u>Cargo Boats</u>	<u>Fishing Trawler</u>	<u>Hora</u>	<u>Bunker Barge</u>
<u>1985</u>	16,000.00		3,000.00	
			3,000.00	
			3,000.00	
			3,000.00	
	16,000.00	80,000.00		
			5,000.00	44,50,000
			3,000.00	
TOTAL	32,000.00	80,000.00	20,000.00	44,50,000
<u>1986</u>	16,000.00		3,000.00	
	16,000.00		3,000.00	
	16,000.00		3,000.00	
	16,000.00		3,000.00	
			3,000.00	
			3,000.00	
			3,000.00	
			3,000.00	
			3,000.00	
		8,000.00	3,000.00	
TOTAL	64,000.00	8,000.00	30,000.00	-
GRAND TOTAL	176,000.00	160,000.00	89,000.00	44,50,000

#### 4.8 SURVEY AND CERTIFICATION:

As per our national regulation for inland vessels i.e. Act No. 1 of 1917 (as modified in 1951) Chapter II, Section 1, "A mechanically propelled vessel shall not proceed on any voyage unless she has a certificate of survey. All mechanically propelled vessels must have one certified master (I or II Class) or serang and an engine driver (I, II, III Class)."

At present all other inland vessels comply with these rules but the mechanically propelled fishing vessels do not comply with any of these rules.

#### 4.9 INTERNATIONAL REGULATIONS:

The international regulations are applied on large vessels. In Pakistan there are only 2 - 3 deep sea fishing vessels. These vessels are treated as large coastal vessels and their surveys are carried out accordingly.

Pakistan has implemented the following International Conventions:

- i. SOLAS 74
- ii. L.L. 66
- iii. STCW
- iv. INMARSAT
- v. COLREG 72
- vi. Safe Containers
- vii. OILPOL 54

In Pakistan most of the major conventions are in force. It is our obligation to ensure that in our waters all vessels should follow the rules and regulations of those conventions in force.

All foreign-going vessels and inland vessels observe national and international regulations.

**CHAPTER 5**

**RECOMMENDATIONS**

## CHAPTER 5

### RECOMMENDATIONS

#### SECTION 1 - CONSTRUCTION

##### 5.1.1 GENERAL:

The present fishing vessels' design and method of construction is quite old (the same way of construction during last 30 - 40 years).

There are no approved plans for construction. Besides there is no check during construction from a competent authority (like the Safety Administration) nor any rule for construction from an authority.

It is therefore essential that the regulations for construction of fishing vessels need to be framed and implemented at the earliest. All the construction must be carried out under the supervision of an administration surveyor for the proper workmanship and proper construction material. The following is recommended for fishing vessels below 24 m length. These recommendations have been formulated on the basis of the information gathered from various sources mentioned in the Bibliography, keeping Pakistan's geophysical condition in view.

##### 5.1.2 STRUCTURAL STANDARDS:

Strength and construction of hull, deck erection, machinery casings, companion ways and other structure and equipment should be sufficient to withstand all foreseeable conditions of intended service and should be to the satisfaction of the safety administration.

All vessels are to be built after prior approval of plan by the administration.

Bulkheads, closing devices and closures of openings in these bulkheads as well as methods for their testing should be in accordance with the order of the administration. And bulkheads should be extended upto the working deck and should be water-tight.

No door, manhole, ventilation duct or any other opening should be fitted in the collision bulkhead below the working deck.

#### 5.1.3 OPENINGS IN WATER-TIGHT BULKHEADS:

A minimum number of openings in water-tight bulkhead are to be permitted, which are essential for vessel's operation. All other openings should be fitted with satisfactory water-tight closing appliances of same strength as that of the closed structure of the vessel.

Watertight doors should be operable locally from each side.

#### 5.1.4 WEATHER-TIGHT DOORS:

All access openings in the bulkheads of enclosed deck erections, through which water could enter and endanger the vessel, should be fitted with doors permanently attached to the bulkhead, framed and stiffened so that the whole structure is of equivalent strength to the unpierced structure, and weather-tight when closed, and can be operated from each side of the bulkhead.

#### 5.1.5 HATCHWAY OPENINGS AND COVERS:

The hatchways should be provided with covers. It should be

so arranged that the openings are in the centre line of the vessel. Covers should be fitted in such a way that they are giving sufficient weather-tightness.

The finished thickness of the wood hatchway cover should include an allowance for abrasion due to rough handling. In any case, the finished thickness of these covers should be at least 4mm for each 100 mm (to agree with Torremolines) of unsupported span subject to a minimum of 40mm and the width of their bearing surfaces should be at least 65mm.

#### 5.1.6 MACHINERY SPACE OPENING:

Machinery space openings should be properly framed and efficiently enclosed by casings of ample strength. This opening should be arranged in such a way that it is weathertight.

Openings other than access openings, should be fitted with strong cover of similar strength as the enclosed structure.

#### 5.1.7 OTHER DECK OPENINGS:

If there is any opening which is essential for fishing operations, manholes may be fitted, provided that these are capable of being closed water-tight and remain safely attached to a structure.

An efficient deck erection or companion way, fitted with weather-tight doors or their equivalent, should be provided to protect openings, other than hatchways, machinery space openings, manholes and flush scuttles in the working deck. Companion-ways should be situated as close as practicable to the vessel's centre line.

#### 5.1.8 VENTILATORS:

- Ventilators should be arranged as close to the vessel's centre line as possible and where practicable.
- Ventilators should have coaming of substantial construction and should be capable of being closed weather-tight by devices permanently attached to the ventilator or adjacent structure.
- The coaming of ventilators should be as high as practicable. On the working deck the height above deck of coamings of ventilators other than machinery space ventilators should be not less than 760 mm and on superstructure deck not less than 450 mm. If these heights interfere with the working of the vessel, they may be reduced with prior approval of the administration.
- Machinery space ventilators' height above deck is to be to the satisfaction of the administration. If the coaming height of a ventilator is 2.5 m above working deck or more than 1.0 m above deckhouse top or superstructure deck need not have closing appliances.

#### 5.1.9 HATCHWAY COAMING HEIGHT AND DOOR SILLS:

- Hatchway coaming height above deck should be 300 mm for fishing vessels of 12 m in length. For vessels of 24 m in length it should be at least 600 mm. For vessels of intermediate length the minimum height should be obtained by linear interpolation.
- Doorway sill height should also be as specified above. If machinery space water-tightness is satisfactory, the safety administration may allow a reduced height which can be upto 150 mm.

#### 5.1.10 AIR PIPES:

- Air pipes should be arranged in such a way that they are protected from danger by fishing gear and/or lifting gear. On working decks, all pipes should be with a permanent closing device, which can be incorporated with the pipe or placed in the adjacent structure.
- The height of the pipes from deck should be at least 760 mm and on superstructure should be at least 450 mm.
- If these pipes create any obstruction in the working of the vessel, the Administration may allow a reduced height.

#### 5.1.11 SIDE SCUTTLES, WINDOWS AND OTHER OPENINGS:

- Side scuttles below working deck and to enclosed spaces on the working deck should be fitted with a hinged deadlight capable of being closed water-tight.
- Side scuttles should be fitted in a position such that their sills are above a line drawn parallel to the working deck at the side having its lowest point 500 mm above the deepest operating water line.
- Sidescuttles, together with their glasses and deadlights, should be of substantial strength and constructed to the satisfaction of the Administration.
- Skylight leading to spaces below the working deck should be of substantial construction and capable of being closed and secured weather-tight, and with the provision of an adequate means of closing in the event of damage to the inlet. Skylights, leading to machinery spaces should be avoided as far as practicable.



