

ISLAMIC REPUBLIC OF MAURITANIA

Honor — Fraternity — Justice

Ministry of Economy and Finance

**Directorate of Studies and
Programming**

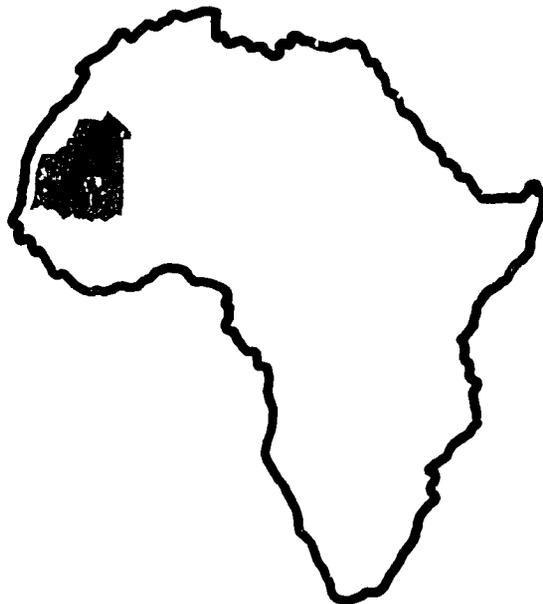
RAMS PROJECT

Rural Assessment and Manpower Surveys

Traditional Maritime Fisheries

SS-6

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I. INTRODUCTION

The object of this study is to present the data needed for as precise a description as possible of traditional maritime fishing.

It will not be possible to answer all questions because of the present state of the subsector. As noted in the study on inland fishing, this sector must be structured on all levels if it is to become operational.

This economic sector is located along about 900 miles of the continental shelf and has an annual productive capacity of 12,000 tons of fish.

This level of production can be raised by improving present fishing practices, introducing methods of large scale fishing and by setting up an adequate collection infrastructure.

It ought to be noted that for a long time this potential has been left to traditional fishermen having at best rudimentary fishing equipment and no assistance whatsoever from the authorities.

Without a doubt, this situation is due to the minor role this subsector plays in the national economy. In effect, until recent years, fish consumption was limited to the people inhabiting the Atlantic coast (the Imraguen) and those living along the Senegal River.

The inaccessibility of the coastal fishing areas and the ignorance of many people have certainly limited consumption of

fish as well. Only certain Moorish groups went to Imraguen fishing camps or certain inland ponds or lakes for a fish diet to cure abdominal pains.

Although the continuing drought has severely affected herding, causing the sedentarization of nomads, a disastrous reduction of fish in the river, its tributaries and other inland bodies of water, it has nevertheless created a growing potential market for sea fish.

Nouakchott, which has grown tremendously in recent years, contains about 10% of the population of Mauritania (SCET Report, 1978). The capital is the main distribution center for the traditional maritime fishing sector and is the shipping point for catches sent out along the Nouakchott-Néma road corridor as well as to the River Region, where locally-caught fish are lacking. For this reason, Nouakchott should receive a maximum of technical inputs to improve its role as a distribution center.

Even Nouadhibou, a major fishing center, suffers from an inadequate collection infrastructure, incapable of meeting the equipment needs of industrial fishing or of semi-industrial fishing practiced by traditional fishermen.

It is fortunate, however, that the authorities have become aware of the importance of this economic subsector and of the need to provide sea fish to inland areas.

This study was carried out in order to describe the present situation of traditional fishing and will successively describe the forms of organization and the mode of production of the fishermen as well as factors limiting production. It will also

give recommendations for the choice of possible actions to be taken to stimulate this sector.

The study will suggest general policy guidelines for eventually identifying projects intended to increase production, improve the living conditions of the Imraguen and other fishermen and to insure a regular supply of fish to interior markets by means of a well-organized and well-structured marketing mechanism.

In short, the following are the objectives of this study:

- 1) Description of the present state of the subsector;
- 2) Description of the forms of organization and mode of production of the fishermen;
- 3) In-depth analysis of these data and bottle necks in order to make suggestions aimed at stimulating the subsector;
- 4) Outlining general policy guidelines for identifying projects aimed at developing traditional fishing in the direction of industrial fishing and for supplying interior markets.

Methodology:

In order to describe the present state of the subsector of traditional maritime fishing, a certain amount of data was obtained by carefully reading existing documentation on fishing and other subjects concerning this sector: sociology, oceanography, commerce, etc.

More information was obtained by visiting various services in Nouakchott as well as the offices of international organizations.

A field trip was made along the coast from Nouakchott to Tichitt via numerous Imraguen camps and the villages of M'Haïjratt and Nouamghar, called Timiris, in order to carry out observations. A further trip was made to Nouadhibou.

No sample catches were made as they were not necessary for this study, but marketable species were identified, based on the list of species found in the off-shore waters, drawn up by the National Center for Oceanographic Research and Fishing in Nouadhibou.

The state of repair of the fishing boats and fishing equipment was observed and interviews were held with the technical and administrative cadres in Nouakchott, Nouadhibou and the interior. Interviews were also held with numerous fishermen in pre-cooperatives who explained their difficulties linked with the acquisition of fishing materials, marketing catches and the regrettable lack of support from the authorities, which all add up to the total abandonment of the subsector.

Summary and Conclusions

Summary

This study describes the present situation of this subsector in four chapters:

Chapter One: This chapter is concerned with resources; it describes the fishing zone of the continental shelf and its potential resources, the species caught and their reproduction. The chapter also describes the fishermen, their ethnicity, professional organization, including the number of members, and describes the Traditional Fisheries Service.

Chapter Two: The relative productivity of different types of fishing is analyzed in this chapter, based on the experience of Senegal. Equipment, cooperatives, processing and storage are also considered, as well as marketing & the main markets. There is also a breakdown of the operating cost of traditional maritime fishing including additional economic considerations. This chapter gives the most realistic idea possible of the reality of production in traditional maritime fishing.

Chapter Three: In this chapter, the constraints affecting traditional maritime fishing are cited and analyzed. These are in the areas of infrastructure, supervisions, training, management and financial resources.

Chapter Four: This chapter discusses the development possibilities of the subsector on the national and international levels.

Conclusions

The traditional maritime fishing subsector requires special attention because of its economic and social importance. This is the conclusion reached after studying available documents, interviewing various Mauritanian authorities, specialists in international organizations, talking with fishermen and undertaking direct observations in the field (markets, Imraguen camps and villages, fishing cooperatives, fishing ports, storage infrastructure, private enterprises).

According to the SCET international report of 1978, about 8,150 tons of fish were consumed during that year as opposed to 2,260 in 1979.

The Nouakchott and M'Haïjratt pre-cooperatives, which are mainly responsible for supplying the Nouakchott and the interior markets, indicate that 3,264 tons plus 400 tons were caught by the Imraguen of Nouamghar in 1980.

Added to the 1978 figures, this gives a total of 11,814 tons or an annual increase of 1,200 tons, which confirms the projections established by the CILSS specialists, who envision a consumption of 24,000 tons in 1990 and 36,200 tons in the year 2000.

This situation highlights the tendency of sea fish gradually to replace fresh water fish. There are also new consumers, who formerly had a greater preference for meat and dairy products.

The markets regularly supplied (Rosso, Doghé, Kaédi) have an average consumption of 60 tons a month, 30 tons and 45 tons respectively. Already, other markets are being reached, such as M'Bagne, Bababé, Aleg, Magta Lahjar, Kiffa, Selibaby, Aïoun, Néma, Akjoujt and Zouerate, either regularly or occasionally.

However, the forecasts of the CILSS specialists will not be reached until after a solution is found to the problems related to the absence of handling facilities, storage and sale areas.

In order to improve the organization of fishing, the Administration should also establish price guidelines and create a body of technical personnel to supervise the fishermen.

Chapter One: POTENTIALS

1-1 Fishing Zones

The traditional maritime fishing zone is located on a 900 km stretch of the continental shelf. The northern part of the shelf is rocky as far as Nouadhibou whereas the southern part has a fairly thin sandy cover. The edge of this plateau

is abrupt and composed of sharp submerged rocks which make navigation difficult. This plateau is also a great reserve for numerous fish species.

The Arguin Bank, lying to the northwest of Cape Timiris, is an important spawning zone that the government is trying to protect.

Formerly, the traditional fishing zone extended three miles from the coast whereas the trawling or industrial fishing zone stretched from 3 to 6 miles.

After the FAO Fisheries Committee for the East-Central Atlantic had held its working session on the promotion, coordination and support of national programs of study and rational research in maritime fishing resources in Casablanca between May 17 and 20, 1971, the Mauritanian Government extended the limit of its territorial waters to 12 miles as a measure to protect its maritime resources.

According to Report No. 189 of November 1971 of the Central Bank of West African States, this 12 mile limit extends from a "base line" stretching from Cape Blanc to Cape Timiris (protecting the Arguin Bank) and from the low tide mark south of Cape Timiris.

Trawling and fishing by foreign boats are forbidden within the 3 mile limit, which is reserved for traditional fishing.

An exclusive fishing zone of 200 nautical miles was created by law No. 78-043 of 2-28-78. This zone, called "the exclusive economic zone" includes the first 70 miles of territorial waters.

It is not surprising that the ichthyological resources of this region have drawn numerous trawlers of all nationalities since the beginning of the 20th century. The traditional fishermen are obliged to go beyond the 3 mile limit with outboard motors to a

distance of 50 to 70 kilometers from the coast.

1-2 Fishing Resources

The fishing resources of the Mauritanian coast are some of the richest in existence.

According to different studies and various estimates of oceanographers, ORSTOM research and the most recent SCET International report of 1978, the biomass can be estimated to be about 6,400,000 tons along the Mauritanian coast between 16° and 24° north latitudes.

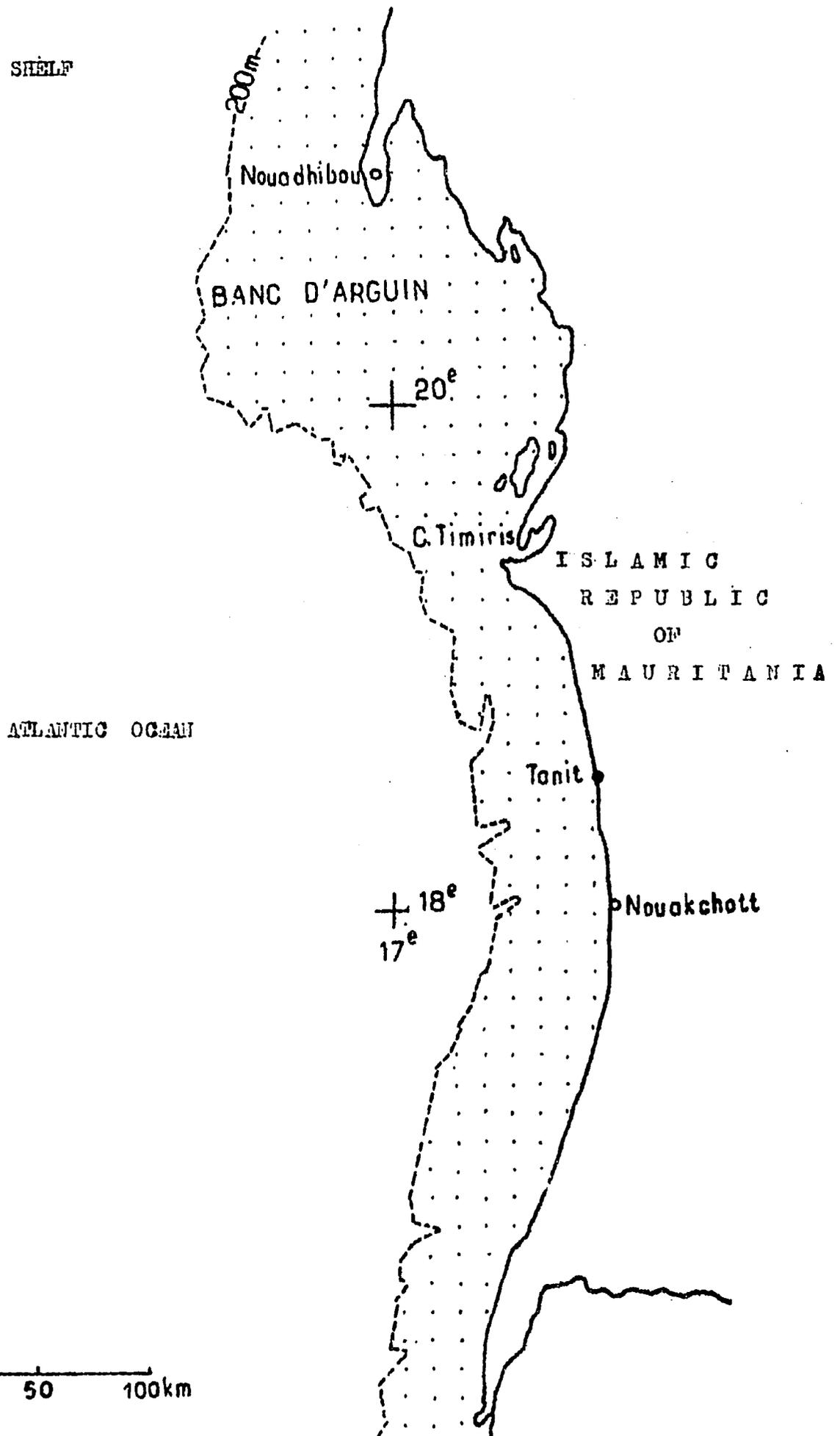
The annual fishing potential can be broken down by tons per two types of species as follows:

<u>Demersal Species:</u>	<u>Tons</u>
Fish	250,000 to 300,000
Cephalopods	180,000 to 200,000
Crustaceans	2,000
	<hr/>
	432,000 to 502,000
 <u>Pelagic Species</u>	
Clupeidae	450,000 to 550,000
Small Carrangidae	400,000 to 450,000
Mackerels	50,000
	<hr/>
	900,000 to 1,050,000

Thus, there is a total of about 1,330,000 to 1,550,000 tons of which 60% are south of Cape Blanc, or about 800,000 tons. As a comparison, it must be remembered that more than 1,400,000 tons were caught in the waters of the coast of Mauritania in 1976; more than 90% were caught by foreign fleets that, for the most part, never call at a Mauritanian port.

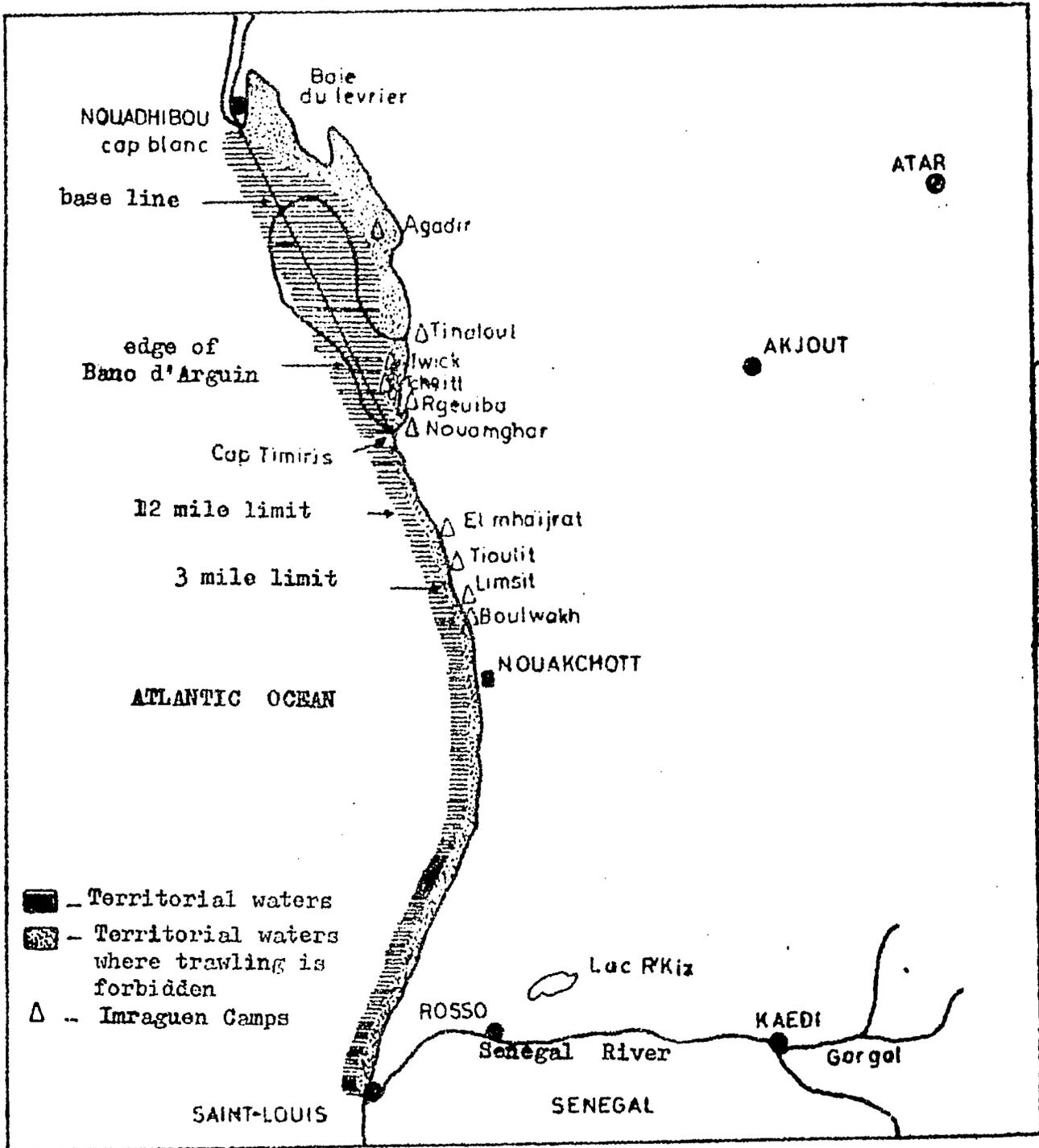
Map 1-1

THE CONTINENTAL SHELF



Map 1-2

THE COAST OF MAURITANIA



Although varied, the fish caught belong to a small number of families and species, but are represented by individual fish of competitive size on the market.

