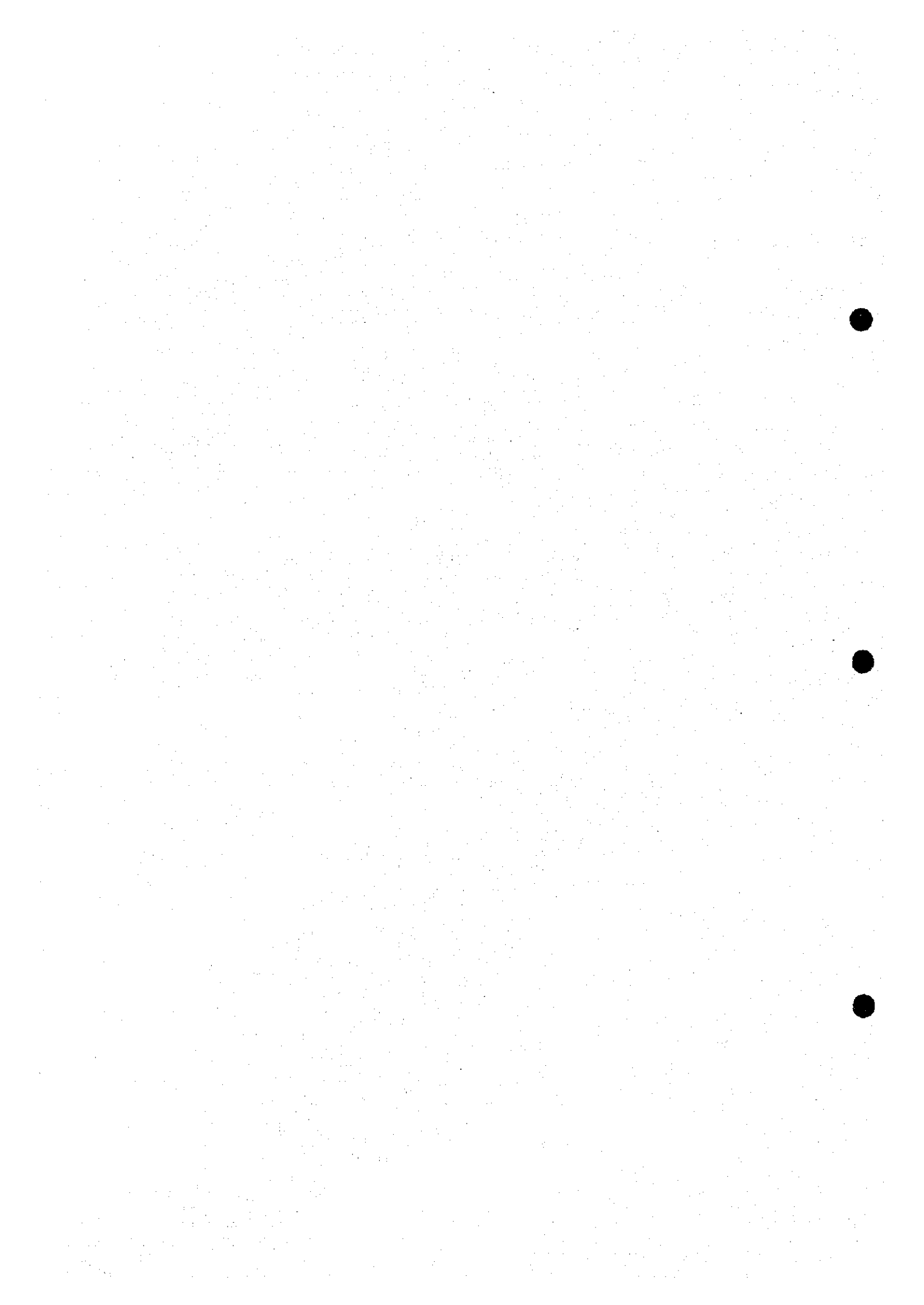


CHAPTER 2



CHAPTER 2 SYNOPSIS: THE KINGDOM OF MOROCCO

2-1 Economic Condition

In the mid 1970s, Morocco was pursuing a policy of rapid economic growth. It achieved high growth as a result of increased export income brought on by a boom in the sale of phosphate rock, its staple export in the wake of the first oil crisis. After 1976, however, loans from foreign countries and excessive public investment became a continuing trend. At the same time, due to strife on the front lines in Polisario, soldiers were being dispatched in increasing numbers. The conflict put the economy in the red and led to an international trade deficit. These developments were above and beyond the falling price of phosphate rock. In the 1980's, Morocco entered a 5 year recession. Fuel prices climbed in the wake of the second oil crisis. This, coupled with an inflated dollar and a depressed market for phosphate rock, threw Morocco into a severe economic crisis.

After 1983, acting on the advice of the World Bank, Morocco opted for Structural Adjustment. This entailed the pursuit of free-trade policies, increased exports, private investments, tax reform and spending restraints. As a result, Morocco's economy was gradually put on the road to recovery.

In the 1990's, the country saw an extended period of drought. The economy had entered a slump, due to a decrease in agricultural production. In 1994, sufficient rainfall increased production and brought recovery, and Morocco set an economic growth record of 11.5%. In 1995, however, Morocco again experienced a drought and saw a rock bottom rate of economic growth. In 1996, with favorable rains, the country rebounded to set a new record for economic growth of 11.9%. Again, in 1997, the country was blessed with continuing rains, leading to a forecast of an increase of over 4% in the Gross Domestic Product (GDP).

Fundamentally, Morocco is an agricultural country based on a free market economy. While agriculture is its main concern, the government has a policy of progressive industrialization. In 1988, through policies based on the Structural Adjustment, the government sought to develop agricultural villages and pursued a socio-economic system based chiefly on small to medium sized industries. Such policies were intended to produce sustainable economic growth. In addition, the government implemented new investment laws, relaxed foreign exchange regulations