- Toughened safety glass or any suitable transparent material of equivalent strength should be fitted in all wheel house windows exposed to the weather.
- Deadlights or any suitable number of storm shutters should be provided where there is no other method of preventing water from entering the hull through a broken window or side scuttle.
- The Safety Administration may accept side-scuttles and windows without deadlights, when they are inside or after bulkheads of the deck erections located on or above the working deck if satisfied that the safety of the vessel will not be impaired.
- The number of openings in the sides of the vessel below the working deck should be the minimum compatible with the design and the proper working of the vessel and such openings should be provided with closing arrangements of adequate strength to ensure water-tightness and the structural integrity of the surrounding structure.

#### 5.1.12 INLETS AND DISCHARGES:

Discharges led through the shell either from spaces below the working deck or from spaces within deck erections should be fitted with efficient and accessible means for preventing water from passing on board.

Each separate discharge should have a non-return valve with a positive means of closing. It should be fixed at readily accessible position. There should be indicator for indicating if the valve is in closed or open position.

- In machinery space sea inlets and discharges essential for the operation of machinery should be controlled

locally. There should be an indicator which shows the position of the valve in either its open or closed position.

- All fittings and valves attached to the shell should be of ductile material. All pipes between the shell and valves should be of a suitable material.

#### 5.1.13 BULWARKS, RAILS AND GUARDS:

Efficient bulwarks or guard rails should be fitted on all exposed parts of the working deck and on superstructure and deck erection decks. The height above deck of any fixed bulwark should be at least 600 mm.

Satisfactory means in the form of guard rails or lifelines should be provided for the protection of the fishermen in getting to and from their accommodation, machinery spaces and other working spaces.

#### 5.1.14 FREEING PORTS:

Where bulwark on the weather parts of the working deck form wells, the minimum freeing port area (A) in square metres, on each side of vessel for each well on the working deck should be determined in relation to the length (L) and height of bulwark in the well as follows:

$$A = K \times L$$

Where  $K = 0.07$  for vessels of 24 m in length

$K = 0.035$  for vessels of 12 m in length

For intermediate lengths the value of "K" should be obtained by linear interpolation.

Note:

- i. "L" need not to be taken greater than 70% of the vessel's length.
  - ii. Where the bulwark is more than 1.2 m in average height the required area may be increased by  $0.004 \text{ m}^2$  per metre of length of well for each 100 mm difference in height.
  - iii. Where the bulwark is less than 900 mm in average height, the required area may be decreased by  $0.004 \text{ m}^2$  per metre of length of well for each 100 mm difference in height.
- The freeing port area calculated according to above (i) should be increased where the competent authority considers that the vessel's sheer is not sufficient to ensure the rapid and effective freeing of the deck of water.
  - Freeing ports should be so arranged along the length of bulwark as to provide the most rapid and effective freeing of the deck water. Lower edges of freeing ports should be as near the deck as practicable.
  - Fishing gear and equipment shall be arranged or installed in such a way that the effectiveness of the freeing ports will not be impaired or water trapped on deck and prevented from easily reaching the freeing ports.
  - A freeing port over 300 mm in depth should be fitted with bars spaced not more than 230 mm nor less than 150 mm apart or any other suitable protection arrangement. Any covering of the freeing port during fishing operation should be approved by the Safety Administration.

#### 5.1.15 ANCHORING AND MOORING EQUIPMENT:

Each fishing vessel should be provided with anchoring equipment, designed for quick and safe operation which should consist of an anchor chain or wire ropes, windlass or other arrangement for dropping and hoisting the anchor and for holding the vessel at anchor.

- The vessel should have adequate mooring ropes.
- The hull of the vessel should be suitably strengthened in way of the hawse pipe, chain stoppers, windlass and other equipment associated with the anchoring and mooring.

#### 5.1.16 FISH HOLD:

- Pipes chains or conduits passing through the fish-hold should, if practicable, be installed flush with ceilings or boxed in and adequately insulated in a manner facilitating access for inspection and maintenance.
- There should be no sharp corners in the fish holds, so as to facilitate cleaning and reduce any inherent dangers to workers in these holds.

#### 5.1.17 STABILITY:

Every fishing vessel should be designed and constructed to provide adequate intact stability for anticipated conditions.

The approximate method of determination of a vessel's stability at the time of inclining test, by means of the rolling period includes values of factor of rolling period particular to the vessel. The GM calculation formula is as follows:

$$GM = \left( \frac{F B}{T} \right)^2$$

Where  $F$  = Factor of rolling period (which is for fishing vessel between 0.80 to 0.95 in metric system and 0.445 to 0.555 in feet system.).

$B$  = Breadth of vessel in feet or metric units.

$T$  = Time for full roll period in seconds.

The GM should be not less than 0.2 m.

For a vessel with  $L$  less than 30 m minimum dynamic stability to be calculated with following formula:

$$GM_{\min} = 0.53 + 2B \left( 0.075 - 0.37 \left( \frac{F_{\min}}{B_s} \right) + 0.82 \left( \frac{F_{\min}}{B_s} \right)^2 - 0.014 \right)$$

$$\left( \frac{B_s}{D_m} \right) - 0.032 \left( \frac{l_s}{L_s} \right)$$

$(L_s)$  is the standard water-line length measured horizontally between perpendiculars.

$(B_s)$  standard water-line breadth: maximum width at standard water-line.

$(D_m)$  is the midships depth and is the vertical distance at side measured from the top of deck beams at the free board deck to keel line plus the minimum thickness of decking.

$(F_{\min})$  is actual minimum free board and is the distance from the underside of the freeboard deck at the side to a water-line measured perpendicularly to the water-line, plus the minimum thickness of decking.

$(l_s)$  = actual length in m of superstructure.

The formula is applicable for vessel having:

- i.  $\frac{F_{min}}{B_S}$  between 0.02 and 0.2
- ii.  $\frac{l_S}{L_S}$  smaller than 0.60
- iii.  $\frac{B_S}{D_m}$  between 1.75 and 2.15
- iv. Sheer fore and aft at least equal to or exceeding the standard sheer prescribed in regulation 38(8) of the International Load Line, 1966.
- v. Height of superstructure included in the calculation not less than 1.8 m.

In applying the formula the actual GMo should be known to a sufficient degree of accuracy. If a rolling test, an inclining experiment based on estimated displacement, or another approximate method of determining the actual GM is used, a safety margin should be added to the calculated GM min.

Adequate free board to be provided ensuring a reasonable degree of safety for the vessel to prevent entry of water into enclosed spaces having regard of the closing appliances provided and to the influence of water being shipped and trapped on deck.

#### 5.1.18 MACHINERY INSTALLTION:

- Machinery installations should be designed, constructed and installed in accordance with good engineering practice using, where applicable, the requirements of the Safety Administration. All equipment should be so installed, protected and maintained so as not to constitute a danger to persons and the vessel.