1-3 Species Caught

Thanks to the observations of the National Center for Oceanographic Research and Fishing in Nouadhibou, a list of 70 species currently caught in this zone has been prepared (see list extracted from the bulletin of the fishing laboratory in Nouadhibou). (1)

The list gives the species found in the Mauritanian part of the Atlantic. The time available did not permit direct observations, but the families and the species correspond to those described in the eastern Atlantic, edited by ORSTOM. (2). These fish, which are found in certain processing companies in Nouadhibou and in the markets of Nouakchott, have virtually replaced fresh water fish.

-
- (1) This list contains a certain number of families with the main species caught; the French, Hassaniya, Wolof and Spanish names are included as well. These four languages are the most currently used in the milieu of fishermen.

It is well to remember that the scientific (Latin) name is composed of a first word indicating the genus and followed by a second which indicates the species. Sometimes several species that are very similar are grouped together and the term SP is then used.

In Hassaniya, the Arabic spoken in Mauritania (close to literary Arabic), the names of fish mentioned are used by the Imraguen fishermen. The Spanish names are used because most of the fishermen in Nouadhibou are from the Canary Islands.

- (2) Office de la Recherche Scientifique et Technique Outre-Mer (Office of Scientific and Technical Research Overseas).

Since the beginning of the drought, almost everywhere in the interior and notably in the commercial centers of Rosso, Boghó, M'Bagne, Bababó, which lie along the Senegal River, as well as in Aleg, Kiffa, Aioun, el Atrouss, Néma, Akjoujt and Atar, there are fish available which are eaten by everyone almost year-round, in spite of the transportation difficulties involved in reaching these places. Based on this list, it was possible to constitute tables 1-1 and 1-2, classifying the species by order of commercial importance, based on the list of products approved by the Ministry of Commerce in 1980. The species are very varied and, according to the category and favorable periods, are to be seen in the north in Nouadhibou in Imraguen villages and camps.

Table 1-3 List of Common Species on the Continental Shelf

Family	Species	Hassaniya	French	Spanish
	Octopus sp.	AZEIZ	Poulpe	Pulpo, Pota
	Loligo sp.	OUM SEMRA	Encornet	Calamar, Chipiron
	Sepia sp.	OUM SEMRA	Seiche	Chco, Choquito
	Panulirus mauritanicus	CHOMEIRA	Langouste rose	Langosta
	Panulirus regius	CHOMEIRA	Langouste verte	Langosta verde
	Panaeus sp.	-	Crevette	Gamba, Caramon
Triakidae	Mustelus mustelus galeiforma	TAESS	Emisole	Tollo Requin
	Scyliorhinus canicula	TAESS	Roussette	Marajo, Gallo
"	Leptocharias smithi galeiforma	TAESS	Requin	Marajo, Gallo
	Rhizoprionodon	TAESS	Chien mer	

Table 1+3 (continued)

	<i>Rhizopriodon acutus</i>	TAESS	Chien Mer	Marajo, Gallo
	<i>galciforma</i>			
Carcharhinidae	<i>Paragaleus pectoralis</i>	TAESS	" "	" "
Torpedinidae	<i>Torpedo sp. hypotremata</i>	REGUAT ARGIL	Torpille	Tembladeras
Rhinobatidae	<i>Rhynobato sp.</i>	"	AGHARDE	Raie-guitare
Dasystidae	<i>Dasystis sp.</i>	"	N'JEMMA	Pastenague
"	<i>Gymnura sp.</i>	"	"	Chucho
				Raie-aigle
Rajidae	<i>Raja sp.</i>	"	"	Raie
Myliobatidae	<i>Rhinoptera sp.</i>	"	"	Raya
"	<i>Pteromyllacus sp.</i>	"	"	"
Clupeidae	<i>Sardinella cba</i>	TAYIT	Sardinelle	Machunelle
"	<i>Sardinella aurita</i>	"	plate	Alacha
"	<i>Sardina pilchardus</i>	-	Sardinelle	ronde
"	<i>Ethmalosa sp.</i>	IGIR BICHAM	Sardine	Sardina
			Ethmalose	Machuello marion
Angraulidae	<i>Engraulis sp.</i>	-	Anchois	Anchon, Boauero
Diodontidae	<i>Diodon sp.</i>	AHMAR L'ABRHAR	Poisson	Pez-globo
			coffre	
Aridae	<i>Arius sp.</i>	ABRAR	Machoiron	Saballo
			Silure	
Anguillidae	<i>Conger sp.</i>	-	Congre	Congrio
Sphyraenidae	<i>Sphyraena sp.</i>	AHNECHE	Brochet de Mer	Marracuda
Mugilidae	<i>Mugil cephalus</i>	ZOULE	Mulet	Lissa amaria
"	<i>Mugil monodi</i>	G'MEL	jaune	
"	<i>Mugil saliens</i>	TAOUNITE	Mulet	Cabezote
"	<i>Mugil auratus</i>	TAGAQUA	"	Lissa blanca
Merlucidae	<i>Merluccius sp.</i>	-	"	Lissa negra
			Merlu	Merluzza del
			merluchon	Norte

Table 1-3 (continued)

Zeidae	<i>Zeus faber</i>	-	Saint-Pierre	San Pedro Pez Gallo
Seranidae	<i>Epinephelus aenus</i>	ARHANI	Tiof	Cherne
"	<i>Epinephelus sp.</i>	MADEIJA	Mérou	Mero
"	<i>Mycteroperca rubra</i>	-	Badeche	Gitano
"	<i>Morone punctata</i>	ABLAGH	Truite de Mer Bar moucheté	Baïla
Pomadasyidae	<i>Pomadasys incisus</i>	JEID L'AKHBAPCH	Grondeurs	Roncador
"	<i>Pomadasys jubelini</i>	AYIR	"	"
"	<i>Pomadasys rogeri</i>	BASDOUL	"	"
"	<i>Diagramma mediter- raneanum</i>	EL ABD	Diagramme	Burro
Sciaenidae	<i>Argyrosoma regium</i>	ITAN	Courbine	Corvina
"	<i>Umbrina canariensis</i>	OBOUNE	Ombrine	Umbrina
"	<i>Scinena umbra</i>	"	Vieille noire	Berrugate
"	<i>Pseudotolithus sp.</i>	TACHARA- COUT	Capitaine	Merluzza
Carangidae	<i>Caranx sp.</i>	ASSATAT	Chinchard	Chincharro, jurrel
"	<i>Trachurus sp.</i>	"	"	"
"	<i>Lichia vadigo</i>	AGHAOU	Liche	Lirio
"	<i>Lichia amia</i>	ACHOUN	"	Palémeton
Pomatomidae	<i>Pomatomus salta- trix</i>	ACH'KED	Tassergal Coupe-fil	Anjova
Mullidae	<i>Mullus sp.</i>	-	Rouget- barbet	Salmonette
Sparidae	<i>Dentex sp.</i>	ALHOT LACHMAR	Denté cachu- cho Dorado rose	Zapata blanca
"	<i>Pagrus sp.</i>	" "	Pagre	" "
"	<i>Pagellus sp.</i>	" "	Pageot Besugo	Aligote Breca
"	<i>Sparus auratus</i>	N'TAD	Dorade royale	Zapata morisca
"	<i>Pagrus auriga</i>	TAMENDERT	Dorade rayée	Hurta

Table 1-3 (continued)

Sparidae	Diplodus sp.	TAOUAJITT	Sar	Sargo
"	Lithognathus mormyrus	ABDHIM	Marbré	Herrera
"	Sarpa salpa	TANDUIZITT	Saupe	Saléma
Ephippidae	Drepane sp.	TOUAZOUA	-	-
Trachinidae	Trachinus sp.	-	Vive	Aragna
Cybiidae	Cybium tritor	TAINKI-DITT	Maquereau-bonite	Garita
"	Orcynopsis unicolor	IRIL	Palomette	Tasarte
Thunnidae	Euthynnus alletteratus	LABEIDNA	Thonine	Bacorete
Stromateidae	Stromateus fiatola	LEMLISSA	-	Pampano
Scorpaenidae	Scorpaena	-	Rascasse	Rascacio
Triglidae	Trigla	-	Rouget-grondin	Rubie
Psettodidae	Psettodes sp.	AFREL	Flétan	Perro
Botidae	Citharus macrolepidotus	-	Limande Cardine	Patuxa
Soleidae	Solea senegalensis	IDISS	Sole	Linguado
"	Dicologlossa cuneata	"	"	Acedia
"	Synaptura sp.	"	Sole perdix	Linguado tigre
"	Bathysolea polli	"	Sole noire	Linguado negra
Cynoglossidae	Cynoglossus sp.	"	Sole langue	Linguado senegales
Lephiidae	Lophius sp.	-	Baudroie, lotte	Rape

1) Pelagic Species

The mullet (*Mugil Cephalus*) (see Table 2-1 for scientific and local names), is sought after for drying and salting; its caviar is also prized by the Imraguen fishermen. It is caught in October, December and especially in March-April.

The corbina and the shark (also dried and salted) are caught beginning in June.

2) Benthic Species

Halibut, soles, sea trouts as well as cephalopods-octopi, cuttlefish and squid are caught year-round to be frozen fresh except for the gilt-head, which is found essentially in October and November.

The sardine is used for flour, fish oil or is frozen and is caught by trawlers year-round.

As for the spiny lobster, a ban has been proclaimed because overfishing is threatening the pink and the green varieties with extinction on the continental shelf of Mauritania.

In the south: from N'Diago to Nouakchott as well as several Imraguen camps in the immediate vicinity there are:

- tiofs. (*Epinephelus aenus*), courbine, pacitaine (*Pseudolithus* sp.), groupers, yellow mullets and sardines (pelagic species);

- sole, halibut, sea trout, sea pike (benthic species).

It must be noted that individual fish are rather large, weighing from 5 to 20 kilograms and even more.

1-4 Reproduction

Various studies and research efforts confirm that the water conditions along the Mauritanian coast are periodically enriched and favor the spawning and growth of deep and shallow water species.

(3) Only net fishing for the green spiny lobster is practiced.

Table 1-4 List of Marketed Species in order of Importance

<u>Scientific Name</u>				
<u>Family</u> 1	<u>Species</u>	<u>French Name</u>	<u>Wolof Name</u>	<u>Hassaniya Name</u>
SERRANIDAE	<i>Epinephelus aeneus</i>	Mérou bronze	Tiof	Arhani
"	<i>Epinephelus gigas</i>	Mérou de méditerranéen	Khautieu	Madeija
TRIAKIDAE	<i>Leptocharias smithi</i>	Requin		Taess 1)
"	<i>Mustelus mustelus</i>	Emissale		Taess
SPHYRAENIDAE	<i>Sphyræna sphyraena</i>	Brochet de mer	Khède	Ahnech
SPHYRNIDAE	<i>Sphyrna</i> sp.	Requin marteau		Taess
RACHYCENTRIDAE	<i>Rachycentron canadum</i>	Mafou	Todié	
CYBIIDAE	<i>Cybiium tritor</i>	Maquerreau bonite	Ndioune	Tainkeditt
POMATONIDAE	<i>Pomatomus saltatrix</i>	Tasseçgal	N'gott	
SCIANIDAE	<i>Argyrosoma regium</i>	Courbine	Seukhebi	Ftan
2				
SPARIDAE	<i>Pagrus chrenbergi</i>	Pagre	Kibare	Alhot lachmar
"	<i>Dentex canariensis</i>	Denté des canaries	Kibaro N'gokh	"
SCIAENIDAE	<i>Pseudotolithus senegalensis</i>	Capitaine-Utholithe	Feute	Tacharacout
"	<i>Umbrina canariensis</i>	Ombrine	Niaw nehk	Oboune
POMADASYIDAE	<i>Diagramma mediterraneum</i>	Derade grise	Banda	Alhot lachmar
"	<i>Pomadasyus peroteti</i>	Pristipome ordinaire	Corogne	
CARRANGIDAE	<i>Caranx ronchus</i>	Chinchard jaune	Diaï	
CYBIIDAE	<i>Orcynopsis unicolor</i>	Palomette	Sipon	

Table 1-4 (continued)

POLYNEMIDAE	Galbāides decadactylus	Plexiglas	Siket-Mbao	
EPHYPPIDAE	Drépane Africana	Drépane	Tapandar	
MUGILIDAE	Mugil cephalus	Mulet jaune	Deem guiss	Zoule
	3			
SPARIDAE	Pagellus coupei	Pageot	Youfouf	Alhot lachmar
"	Piplocus sargus	Sar rayó	Siga	Tamendert
"	Cantharus cantharus	Griset brème de mer	Uersoun	Tamendert
CARRANGIDAE	Lichia amia	Liche à mie	Ouarangal	
"	Trachurus trachurus	Chinchard	Diaï bougnoule	
"	Chloroscombrus chrysurus	Petite noir carangue	Lagna-lagna	
POMADASYIDAE	Brachydeuterus auritus	Pristipome doré	Fañour	
"	Parapristipoma ostolineatum	Pristipome à 3 bandes	Mbeul beut	
CLUPEIDAE	Sardinella maderensis	Sardinelle plate	Yabooy tass	Tayitt
"	Sardirella aurita	Sardinelle ronde	Yabooy mbeureng	Tayitt
THUNNIDAE	Euthynus alleteratus	Thonine	Kiri-kiri	
ARRIDAE	Arius Hadelioti	Machoirion	Daakar	Abrar
PSETTODIDAE	Psettodus belcheri	Elatan-turbo	Bang	Idiss
CYNOGLOSSIDAE	Cynoglossis sp.	Sole langue		
STROMATEIDAE	Strometus fiatola		Khassaw	

1) Leptocharias and ~~M~~telus make up 90% of the hauls and are worth more than the other species, which make up only 5%.

1. 1st category: approved price/kg: 60 UM - 1st category: 16 (Nouadhibou)
2. 2nd category: approved price/kg: 40 UM (Nouakchott) - 2nd category: 14.50
3. 3rd category: approved price/kg: 35 UM non-approved industrial price.

The Arguin Bank northwest of Cape Timiris is an important spawning area and is therefore protected by the Mauritanian authorities. Various studies, and notably those carried out by ORSTOM and whose findings are supported by the SCET International report of 1978 point this out:

"On the one hand, the successive presence of four types of water, and particularly the one caused by upwelling from October to May to the west and southwest of Cape Blanc and from November to May off Cape Timiris and to the south. On the other hand, the existence of a thermal front that moves between latitudes 11° north and 22° north each year from January to August/September and from 22° N to 11° N from August/September to January, cause a permanent renewal of the surrounding milieu and its constant enrichment."

A high level of primary productivity results as well as high successive or simultaneous concentrations both of pelagic as well as benthic species.

The paragraph on fishing potential gives a succinct idea of how large this potential is.

1-5 Human Resources

The fishermen are generally Imraguen settled in camps and villages along the northern part of the coast as far as Nouadhibou and vicinity.

There are also Mauritanians of Wolof origin and Senegalese who come for the fishing season.

1-5-1 The Imraguen

The Imraguen, the pioneers of traditional fishing in Mauritania, are "dependent Haratin" (see RAMS report on Black African Mauritania) who were harshly exploited by warriors and marabouts;

the Imraguen had to pay numerous forms of tribute (up to 7 different kinds) which they were required to pay until 1944, based on their catches.

The exemption from paying numerous forms of tribute to the warriors improved their servile condition but the influence of the marabouts, based on belief (fidelity) seems to have remained (F.X. Pelletier, 1975). Surveys made during the research for this report showed that the Imraguen still make payments to marabouts or their representatives when they go to Imraguen villages. In most cases, however, it is the Imraguen themselves who go to see the marabouts.

The Imraguen live in the sterile coastal desert, where conditions make human life extremely difficult. The hostility of the environment explains why the population density is so low. The people who have lived there for years (or even centuries) are attached to this hostile area even though the natural environment is without any of the means that might improve their living conditions: no fresh water or availability of housing. Indispensable services for human existence and development are lacking (administrative and medical services and schools, to mention only the most essential ones). The only place where there is a school and a dispensary is Nouamghar, south of Cape Timiris, and it has no teachers or nurses because of the harshness of the local living conditions. There is only a brigade of the National Guard there. Elsewhere, in the villages of M'Haïjratt, Rguebat and Techiff, which are just as important because of the size and sedentary character of their population, there is no administrative service of any kind.

Between Nouakchott and Cape Timiris, only the Imraguen engage in traditional fishing. It is hard to count them with any accuracy because they move frequently and might be counted several times in

different places. They live in a number of villages (about a dozen) and in camps around Nouamghar (Timiris). Based on the census of the members of the Imraguen cooperative between Timiris and Nouadhibou, and of the members of the M'Haïjratt pre-cooperative, it is possible to estimate 450 inhabitants for this region. There appear to be 880 between Agadir and Nouamghar (see Table 2-3).