for Moroccan immigrants working in Europe, removed foreign exchange rate restrictions; and, moreover, promoted a more favorable investment climate by privatizing the management of quasi-public industries and encouraging private and foreign investment. At the same time, Morocco has cut subsidies and instituted a series of tax reforms to give even greater impact to its programs for financial reconstruction.

The Moroccan economy is characterized by unstable agricultural production, based on varying patterns of rainfall; and, an unstable balance of trade, based on the fluctuating prices of phosphate rock and fuel oil on the international market. Moreover, the high unemployment rate of Moroccan youth and the wide gap between rich and poor are economic problems which must be dealt with hereafter.

Morocco is in close proximity to Europe. It has sought to use this advantage to join the broad based "European Union", and the country has to challenge thorny reform measures, such as one that would allow for free trade within 12 years.

2-2 Commercial Fishing Sector

1) Outlook

Until now, the development of commercial fishing in Morocco has focused on the modernization of offshore commercial fishing. To tap the rich deep sea fishing resources offshore, Morocco has employed foreign fleets comprised mainly of Spanish vessels to catch fish in Moroccan waters under Moroccan authority, using the offshore Canary Islands as its base of operations. Moreover, due to problems of sea currents and a lack of berthing facilities, the bulk of catches made by ships registered in Morocco have been landed in Las Palmas (Spain). To rectify such conditions, Moroccan government promoted modernization of Moroccan fishing vessels. This led to the increasing emergence of commercial scale steel fishing trawlers. Even after this, however, the crews were of foreign origin, the catches were landed in foreign ports, processing was done in foreign countries and the produce was purchased by foreign consumers. Since such conditions have been long standing, the real economic contribution of fisheries sector to Morocco's national economy has remained at a low level. Therefore, to "nationalize" its fishing industry, the Moroccan government has implemented various commercial fishing development programs to: promote the training of Moroccan crews, create a fishing port infrastructure, obligate the local landing of catches, and promote local processing.