- Machinery spaces should be designed so as to give safe and free access to all parts of the engines, equipment and tanks which may need attention at any time.
- All the necessary items in the engine room should be properly marked.
- All the hot surfaces in an engine-room should be properly insulated or protected to prevent accidents, burns or fire.
- The engine-room floor should be properly secured in place and should have a non-slip surface where practicable.
- Machinery space should be provided with extensive ventilation and should be given to climatic condition in the engine-room and provide adequate amount of air for internal combustion engines.
- If air cooled internal combustion engines are installed then special consideration should be given to the cooling of the engine and removal of hot gases from the engine-room.
- If the engine is water cooled then emergency cooling arrangements should be provided.
- Adequate tools and necessary spare parts for repair and maintenance should be provided and stowed and secured in an easily accessible space.

#### 5.1.19 PROPULSION AND AUXILIARY MACHINERY:

- Sufficient power should be provided for the vessel under all normal operations.

- Sufficient information regarding maintenance and operation of machinery should be available on board.
- Two provisions should be provided for starting of the engine (i.e. either one by battery and the other by handle or one spare set of batteries for emergency starting).
- The main engine should have the following gauges for the safer running of the engine:
  1. An engine revolution counter.
  2. An engine lubricating oil pressure gauge.
  3. An engine reverse/reduction gear-box oil pressure gauge.
  4. An engine cooling temperature gauge.
  5. An ammeter and battery charge indicator.
- For safety of engine audible and visual alarms should be fitted for low lubricating oil pressure and high cooling water temperature.
- In the case of an outboard engine it should be capable of being easily and securely fastened to the hull, and be provided with a safety chain or cable.

#### 5.1.20 STEERING ARRANGEMENTS:

The steering arrangements including, the rudder and associated fittings, should be of adequate strength and capable of steering the vessel at the maximum speed and should be so designed and constructed so that they are not damaged at maximum astern speed or by manoeuvring during fishing operations;



- where the main steering device is mechanically operated an emergency means of steering should be provided which should be easily accessible;
- the wheelhouse should be so arranged that the person steering the vessel should have a clear view ahead and that as far as practicable an all round vision should be possible from within the wheelhouse;

#### 5.1.21 FUEL SYSTEM:

- Fuel tanks, their filling system, valves and associated piping should be carefully installed and be maintained so as to prevent the leakage of fuel or fumes within the hull.
- Vents and filling connections of fuel tanks should be located in a safe, open-air position and remote from any ventilation intake. Vent openings should be fitted with suitable wire gauge screens or equivalent protective devices.
- A valve capable of shutting off the supply to the engine should be mounted on fuel tank and control of this valve should be accessible from outside the machinery space.
- Fuel storage tanks should be insulated away from heated surfaces and should not be situated above stairways and ladders.
- Sounding arrangements on the fuel service tank should be such that in the event of the tanks being overfilled, spillage through the means of sounding cannot occur.
- Fuel pipes of internal combustion engines should be seamless of stainless steel or other approved materials and should be adequately secured and protected.

- Plastic piping should not be used for the fuel supply to machinery or to fuel tanks or for any purpose in the machinery space where its destruction by fire would present a safety hazard.
- Fuel oil tanks should be provided with emergency closing arrangements, controlled from outside the machinery space and accommodation.

#### 5.1.22 LUBRICATING SYSTEM:

- Lubricating oil tanks, their associated piping and valves should be carefully installed and maintained so as to prevent leakage of lubricating oil within the hull.
- Adequate means should be provided for indicating the failure of the lubricating oil system.
- Lubricating oil pipes should be seamless or stainless steel or other approved materials and should be adequately secured and protected.

#### 5.1.23 BILGE SYSTEM:

- Arrangements should be provided for draining any water-tight compartment under all service conditions.
- Valves and cocks not forming part of a piping system should not normally be permitted in water-tight bulkheads.
- Bilge suctions should be fitted with suitable strainers.
- At least two bilge pumps should be provided, one in the machinery space and the other may be portable or installed in another compartment.

- The inside diameter of the bilge main and bilge suction pipe directly connected to the pump should not be less than the inside diameter of the bilge pump suction inlet.

#### 5.1.24 EXHAUST SYSTEMS:

- Exhaust pipes from engines and from heating and cooking appliances should be permanently mounted and lead to the open air. They should be of sufficient height to ensure that no exhaust gases can pass back into the vessel. Where an exhaust pipe passes through the hull of the vessel, the hull connection should be water-tight and provision be made so that the engine cannot be flooded.
- All exhaust pipes should be assembled with the minimum number of bends and of a diameter as specified by the engine manufacturers. All joints should be gas-tight, the pipes well secured and supported by hangers or brackets and fitted with a section of flexible pipe or a below pipe; exhaust pipes should be led clear of all woodwork and other combustible material and where necessary they should be effectively insulated.
- Where exhaust pipes pass through a wooden deck or any combustible material, suitable protection should be provided to the structure to avoid the risk of fire.

#### 5.1.25 ELECTRICAL INSTALLATION:

- Electrical equipment exposed to the weather should be protected from dampness and corrosion as well as mechanical damage.
- Lighting fittings should be arranged to prevent temperature fluctuations that would be injurious to the wiring, and to prevent the surrounding material from becoming excessively hot.

- Wiring should not be located close to hot surfaces such as engine exhausts.
  
- Accumulator batteries should be suitably housed using acid-resistant materials where necessary. Where such accumulators emit dangerous gases they should not be installed in the accommodation. Compartments used primarily for their storage should be properly constructed and adequately ventilated.
  
- An emergency source of power of 12 volts for minimum two hours should be provided.

## CHAPTER 5

## RECOMMENDATIONS

## SECTION 2 - FIRE PROTECTION, FIRE DETECTION, FIRE EXTINCTION

5.2.1 GENERAL:

Every vessel should be so constructed and equipped that there is no substantial fire risk to the vessel or to persons on board. The structural fire protection arrangement provided should be capable of withstanding the passage of flame for at least one half hour unless the competent authority is satisfied that suitable alternative arrangements have been provided.

5.2.2 STRUCTURAL FIRE PROTECTION IN VESSELS WITH HULLS  
CONSTRUCTED OF WOOD:

1. The main machinery casings and beams supporting that part of the deck forming the crown of the machinery space should be constructed of steel where reasonably practicable.
2. Decks and bulkheads separating machinery spaces from accommodation space, service space or control station should be constructed to F class or B-15 class standard.
3. In the galley or where cooking appliances are fitted, in service spaces and adjacent to wood structures, such surrounding structures should be adequately insulated.
4. Primary deck covering within accommodation spaces, service spaces and control stations should be of a type which will not readily ignite.

5. Insulation in the fish hold should be non-combustible unless the exposed surfaces there of are protected by closefitting cladding.
6. Paint, varnishes and other finishers used on exposed interior surfaces should be of the low flame spread type, that is to adequately restrict the spread of flames on such surfaces.
7. The number of openings in the bulkheads and deck should be as few as reasonably practicable and fitted with closing devices which provides protection in resisting fire at least equivalent to the surrounding structure.
8. Particular attention should be given to adequate insulation and properly positioning of exhaust pipes, ducts and equipment which may otherwise present a fire risk.
9. Ladders or stairways from below deck should be constructed of steel.