The people there live almost entirely on fish and customary items (such as tea, sugar and rice) which they buy from the few shopkeepers at very high prices.

Their fishing is based on the yellow mullet and the corbina during the periods mentioned in the chapter on the species caught. The Imraguen wait for shoals of fish to come near the beach, where watchmen are posted. The yellow mullet is caught with one-piece nets that form a seine that is pulled up on to the beach by two fishermen, like the goubol used in the river, but narrower and shorter than the latter. It is a suitable net for the task. Corbina are caught either by a handheld fishing line or in a non-slicking purse seiner.

Overall production in 1980, based on statistics kept regularly by the cooperative group of Nouadhibou and by the refrigeration complex of Nouadhibou can be broken down as follows:

- Nouadhibou cooperative group: Imraguen production alone: 700,000 kg of dried and salted fish (SIGP) after subtracting the amount consumed by the fishermen and their families.

- M'Haïjratt pre-cooperative group: 334 tons of which a third is consumed fresh or salted locally.

This high quality food which the Imraguen live on is also very well-appreciated by the nomads who occasionally eat fish to make up for deficiencies in animal protein. It is common to see

them spend weeks (and even months) in Imraguen villages or camps to go on a fish diet (cure de poissons), just as they go on a date diet during the "guetna".

Fresh fish is rarely sent to Nouakchott, since it has to be taken by passing trucks that drive down the beach.

Dried fish is generally purchased by shopkeepers in Nouakchott and sometimes in Senegal. The Nouakchott shopkeepers transport it in trucks and even on camel-back. Most of the dried fish produced by the Imraguen comes from the village of Nouamghar (Timiris). According to the fishermen, its production can be estimated to be between 500 and 600 tons a year.

The Imraguen also produce dried and salted fish for export through the intermediary of the Industrial Company for Large-Scale Fishing (S.I.G.P.), which is the main purchaser of the product. They have also been producing a kind of caviar (poutargue) since 1934, according to the B.C.E.A.O. report. The product consists of fresh yellow mullet roe still in their ovarian cover; they are salted, pressed and lightly dried before being given a thin covering of bees' wax and parafin as a protection (see description of processing material at the Imraguen cooperative headquarters in Nouadhibou). Unfortunately, the export of dried and salted fish has dropped and even stopped since 1979 and about 700 tons have been stored in Nouadhibou with risks of weight and quality losses, given the conditions of storage.

It must be noted that the Imraguen have fished for centuries using methods that scarcely go beyond the subsistence level, giving them little in return for their efforts. The absence of a maritime tradition among these coastal people, in addition to their fixed methods of production have favored the development of fishing by foreign boats. It is only within the past fifteen years that the Imraguen have begun to use launches. These are Spanish-made boats, equipped with a sail.

1-5-2 Black Africans

1-5-2-1 The Wolofs

They were described in the report on fresh water inland fishing (see Chapter 1). A certain number of Wolofs once migrated to the river basin or to the sea shore at N'Diango, Keur Macène, Nouakchott and Nouadhibou, where they engage in maritime fishing using the same methods used in Senegal and the Gambia.

It must be mentioned that they are joined by relatives from St. Louis and other parts of Senegal for the fishing season in Nouakchott and Nouadhibou (see the report on Black African Mauritania).

They have been organized, as mentioned earlier, in a pre-cooperative group since 1978. (4) The 280 members use Senegalese canoes of which about 100 are motorized. They have always supplied the fish to the markets of Nouakchott as well as the interior. In order to support their work, the government has given them a refrigeration system on a trial basis. (5)

Of this production, 1,391,943 kg or 47% were marketed in the interior of the country, representing 23,400,000 UM on the basis of an average price of 16 UM/kg. It is difficult to establish a fixed price in this subsector because the price depends on supply and demand which lead to alternating periods of abundance and scarcity. The species caught are enumerated in Table 2-1; the marketable species include the Serranidae, Triakidae, Sphyranidae, represented by the grouper, sea pike, gilt-head, etc. Unlike the Nouadhibou fishermen, they sell their catches either by individual

(4) The statistics of the Oceanographic Center show that they have produced 2,919 tons in 1980 (see Table 2-8). They specialize in deep-sea fishing.

(5) Letter No. 346 of July 18, 1970 by the Minister of Fisheries and Maritime Economy.

fish to retailers or entire canoe-fuls wholesale at the average price mentioned above without any distinction made among species.

1-5-2-1-1 The Role of Youth

Youth play an important role in family activities, within an age hierarchy. They are all less than 20 years old, the age when they learn the occupation of fishing either by going to sea with their fathers or a member of the family, or by helping adults to fish from the beach.

Youth have always been the fishermen's main helpers. They represent labor that is paid only after a long time. In effect, the young men are under their fathers' or another relative's responsibility when they go out on fishing expeditions along the continental shelf. These trips allow them to get away from the family structure. Once separated from his family, the adolescent is obliged to take care of his own needs. He takes advantage of the situation to save up money and gives all of his savings to the head of the family, who has the right to use it rationally (this is the educational aspect). The young man's father often finds him a pre-selected wife, who is able to contribute to production, or the father might buy his son a canoe, with contributions from other relatives.

1-5-2-1-2 Youth Attitudes Toward Fishing

Since motorization tends to eliminate the physical exertion required to move the canoe, canoe fishing has become a lucrative business. Among Black Africans, young men seem to be aware of the importance of fishing. They are interested in certain forms of fishing of which the commonest is net fishing. Fishing with beach nets, although a collective and even social activity, is paid. Besides the classical mode of fishing in a canoe or with a net on the beach, adolescents are often seen fishing with lines on the beach.

There is another activity of a certain importance: the selling of sea-food in Nouakchott (mussels and pieds-de-biche, a local shellfish). If such motivations can be encouraged they would facilitate the training of young Mauritanian sailor-fishermen in a relatively short time. Certain young men are already trained on the job and it seems desirable to structure the pre-cooperative or cooperative groups, which seem to be the right kind of organization for self-training.

The young begin to learn their occupation very early, first with their mothers, who take care of processing. They then work with the men, carrying the catches to the place where they are processed. They also learn how to swim, repair and set up nets and finally begin to fish after observing for a long time.

1-5-2-1-3 The Role of Women

Women are involved mainly in the processing and marketing of fish after they finish their household work.

With the profit they make, certain women are able to buy the entire catch, which they sell in the markets for themselves.

Fish processing and preserving are women's specialities. In general, the surplus from the catches (as well as certain species) are preserved using methods described in the report on fresh water fishing in order to make gedj, which is salted and dried in the sun.

1-6 Professional Organizations

Like its counterpart in fresh water, traditional marine fishing has a definite ethnic character. The two main ethnic groups that make their living as fishermen are Black African Mauritanians (Wolofs), and Imraguen, one of the Moorish ethnic groups made up of dependent Haratin. There are also a few white

Moors who have recently become interested in this not insignificant source of income.

They have always worked in families within the ethnic group, obeying its rules. These rules are based on respect, faithfulness and obedience to elders. Those who are still subject to certain groups pay tribute.

The Imraguen have the particular habit of following schools of fish along the coast. These trips take place when the upwellings occur. This is unlike the practice in the fresh water fisheries subsector, in which the fishermen go and remain in particular places to fish. Fish caught on the line are divided into equal portions which each fisherman can dispose of as he sees fit.

There is no restriction or fishing zone reserved for a family or an ethnic group in marine fishing. The size of catches depends upon the means of production available to the fishermen and particularly the means subsistence including staples, such as water, rice, tea, sugar, etc.

The Imraguen formed pre-cooperative groups during the 1960's. These will be discussed in chapter 2.

1-7 The Traditional Fisheries Service

The Traditional Fisheries Service is described in the report on continental fishing including an organizational chart of the Ministry of Fishing and Maritime Economy (see chapter 1-8 of the above-mentioned report).

Chapter Two: PRODUCTION

2-1 Boats

Traditional fishermen use three types of boats, but this report will cover only the ones that they are really able to operate. This ability is judged to be the capacity to build, repair and maintain the boats. It is also necessary to know the advantages and disadvantages of the boats.

A. The Léboue Canoe: Commonly known as the Senegalese canoe, this type of boat is well-adapted to the particularly difficult conditions of navigation caused by the sand bar along the coast. There are three sizes of canoe used, the largest of which is the "large canoe", 14 to 17 m long, capable of carrying 8 persons and 4 tons. It is generally used in purse seine fishing, in which case the owner uses two nets.

The second is the medium-sized canoe. It is 7 to 9 m long and has a maximum capacity of 5 persons and 2 tons.

The third is the small canoe (4.5 m long) and is used by individual fishermen. It has a capacity of 300 to 500 kg.

These canoes cost between 20,000 to 80,000 UM on the average (see Table 2-11) and are used all along the coast from Nouakchott to Nouadhibou. They are made by the Senegalese only and have 3 means of propulsion.

a) Oars: an ancient means of propulsion, but requires great exertion and causes the fishermen to lose a lot of time at sea. They are also subject to the caprices of the weather.

b) Sails: these are of a European style adapted to the Senegalese canoes, but are also at the mercy of weather condition. Using them correctly depends on the steersman's skill and his dexterity in handling the cords connected to the mast to control the force of the wind.

c) Outboard motor: this aspect of modernization has many advantages:

- independence of navigation under most weather conditions;
- little or no physical exertion in propelling the boat compared with using oars;
- ease in handling the canoe;
- time saved in going to and from fishing areas and the shore.

The power of the motors used depends on the size of the boats. 25 H.P. motors are suitable for 14 to 17 meter canoes, 18 H.P. motors for the medium-sized canoes and 6 H.P. motors for the small one-man canoes. It is not unusual these days to see two motors in a boat as a precaution against a mechanical breakdown at sea; the fishermen can thus be assured of always bringing in their perishable product.

B. Launches: First introduced in Mauritania by Spanish fishermen from the Canary Islands a decade ago. The Imraguen have bought them to carry their production from their villages to Nouadhibou, the main shipping point for the part of their production that is exported. These sail-powered boats can carry 4 to 6 tons and even more, depending on their size. There is no information available on the characteristics of the boats that the Imraguen have had built by blacksmiths within the past 3 years. This kind of boat is usable only in bays and in calm water. Indeed, these boats cannot cross the sand bar, which is why they are seen only between Limsit and Nouadhibou. If equipped with outboard motors, these boats could become as useful as the canoes. Production could also be increased and transportation time saved.

These boats cost 300,000 UM when they are new not counting the food and other minor expenses that the owner incurs during their construction. They can last 10 years on the average, but the cost of repairs is equal to the original selling price.

C. Terafiers

In addition to these artisanal boats, there are Japanese boats with a storage capacity of 3-8 m³ and a central motor with about 67 hours of autonomy. There are also Spanish Terafiers with a greater capacity. The price of the Japanese boats is 5,585,300 UM and the Canarian launches and the Terafiers are usually bought second-hand and cost about 2,000,000, depending on their condition. These boats are used only in Nouadhibou, either by members of the fishermen's cooperative or by private individuals (see Table 2-4).

2-2 Acquisition of Fishing Equipment

The traditional fisherman has two possible ways of obtaining his material, not counting the nets he must inevitably buy through working as a simple fisherman in a canoe, receiving his salary as a share of the catch.

First possibility: the fisherman saves up much of the money needed to buy the canoe, which he presents to his close relatives: father, brothers and parents-in-law, who help him make up the difference through gifts or disinterested assistance to help him get ahead in the occupation. Among the Imraguen, the boats (launches) are built and paid for in installments, as agreed upon with the builder.

It must be noted that fishermen very rarely if ever buy their canoes or nets on credit.

Second possibility: outboard motors can be paid for by installments. This new system has been used only since the introduction of these motors in traditional fishing.

In Nouakchott, a 25 H.P. motor costs 60,000 UM if bought outright and 66,000 UM if bought on credit (the sum is to be paid over a 12-month period after a down-payment of 5 to 10,000 UM or more has been paid).

As collateral, the fisherman has his canoe and his catches, although the latter depend on the hazards of the weather. However, most fishermen outfit themselves in Dakar, where it is easier to obtain credit.

2-3 Quantities Caught by Different Types of Equipment

In Mauritania, traditional fishermen practice various kinds of fishing in canoes of Senegalese origin with two cutwaters; they also use launches and most recently, boats of 5 to 20 tons.

The fishing season lasts from September to April. The *Pagrus* species is by far the commonest fish caught during the first few months and is present in catches during the whole year. Fully-grown fish are caught.

In Nouadhibou, fishing is about the same as it is in Nouakchott. The fishing season is year-round because the fishing boats are larger and capable of being at sea longer. *Mustelus galeiformis*, the Shark or dogfish and the Halibut are more important than *Pagrus* (6), *Corbina* and *Diagramma mediterraneum*.

In this region, Cephalopod fishing is a significant activity. During the first 4 months of 1980, the Japanese launches caught, on an experimental basis, 4,339 kg using pipes and old tires as well as pot-type cages (fishermen's cooperative of Nouadhibou).

Monthly catches are about the same in the three fishing centers on the continental shelf. In all places there are major

(6) It must be noted that the make-up of catches varies from one year to another and according to the members of the Nouadhibou cooperative, the proportion of Sparidae (*Pagrus* and *Dentex* species) used to be larger than it now is. The available data lead to several hypotheses: competition from trawlers and particularly over-fishing by trawlers along the entire coast of Mauritania.

variations in the size of catches, the maximum corresponding to the passing of full-grown fish that favor the Saharan coastal waters in the areas of canoe fishing.

- Ledger Line Fishing. These are nylon lines with a stainless steel hook attached to the end, whose number corresponds to its size. In spite of the increasing use of nets, line fishing has not declined. Thus, every time a fisherman puts out to sea, he takes his ledger lines with him.

The fishermen know from experience when it is better to use lines rather than nets. The yield of one or the other depends upon the abundance or lack of fish. Fishermen use handlines mainly when there are not many fish in the sea. The fishermen formerly used a heavy cotton line that they sometimes dipped in tar, which served two purposes: to prevent fish from seeing the line and to give it strength. The hooks that they once used were made by blacksmiths.

Hooks imported from Europe have become more numerous on the market, and since they are cheaper, local hook manufacturing has died out.

The use of cotton has similarly declined with the introduction of nylon or synthetic fiber lines. The fishermen use various nylon lines classified according to their thickness and strength, as are the hooks mentioned above. The line with a single hook is the commonest and is used to catch large fish.

The Size of Hauls

Fish caught with handlines constitute about 75% of the hauls for canoe fishing in Nouakchott. This is the main center for this type of fishing, which brought in 1,914,057 kg in 1980 (see Table 2-1).

Make-Up of Catches

It is interesting to note that several species alone constitute 70 to 90% of the fish caught at Nouakchott and M'Haïjratt; these include Pagrus (25 to 50 cm long), Caranx (20 to 40 cm long), Epinephelus aenus and groupers (50 to 90 cm long) as well as Seranidae and Sphyraenidae.

Fishing with Sliding Purse Seines

The nets in question are 200 to 300 m long and with a drop of 40 meters. Experiments in adapting the canoe seine were undertaken in 1969 (Grasset and Seck, 1973) at the Oceanographic Research Center in Dakar-Thiaroye, but its appearance in fisheries did not effectively begin until 1973. The use of this net has become particularly widespread in Senegal since 1973, in this case on the small coast (M'Bour, Joal and Djifère). It finally appeared in Mauritania in 1979 in the Nouakchott pre-cooperative group. It requires at least 20 fishermen and two motorized canoes.

Size and Make-Up of Catches

The catches during each expedition are very large: they can range from 2 to 20 tons. These yields are all the more remarkable because the duration of expeditions is shorter for purse seine nets than for barrier nets. (7) According to experiments carried out on the small coast of Senegal by the Oceanographic Research Center of Thiaroye, a purse seine expedition lasts 7 hours as compared to 9 hours for sleeping nets (filets maillants) when both types are used to catch sardinella in the same area. Other pelagic or demersal coastal species that can be caught include Pomadasys sp., Caranx Rhonchus, Argyrosoma requin, Brachyleuteres auritus, Chloroscombrus Chrysurus,

(7) The latter are rarely used in Mauritania.

Sphyraena sp., Clupeidae, *Caranx* sp.

In Nouakchott, maximum catches are obtained during the hot season, when the Clupeidae species abound, in this case, *Sardinella maderensis*. In December, 1980 full-grown fish were the commonest kind brought in.

Fishing with Beach Seines

The beach seine is a moveable net that is anywhere from 300 meters to 1 kilometer long and is pulled ashore by fishermen standing on the beach. A survey carried out during the research for this study located this net in Nouakchott. It is used on a seasonal basis and its yield is extremely variable; it is therefore difficult to estimate the amount of fish caught. According to the statistics of the Oceanographic Research Center, the hauls brought in by the Nouakchott pre-cooperative amount to 74,003 kg.

Yields and Make-Up of Catches

This kind of net is commoner in Senegal and particularly in the Bay of Sombédioune and Gorée. The fishing season is during the hot season and catches are made up of young fish (5 to 15 cm long) of a great variety of pelagic or demersal species. The main species caught are *Sardinella maderensis*, *Caranx rhonchus* and *Brachydentereus auritus*. Catches range from 50 to 500 kg per haul.

On the Mauritanian coast, the seine is of larger dimensions and its mesh is better. It is used during the hot season and the fish caught are fully-grown adults of large size (*Carangidae*, *Pomadasyidae*, *Mugilidae*, *Lichia* sp.).