#### 5.2.3 VENTILATION SYSTEM:

1. It should be possible to stop ventilation fans and to close main openings to ventilation systems from a position outside the spaces served.
2. Ventilation ducts for main machinery spaces should not in general pass through accommodation spaces, service spaces or control stations unless the ducts are constructed of steel and arranged to preserve the integrity of the division.

#### 5.2.4 HEATERS AND COOKING STOVES:

1. If there are any electric radiators they should be fixed

in position and so constructed as to reduce fire risks to a minimum. No element should be so exposed that clothing, curtains or other similar materials can be scorched or set on fire by heat from the element.

2. Heating by means of open fires should be prohibited. Heating stoves and other similar appliances should be firmly secured and adequate protection and insulation against fire should be provided beneath and around such appliances and in way of their uptake. Uptakes of stoves should be so arranged as to minimize the possibility of becoming blocked by combustive materials and should have a ready means for cleaning. Spaces in which stoves are installed should be provided with ventilators to provide adequate combustion-air for stove. Such ventilators should not incorporate means of closing.
3. Open flame gas appliances, except cooking stoves and approved heaters, should not be installed. However, where such stoves are installed, their space should have adequate ventilation to remove fires and possible gas leakages to a safe place.

## CHAPTER 5

## RECOMMENDATIONS

## SECTION 3 - FIRE FIGHTING EQUIPMENT

5.3.1 GENERAL:

Listed below are the minimum recommended fire-fighting equipment that should be carried by fishing vessels:

1. Fire Pump:

Each vessel should be fitted with at least one fire pump (which may also be portable).

2. Fixed Fire-Extinguishing System in Machinery Space:

Vessels constructed of wood and installed with internal combustion type propelling machinery should be provided with one of following fixed fire-extinguishing systems;

- a. Halon System
- b. High Expansion Foam Installation
- c. CO<sub>2</sub>

3. Portable Fire Extinguishers:

- a. At least one portable fire extinguisher in the accommodation;
- b. One portable fire extinguisher at cooking space;
- c. Two portable fire extinguisher in internal combustion machinery space one CO<sub>2</sub> and one foam type should be placed near the entrance of the machinery space.



- d. All fire extinguishers should be type approved by the Maritime Safety Administration.

4. Fire-Fighting Equipment and House Keeping:

- a. At least one fireman's axe;
- b. Four fire buckets;
- c. Drip tray should be provided under internal combustion engine to prevent fuel oil and lubricating oil from leaking into bilge which is harmful for wooden vessel;
- d. One sand box with scoop in machinery space;
- e. One covered steel container for combustible waste.

**CHAPTER 5****RECOMMENDATIONS****SECTION 4 - LIFE SAVING APPLIANCES****5.4.1 LIFE-SAVING EQUIPMENT:**

1. One approved life-jacket for each person.
2. Two approved life buoys of which one with a self-igniting light and one with a buoyant lifeline of 27.5 m. attached to life buoy.
3. Twelve parachute distress rocket signals.
4. Two smoke signals.
5. Survival craft or buoyant apparatus of sufficient aggregate capacity to accommodate the total number of persons on board.

**5.4.2 MISCELLANEOUS:**

1. Wheelhouse top should be painted in a highly visible colour and should bear the vessel's registration and identification mark (name) in contrasting colour similar marks should be on either side of the vessel.

## CHAPTER 5

## RECOMMENDATIONS

## SECTION 5 - NAVIGATIONAL EQUIPMENT

5.5.1 NAUTICAL EQUIPMENT:

1. One magnetic compass of suitable type. The magnetic compass should be calibrated every year.
2. Leadline for sounding to be provided.
3. Rudder indicator on the bridge.

5.5.2 LIGHTS, SHAPES AND SOUND SIGNALS:1. Sound Signals:

- One Whistle
- One Bell

2. Lights:

- Navigation lights under way e.g. mast lights, side lights and stern light.
- Not under command light.
- Trawling lights.
- Engaged in fishing (not trawling).

All lights should comply with COLREG '72.

3. Shapes:

- Engaged in trawling.
- Not under command

5.5.3 COMMUNICATION:

1. One VHF transmitter/receiver is to be fitted on bridge.

## CHAPTER 5

## RECOMMENDATIONS

## SECTION 6 - INTERNATIONAL REGULATIONS

5.6.1 INTERNATIONAL REGULATIONS:

Since in Pakistan the deep sea fishing is not yet developed, fishing vessels more than 24 m in length are non-existing at the moment. Furthermore, the International convention for Safety of Fishing Vessels i.e. Torremolinos Convention, 1977 and United Nation Convention Law of the Sea 1982 are not yet in force. .

Under the circumstances the national enactments do not take the requirements of the conventions into consideration. But it is imperative in the interest of the country as well as the industry, that the regulations are formulated with a futuristic view. So that as and when these conventions enter into force and with the subsequent development of the deep sea fishing when 200 miles exclusive economic zone comes into force the industry should not be caught unaware thus ensuring a continuous operation of these fishing vessels.

**CHAPTER 6**

**CONCLUSION**

**CHAPTER 6****CONCLUSION**

The fishing industry of Pakistan, which has a long and ancient history, has tremendous scope for expansion and improvement. With the enforcement of the Law of the Sea Convention the scope has enhanced greatly. Since Pakistan does not have much inland (sweet water) fishing it can inherit substantial sea fish from its large EEZ of approximately 250,000 square miles.

However, for the healthy and modernized growth of the fishing industry, comprehensive legislation has to be enacted encompassing requirements as listed in the preceding Chapter (Chapter 5).

In conclusion the following items are considered essential:

1. All the fishing vessels must be registered.
2. All mechanically propelled vessels should be surveyed at the construction stages.
3. The design should be approved by the maritime administration prior to construction.
4. Every year all mechanically propelled vessels must be inspected.
5. During construction all the safety requirements mentioned in Chapter 5 must be complied with.
6. The basic training of fishermen, regarding safety equipment and fire fighting, should be provided either in the marine academy or at a marine fishery training institute (if established).
7. All mechanically propelled vessels should carry one certified skipper (serang) and one engine driver.

8. No mechanically propelled fishing vessel should proceed on voyages without a safety certificate (from the Maritime Safety Administration) and a fishing certificate (from the Marine Fisheries Administration).
9. No loans should be provided without a safety certificate/ approval/clearance from the Maritime Safety administration.
10. The Unscheduled inspection of vessels should be carried out.
11. In the event of violation of any provision of the rules heavy penalties/fines are to be imposed.

As experienced earlier enactment legislation is not enough. The existing Maritime Safety Administration has to be suitably structured and manned to ensure proper enforcement of the requirements. If this can be achieved the massive loss of life and property could be curtailed and the industry as a whole would become more profitable and could easily flourish into a major revenue earning/export oriented industry.



**A P P E N D I C E S**

## APPENDIX -- 1

NOMINAL CATCH OF MARINE & INLAND  
COMMERCIAL INDUSTRIAL  
AND  
SUSTISANCE CATCH  
(1984 - 1985)

(Quantity in M. Tons)

Province/Area	TOTAL		MARINE		INLAND	
	1985	1984	1985	1984	1985	1984
PAKISTAN	408,404	378,656	333,316	308,050	75,088	70,606
(i) Karachi & Sind Coast.	275,797	266,124	229,220	221,505	46,577	44,619
(ii) Baluchistan Coast.	94,110	79,126	94,110	79,126	—	—
(iii) E. E. Z.	9,986	7,419	9,986	7,419	—	—
(iv) Punjab	26,806	24,534	—	—	26,806	24,534
(v) N.W.F.P.	795	782	—	—	795	782
(vi) Mangla Dam.	666	—	—	—	666	—
(vii) Chashma Barrage	211	636	—	—	211	636
(viii) Tarbela Dam.	—	—	—	—	—	—
(ix) Northern Areas.	33	35	—	—	33	35

## APPENDIX - 2

COMMERCIAL & INDUSTRIAL PRODUCTION OF FISH  
(1947 - 1985)

(Quantity in M. Tons)

Year	M A R I N E				Inland	Grand Total
	Karachi and Sind Coast	Baluchistan Coast	E. E. Z.	Total		
1947	23,910	8,983	—	32,893	7,050	39,943
1948	24,400	9,364	—	33,746	8,350	42,114
1949	25,062	10,118	—	35,180	9,850	45,030
1950	26,360	10,889	—	37,249	10,400	47,649
1951	28,129	11,796	—	39,925	12,300	52,225
1952	28,810	12,023	—	40,833	15,000	55,833
1953	28,855	12,431	—	41,286	15,500	56,786
1954	29,037	12,704	—	41,741	16,000	57,741
1955	32,349	13,611	—	45,960	16,330	62,290
1956	34,309	13,838	—	48,147	16,750	64,897
1957	35,007	14,518	—	49,525	17,000	66,525
1958	35,116	14,636	—	49,752	17,180	66,932
1959	35,561	15,707	—	51,268	18,000	69,268
1960	45,824	16,333	—	62,157	18,500	80,657
1961	48,410	16,469	—	64,469	19,000	83,879
1962	50,179	16,787	—	66,966	19,800	86,766
1963	58,074	17,150	—	75,224	20,100	95,324
1964	66,104	17,331	—	83,435	21,000	104,435
1965	72,138	17,694	—	89,832	22,000	111,832
1966	100,494	18,148	—	118,642	22,550	141,192
1967	97,945	18,711	—	116,656	23,290	139,946
1968	98,417	19,173	—	117,590	28,000	145,590
1969	100,667	35,151	—	135,818	28,220	164,038
1970	102,418	37,385	—	139,803	18,740	158,543
1971	101,955	35,316	—	137,271	18,028	155,299
1972	131,741	41,481	—	173,222	18,022	191,244
1973	158,892	37,722	—	196,614	17,617	214,231
1974	110,220	39,790	—	150,010	19,092	169,102
1975	113,000	41,124	—	154,124	20,015	174,139
1976	127,795	49,373	—	177,168	28,491	205,659
1977	165,968	68,848	—	234,816	33,138	267,954
1978	189,460	68,346	—	257,806	35,223	283,029
1979	197,248	62,423	—	259,671	40,718	300,390
1980	175,255	57,688	—	232,943	46,320	279,263
1981	190,117	71,422	—	261,539	56,310	317,849
1982	250,500	70,335	2,314	278,149	59,140	337,289
1983	202,572	77,362	3,109	283,043	60,359	343,402
1984	221,505	79,126	7,419	308,050	70,606	378,656
1985	229,220	94,110	9,986	333,316	75,088	408,404

Includes Subsistence catch (1976-1985).

## APPENDIX - 3

LOCAL CONSUMPTION & EXPORTABLE SURPLUS OF NOMINAL CATCH.  
COMMERCIAL, INDUSTRIAL & SUBSISTENCE CATCH.  
(1984 - 1985)

(Quantity in M. Tons.)

Province/Area	Commerical Industrial & Subsistence Catch		Local Consumption		Exportable Surplus	
	1984	1985	1984	1985	1984	1985
PAKISTAN	378,656	408,404	324,264	345,201	54,392	63,203
MARINE	308,050	333,316	253,658	270,113	54,392	63,203
(i) Karachi & Sind Coast.	221,505	229,220	187,748	192,866	33,757	36,354
(ii) Baluchistan Coast.	79,126	94,110	65,910	77,247	13,216	16,863
(iii) E. E. Z.	7,419	9,986	—	—	7,419	9,986
INLAND	70,606	75,088	70,606	75,088	—	—
(i) Sind.	44,619	46,577	44,619	46,577	—	—
(ii) Punjab.	24,534	26,806	24,534	26,806	—	—
(iii) N.W.F.P.	782	795	782	795	—	—
(iv) Mangla Dam (Reservior)	—	666	—	666	—	—
(v) Chashma Barrage	636	211	636	211	—	—
(iv) Tarbela Dam.	—	—	—	—	—	—
(vii) Northern Area.	35	33	35	33	—	—

## APPENDIX - 4

**LOCAL CONSUMPTION OF FISH & SHRIMPS  
COMMERCIAL, INDUSTRIAL & SUBSISTENCE CATCH  
(1984 - 1985)**

(Quantity in M. Tons.)