Fishing with Shoulder Nets

These nets are 6 to 10 meters long and are used to encircle the fish without a draw-string. The fish are caught in the net after being surrounded near the beach. This type of net is used

all along the northern coast by the Imraguen of the M'Haïjratt and Nouakchott pre-cooperative groups; each net is hauled ashore by two fishermen. Each net can land about 600 tons a year (see Chapter 1-1 on the Imraguen's production).

Yields and Make-Up of the Catches

This net is manipulated, as mentioned above, by two fishermen swimming in the water who encircle fish that have been frightened by dolphins and have swum close to the beach. As in the case of the beach seine, hauls are difficult to estimate.

According to the Imraguen and direct on-site observations, each catch weighs between 15 and 250 kg. The catches are made up of pelagic or demarsal species, especially Mugil cephalus and the Pagres and Arius species.

Table 2-1 Yields per Type of Fishing Equipment

Name	Mode of Operation	Periods Used	Yields per Haul in kg.
Hook	bait	Year-round	300- 1,000
Purse Seine	encircling	Sept.-April	1,000-20,000
Sleeping Net	netting by gills	year-round	0- 200
Shoulder Net	encircling	Sept.-April	10- 100
Beach Seine	encircling	Sept.-April	50- 500

Table 2-2 Prices of Sea Fish in Inland Markets

Prices of sea fish bought in Nouakchott at an average of 18-20 UM/kg and re-sold in Rosso, Boghé and Kaédi:

Rosso: from 25 to 30 UM/kg

Boghé: from 35 to 40 UM/kg

Kaédi: from 45 to 50 UM/kg

2-4 Cooperatives

As mentioned above, pre-cooperatives were not formed until after independence, more precisely, between 1976 and 1977. The first pre-cooperative was formed at Nouamghar. It included all of the Imraguen on the northern part of the coast of Mauritania. For reasons of convenience, it was divided in two in 1980, giving birth to the M'Haïjratt pre-cooperative. It is made up of Imraguen who market their fish in Nouakchott. In 1978 the Nouakchott pre-cooperative was formed, made up of Black African Mauritaniens from the south. The pre-cooperative supplies the capital and the interior markets.

2-4-1 The Timiris Pre-Cooperative

In 1980, the first pre-cooperative group became a cooperative, after two years of difficult operation without any governmental assistance. This cooperative, called "The Artisanal Fishermen of Timiris", is one of the most active and best equipped, judging from its production. A part of its catch is exported by certain companies in Nouadhibou, either freshly frozen, or salted and dried; another portion is dried for local consumption in Imraguen camps and villages, for sale in Nouakchott and for fish diets (cures de poissons). The cooperative also produces a little fish oil for local consumption as well as a diminishing quantity of caviar (poutargue).

The cooperative has about 300 members, all of whom subscribe to the National Social Security Fund, including 229 certified Imraguen fishermen or boat or canoe owners. They are spread out in seven villages around Nouadhibou (see Table 2-3). The rest of the membership is composed of Mauritaniens of Black African origin and of Moors who have settled in Nouadhibou. The cooperative is divided into two groups:

The First: This group is made up of Nouadhibou fishermen who use boats and canoes (see census of traditional boats in Nouadhibou). It must be noted that the number of boats is made up of 40 launches from the Canary Islands, 3 terafiers from Nouadhibou. Ten launches and 40 canoes, a gift from Japan, have been added since 1979. They capture both pelagic and benthic species as well as lobsters, which are sold fresh to sea products processing companies for export.

The Second: This group consists only of Imraguen living in villages and who use 71 launches, of which 61 are in usable condition (see Table 2-3). The Imraguen's speciality is pelagic species, which they catch from the beach. They produce dried and salted fish and caviar (poutargue) for export from Nouadhibou in addition to dried fish for their own consumption and for interior markets. According to the Department of Fisheries, total production was estimated to be 12,000 tons for 1978. The Nouadhibou cooperative alone provided 4,000 tons during the first 9 months of the same year, or a third of total production. The SOFRIMA company alone produced 2,462 tons during the first 8 months of 1979. The cooperative's gross income was 198.8 million UM in 1979.

During the first four months of 1980, non-industrial production in Nouadhibou reached 881 tons broken down in the following way:

Traditional boats:	614 tons
Japanese launches:	222 tons
Traditional canoes:	45 tons
Total	<u>881 tons</u>

It must be noted that this cooperative has been supplying the city of Nouadhibou with a ton of fish a day since June, 1980, because of the numerous complaints of the inhabitants, who had trouble obtaining fish on the market.

In 1979, the Imraguen produced 700 tons of dried and salted fish which are awaiting delivery to the Industrial Company for Large-Scale Fishing (S.I.G.P.), their main customer since 1934. In addition, the Imraguen produced an estimated 400 tons for their own consumption and for sale in inland markets. This estimate is based on the volume of business, the number of regular visits of people for fish diets (cure de poissons), mainly in Nouamghar, the main Imraguen village south of Cape Timiris, and on the 1971 B.C.E.A.O. (Central Bank of West African States) estimate of 500 tons.

In spite of S.I.G.P.'s long delays in payment (7 to 8 months after delivery to Nouadhibou), the Imraguen have always made substantial deliveries (see table below) of dried and salted fish for shipment to Zaire, the Congo and Gabon.

Breakdown of deliveries:

1976 -	800 tons
1977 -	1,250 tons
1978 -	900 tons
1979 -	400 tons
1980 -	700 tons

This dried and salted fish is usually made up of the following species, presented in order of commercial value:

1st category:	Corbina, sold at	- 32 UM/kg
2nd category:	Mullet and Bakala	- 15 UM/kg (see Table 1-3).

Between 1970 and 1977 the Imraguen also delivered 48.5 tons of caviar (poutargue) according to the following seasonal breakdown:

1970-71 -	15 tons
1971-72 -	10 tons
1972-73 -	6 tons
1973-74 -	5 tons

Table 2-3 Statistics on Imraguen Villages between Aquadir and Nouamghar (1980)

Name of village	No. of Fishermen	No. of Women	No. of Children	Total Pop.	No. of Launches in use	Launches out of order	Launches Tot.	No. of Cisterne condition	
								good	bad
Aquadir	14	16	15	45	6	-	6	-	-
Tinaloul	7	15	9	31	3	1	4	-	-
Iwick	20	15	10	45	6	1	7	1	1
T'Cheitt	28	20	30	78	9	2	11	1	1
R'Geuiba	50	49	74	173	15	-	15	-	2
Acougege	9	10	6	24	3	-	3	-	1
Nouamghar	102	150	200	452	19	6	25	1	1
Total	229	275	344	648	61	10	71	3	6

Source: Nouadhibou Cooperative

1974-75 - 5 tons
1975-76 - 4 tons
1976-77 - 3.5 tons

This caviar was sold at three different prices, which are determined by quality:

225 UM/kg for the high grade
180 UM/kg for the medium grade
150 UM/kg for the low grade

Table 2-4 The Traditional Boats and the Japanese Launches of Nouadhibou

Owners	No. of Owners	No. and Condition of Boats		
		Good	Out-of-commission	Total
Various Outfitters	41	41	6	47
Cooperative (Japanese Project)	1	10	-	10
	42	51	6	57

Source: Nouadhibou Cooperative.

It was not until 1978 that the "Timiris" pre-cooperative group in Nouadhibou began to process and market this product on its own. Thus, in 1978, the cooperative was able to process 2,320 kg of caviar (poutarque) under hygenic conditions and sell it without any intermediary at the following prices:

600 UM/kg for high grade
500 UM/kg for medium grade
400 UM/kg for low grade

Unfortunately, production has been dropping at a growing rate since the 1975-76 season. This drop is because trawlers come too close to the beaches, thus chasing away the dolphins that cause the mullet to come close to the shore.

In addition to Nouakchott and Nouadhibou, traditional fishermen everywhere complain about this situation. The trawlers often scoop up their nets, for which they receive no indemnity either from the trawler, which they cannot identify, nor from the authorities whose only attempt to render justice is to ask the fishermen for the number of the boat.

One of the business's serious problems is in sales. As shown in the tables, only 10 species plus Cephalopods are bought by SOFRIMA. Among these 10 species, five are plentiful during the first four months of the year.

Tollo (sharks) comprise 95% of catches sold at 14.5 UM/kg; halibut, pink and gray gilt-head and grouper constitute 5% of the catches sold at 16 UM/kg.

The other species such as Myliobatidae, Biodontidae, etc. are considered to be of no commercial value and are thrown back into the sea. The fish flour factory does not take them because it is regularly supplied by its own trawlers. There is thus a great loss, considering that after each sorting, the fishermen throw back nearly half their daily catch.

The second problem is a navigational problem in the Bay of Rest (Tierka). The sand bars and debris are a serious danger for the traditional boats, which have to weave their way among the wrecks each time they go out.

Furthermore, it is almost impossible to repair broken down boats in Nouadhibou. The cooperative members are often obliged

to go to Dakar for repairs.

There is still another problem, which is the difficulty of obtaining fresh water and food in the Imraguen camps and villages. The irregularity of deliveries has given rise to a parallel trade carried out by private entrepreneurs who sell 200 liter barrels of water for 500 UM. Depending on the number of members present, a family can use up the water in 2 or 3 days. Thus, water is used strictly for cooking food and for drinking. During very hot weather, consumption doubles. The entrepreneurs also sell small packets of tea for 100 UM and sugar loaves for 150 UM, according to the Head of the Arrondissement (county).

It must be noted that the Nouadhibou cooperative group has been operating a cooperative store selling basic foodstuffs (rice, loose leaf tea, powdered milk, sugar, tomato paste). There are also ropes and paint for the boats which is fortunately sold for cheaper prices than in private shops. The absence of adequate processing and storage facilities is evident in all villages.

The need for skilled workers (mechanics, carpenters) to repair and maintain the boats and to build launches in the Imraguen villages is keenly felt.

There is one Spaniard who goes to these villages during the off-season to repair damaged boats at exorbitant prices. At Nouamghar and Techitt it would be possible to construct boat building and repair yards with the help of certain fishermen who have become carpenters or blacksmiths and are capable of building launches without outside help if they have the necessary material.

The problems of schooling are also far from being solved. Only in Nouamghar there is a school, and it has been deserted by the teachers who could not bear the local living conditions

(described above). Elsewhere, only shacks made of branches held together by old nets exist and there are serious risks of illness. Although the children are well, it would be advisable to set up some kind of supervision system for them and to start a program of nutritional education based on principals of preventive medicine, which should receive particular emphasis.

In spite of all the problems and underlying difficulties, the cooperative group has been able to achieve several accomplishments in the social domain. Among others is the training of 300 sailor-fishermen between 1978 and 1980, all of whom were Mauritians. There are two per boat and they were chosen on the following criteria:

Mauritanian nationality, practicing fisherman; the owner of each boat chose the first trainee, the cooperative recruited the second.

These apprentices had a practical 3-month training program. During this time, the owner of the boat and the other crew members evaluated the trainees' capabilities both at sea and on land. As they are generally Imraguen or fishermen without resources, they receive a salary of 6,000 UM a month after the first three months for the first rank, 7 to 9,000 UM for the second rank and 11 to 15,000 UM for the third rank. After the first group had been trained, the authorities had to stop this practice of self training because of the high number of people leaving; many preferred to find jobs with foreign companies once they got their navigation permit (livret de navigation) because of the higher salaries and other advantages offered. It must be mentioned that the cooperative has employed Imraguen for ten years during the off season, which corresponds with the end of the season in the villages. The Imraguen's wages are based on the salaries cited above, according to their experience. The owners of these traditional boats are all Mauritanian and are paid according to production and the condition of their boat. Their wages vary between 2,000 to 75,000 UM a month,

which is a considerable sum.

The cooperative also supplies water to the Imraguen villages of R'Ouebatt, Iwich, Ten-Aloul, Techitt and Nouamghar. Supplies arrive once every two or three weeks, theoretically in accord with local authorities.

2-4-2 The Nouakchott Pre-Cooperative

The Nouakchott fishermen's pre-cooperative was created in 1978. Its 280 members own boats, fishing equipment and outboard motors or are simply fishermen. The canoe lot contains about 150 boats of varying capacities of which about 100 are motorized. It must be noted that this lot is often expanded by the temporary presence of Senegalese fishermen who have traditionally come to fish during the season of large catches.

The cooperative is primarily concerned with supplying the markets of Nouakchott and the interior, which the fishermen already supplied before forming a pre-cooperative.

As part of the Japanese technical assistance program, a refrigeration complex with a capacity of 40 tons and a large quantity of fishing material were made available to the pre-cooperative by the government. Since the beginning of 1980 the Nouakchott branch of the Nouadhibou Oceanographic Center has kept records of the hauls as well as the quantities sent to the interior of the country. This government effort has come at the right time and shows its interest in the subsector which must become the nucleus of an essentially Mauritanian fishing industry capable of supplying the interior markets. Statistics show that gross production in 1980 amounted to 3,264,294 kilograms (see Table 2-5 for a breakdown by type of fishing equipment).

Table 2-5 Summary Table of Yields of Different Types of Fishing Equipment (1980)
in kilograms

Month	Fishing Line	Furse Seiner	Barrier or Sleeping net	Shoulder net	Beach net	Lobster net	Total
February	31,991	-	23,414	-	4,817	-	60,222
March	24,190	-	153,206	8,069	16,126	-	201,591
April	107,637	-	287,327	-	8,987	-	404,151
May	224,129	59,435	126,562	-	14,052	-	424,178
June	461,915	10,986	19,699	-	7,558	-	500,158
July	179,652	70,684	13,772	-	-	-	264,108
August	195,496	58,411	1,777	-	-	-	255,684
September	260,693	97,323	-	4,215	819	380	363,630
October	248,282	112,177	-	2,220	11,264	1,587	375,530
November	179,672	138,163	85,086	-	10,380	1,807	415,108
December							
Total	1,914,057	547,179	710,843	14,504	74,003	3,774	3,264,360

Table 2-6 Summary Table

Quantities of Fish Marketed in Commercial Centers
between the Months of February and December, 1980.

Name of Center	Quantity in kg
Rosso	143,600
Aleg	1,585
Boghé	120,000
Kaédi	84,000
Kiffa	7,250
Akjoujt	500
Nouakchott	2,867,769
Aïoun	1,850
Total	3,226,554

Table 2-6 shows that the total quantity marketed in the main commercial centers was 43,450 kg monthly on the average, except Nouakchott, which is by far the largest market with 358,471 kg. Next is Kiffa, followed by Aïoun and Aleg. Akjoujt is supplied from Nouadhibou but receives some shipments from Nouakchott. Mauritania exported 2,120 kg of dried and salted fish to Senegal (St. Louis).

It must be noted that the Imraguen catches at O'Haïjratt are collected daily by an isothermal truck and are stored before being shipped to the interior. The same truck often carries the fish to be sold to the wholesale fish dealers of Rosso, or cargoes that the pre-cooperative tries to sell in Rosso or Aleg.

This latest initiative proves the need to create a marketing network with junctions along the Nouakchott-Néma road. More will be said about this in Chapter 3.

Of all the factors holding back the development of this group, the most important one is storage facilities. In fact, in spite of the availability of the refrigeration complex on the beach and its 40 ton capacity, the fishermen have storage problems, especially during periods of large catches. At times the cold storage chamber is full and the fishermen cannot store their surplus, which usually spoils. This problem will be partially solved as soon as a marketing network becomes operational. The pre-cooperative group will then provide the monthly allocation for each of its centers, which it will plan in order to avoid the bottlenecks in Nouakchott and the exhaustion of supplies in the centers. In the medium term, the creation of a 300-ton complex that is part of the 5th EDF plan will permit the keeping of a large stock in order to supply the inland markets during the off-season and to regulate supplies to the interior markets.

An adequate drying facility is lacking. The installation set up by the fishermen's wives must be enlarged and improved, as described in the report on fresh water fishing.

Marketing is often disrupted by banabanas (8) who bring down the prices while benefitting from wide profit margins. Although prices are approved by the Ministry of Commerce (see Table 2-7) no actions are taken to enforce them.

(8) Banabana: a middleman, between the fishermen and the consumer.

Table 2-7 Prices of Fish Approved by the Department of Commerce

Name of Fish	Wholesale price UM/kg	Retail price UM/kg
Tiof and Kothe	-	60
Gilt-heads, Seukh and Dom	-	40
Doy and Others	-	35

Source: Interior Commerce Service

In spite of numerous requests and group actions of the fishermen and the Traditional Fisheries Service, no solution is yet in sight for the problem of tax-free fuel needed for fishing or for the other kinds of equipment used. This is true for all traditional fishermen, because even in Nouadhibou, where consumption is high, the cooperative has no support.

It is also difficult to get spare parts and the fishermen usually have to go to Dakar, as do those in Nouadhibou and M'Kaïjratt.

The fishermen are not affiliated with the National Social Security Fund, which is a serious problem for persons working in such conditions.

Table 2-8 Summary Table of Monthly Catches of the Nouakchott Pre-Cooperative (1980) (in kg)
Not including spiny lobsters

February	42,835
March	123,170
April	262,730
May	335,432
June	500,158
July	264,108
August	255,684
September	359,415
October	373,310
November	<u>402,440</u>
Total	2,919,282

Source: Oceanographic Branch Center.

500,000 kg of this production was marketed in the interior of the country, at a gross profit of 9,000,000 UM (average price: 18 UM/kg). It is difficult to establish prices in the fishing industry because they depend on supply and demand, which lead to periods of abundance and scarcity.