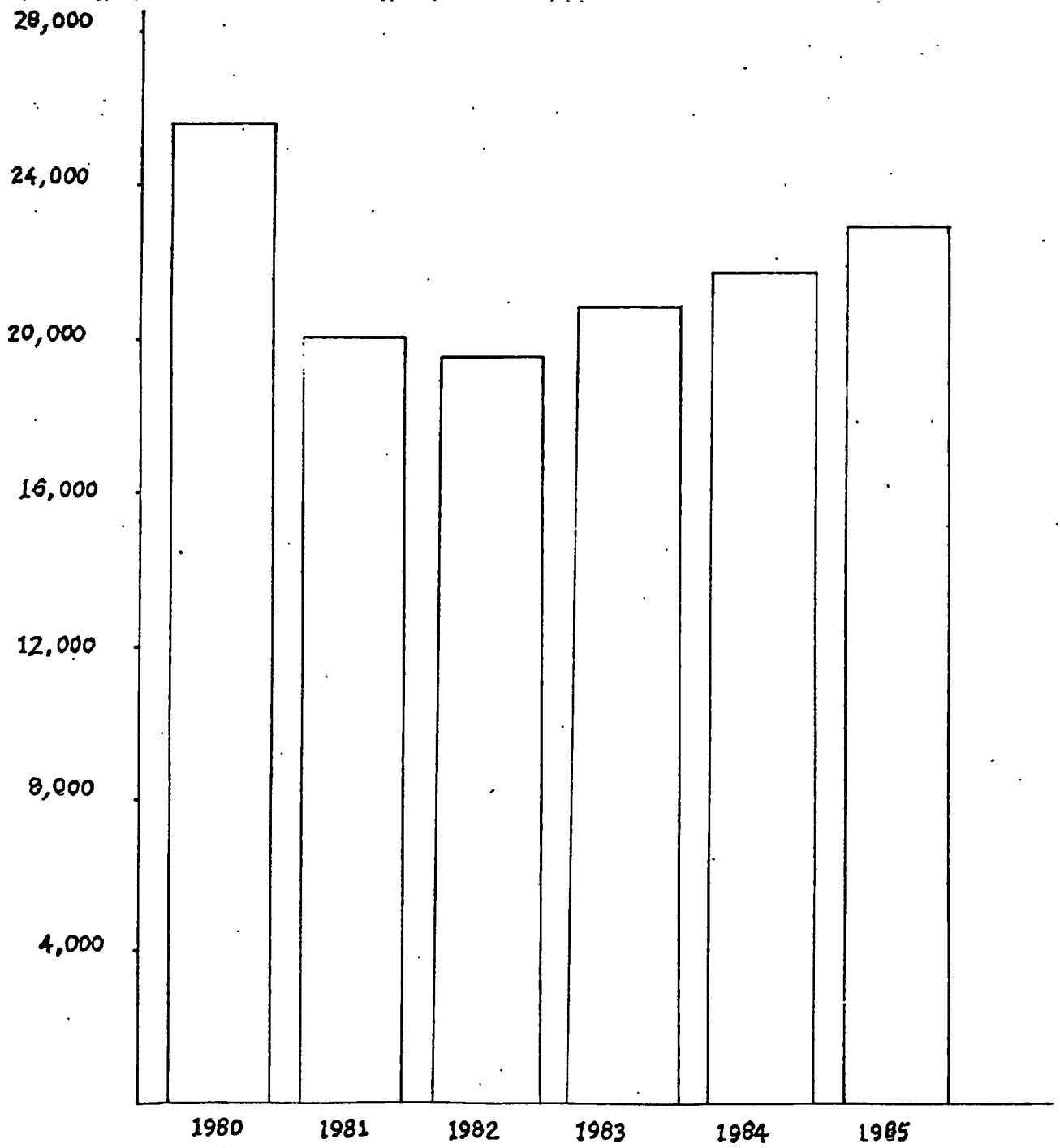
Province/Area	LOCAL CONSUMPTION					
	Commercial & Industrial Catch		Subsistence Catch		Total	
	1984	1985	1984	1985	1984	1985
<b>PAKISTAN</b>	<b>295,377</b>	<b>314,833</b>	<b>28,887</b>	<b>30,368</b>	<b>324,264</b>	<b>345,201</b>
<b>MARINE</b>	<b>236,340</b>	<b>251,876</b>	<b>17,318</b>	<b>18,237</b>	<b>253,658</b>	<b>270,113</b>
(i) Karachi & Sind Coast.	174,198	179,110	13,550	13,756	187,748	192,866
(ii) Baluchistan Coast.	62,142	72,766	3,768	4,481	65,910	77,247
(iii) E. E. Z.	—	—	—	—	—	—
<b>INLAND</b>	<b>59,037</b>	<b>62,957</b>	<b>11,569</b>	<b>12,131</b>	<b>70,606</b>	<b>75,088</b>
(i) Sind.	38,619	40,567	6,000	6,010	44,619	46,577
(ii) Punjab.	19,064	20,806	5,470	6,000	24,534	26,806
(iii) N.W.F.P.	730	722	52	73	782	795
(v) Mangla Dam (Reservoir)	—	664	—	2	—	666
(v) Chashma Barrage	604	191	32	20	636	211
(vi) Tarbela Dam.	—	—	—	—	—	—
(vii) Northern Area	20	7	15	26	35	33

## APPENDIX - 5

FISHING CRAFT MARINE & INLAND  
(1984 - 1985)

Method of Propulsion or Type of Vessel	MARINE		INLAND		T O T A L	
	1984	1985	1984	1985	1984	1985
<b>TOTAL NUMBER</b>	<b>9,773</b>	<b>10,415</b>	<b>11,572</b>	<b>12,188</b>	<b>21,345</b>	<b>22,603</b>
<b>MECHANIZED</b>	<b>2,722</b>	<b>2,880</b>	<b>-</b>	<b>-</b>	<b>2,722</b>	<b>2,880</b>
(i) Trawlers	1,539	1,631	-	-	1,539	1,631
(ii) Gillnetters	1,183	1,249	-	-	1,183	1,249
<b>MECHANIZED-CUM-SAIL DRIVEN BOATS.</b>	<b>4,163</b>	<b>4,417</b>	<b>3</b>	<b>213</b>	<b>4,166</b>	<b>4,630</b>
(i) Sail Boats fitted with out Board Motors.	4,163	4,417	3	213	4,166	4,630
<b>NON-MECHANIZED</b>	<b>2,888</b>	<b>3,118</b>	<b>11,569</b>	<b>11,975</b>	<b>14,457</b>	<b>15,093</b>
(i) Sail Boats.	2,882	3,112	8,109	7,890	6,081	6,072
(ii) Row/oar Boats.	6	6	3,460	4,085	8,376	9,021

## APPENDIX - 6

FISHING FLEET OF PAKISTAN  
(1980 - 1985)

APPENDIX - 7

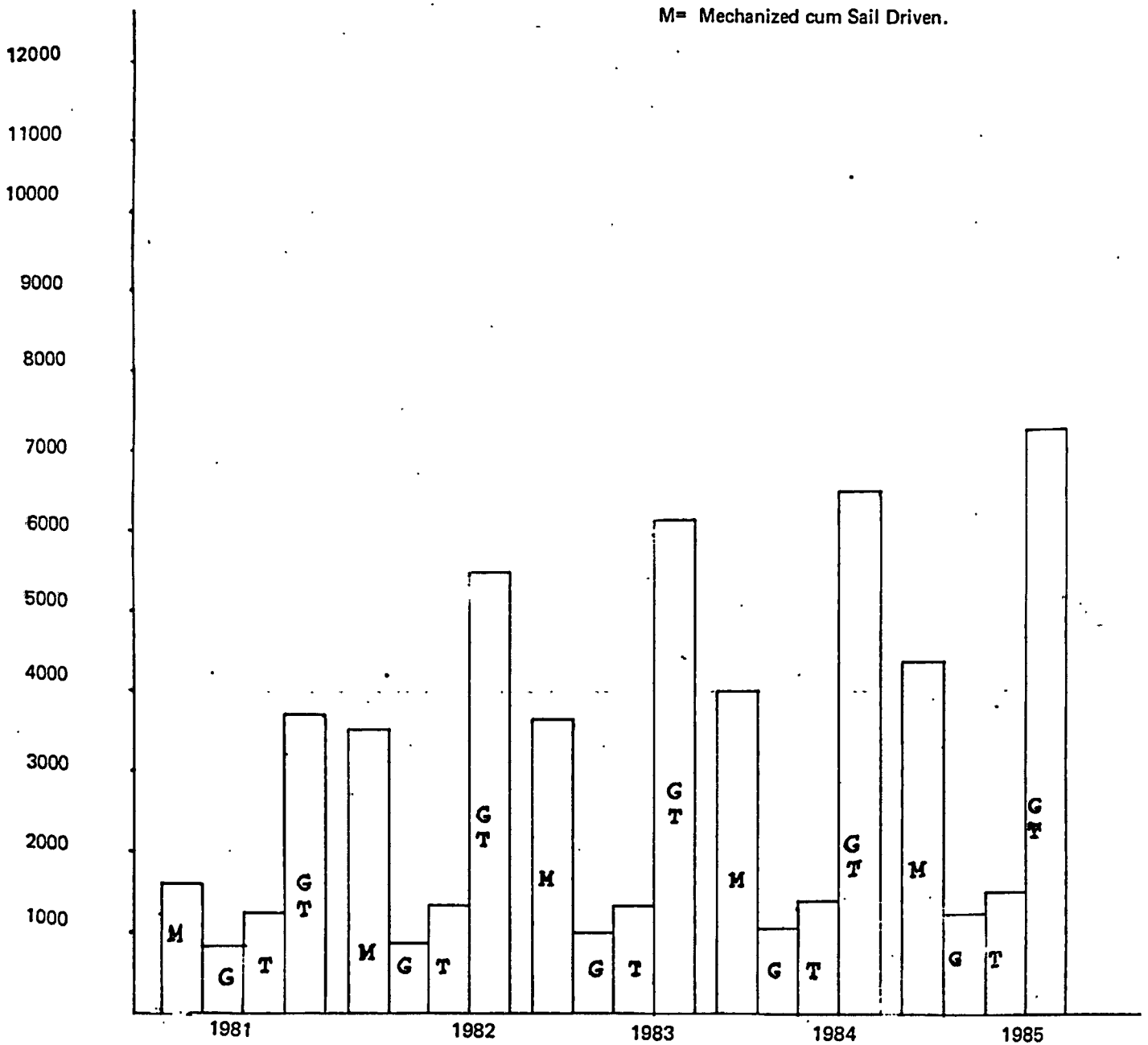
MECHANIZED FISHING CRAFTS OF PAKISTAN  
(1981 - 1985)

GT= Grand Total

T= Trawler

G= Gillnetter

M= Mechanized cum Sail Driven.





## APPENDIX - 8

FISHING CRAFT PROVINCE-WISE  
(1984 - 1985)

SECTOR/ METHOD OF PROPULSION	TRAWLERS		GILLNE- TTES		MECHANIZED CUM-SAIL DRIVEN BOATS		SAIL BOATS		OAR/ROW BOATS		GRAND TOTAL	
	1984	1985	1984	1985	1984	1985	1984	1985	1984	1985	1984	1985
<b>Total Number</b>	<b>1539</b>	<b>1631</b>	<b>1183</b>	<b>1249</b>	<b>4166</b>	<b>4630</b>	<b>10991</b>	<b>11002</b>	<b>3466</b>	<b>4091</b>	<b>21345</b>	<b>22603</b>
<b>Marine</b>	<b>1539</b>	<b>1631</b>	<b>1183</b>	<b>1249</b>	<b>4163</b>	<b>4417</b>	<b>2882</b>	<b>3112</b>	<b>6</b>	<b>6</b>	<b>9773</b>	<b>10415</b>
(i) Karachi & Sind Coast	1539	1631	1047	1090	2000	2211	2539	2785	—	—	7125	7717
(ii) Baluchistan Coast	—	—	136	159	2163	2206	343	327	6	6	2648	2698
<b>INLAND</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>3</b>	<b>213</b>	<b>8109</b>	<b>7890</b>	<b>3460</b>	<b>4085</b>	<b>11572</b>	<b>12188</b>
(i) Sind	—	—	—	—	—	—	2489	2710	2729	3100	5218	5810
(ii) Punjab	—	—	—	—	—	—	4910	4930	728	732	5638	5662
(iii) NWFP	—	—	—	—	—	—	250	250	—	—	250	250
(iv) Mangla Dam.	—	—	—	—	—	7	150	—	—	250	150	257
(v) Tarbela Dam.	—	—	—	—	2	—	100	—	—	—	102	—
(vi) Chashma Barrage	—	—	—	—	—	250	210	—	—	—	210	205
(vii) Northern Areas.	—	—	—	—	1	1	—	—	3	3	4	4

## APPENDIX - 9

**NUMBER OF MECHANIZED & MECHANIZED CUM SAIL DRIVEN  
FISHING VESSELS IN ACTUAL OPERATION ON SIND AND  
BALUCHISTAN COASTS.  
(1984 - 1985)**

TYPE OF VESSELS	SIND		BALUCHISTAN		TOTAL	
	1984	1985	1984	1985	1984	1985
<b>MECHANIZED</b>	<b>1,170</b>	<b>1,248</b>	<b>136</b>	<b>159</b>	<b>1,306</b>	<b>1,407</b>
(i) Trawlers	1,032	1,070	—	—	1,032	1,070
(ii) Gillnetters	138	178	136	159	274	337
<b>MECHANIZED-CUM-SAIL- DRIVEN BOATS.</b>	<b>2,000</b>	<b>2,211</b>	<b>2,163</b>	<b>2,206</b>	<b>4,163</b>	<b>4,417</b>
(i) Sail Boats fitted with out Board Motors.	2,000	2,211	2,163	2,206	4,163	4,417
<b>TOTAL</b>	<b>3,170</b>	<b>3,459</b>	<b>2,299</b>	<b>2,365</b>	<b>5,469</b>	<b>5,824</b>

## APPENDIX - 10

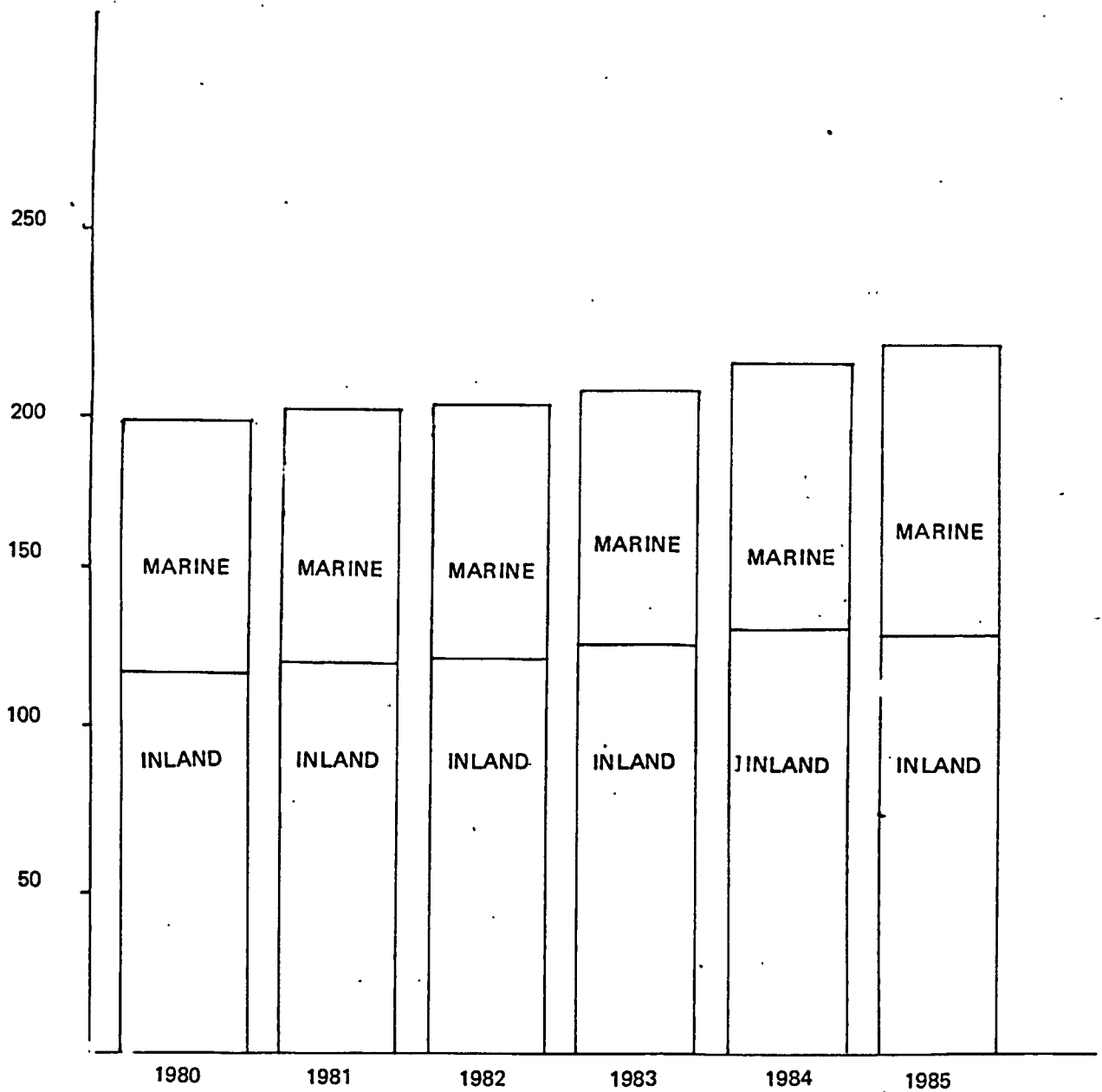
FISHING CRAFTS  
(1955 - 1985)