Unlike the Nouadhibou fishermen, the Nouakchott fishermen sell their catches either in quantities of individual fish to retailers or by the canoe-full to wholesalers, without distinction among species.

2-4-3 The M'Haïjrat Imraquen Pre-Cooperative

It was formed in 1980 for the reasons cited in Chapter 1. It has a total of 146 members spread over the villages of Dreulwakh, Limsitt and M'Haïjrat, all located in the Prefecture of Ouad Naga (see Table 2-9).

Table 2-9 Statistics on Imraguen Villages from Limsitt to M'Haïjratt

Village Name	Number of Fishermen	Number of Families	Total Inhabitants	Number and Type of Boats
Limsitt	25	100	171	17 canoes of which 14 have motors
Breulwakh	35	139	130	18 launches of which 12 are serviceable
M'Haïjratt	86	314	450	

Source: Minister of the Food Distribution Commission of the Food Aid Board (Commissariat à l'Aide Alimentaire) 7/31/80.

The advantage of this group is that it benefits from refrigeration facilities and daily collection of catches by an isothermal truck. Food and fresh water are supplied to the villages by the prefecture of the 4th Ward (Arrondissement) of Nouakchott. SÜNIMEX sells foodstuffs to the pre-cooperative and sends them up from Nouakchott in isothermal trucks.

The pre-cooperative group is the headquarters of an FAO project in traditional fisheries development. This project, which will be described further on, is reinforced by 12 Japanese canoes and outboard motors. The total stock is made up of 35 boats including 17 canoes (14 of which have motors), 18 launches (12 of which are serviceable). The number of boats temporarily increases during the fishing season when Senegalese fishermen are present.

According to data kept by the refrigeration unit, the group's production amounted to 334,112 kg (Table 2-10) in 1980. This figure is, of course, insignificant, but attention must be drawn to experimentation with new fishing methods (line fishing) and the sedentarization of fishermen who will be employed year-round from

now on. Their families will also settle in the work areas. The fishermen still use the shoulder net, which is due to disappear or to be used only by young people who stay behind in the villages. Line fishing gives encouraging results because of the weight of the fish caught (full-grown individual fish),

In order for these initiatives to continue, the government authorities should look into the problem of communications. The first Imraguen villages are reached by an 60 km road in bad condition. Furthermore, schooling for children as well as medical care must be considered. A program of preventive medicine is apparently a desirable approach for these villages, as well as the whole country, first of all because of it costs less than curative medicine and secondly, because of its accessibility to all social groups.

Table 2-10 Summary Table of Monthly Catches of the M'Haïjratt Pre-Coopvative (in kg)

Locations Months	Limsitt	Breulwakh	M'Haïjratt	Total
February	10,613	6,774	-	17,387
March	70,881	7,534	-	78,415
April	99,123	21,700	20,598	141,421
May	73,398	9,475	5,873	88,746
June	-	-	-	-
July	-	-	-	-
August	-	-	-	-
September	2,215	-	-	2,215
October	-	1,220	-	1,220
November	4,718	-	-	4,718
Total	260,948	46,703	26,471	334,122

In the short term it would be desirable to train mid-level cadres to assure the continuation of the FAO project, which is concerned with improving the living conditions of the people, introducing new fishing and appropriate processing methods.

Medium-term activities include increasing the amount of fishing equipment available and training people to use them as well as introducing methods of processing and storing fish. The stock of boats should be increased by adding larger vessels with greater autonomy. A fishing port should be built with ample distribution and storage infrastructures. At the same time, the fishermen will need training.

In the long-term, industrial-scale fishing equipment should be introduced and fishermen could learn to use it through a process of on-the-job training. This type of training has a long tradition and appears to be appropriate to the needs and customs of the local people. Technical and administrative cadres should be trained in specialized institutions while at the same time professional organizations should be developed among the fishermen.

To insure the coordination and follow-up of these efforts, the main Imraguen villages should be attached to the Prefecture of the Fourth Ward (Arrondissement) of Nouakchott, which is already responsible for providing water to them and for organizing and supervising food distribution and for sending medical personnel in case of need.

It must be noted that these settlements are part of the Trarza Region and the Prefecture of Guad Naga whose administrative center is situated 80 kilometers southeast of Nouakchott on the Boutilimit road. Given the communication problems and the lack of economic resources, it appears that attaching these villages to Nouakchott, is the most viable way of favoring their development.

Among the supporting, motivating and supervisory measure that the authorities should take, the most urgent is providing a water supply to the fishing communities. Basins or resevoirs should be installed and could be filled by sea, by appropriate boats, or overland, by tank trucks or by digging wells where it is possible; desalination units could be installed in the sea-side villages.

Of course, the government has tried to help these communities by bringing them water in a flat-bottomed boat built in Dakar in 1974, but after two or three voyages, the boat was towed to the harbor of Nouadhibou. In early 1980, Iraq donated some trucks which were put at the disposal of the District of Nouakchott, whose 4th Ward Prefecture undertook providing water to several Imraguen villages and camps 70 kilometers up the road to Nouadhibou.

Since 1979 these Imraguen villages have been united within one pre-cooperative group with collection points for fish at Breukwakh, Limsitt and Twilit. Fish have been collected daily since November, 1980. Two Japanese boats provide shuttle service between Twilit and M'Haïjratt.

Given the large size of the population of these villages and the growing number of children (see Table 2-9), a dispensary and a school should be built in this area. These facilities could be built in Twilit for the following reasons:

- 1) This village is equidistant from the other villages on the coast and is easily accessible from the road to Nouakchott.
- 2) The FAO will build a training center for fishermen at Twilit.
- 3) The two motor boats that the FAO uses for the project, could be used to bring people from M'Haïjratt to Twilit.
- 4) A health service agent could easily be brought to Twilit thanks to the isothermal truck that carries the fish to Nouakchott every day.

These first efforts will no doubt contribute to settling the Imraguen in the villages. They can use the two motorized boats which have just been added to the stock of canoes, to go far out to sea and use new fishing methods. Now that they have a dependable daily pick-up service for fresh fish kept in the refrigeration unit at the beach at Nouakchott, their production will no doubt be improved in quality and quantity.

In the medium term, this group should be better structured and provided with equipment allowing it to join with its counterpart in Nouakchott in supplying the interior markets.

2-5 Catches by Species

When the catches were studied it was found that coastal pelagic species made up most of the hauls. Statistics on the 1980 catches show that the Sparidae family (Pagrus sp., Dentex sp., Pagellus sp.) are predominant. Next in order of frequency come Scianidae (Umbrina sp.), Pomadasyidae (Pomodasy sp.), (Clupeidae) Sardinella maderensis, (Aridae) Arius sp. (Mugilidae) yellow and black mullet.

Demersal species caught by fishing lines and occasionally in barrier nets constitute the smaller proportion of catches.

Given the selling prices of the species caught, bottom fish constitute 50 to 65% of the total value of the catches. Groupers and especially Tiof Serranidae (Epinephelus sp.) are in high demand both among foreigners and Mauritians; consumption is limited only by production, which explains the higher prices charged for these fish (see table of approved prices).

The importance of two Cephalopod species caught in Mauritania is not to be neglected:

- Cuttle-fish (*Cepia officinalis*) will become increasingly important because the Japanese market is one of the largest for this seafood. Experimental production by the Nouadhibou cooperative was 4,899 kg during the first four months of 1980.

- "Yet" (*Cymbium* genus) is on the other hand, a locally-consumed product. It is dried in the sun and used as a condiment with certain dishes. Annual production is about 6 tons.

There are also numerous other species of considerable commercial value. These include *Brachydeuterus* (for frying), *Tassergal*, *Carangidae* (*Lichidadvadigo*) (liche), *Caranx* sp. (*chinchard*), *Cybiidae* (*Orcynopsis unicolor*) (*palomette*) long sole, sea pike, etc. Quantities are minimal and the species are cited in order to give an idea of the diversity caught.

Partial average production figures are shown below.

In diminishing order of importance and among pelagic species are: Sparidae, the most plentiful, with 289,000 kg, caught followed by Pomadasidae with 186,000 kg, Clupeidae with 165,000 kg, Aridae, with 93,000 kg and Mugilidae with 36,000 kg.

Demersal, or deep-sea species, are dominated by the Serranidae (154,000 kg) followed by the Cephalopods, and by *Cymbium*. The rest are divided among numerous and varied species that have been grouped by family.

2-6 Processing

There is but one method of drying, which is described in the report on continental fishing. The only difference is that among the Imraguen, men and women work together in cleaning fish.

After having soaked in brine for 3 or 4 days, pieces of fish, which are usually large, are spread out for 4 or 5 days on racks of the kind used in inland fishing and are turned from time to time.

At night, some people cover the racks with jute sacks to protect them from jackals that prowl about. The racks are set up at the sea-side, usually behind the village. In the camps, the fish are laid out directly on the sand. It cannot be overemphasized that such practices yield a low quality product and as a result cannot be marketed competitively. These methods of processing should be studied and replaced by a drying method better adapted both to the working conditions of the fishermen and to producing a better quality product.

The Nouakchott and M'Haïjratt pre-cooperatives have a refrigeration unit with a 40 ton capacity and an apparatus capable of making 1.5 tons of shaved ice daily. This facility has given an entirely new look to local traditional fishing.

In fact, catches are unloaded directly in plastic cases and kept in the cold storage chambers at an average cost of 2 UM a day. Only the fish sold to the women or set aside for drying are still piled up on the beach to be auctioned.

In Nouadhibou, the cooperative is negotiating the acquisition of a refrigeration complex. Although it works to a greater extent with processing companies for export, it delivers most of its production fresh.

To conclude, if cold storage units are set up along the marketing network in the interior, it will be possible to supply interior markets regularly to the advantage of the consumer, at prices affordable by all (see Chapter 4).

2-7 Storage

There are no governmental or private facilities at any landing points in the traditional fisheries sector, except at Timiris, where S.I.G.P. built a storage facility for caviar

(poutarque). This storage facility has been partially converted to a supply point for the Nouadhibou cooperative, which has taken it over. The other part of the facility is used as a processing and storage center for the poutarque before it is sent to Nouadhibou for export.

Once the fish is dried, it is loaded on launches without any special kind of wrapping. The dried fish are covered with old nets to be carried to Nouadhibou (S.I.G.P.) in order to be sent abroad. The fish for the Nouakchott and interior markets are put into jute sacks or in nets and are taken away in trucks or on camel-back.

In order to insure certain standards of product quality, the recommendations for storage described in the report on continental fishing should be followed until more appropriate methods are found.

2-8 Marketing and Associated Factors

The market for sea fish has grown tremendously since the start of the drought. Distribution covers not only the River Basin where fishing has diminished drastically since 1970, but also the interior of the country where private entrepreneurs or cooperatives market the fish more or less regularly. In spite of the poor road conditions and impassibility of certain tracks as well as the lack of storage facilities in markets, the demand for fish will certainly rise. The increasingly sedentarized nomads have taken a liking to this high quality food; as a result, the markets for sea fish are growing even in the most isolated areas. It appears that fish is now consumed nearly everywhere.

In a Moslem country where the Koran recommends eating fish, the prospect for larger markets seems virtually assured, assuming the existence of a well-organized and regularly-supplied distri-

bution system. Prices vary from one place to another and are not approved. They depend on supply and demand (periods of plenty or scarcity), and especially distances travelled and road conditions.

For prices of sea fish bought in Nouakchott see Table 2-2.

Rosso: from 25 to 30 UM/kg

Doghé: from 35 to 40 UM/kg

Kaédi: from 45 to 50 UM/kg

Elsewhere, in towns that are farther away, the price is very high because of high transportation costs and profit margins, which means that fish is affordable only by a minority in some regions (see Table 2-5 in the report on Inland Fishing, which gives a precise idea of the transportation costs per kilogram to the four main interior markets. Individual fish or pieces of fish are also sold on a retail basis in interior markets.

About 3,000 tons were marketed in interior markets in 1980. The fish were supplied by the two pre-cooperatives of Nouakchott and Allaïjrat. For quantities of fish marketed in Commercial Centers between the months of February and December, 1980 see Table 2-6.

2-9 Principal Markets

The main markets are:

Supplied from Nouadhibou: Nouadhibou, Zouérate, Atar, Akjoujt.

Supplied from Nouakchott: Nouakchott, Rosso, Doghé, Kaédi, Selibaby, Boutilimit, Aleg, Nagta Lahjar, Kiffa, Aïun, Néma, etc.

Table 2-11 Prices of Boats and Outboard Motors in Mauritania

Types	Size or power	Length (meters)	Width (meters)	Capacity (kg)	Price (UM)
Canoe	large	14-17 m	2 m	4,000	100,000
	medium	7- 9	1	2,000	50,000
	small	4- 5	0,60	3 à 500	25,000
Launch	medium	10	3	6,000	300,000
Large Launch	medium	14.08	3	9,000	1,000,000
Terafier	medium	20	5		2,000,000
Outboard Motor	25 HP				80,000
	18 HP				60,000
	6 HP				28,000

Source: RAMS - based on data gathered in cooperative groups and among fishermen.

2-10 Analysis of Production Costs in Traditional Marine Fishing

Cost factors:

Capital: Canoe, purse seine, beach seine, shoulder net and ledger line (15% depreciation of capital).

Salary: Based on individual shares of daily catches.

Production: Based on each type of fishing equipment used daily (1 catch) during the fishing season.

Results: See Table.

Table 2-12 Breakdown of Production by Type of Equipment

An analysis of annual production of a fisherman using the following types of fishing equipment gives the results below:

Type of Equipment	Annual Production (kg)	Manpower Required
Purse Seine	547,119	20
Barrier or Sleeping net	710,843	5
Beach net	74,003	30
Shoulder net	14,498	2
Fishing line	<u>1,914,057</u>	5
	3,260,520 kg	
	or 3,260 tons	

Source: From statistics on canoe-based fishing in the M'Haïjratt and Nouakchott pre-cooperatives, kept by the branch of the National Oceanographic Center in Nouakchott in 1980.

2-10-1 Various Economic and Technical Aspects of Traditional Marine Fishing

2-10-1-1 Base-Line Data

Given the average price per species and the average size of catches per canoe, it is possible to estimate the average value of annual sales of gross average production per canoe in each of the four types of traditional fishing already described. The breakdown of catches by type of fishing shows that line fishing is by far the most productive in terms of weight; next is the purse seine in Nouakchott, where the fishermen fish in

canoes only, followed by the beach seine which is rarely used in Nouakchott, possibly because the continental shelf is too deep for this type of net (the best places to use it are in bays or in the Senegal River).

The other kinds of equipment (barrier, or sleeping nets) are always used in conjunction with ledger lines in order to cover various costs. The disadvantage of these nets is the damage caused by predators while the nets are in the water with fish in them - not only does the long period of time that the nets are in the water affect the quality of the catches, but the position-in of these nets provides easy prey for predators, not counting the losses caused by trawlers that fish close to the beach, often tearing the barrier nets placed in the vicinity.

At the Arguin Bank this type of net is hampered by the masses of algae swept into it by the waves in shallow water. The budget breakdown shows that this net is not profitable by itself.

Data on the shoulder net were gathered only in N'Haïjratt, Limsitt and Breulwakh. It is used when shoals of fish come near the beach to escape predators, usually dolphins, which follow their migrations.

The fishermen often wait for days and even weeks for a shoal of fish to pass by; if one does not come near the beach they cannot catch any fish because they have to swim out to the shoals with their shoulder nets in order to catch the fish. There are many accounts of this traditional type of fishing, which is of considerable interest to tourists passing through the area. Without a shadow of doubt, this kind of production is a limited one, which is why substituting fishing lines would be profitable. The Arguin Bank is a permanent habitat of large fish which cannot be caught without long lines because of the Bank's escarpment and particularly its sharp rocks.

Annual intermediary production costs for each of these types of equipment can be calculated. The figures cover four factors which are:

Consumption of fuel and food, minor repairs and bait (for line fishing). Total investment (Table 2-13) is calculated based on current prices of materials.

It must be noted that these prices are variable and rise considerably, particularly canoe prices (Table 2-13). The length of depreciation of the material is hard to estimate; in the case of nets and canoes it is risky to establish a time during which this equipment can be considered to have been completely amortized - because as soon as part of a net or a canoe is damaged or lost it is immediately repaired or replaced. After a certain amount of time the net or canoe is completely rebuilt or re-woven. Nevertheless, a canoe that has been used intensively at sea generally has to be replaced after 7 years; a purse seine has an average life of 3 years, as do a barrier or sleeping net and a beach net. Motors, which are in great demand, have a short life and must be replaced at the end of 3 years on the average.

Using base-line data, two ways of calculating value added can be used:

- 1) Based on the method of payment by shares. This method can detail the costs to fishermen and owners but does not give the profitability of each type of fishing gear.
- 2) Based on the size of catches obtained with each type of gear and the number of fishermen employed by each type.

2-10-1-2 The Family or Cooperative Sharing System

If only the distribution of profits is considered, the value of production of each type of fishing equipment can be calculated by subtracting depreciation costs from the gross value of production. This net value of production can be considered to be revenue received either by families or by cooperatives. The purse seine is thus more profitable than the barrier, or sleeping net or the beach net even though it requires four times as many fishermen. Nevertheless, the barrier or sleeping net is quite productive because it requires little investment. Barrier nets could be used more extensively if:

- 1) SUFRIMA bought all kinds of fish caught, with a sliding price mechanism.
- 2) the other fishing/processing companies in Nouadhibou re-opened and followed the SUFRIMA in buying the entire range of fish caught by traditional fishermen.