Year.	M A R I N E											Inland	
	Karachi & Sind Coast					Baluchistan Coast					Grand Total		
	Traw- lers	Gill- net- ters	Mech- cum- S. Boats	Sail Boats	Total	Traw- lers	Gill- net- ters	Mech- cum S. Boats	Oar- row Boats	Sail Boats	To- tal	Sail Boats	
1955	2	52	-	955	1009	-	-	-	-	1400	1400	1000	3,409
1956	3	70	-	1000	1073	-	-	-	-	1485	1485	1500	4,058
1957	3	70	-	1030	1103	-	-	-	-	1515	1515	1550	4,168
1958	3	80	-	1030	1113	-	-	-	-	1520	1520	1600	4,233
1959	33	135	-	1065	1233	-	2	-	-	1550	1552	1670	4,455
1960	86	146	-	1100	1332	-	14	-	-	1961	1975	1700	5,007
1961	113	253	-	1100	1466	-	14	-	-	2000	2014	2000	5,480
1962	141	301	-	1198	1640	2	17	-	-	2005	2024	2500	6,164
1963	176	359	-	1367	1902	2	16	-	-	1915	1933	2500	6,335
1964	224	422	-	2644	3290	2	16	-	-	1915	1933	2500	7,723
1965	258	490	-	2794	3542	2	20	-	-	1933	1955	2500	7,997
1966	292	506	-	2891	3689	4	54	-	-	2475	2533	2500	8,722
1967	316	559	-	3029	3904	4	54	-	-	2475	2533	2500	8,937
1968	356	593	-	3127	4076	7	61	-	-	2500	2568	8699	15,343
1969	388	627	-	3206	4221	7	61	-	-	2500	2568	8707	15,496
1970	443	659	-	3339	4441	-	48	-	-	2004	2052	4933	11,426
1971	668	559	-	3389	4616	-	48	-	-	2004	2052	5012	11,680
1972	745	618	-	3567	4930	-	48	-	-	2004	2052	5863	12,845
1973	922	691	-	3967	5580	-	60	-	-	2200	2260	6431	14,271
1974	1076	731	-	4130	5937	-	60	-	-	2200	2260	7164	15,361
1975	1098	752	230	3978	6058	-	63	-	-	2249	2312	7431	15,801
1976	1130	825	250	4000	6205	-	40	158	-	2070	2268	7972	16,445
1977	1151	840	267	4152	6410	-	42	330	-	2014	2386	8107	16,903
1978	1270	859	327	4191	6647	-	42	677	-	1673	2392	8487	17,526
1979	1280	863	377	4247	6767	-	42	758	-	1661	2461	8908	18,136
1980	1296	888	487	4220	6891	-	21	846	-	1639	2506	16391	25,788
1981	1315	904	637	4270	7126	-	14	1307	-	1208	2529	9954	19,609
1982	1380	933	1736	2745	6794	-	18	1895	-	652	2565	10185	19,544
1983	1431	1019	1770	2769	6989	-	106	2020	-	473	2599	10766	20,354
1984	1539	1047	2000	2539	7125	-	136	2163	6	343	2648	11572	21,345
1985	1631	1090	2211	2785	7717	-	159	2206	6	327	2698	12188	22,603

## APPENDIX - 11

**FISHERMEN ENGAGED IN PAKISTAN  
(1980 - 1985)**

IN '000 NUMBER



## B I B L I O G R A P H Y

1. Publication of Internatinal Maritime Organization, 4 Albert Embankment, London SE1 7SR, United Kingdom.
  - a. International Convention for the Safety of Life at Sea, 1974  
ISBN 92-801-1200-7 Sale Number: 110 86.02 E
  - b. International Regulations for Preventing Collisions at Sea, 1972  
ISBN 92-801-1178-7  
Sale Number: 904 85.01 E
  - c. Safety of Fishing Vessels 1977  
Torremolinos International Convention for the Safety of Fishng Vessels, 1977  
ISBN 92-801-1064-0  
Sale Number: 741 77.10.E
  - d. FAO/ILO/IMO  
Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels.  
ISBN 92-801-1103-5  
Sale Number: 80.08.E
  - e. FAO/ILO/IMO  
Code of Safety for Fishermen and Fishing Vessels  
Part A  
Safety and Health Practice for Skippers and Crews  
ISBN 92-801-1041-1  
Sale Number: 75.08.E
  - f. FAO/ILO/IMO  
Code of Safety for Fishermen and Fishing Vessels  
Part B  
Safety and Health Requirements for the Construction and Equipment of Fishing Vessels  
ISBN 92-801-1040-3  
Sales Number: 75.05.E

2. Government of Pakistan, Inland Mechanically Propelled Vessels Act, 1917 (1 of 1917)  
(as modified upto the 1st September 1951).
3. Casualties Report from Mercantile Marine Department (Port and Shipping Wing), Ministry of Communications, Government of Pakistan.
4. Government of Pakistan Gazettes Sind Region.
5. Hand-book of Fisheries Statistics of Pakistan 1985, Vol. 14, Published by Marine Fisheries, Department, Ministry of Food, Agriculture and Co-operatives  
(Live Stock Division), Government of Pakistan.
6. Research and Activities of Marine Fisheries Department, Ministry of Food, Agriculture and Co-operatives, Government of Pakistan, September 1986.
7. Report on the Fisheries of Pakistan  
by: Dr. G. L. Kesteven.
8. The Fishermen's Settlements of the Coast of Pakistan  
by: Mohamed Ismail Siddiqi  
Schriften Des Geographischen Instituts Der Universital Kiel
9. Fishing Boats of the World  
Edited by: Jan-Olof Traung  
Naval Architect, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy  
Published by: The Fishing News - Arthur J. Heighway Publications Ltd.  
Ludgate House, 107 Fleet Street, London EC4, United Kingdom
10. Rules for Construction and Certification of Vessels less than 15 metres, 1983  
Det Norske Veritas  
Veritas Veien 1, 1322 Hovik  
Norway