Ledger line fishing is profitable when one considers that it is often a family-based practice (which is usually the case because of the smaller amount of investment required) and can yield 100,000 Ufr a year to an individual fisherman in Nouakchott (net calculated revenue).

Further on, data on semi-industrial fishing carried on by the Nouadhibou cooperative will be analyzed. Since the cooperative's boats generally have greater autonomy than the canoes, this fact should be an important aspect choosing profitable means of fishing. Both kinds of fishing should be encouraged and improved so that canoe fishing can benefit from efforts permitting it to evolve in the direction of semi-industrial fishing (see appendix for the results of the 1978-69 fiscal year of the Timiris Cooperative).

In traditional fishing, equipment may belong to one or to many persons (owners). Sometimes the canoe and the motor belong to the same person.

In order to establish the remuneration of each owner and fisherman, the following procedure is used:

- 1) Intermediary production costs (fuel, food, bait, maintenance of equipment) are subtracted from sale revenues.
- 2) After this operation, the amount remaining from the sale of the fish makes up added value and is broken down as follows:
 - one portion for the owner of the boat;
 - one portion for the owner of the motor;
 - one portion for the owner of the net;
 - one portion for each fisherman

When the net is a particularly expensive one (such as the purse sein) the owner's share includes several portions and may be as high as 33% of the net product. However, the owner of the net is responsible for the maintenance and repair costs involved in using the net; this may amount to as much as 10,000 to 12,000 UM a month.

The value of the shares received by fishermen and equipment owners has been calculated and is presented in the following tables. In order to establish the actual revenue of the owners the total cost of necessary amortization can be subtracted from the total shares received. The results show that under conditions prevailing in 1980, ledger line fishing is by far the most profitable (1,914,057 kg) valued at 34,453,000 UM. This explains why so many fishing lines are in use (they catch large fish in particular). Next in profitability is the purse seine and beach seine; last of all is the barrier, or sleeping net. Owners of

beach seines receive 140,000 UM per year whereas owners of barrier nets receive nothing. However, since the owner of the barrier net is usually the fisherman himself, investments are quite modest. To conclude, then, the purse seine and ledger line are the most profitable types of fishing implements.

It is well to recall the statements of the Director of the Traditional Fisheries Service during the last seminar on fisheries development and the estimate of the SCET International Report of 1978 concerning the population involved in traditional marine fishing, estimated to be 1,800 persons; including non-members of cooperatives and foreigners. These persons are distributed in the following way:

a) Nouadhibou	300
b) Nouakchott	280
c) M'Haïjrat	146
	<u>726</u>

This figure includes a little over a third of the persons involved in traditional fishing.

2-11 Production Budget of Different Types of Fishing Equipment Production Budget of the Ledger Line

Hypothesis:

Average production of one canoe per year (1980) or fishing season.

Cost of the means of production:

1 canoe	60,000 UM
1 motor	66,000 UM
30 ledger lines	14,000 UM

5 fishermen use this equipment. Average production of a canoe using 30 fishing lines a year is about 42.5 tons a year.

Table 2-13 Breakdown of Production Costs of Various Kinds of Fishing Equipment:

Type of Equipment	C A P I T A L				Annual capital costs	P R O D U C T I O N		
	Approximate number in existence	Average life of equipment in years	Buying price in UM	Maintenance costs		Average number of imple-ments in daily use	Number of employees per canoe	Number of days when equipment is in use
Canoe	150	7	60,000	5%	15%	45		300
Outboard Motor	100	3	66,000	5%	15%	45		300
Purse Seine	5	3	600,000	10%	15%	1	22	210
Barrier-Sleeping net	5200	3	50,000	5%	15%	12/canoe	5	240
Beach seine	4	3	60,000	10%	15%	4	30	160
Shoulder net	200	3	3,000	10%	15%	31	2	90
Ledger line	8610	i def.	2,400	10%	"	30	5	300

Based on data gathered from fishermen, officials and shopkeepers. Costs reflect prices of equipment in Nouakchott given the life of the material and its maintenance cost. Yields (production) and the number of days of equipment use were estimated taking into account bad weather, holidays, illness and unexpected problems.

Source: RAMS.

-64- Traditional Marine Fishing Subsector

P R O D U C T I O N C O S T S										S A L A I R E		
Gross daily production per person/kg	Own consumption	% marketed	Average price per kg in UM	Daily food costs	Daily bait costs UM	Daily fuel consumption/UM	Average storage costs in UM/kg	Annual Distr. tax	Other cost	Material depreciation	Purse seine owner's share	Daily salary in UM
								6,000				
41	2%	98%	18	500		6,000	2		5%	1.5%	1,492	416
278	2%	98%	18	100		3,000	2	6,000	5%	1.5%		3,802
202	2%	98%	18	"		"	2		5%	1.5%	1,382	72
20	1%	99%	18	"	300	"	2		5%	1.5%		285
749	2%	98%	18	100	300	3,000	2		55%	1.5%		10,605

Total number of fishermen in Nouakchott and M'Haïjratt: 434

I. Costs borne by the owner:

- a) Purchase of the means of production (canoe, motor, lines),
- b) maintenance and repair as well as fixed costs of the canoe and the motor,
- c) incidental costs and taxes.

II. Costs borne by the crew:

- a) Operating costs (maintenance of lines, fuel, food, bait),
- b) storage costs of catches.

III. Yield: quantity = 42.5 tons
price per kg = 18 UM
value = 765,000 UM

. Calculation of results:

IV. Gross Annual Revenue = IV - (I + II + III) =

V. Fishermen's income = $\frac{V \times 5}{8} =$

VI. Owner's income = $\frac{V \times 2}{8} =$

VII. Annual income per fisherman = $\frac{V}{5}$

Table 2-14 Operating Budget of a Ledger Line
Annual Yield in kg and Duguiya Value

<u>Factors</u>	<u>Quantity</u>	<u>Value</u>
Yield	42.5 tons	765,000 UM
Number of fishermen	5	
<u>Investment Costs (depreciation)</u>		
Canoe	17,500)	
Motor	31,900)	= 51,500
Lines	2,100)	
<u>Maintenance Costs</u>		
Motor	3,000)	
Canoe	3,300)	= 7,700
Lines	1,400)	
<u>Variable Costs</u>		
Fuel	168,000)	
Food	24,000)	= 227,000
Bait	6,000)	
Storage	29,000)	
<u>Other Costs</u>		
Incidental Costs and Taxes		= 6,000
<u>Total gross annual revenue</u>		= 427,800
<u>Annual income to fisherman</u>		= 295,500
<u>Annual income per fisherman</u>		= 51,100
<u>Annual income from catches</u>		= 118,200

(Reauneration system not included)

Operating Budget of a Purse Seine

Hypothesis

Average yield of a net and 2 canoes per year (1980) or fishing season.

The owner receives 1/3 of net production.

Capital

2 canoes	120,000 UM
2 motors	132,000 UM
1 net	600,000 UM
20 fishermen	

Average annual yield of a purse seine using 20 fishermen is 103,500 tons.

- I. The investment costs (costs of canoes, motors, net and their depreciation) are borne by the owner.
- II. The maintenance costs (of canoes, motors and the net) are borne by the owner.
- III. Other costs (incidental expenses and taxes) are borne by the owner.
- IV. Yield: 103.5 tons valued at 18 UM/kg = 1,863,000 UM

Result

- V. Net annual revenue = IV - (I - II - III)
- VI. Fishermen's income: $\frac{V \times 2}{3} =$
- VII. The owner's income: $\frac{V}{3} =$
- VIII. Annual income per fisherman: $\frac{VI}{20} =$

Table 2-15 Operating Budget of a Purse Seine

Annual Yield in kg and UM value

<u>Factors</u>	<u>Quantity</u>	<u>Value</u>
Yield	103,423 tons	1,863,000
Number of fishermen	20	
<u>Investment Costs</u> (depreciation)		
Canoes	35,000)	
Motor	63,800) =	288,800
Net	90,000)	
<u>Maintenance Costs</u>		
Canoes	6,000)	
Motor	6,600) =	72,600
Net	60,000)	
<u>Variable Costs</u>		
Fuel	196,000)	
Food	35,000) =	252,000
Storage	21,000)	
<u>Other Costs</u>		
Incidental Costs and Taxes		12,000
<u>Total annual gross revenue</u>		1,237,600
<u>Annual income-fishermen</u>		825,066
<u>Annual income per fisherman</u>		41,253
<u>Annual income-owner</u>		412,533

The owner receives 1/3 of production; the other 2/3 are divided among the fishermen according to the shares system.

Table 2-16 Operating Budget of a Beach Seine

Annual yield in kg and ouguiya value of a beach seine.

<u>Factors</u>	<u>Quantity</u>	<u>Value</u>
Yield	18,500	333,000
Number of fishermen	30	
<u>Investment Cost (depreciation)</u>		
Net		48,000
<u>Maintenance Cost</u>		
Annual maintenance cost		10,000
<u>Value added</u>		
Employee salaries		107,340
<u>Other Costs</u>		
Incidental costs		16,650
<u>Owner's net income</u>		161,010

Operating Budget of a Barrier or Sleeping Net

Hypothesis

Average yield of 8 nets and one canoe per year (1980) or fishing season.

Capital

1 canoe	60,000 UM
1 motor	66,000 UM
8 nets	400,000 UM
5 fishermen	

Average yield of the 8 nets operated by 5 fishermen = 15.5 tons.

- I. The investment costs (costs of canoe, motor and 8 nets) as well as their depreciation) are borne by the owner.
- II. The maintenance costs of the canoe, the motor, the nets and other items are borne by the owner. Variable costs include fuel, food, storage and other items borne by the fishermen.
- III. Other Costs (incidental costs and taxes) are borne by the owner.
- IV. Production: 15.5 tons valued at 18 UM/kg. = 270,000 UM

Results

- V. Total annual revenue = IV - (I + II + III)
- VI. Annual income-fishermen = $\frac{V \times 5}{7}$
- VII. Annual income per fisherman = $\frac{VI}{5}$
- VIII. Annual income-owner = VII x 2

Table 2-17 Operating Budget of a Barrier or Sleeping Net

Annual Yield in kg and Value of 8 nets

<u>Factors</u>	<u>Quantity</u>	<u>Unit Price (UM)</u>	<u>Value (UM)</u>
Yield	15,500 tons	18	279,000
Number of fishermen	5		
<u>Investment Costs (depreciation)</u>			
Canoe		11,500)	
Motor		25,300) =	128,800
Nets		92,000)	
<u>Maintenance Costs</u>			
Canoe		9,000)	
Motor		9,900) =	54,900
Nets		36,000)	
<u>Variable Costs</u>			
Fuel		126,000)	
Food		18,000) =	150,000
Storage		6,000)	
<u>Other Costs</u>			
Various Costs and taxes		6,000	6,000
<u>Total gross annual revenue</u>			68,100
<u>Annual income-fishermen</u>			48,643
<u>Annual income per fisherman</u>			9,728
<u>Owner's income</u>			19,457

Table 2-18 Contribution of Ledger Lines to G.D.P. (1980)

1. Theoretical yield per line: $\frac{42,500}{30} \text{ kg} = 1,416.6 \text{ kg/year}$
2. Theoretical yield of all lines: $1,416.6 \times 8,640 = 12,239,424 \text{ kg.}$
3. Adjustment coefficient between theoretical and actual yields (9):
$$\frac{12,239,424}{1,914,054} = 6.39$$

Value added to G.D.P. by Ledger Lines

Yield - Cost of Production = Value added

$$1,914,057 \times 18 = \underline{34,453,000 \text{ UM}}$$

Cost of production per line: $\frac{227,000}{30 \times 6.39} = 1,184 \text{ UM}$

Total Cost of production: $1,184 \times 8,640 = \underline{10,231,000 \text{ UM}}$

Value added by total actual production:

$$34,453,000 - 10,231,000 = \underline{24,222,000 \text{ UM}}$$

(9) See production table for each type of equipment.

Table 2-19 Contribution of Purse Seine to G.D.P. (1980)

Value added to G.D.P. (Purse Seine): Yields- Production Costs (10):

$$547,110 \times 18 = 9,848,142 \text{ UM}$$

Production costs per net: 252,000 UM

Cost of total production: 252,000 \times 5 = 1,260,000 UM

Value added by total production: 9,848,142 \times 1,260,000 = 8,588,142

Table 2-20 Contribution of the Beach Seine to G.D.P. (1980)

Actual yield of all nets: 18,500 \times 4 = 74,000 kg (11)

Value added to G.D.P. (beach net): Total yield - Costs of production

Total yield: 74,000 \times 18 = 1,332,000 UM

Total production cost: 133,200 \times 4 = 532,800 UM

Value added by total production: 1,332,000 - 532,800 = 799,200 UM

(10) See production table for each type of equipment.

(11) See Table 2-16 for yield per net.

Table 2-21 Contribution of the Barrier or Sleeping Net to G.D.P.
(1980)

1. Theoretical yield per net: $\frac{15,500}{8} = 1,937 \text{ kg}$
2. Theoretical yield of all nets: $1,937 \times 5,208 = 10,087,896 \text{ kg}$
3. Adjustment coefficient between theoretical and actual yields:

$$\frac{10,087,896}{710,843} = 14.19 \text{ kg}$$

Value added to G.D.P. by barrier or sleeping nets =
yields x cost of production.

$$\text{Production} = 710,843 \times 18 = 12,795,174$$

$$\text{Production cost per net: } \frac{150,000}{8 \times 14.1} = 1,330 \text{ UM}$$

$$\text{Total production cost: } 1,330 \times 5,208 = 6,926,640$$

$$\text{Value added by total yields: } 12,795,174 - 6,926,640 = \underline{5,868,534}$$

Total contribution of the traditional marine fisheries sector to G.D.P. according to tables 2-18, 2-19, 2-20 and 2-21:

1. Yield from Ledger Lines: 34,453,000 UM/year
2. Yield from Purse Seines: 9,848,142 UM/year
3. Yield from Beach Seines: 1,332,000 UM/year
4. Yield from Barrier or Sleeping Nets: 12,795,174 UM/year

Table 2-22 Summary Contributions to G.D.P.

Types of fishing	Gross theoretical yields (kg)	Production costs (UM)	Contribution to G.D.P. (UM)
Ledger line	34,453,000	10,231,000	24,222,000
Purse seine	9,846,142	1,260,000	8,588,142
Beach net	1,332,000	532,800	799,200
Barrier or sleeping net	12,795,174	6,926,640	5,868,534
	<u>58,428,316</u>	<u>18,950,440</u>	<u>39,477,876</u>
			(0.1% of National Income)

2-12 Contribution of Traditional Marine Fishing to G.D.P.

Production in this sector was worth 39,477,876 UM (1980 prices) and was equal to 0.1% of national income. This does not include the Nouadhibou cooperative's catches or those of non-members of cooperatives or of foreigners.

Given previous levels of production and the increase in consumption noted in recent years, this production can be estimated to be 9,600 tons, or a total production of 13,000 tons for the whole subsector of traditional maritime fishing, which employs some 1,800 fishermen (1980).

2-13 Modernization

2-13-1 Motorization

Motorization is one of the decisive means of modernizing the methods of traditional fishing and of increasing its productivity.

The first outboard motors appeared in 1963 among the traditional fishermen of Nouakchott. Since that date the number of motors in use has grown considerably and the use of motors has spread northwards to Nouadhibou.

In order to stimulate a more profitable use of motors, the Department of Traditional Fisheries should put together a rational modernization plan. This program should include steps such as removing taxes on outboard motors and fuel used by fishermen. Pre-cooperatives could be in charge of selling motors on credit to fishermen.

Such a program could be implemented in successive stages with evaluation of the impact of each stage on production being undertaken at appropriate times as well as a study of the rate of repayment. These steps will allow for proper diffusion of motor use among traditional fishermen.

The following factors are necessary in carrying out the project:

- a distribution center,
- a fishermen's credit cooperative,
- on-the-job training of artisan mechanics to repair the motors,
- installation of a network of maintenance and repair workshops with a supply of spare parts,
- supply of branch units in fishing zones from central warehouse in Nouakchott and a branch center in Nouadhibou,
- training of technical and administrative supervisory personnel.

The overall storage and distribution facilities at the beach of Nouakchott and at Nouadhibou should receive stocks and assure distribution with technical support and training.

The number of motorized boats is 125 out of an estimated 250, or a 50% rate of motorization.

Motorization will no doubt lead to a significant socio-economic transformation. It will spark a continuous growth process which will result in a progressive increase in catches made from canoes, as has happened in Senegal (see table below) as a result of an experiment there between 1960 and 1975.

	1960	1968	1973	1974/75
Stages of the Motorization Program		Beginning of Supervision	Beginning of Canadian Program	
Total number of canoes	3,900	5,140	5,930	6,443
Number of motorized canoes	702	2,646	3,561	4,187
% motorized	18	51	60	65
canoe-based catches	80,000 tons	125,000 tons	227,000 tons	265,000 tons

Source: "Note sur les résultats du projet/aide du Canada 'Motorisation des pirogues' et son impact sur le développement de la pêche artisanale." Direction de l'Océanographie et des Pêches Maritimes.

This economic growth was accompanied by a change in the mentality of the fishermen, who acquired new attitudes towards the problem of development. Fishing cooperatives grew and multiplied from Dakar to St. Louis and in N'Dour and Cayor.

One noticeable result is a renewed interest of youth in fishing.

Considerable exertion was once necessary to move a canoe. Nowadays, however, one has only to operate a lever to make the boat go. The canoe can also travel farther than before.

In Mauritania, such motorization would be followed by the introduction of new high-yield fishing methods such as the use of a purse seine and the improvement of equipment. These new means will give the fisherman a confident attitude toward modernity. A new step in the direction of modernization will thus be made, permitting an increase in production.

This need to increase production requires adding other types of boats to the existing traditional canoes because no matter what modern equipment may be installed, the traditional canoe has a limit beyond which it cannot go. Therefore, means of navigation permitting greater autonomy and larger catches seem to be the only solution to the problem.

In order to avoid losses due to a small market, it is necessary to rationalize distribution. The opening of a marketing network reaching the main census of commerce would undoubtedly favor the distribution of a good portion of the catches (see the report on inland fisheries), as would the re-opening of the companies in Nouadhibou that are now closed down.

At present all processing factories are concentrated in Nouadhibou, which is not bad in and of itself, but the off-shore coastal bar at Nouakchott excludes the use of any boat except the two prowd Senegalese canoes. The larger and heavier Japanese canoes turned out to be unusable because of this bar. The absence of a port does not favor the marketing of fish caught in the southern fishing villages such as N'Diago and Keur Macène. It has also led to the disappearance of certain

surrounding encampments. The case of this town should nevertheless receive the attention of the authorities to study its potential.

The Creation of a Ledger Line Fishing Fleet

The ledger line fishing boat is 13 meters long and 3 to 4 meters wide. It is equipped with a 70 H.P. diesel motor and has a freezer unit of about 10 cubic meters. It can spend 10 to 18 days at sea and it carries a crew of about 10 men. It is also equipped with a sounder. This kind of boat usually operates in waters of 80 to 100 meters deep. Its advantage is its ability to catch commercially valuable species such as Tióf (*Epinephelus aenus*) and gilt-heads (*Dentex* sp.).

The Seiner

The prototype of the seiner is a boat 18 m long and 5 to 6 meters wide, which gives a chance to the traditional fishermen of Nouadhibou to gain experience in the techniques of industrial fishing by using modern equipment.

Major changes are required in order to improve current fishing practices and to increase its productivity. It will be indispensable to set up a system of refrigeration all the way from the main fishing port to the vendor's stalls in the market place. In addition, there will have to be a system of freezer units for fish. This will necessitate:

- setting up the system,
- organizing the fish merchants.

It must be remembered that there are large losses between the areas where the fish are caught and where the catches are landed because there are no refrigeration facilities. The fishermen try to minimize these losses with the help of women,

who make gei. (12)

This method requires improvements (see Chapter on Processing and Storing).

Both fresh and dried fish are sold in the interior. Both wholesale fish merchants and fish mongers place a thin layer of ice between the fish as well as large blocks of ice on top of them and cover the whole with canvas to take the fish to market. That is generally the extent of refrigeration. In order to reduce losses and improve quality, the fish must be refrigerated as soon as they are caught and must remain cooled until they reach the consumer. This will require the construction of cold storage units in ports or on the beach, which was done in Nouakchott in 1980.

The fish must be carried to market in refrigerated trucks while efforts must be made to keep the fish refrigerated once they reach the market.

In order to insure product quality, the whole fish marketing system must be organized. This is why a freezer unit was built in Nouakchott. Such a system requires storage facilities in order to offset not only the seasonal changes in fishing but also the market fluctuation.

(12) sun-dried fish.

Chapter Three: CONSTRAINTS

In general, the main constraint affecting the traditional marine fisheries subsector is a lack of interest on the part of the government. The same is true for the fresh-water fisheries, which are considered to be a minor economic activity. There has never been any effective administrative support for traditional marine fishing.

Because of the absence of government support, traditional fisheries have suffered from a lack of the following kinds of infrastructure:

- technical
- transportation
- marketing
- processing

In addition, there has been nothing done to provide training for technical or commercial personnel in the subsector. Nor has there been any supervision or support provided. These last factors are needed in order to initiate the technical evolution of traditional marine fisheries.

3-1 The Nouadhibou Zone

Nouadhibou, in its role of the economic capital of Mauritania, is the key point for starting an evolutionary process in traditional fisheries, enabling the fishermen not only to improve their standard of living, but to integrate themselves into semi-industrial fishing within a reasonably brief period of time. This would be an intermediary step before they can participate in industrial fishing.

Unfortunately, traditional fishing overlaps with industrial fishing in the domains of infrastructure, and equipment. The boats from both kinds of fishing unload their catches at the same place and take on fuel and other supplies. A logical choice for a fishing port oriented to traditional fishermen would be Tierka or the Bay of Rest (Baie du Repos), which is a secure place. But according to the fishermen, this area is becoming silted up and its entrance is obstructed by old boats and trawlers, which endanger vessels entering the bay. The authorities should therefore make an effort to remove the wrecks and to dredge this area before it is given over to traditional fishing boats or improved by the construction of appropriate infrastructures (unloading, processing and storage facilities) which are now very limited. The same is true for transportation, which needs improving in order to distribute landings. Existing facilities must be improved and made more adaptable to the needs of the traditional fisheries subsector. This is necessary in order to:

- 1) prepare for the increased amount of production resulting from the introduction of new methods of catching fish, which the present port is not adequate to handle.
- 2) improve facilities for keeping fish on ice in small boats, which in spite of the use of outboard motors, often land less than high quality fish, usable only for drying and salting. Such products are suffering from a drop, even a disappearance of demand. In this zone, priority must be given to frozen products, which would find ready markets in Europe.

Attention must also be given to a problem of equal importance: repairs for traditional boats. In fact, although the group has had a repair shop for outboard motors since 1980, it keeps only certain spare parts in stock, and the upkeep of boats and launches is a serious problem for the owners, who often have to go to

Dakar or the Canary Islands. There are no stores that sell fishing material. If the marketing cooperatives were organized and structured, it would also be responsible for buying and selling the whole range of fishing equipment as well as spare parts. Each of the three cooperative groups should have an organization of this type within it to meet its own specific needs.

3) Marketing: the problem of marketing is extremely serious because of the losses caused by the forced dumping of excess catches. Nearly all of the fish processing plants in Nouadhibou have shut down. The absence of a market price list means that companies that agree to buy the products of their choice offer prices that do not suit the fishermen. The road between Nouadhibou and Nouakchott is in very bad condition and is interspersed with sections that are no more than tracks. The railroad, which is used to bring iron ore from Zouerate could, with the consent of S.N.I.M., be used to supply the market of Atar, which is of no small importance with 16,326 inhabitants. In order to do so, large (5 to 10 ton capacity) isothermal containers could be put on the mineral train cars available. At the end of the line in Zouerate, a cold storage unit could be used to keep the fish and make them available to a marketing cooperative.

4) The lack of financing to acquire the means of production and to finance fishing expeditions is also a large handicap.

The last seminar on the development of the fisheries sector, held from September 8 to 12, 1980, made special mention of this deficiency. An appropriate system of financial assistance must be set up, and taxes on fuel and other items used in fishing must be removed.

These last recommendations should be part of a government assistance program, which should also play a role in sensitizing the people and the political authorities to the need for encouraging and supporting this occupation, which has a very significant capacity to absorb manpower.

Independent self-training should be a possibility.

In order to encourage the fishermen, salaries should be raised, which are very low in relation to the cost of living. Technical, mid-level and upper-level cadres must also be trained in specialized institutions and grandes écoles (13). As in the inland fisheries subsector, there are no Mauritanian institutions concerned with training any level of personnel in this subsector.

3-2 The Arguin Bank Zone

The worst problem in this zone is its isolation. This fact makes it very difficult to supply water to the Imraguen villages; as a result, water is very costly (500 UM for a 200 liter barrel).

Although the government has agreed to take steps to improve the supply system of the zone and in spite of certain improvements resulting from the opening of food and supply stores in which goods are sold at lower prices, many problems remain unresolved, including housing.

Solving this problem should be given first priority; of all the Imraguen villages and camps visited, only Timiris (Nouamghar), with 500 inhabitants, had 5 permanent houses. These houses generally consist of a single room in which the whole family lives. The houses were built only through great sacrifices, which had to be made in order to bring in the water needed to make bricks and to plaster the walls.

(13) specialized government-run university-level training schools.

Elsewhere in Nouamghar and the other villages, housing conditions are appalling - sections of old barrels and pieces of wood are used to build with. Hygiene is non-existent and garbage is spread all around these makeshift dwellings. There are no septic tanks and pieces of fish are set out to dry on wooden racks amid all this rubbish, or even on the ground itself with hordes of flies and other harmful insects in abundance.

In camps, the Imraguen live on the beach itself or in tents (for the better-off) for a week or more, depending upon the availability of fish. Providing a permanent water supply is probably the best way to settle the Imraguen in one place and to improve their living conditions. Two possible ways of supplying water to the Imraguen villages have been mentioned earlier, that is, by road or by sea; a third realistic possibility still requires further feasibility studies: desalination of sea-water by solar energy. A team of USAID specialists recently undertook a field trip to Nouamghar to study this question.

Because of its simplicity, a desalination system using solar energy alone seems appropriate for this milieu and could be easily maintained by the local people.

This system could be made profitable by integrating it with other rural activities designed to improve living conditions. These include nutritional and preventive medicine programs and even family gardens, whose vegetables would improve the people's diet, which is now limited to rice, fish and tea. All of these projects should accompany the introduction of new kinds of fishing equipment capable of bringing in larger catches. However, a permanent water supply is by itself the key to solving most of the Imraguen's problems until better equipment is available.

The results of such efforts would have an immediate impact on the economy by increasing production and on society by settling families in one place. Posting of teachers and medical personnel is also essential, as is building a road to improve access to the Arguin Bank Zone.

Supervision is also lacking. In fact, the fishermen have no form of technical assistance whatsoever to build and repair boats (launches). The processing infrastructure is also deficient, consisting of cement basins without any protection. They are infested with insects and dirt which seriously endanger the quality of the produce; in addition, they disintegrate and become ruined through contact with seasalt.

The track linking Nouamghar and Nouakchott is risky for 2-wheel drive vehicles. The beach route is open at low tide only.

More details are to be given in Chapter 4. It is virtually certain that a first step in a development policy for the traditional fisheries is to raise them to a level of semi-industrial production as a preparation for the creation of a purely Mauritanian fishing industry.

A campaign to inform and interest young people in fishing must be undertaken at all levels.

All of these efforts must be supported by a credit system designed for this sector. Groups of fishermen would then be able to borrow equipment and be assured of a ready supply of spare parts. Taxes on fuel and other items used by fishermen must be removed; Mauritania is one of the few countries which does not permit this useful practice. The needs for a market price list cannot be over-emphasized in order to stop the haphazard sale of produce. In addition to organized cooperatives, a system of constant supervisory assistance is needed to insure effective management of production.

In short, the rational development of traditional maritime fishing requires several important factors:

- construction of fishing ports in the area around the Bay of Rest (Baie du Repos), at Nouakchott and Limsitt;
- linking Nouakchott and Nouadhibou with a paved road;
- increasing catches via more productive methods;
- setting up and enforcing a market price list;
- creation of a credit organization;
- reinforcing the Traditional Fisheries Service, with qualified personnel in order to carry out effective supervision.

Research in solar energy is needed in order to make desalination equipment operational. Distilling equipment could be set up in Nouamghar as a first step in spreading its use elsewhere. A comparative study of the means of solving the water problem is essential.

It will not be long before the future for dried and salted fish will be jeopardized by a shrinking African market. Efforts should focus on fresh frozen fish for the interior market, which is growing with each passing year. Once cold storage facilities are available on small boats, a good share of the landings at Nouamghar could be taken by sea to Limsitt, which would be a relay point for collection by isothermal trucks. Limsitt could also serve as a supply point for fuel and other items necessary in fishing.

3-3 The Nouakchott Zone

Unlike the Nouadhibou Zone, Nouakchott is the main storage and distribution center of catches landed by traditional fishermen for the domestic market.

Nouakchott already receives local catches as well as those sent down from K'Haïjrat and its refrigeration complex has already

proved to be too small. If the Saudi project creates a larger storage unit for the area, it will be able to receive some of the catches from Jimiris (Nouamghar) as well as those from N'Diogo and the Senegalese fishermen who spend the fishing season next to these cooperative groups. It will thus be possible to constitute back-up stocks for periods of low production and to plan the supply of fish to the interior.

In spite of the problem of the bar at Nouakchott, the Japanese canoes could be moored off-shore and transfers could be made in Senegalese canoes until a fishing port were built. Catches from N'Diogo and the fishing camps in the south could be easily carried by isothermal trucks because these camps are not more than 5 km from the paved Rosso road.

In order to facilitate the marketing process, a distribution circuit with cold storage facilities must be set up along the Nouakchott-Nema road corridor in order to supply more difficult-to-reach markets at a distance of 30 to 50 km.

In short, then, if the first measures are seriously considered and if a more rational use of the sector's potential is undertaken, Mauritania will be able to undertake the final phase of its sectoral development, which ought to be the industrialization of fishing. This strategy will contribute to economic recovery while at the same time making high quality animal protein readily available and contribute to the social advancement of the Imraguen.

Chapter Four: POSSIBILITIES

4-1 The following chapter will examine on-going projects (The Japanese and the FAO projects) and projects being implemented (Saudi and 5th EDF projects).

The Japanese Project

It is too early to draw conclusions from the two on-going projects, which are only in their first phase and have just become operational. The Japanese project has changed the face of traditional marine fishing in Nouakchott and the surrounding Imraguen villages.

The fragility of this complex and its total dependance on the outside in terms of spare parts and vehicles must be noted. Steps must be taken to continue the work of the project after the departure of the Japanese technician because of the inexperience of the fishermen in using particular implements and of the supervisory personnel in running the project. For the time being, the quality of the fish must be checked when the fish are unloaded, when they are stored and when they are distributed. The profitability of the complex must be studied, as well as all possibilities of extension or improvement, especially in the areas of management, maintenance and supervision.

The FAO Project

The FAO project is introducing line fishing in the Imraguen villages while at the same time providing transportation of catches to the Nouakchott refrigeration unit.

These two projects should be coordinated and oriented in such a way as to give maximum benefits to the traditional fisheries sector and enable it to rise above its present primitive condition. The failures in other activities in the rural sector

should be a lesson in how to avoid uncoordinated operations that endanger economic recovery policies. The authorities must become conscious of the interdependency of different actions, and that the failure of one can lead to the failure of others.

4-1-1 The Japanese Project

Mauritania is at present the beneficiary of a development project entirely financed by Japan.

The goal of the project is to create professional organizations among the coastal fishermen in Nouadhibou, Cape Timiris and Nouakchott in view of increasing their production and thus enabling them, as mentioned earlier, to supply the interior markets. 10 small launches, completely maintained and operated by Mauritanian fishermen and supervised by 2 Japanese technicians have been fishing in the Nouadhibou area since March 25, 1979.

Using boats capable of carrying 5 tons and by using straight nets 50 meters long, the fishermen's gross yield after 4 months of fishing was 403,505 tons valued at 5,437,928 UM, according to the project director in Nouadhibou.

The boats seem to be doing well since the water is calmer than in the Nouakchott area.

The second phase of the project is in Nouakchott, where a small refrigeration complex is already in place: it comprises 2 cold storage chambers with a 20 ton capacity, a small ice-making unit, selling areas, 3 refrigerator trucks, a repair shop, a large stock of material and 10 boats with a minimum capacity of 800 kilograms.

These boats require certain modifications to improve their manoeuvrability. Other measures are required for them to be moored, because the ocean is often rough at Nouakchott.

Project plans call for the construction of a cold storage unit in Aleg where the Daghé and Kaédi cooperatives as well as the fishermen's groups of Bababé, M'Bagne and other equally important centers equipped with transportation would come to get supplies for their local markets. This supply effort should go as far as Nema once the paved road gets that far.

The government's policy of supplying the interior markets from the traditional marine fisheries would be reinforced by cooperation between ocean and river fishermen. This would result in the creation of employment for the river fishermen, who have virtually no fish at present; in the near future this activity will continue to provide employment and income to the fresh water fishermen once they are organized in cooperatives. Covered pick-up trucks locally adapted to carry fish on ice are appropriate for the rural tracks whereas refrigerator trucks cannot be used off paved roads if they are to last a long time. The cold storage unit in Aleg could stock fish to supply places accessible by pick-up trucks. This unit would have an ice-making capability in order to provide ice to ship fish or to keep it for local consumption. An electric generator could provide power for the plant.

The refrigerator trucks that are to carry fish as far as Nema would normally return empty. There is thus a possibility of using them to carry fresh produce from the interior to Nouakchott.

The rental price of the pick-up trucks is very high and supplies of fish to the interior markets are irregular (see table listing rental prices). These rental prices will have to be regularized.

In Chapter 2 it was pointed out that fresh water fishing has dropped to the subsistence level and that sea fish trucked in from the coast have fortunately made up for the deficit.

This additional supply is very timely. Since the beginning of the drought, fish has become an increasingly popular element of the Mauritanian diet and is consumed in massive quantities. As a result:

- 1) The people dwelling along the Senegal River and its tributaries had a preference for fresh water fish but now eat sea fish as well. Certain Moors go to various ponds in the southeastern part of the country or to Imraguen camps along the northern part of the coast for fish diets (cures de poissons).
- 2) The Moorish population in general, which formerly consumed only meat, milk and grains, has begun to eat both fresh water and sea fish.

This phenomenon is irreversible, because it is now an integral part of peoples' food habits; it will be reinforced by the major development projects to be carried out in the river basin (which will benefit the entire population of Mauritania) and improved distribution of sea fish to interior markets. The demand for fish is to grow regularly because of sedentarization and the disappearance of shepherds, who have to be replaced by another type of herding and animal husbandry.

As a result, demand will always be higher than production of the two types of fish. All government and international donor efforts in the area of traditional fishing should contribute directly to reaching food self-sufficiency in this domain.

In order to reach this goal, an interior marketing network must be set up (see table 4-1). This network would be set up

along the Nouakchott-Name road corridor and a chain of cold storage units in centers along the paved road would be able to supply markets that are hard to reach. The Japanese project to develop traditional fisheries has carried out consultations preliminary to the installation of the first cold storage unit in Aleg. It will be able to supply the markets of Boghé, Bababé, M'Bagne, Kaédi, Magta Lahjar, Aleg itself and surrounding villages. The government should duplicate this effort in Kiffa, Aïoun el Atrouss and Nema as the paved road pushes eastward. One of the first positive results of the creation of the cold storage unit is to be the improvement of the marketing of fish. The fishing cooperatives and the merchants in the centers mentioned above will be certain to obtain their supply of fish in Aleg whereas they are now obliged to go to Nouakchott where they sometimes do not find any fish or are obliged to wait two or three days before finding any. In the future, their journey will be shorter and the quality of the fish will be better.

Thus, the development policy of traditional fisheries in the domain of self-consumption will be reinforced and will partially solve one of the problems troubling the government.

4-1-2 The FAO Project

The project's main objectives are:

- 1) to help the government set up or improve the means of production in traditional fisheries;
- 2) to improve the quality and distribution of catches in traditional fisheries.

The project is intended to meet animal protein needs of the population and to improve the social position of the fishermen while at the same time assuring a better use of the fishing potential of the country.

Table 4-1 Estimate of Potential Markets for Sea Fish in the Interior (1980)

Center	Quantity per day	Price (UM)	Comments on prices
Rosso	2 tons	65-70	not approved
Boghé	1 ton	40-50	approved
Bababé	250 kgs (14)	60	not approved
M'Bagne	450 kgs	80	not approved
Kaédi	1.5 ton	55	not approved
Sélibaby	500 kgs	90	not approved
Kankossa	450 kgs (15)	100	not approved
Total	6.150 tons		

Source: RAMS

(14) Bababé is sometimes supplied by surplus fish from Boghé and by fish from Senegal.

(15) Kankossa is supplied from time to time from Kiffa.

Furthermore, the project is designed to assist the Department of Fisheries:

- in setting up an operational basis for carrying out particular tasks;
- in identifying development projects in different fisheries sectors;
- in obtaining foreign or national funding and in preparing basic documentation needed to negotiated financing.

Through the National Oceanographic and Fisheries Research Center, the FAO will set up a pilot project to improve the techniques of traditional marine fishing. This will involve experimentation with new fishing methods and practical training of artisans.

4-2 Planned Projects

4-2-1 The Saudi Project

The Mauritanian government has received the sum of thirty-five million five hundred thousand (35,500,000) ouguiyas as a grant from the Kingdom of Saudi Arabia.

This sum is to finance the construction of:

1 Warehouse	5,040,000 UM
Construction materials	2,430,000 UM
and the purchase of:	
- 30 10-meter canoes	1,620,000 UM
- 37 25-HP motors - research canoes	234,000 UM
- 4 16-meter canoes	688,000 UM
- 5 45-HP motors - research canoes	877,500 UM
Fishing Equipment: Lump sum value	1,620,000 UM
(includes 32 nets and necessary fittings, floaters, cords, hooks and lines)	

This grant will certainly contribute to increased production through the number of boats equipped, the different types of hooks and the warehouse, which can be used for storage or repairs.

These items will help make up for inadequate storage and equipment facilities, which are completely lacking in certain places.

The economic impact of the project will be felt mainly in the areas of catches and supplies of fish.

4-2-2 The Fifth EDF Project

The European Development Fund (EDF) has granted 374 to 406,000,000 UM (four hundred six million UM) to the development of the traditional fisheries sector. This grant is part of the EDF's plan of assistance to developing countries that is drawn up every four years.

This sum is to finance the following operations:

1. improving access to the Imraguen villages through the purchase of two ships;
2. installation of a suction dredge in Nouadhibou;
3. construction of cold storage units in Nouakchott, Rosso, Boghé, Kaédi and Kiffa;
4. construction and improvement in the markets of Rosso, Boghé, Kaédi and Kiffa;
5. purchase of vehicles;
6. construction of maintenance garage;
7. starting of a savings fund for fishermen.

This grant, which covers the most basic limiting factors affecting traditional fisheries should help this sector to meet one of the government's goals in the efforts made for economic rehabilitation. This project should complement the Japanese project if it is properly implemented.

A P P E N D I X

TRADITIONAL FISHERMEN'S PRE-COOPERATIVE

"T I M I R I S"

B.P. 165

Nouadhibou.

REGULAR GENERAL ASSEMBLY

February 1, 1980

Fiscal years 1978 and 1979

"TIMIRIS" Pre-Cooperative
 B.P. 165
 Nouadhibou.

Statement of Assets

Assets

Amount	Depreciation or Reserves	Net Amount	Subtotals
<u>Fixed Assets</u>			995,885
Boats and Equipment	793,400	198,350	595,050
Vehicles	490,000	89,165	400,835
	<u>1,283,400</u>	<u>287,515</u>	<u>995,885</u>
<u>Operative Budget</u>			466,120
Caviar Stock (*)	466,120	--	466,120
<u>Realizable Assets</u>			2,232,499
Debts due from members	2,161,811	--	2,161,811
Diverse Accounts receivable	70,688	--	70,688
	<u>2,232,499</u>		<u>2,232,499</u>
<u>Liquid Assets</u>			71,900
Central Fund	71,900	--	
			3,766,404

(*) poutarque

as of December 31, 1978

	Liabilities	
	Sub-Totals	
Capital		869,000
Short-term Debts		2,274,016.29
Suppliers	155,570	
Client creditors	585,279	
Various Creditors	92,495	
Liabilities regular- ization account	<u>11,000</u>	
		844,344
Banks	1,429,672.29	
		<u>1,429,672.29</u>
		2,274,016.29
Result		623,387.71
		3,766,404

"TIMIRIS" Pre-Cooperative
D.P. 165
Nouadhibou.

1970 Fiscal Year

Operating Expenses

Sales		1,087,860
Tanouderte Product		85,671
Commission		923,865
Membership dues		165,200
Purchases	607,475	
Purchase Overhead	27,175	
Personnel Costs	285,514	
Taxes and Duties	1,050	
Outside Works	211,452	
Transportation and Travel	101,980	
Miscellaneous administrative costs	63,603	
Cost of financing	44,859.29	
Revenue excluding depreciation	919,407.71	
	<hr/>	
	2,262,596	2,262,596

"TIMIRIS" Pre-Cooperative Group
B.P. 165
Nouadhibou.

Fiscal Year 1970

Account of Losses and Profits

Revenues		919,407.71
Losses and Profits from previous F.Y.	0,505	
Depreciation Costs	287,515	
Profit	<u>623,387.71</u>	
	919,407.71	919,407.71

"TIMIRIS" Pre-Cooperative
 B.P. 165
 Nouadhibou.

Statement of Assets

Assets

	Amount	Depreciation	Net Amount	Subtotals
		or Reserves		
Fixed Assets				781,160
Vehicles	999,849	296,641	703,208	
Office materials	85,000	7,040	77,960	
	<u>1,084,849</u>	<u>303,681</u>	<u>781,168</u>	
Operating Budget				114,645
Merchandise in stock	114,645	-	114,645	
Realizable Assets				4,519,700
Debts due from members	2,374,105	-	2,374,105	
Diverse accounts receivable	187,527	-	187,527	
Management debts	360,183	-	360,183	
Warehouse Clients	179,858	-	179,858	
Fish purchasers	1,327,241	-	1,327,241	
debts of personnel	90,786	-	90,786	
	<u>4,519,700</u>		<u>4,519,700</u>	
Liquid Assets				3,770,424
BALM (*)	3,261,087	-	3,261,087	
Central Fund	43,301	-	43,301	
Timiris Fund	474,036	-	474,036	
	<u>3,778,424</u>		<u>3,778,424</u>	
				<u>9,193,937</u>

(*) Banque Arabe Lybienne pour la Mauritanie

as of December 31, 1979

Liabilities

Capital		953,245
Short-term debts		2,223,848.83
Salaries due	70,000	
Social Security	<u>177,933</u>	
		247,933
Banks	<u>1,990,549.83</u>	
		<u>1,990,549.83</u>
		2,238,402.83
Accounting Results		6,002,209.17
Result 1978	623,387.71	
Result 1979	1,689,544.46	
Project	<u>3,689,277.00</u>	
		6,002,209.17

9,193,937

"TIMIRIS" Pre-Cooperative

B.P. 165

Nouadhibou.

Fiscal Year 1979

General Operating Expenses

Sales		12,999,005
Commissions		3,273,703
Membership Dues		45,800
Purchases	1,462,100	
Cost of freezing	33,200	
Overhead on purchases	8,200	
Management share	4,717,515	
Crew rations	539,130	
Salaries	1,170,925	
Social Security Costs	360,779	
Taxes and duties	6,920	
Rent	88,000	
Building upkeep	8,160	
Maintenance of vehicles	208,449	
Maintenance of boats	159,804	
Small tools	48,023	
Boat accessories	110,755	
Electricity	1,960	
Fuel	1,143,009	
Insurance	13,914	
Commissions	196,400	
Official travel	102,753	
Loading and unloading	15,220	
Office supplies	43,607	
Postage	1,000	
Incidental management costs	76,130	
Cost of Financing	207,129.54	
Result	5,595,287.46	
	<u>16,318,508</u>	<u>16,318,508</u>

"TINIRIS" Pre-Cooperative
B.P. 165
Nouadhibou.

Fiscal Year 1979

Operating Expenses

Sales		1,735,955
Commissions		3,273,703
Membership Dues		45,800
Purchases	1,462,188	
Overhead on purchases	8,260	
Management share	78,007	
Crew rations	9,201	
Salaries	722,496	
Social Security Costs	2,485	
Taxes and duties	6,920	
Rent	88,000	
Building upkeep	8,160	
Vehicle maintenance	208,449	
Boat maintenance	39,940	
Small tools	2,100	
Electricity	1,960	
Fuel	50,658	
Insurance	13,914	
official travel	102,753	
Loading and unloading	15,260	
Office supplies	43,607	
Postage	1,000	
Incidental management costs	76,130	
Cost of financing	207,129.54	
Result	1,906,010.46	
	<u>5,055,458.00</u>	<u>5,055,458.00</u>

"TIMIRIS" Pre-Cooperative
B.P. 165
Nouadhibou.

Fiscal Year 1979

Japanese Project Budget

Sales		11,263,050
Cost of freezing	33,200	
Management share	4,638,708	
Crew rations	529,849	
Salaries	448,429	
Social Security	358,294	
Boat maintenance	119,864	
Small tools	45,923	
Boat supplies	110,755	
Fuel	1,092,351	
Commissions	196,400	
Result	<u>3,689,277</u>	
	11,263,050	<u>11,263,050</u>

"TIMIRIS" Pre-Cooperative
B.P. 165
Nouadhibou.

Fiscal Year 1979

Account of Losses and Profits

Revenues		5,595,287.46
Losses and Profits from previous F.Y.	28,100	
Diverse Losses and Profits		26,150
Depreciation costs	246,516	
Profits	<u>5,378,821.46</u>	
	5,621,437.46	<u>5,621,437.46</u>

"TIMIRIS" Pre-Cooperative Group
of Traditional Fishermen
B.P. 165
Nouadhibou.

Ordinary General Assembly of 2-1-1980

At eleven o'clock on the first of February in the year one thousand nine hundred and eighty, the members of the Timiris Pre-Cooperative Group of Traditional Fishermen, whose assets of 953,000 ouguiyas are divided into 953 shares of 1,000 ouguiyas, met in an ordinary general assembly.

The assembly was presided by Mr. Ahmedould Ahmed Salem. The canvassers chosen were Mr. Cheibanyould Lehlou and Mr. Ahmedould Abd'Allahi and the secretary chosen was Sid'Ahmedould Abeid. Since more than 2/3 of the members were present, the assembly was legitimately able to deliberate in accordance with its Charter.

The President recalled the order of the day:

- 1) Approval of the accounts of F.Y. 1978 and 1979;
- 2) Miscellaneous questions;
- 3) Committee elections.

After having given all necessary explanations concerning activities during 1978 and 1979, the President gave the floor to the Auditor, who gave his report on fiscal years 1978 and 1979.

The President put the following resolutions to a vote:

1st Resolution

Having heard the explanations given by the President and the Auditor's report on fiscal years 1978 and 1979, the Assembly approved these accounts and gave full discharge to the members of the Management Committee.

2nd Resolution

The Assembly decided to abolish monthly membership fees.

3rd Resolution

The Assembly decided to establish family contributions at 10,000 (ten thousand) ouguiya.

4th Resolution

The Assembly gave complete authority to the Management Committee to exclude one or more members who do not work in the general interest of the Traditional Fishermen's Cooperative or who do not abide by the regulations of the Pre-Cooperative.

5th Resolution

The Assembly gave complete authority to the Management Committee to establish a cut-off date for joining the Timiris Traditional Fishermen's Pre-Cooperative.

6th Resolution

The Assembly strongly supported the Management Committee and congratulated it for the positive work already accomplished in the general interest of Traditional Fishermen.

7th Resolution

The Assembly maintained the Management Committee's respective functions for fiscal year 1980.

All of these resolutions were adopted unanimously. Since nothing was left on the agenda, the meeting was ended at 3 o'clock p.m. and these minutes were written based on all of the above, and after having been read, were signed by the committee members.

The Secretary

The President

The Canvassers

BIBLIOGRAPHY

- CILSS/FAO/ROME, 1979. Consultation to promote the fishery development in the Sahel.
- Anon 1979. Report on the fishery task force, model of development programme fishery sector. CILSS.
- Anon 1977. The Fisheries of the Sahelian countries prepared by Roger Aubray for the fishery sub-group of the Working party of the club of friends of the Sahel. CILSS/pêche/77/inf. 5.
- Anon 1977. The fishery of Gambia. A comprehensive report. CILSS/Pêche 77.
- Anon 25 mai au 1 juin 1977. Deuxième réunion du club des amis du Sahel. Rapport de l'équipe pêche modèle de programme sectoriel pour la pêche. CILSS.
- Anon, 1977. Programme par pays. Assistance demandée au PNUD par le gouvernement de Mauritanie pour la période de Janvier 1977-Décembre 1981.
- Camine, Mathew, et al., 1979. University of Rhode Island, Artisan fishery Technology: Ghana a case study of a West African Fishery Food Research Institute, Accra, Ghana.
- Anon. Proceedings of the fisheries research planning workshop C the title XII program AID contract N AID/ah - 01135 - 12.
- Ministère du Plan et des Mines, 1976-1980. 3ième Plan de Développement Economique et Social.
- Sylla, Assane, 1976. La philosophie morale des Wolofs Sankore. B.P. 7040 Dakar (Senegal).
- Anon 1979 FI : DP/LAU/73/007. Développement des Pêches Maritimes Mauritanie. Rapport tech. No. 1. Les pêches artisanales en Mauritanie. Situation actuelle et perspectives du développement. PNUD, Rome.
- SCET International, p. 1 25 September 1978. Ministère de l'Industrie, des Pêches et de la Marine Marchande 1978. Le marché des produits de la pêche à Nouakchott dans le Sud et l'Est mauritanien.
- Anon 1978. Plan National pour le développement des pêches continentales du Sahel Mauritanie. CILSS: cas/Pêche/78/5.4 FAO, Rome, Italy.
- Anon. Rapport sur les assistances extérieures en matière de développement. République Islamique de Mauritanie, 1977. PNUD, Nouakchott.

- AID. Proceedings of the Fisheries Research Planning Workshop.
- CAMINE, Mathew and Rhode University. Artisan Fishery Technology: Ghana: A Case Study of a West African Fishery Food Research Institute, Accra, 1979.
- CILSS. Report of the Fishery Task Force: Model of Development Programme - Fishery Sector. 1979.
- The Fisheries of the Sahelian Countries prepared by Roger Aubray for the Fishery Sub-Group of the Working Party of the Club of Friends of the Sahel. 1977.
 - Consultation to Promote the Fishery Development in the Sahel, Rome. 1978.
 - The Fishery of Gambia, a Comprehensive Report. 1977.
 - Deuxième réunion du Club des Amis du Sahel - Rapport de l'Équipe pêche, modèle de programme sectoriel pour la pêche. 25 mai - 1er juin 1977.
 - Plan National pour le développement des pêches continentales du Sahel. Vol. Mauritanie, Rome. 1978.
- Ministère du Plan et des Mines. 3ème Plan de Développement Économique et Social (1976-1980). Nouakchott. 1975.
- PNUD - Programme par pays - Assistance demandée au PNUD par le Gouvernement de Mauritanie. 1981.
- Développement des pêches Maritimes en Mauritanie, Rome. 1979.
 - Rapport sur les assistances extérieures en matière de développement. Nouakchott. 1977.
- SCET - Ministère de l'Industrie des Pêches et de la Marine Marchande - Le Marché des produits de la pêche à Nouakchott dans le sud et l'est Mauritanien. Nouakchott. 1979.
- SYLLA, Assane. La Philosophie Morale des Ouolofs Sankoré. Dakar, 1978.