The needs of the coastal fisheries (i.e., mid-class trawlers and seiners), such as the construction of a fishing port infrastructure and the establishment of distribution systems, have been met through government-sponsored programs. On the other hand, the construction of processing factories and the expansion of fishing fleets were made possible by private investors. However, since the mid-class fishing boats being used were wooden vessels, they are not very efficient, fish hold can not keep catch cool, and there are a lot of obsolete ships. Moreover, a large portion of the fish being caught was of the less expensive pelagic fish and quality control measures were inadequate, the management have been caught in a financial problem. In addition, since these vessels have limited range, there is the fear that resources of coastal pelagic fish may be depleted by overfishing.

Besides the two types of commercial vessels referred to above, there are about 12,000 wooden fishing vessels of various types engaged in artisanal fisheries. These operations being conducted in local waters by low-income fishermen served by about 120 landing sites nationwide. Till now, this segment of the fisheries sector does not, for the most part, seem to have been affected by any type of government policy, except motorization of boats since 1986.

Between 1990 and 1995, the total production of Morocco's commercial fishing industry saw a 50% increase, having sharply risen from 568,771 tons to 852,048 tons. (Table 2-1) A closer look, however, reveals a general decline in the production volume of offshore fishing, which declined from 133,000 tons in 1990 to 114,000 tons in 1995; and a fairly consistent rise in the production volume of coastal fishing, which went from 427,000 tons in 1990 to 729,000 tons in 1995. The production of aqua culture and algal collection has also been on the rise, having gone from about 8,000 tons in 1990 to nearly 10,000 tons in 1995. Almost all of the increase shown in coastal fishing production has been due to increased sardine catches in the Atlantic Ocean. This increase may be attributed to the Moroccan government's current policies for the promotion of coastal fishing. However, the worldwide trend of decreasing sardine catches based on climatic changes is reflected in Morocco's dwindling resources, as well. The volume of the 1996 catch, for example, was 31% lower than the 1995 catch, having sunk to the 392,000 ton mark, and the trend continued through 1997. It should also be mentioned that, since the demersal fish resources of coastal waters are largely comprised of high-cost export varieties, it is felt they are making a great contribution to Morocco's economy, even if their quantity is limited. Of course, much of the catch is attributable to artisanal fishermen and there are many unknown factors.

In the same vein, the export of marine products in the same 5 year period (1990 to 1995) rose 25%, in terms of volume; and 53%, in terms of income generated. The export items and their countries of destination fall into three broad categories, as follows: fresh fish, freeze/processed to the EU; freeze octopus to Japan; and processed products to African countries.

Table 2-1 Changing Volume of Production for the Fishing Industry (Unit of Measure : Tons)

	1990	1991	1992	1993	1994	1995
Coastal Fishing	427,650	442,931	414,202	474,792	608,939	728,721
Offshore Fishing	133,396	147,838	131,500	144,805	134,600	113,765
Miscellaneous Fishing	7,725	9,313	9,234	8,519	7,147	9,562
Total Production	568,771	600,082	554,936	628,116	750,686	852,048

Source : La mer en chiffres 1995

Table 2-2 Changing Volumes and Income Levels for Marine Products (Export Volume Unit of Measure : Tons)
(Export Income Unit of Measure : 1 Million DH¹⁾)

	1990	1991	1992	1993	1994	1995
Export Volume	188,060	218,932	189,106	198,852	209,030	236,710
Export Income	4,445,150	5,439,885	4,870,699	5,141,307	5,874,448	6,824,062

Source : La mer en chiffres 1995

2) Long-term Development Goals

The Moroccan government has provided the following guidelines for the proper development of the fisheries sector:

- (1) The proper use of current resources and the development of resources not yet utilized,
- (2) Increasing the real income produced by fishing; and
- (3) The development of human resources

1. Projected Commercial Fishing Production Volume: 1 Million Tons

The above projection (1 million tons) is based on a recorded annual catch of approximately 850,000 tons in 1995, and is not considered as a difficult goal to reach. In reaching this goal, however, after setting an appropriate amount of consumption of the fishery resources that is sustainable the number of foreign fishing vessels will need to be reduced and new fishing ground will need to be made available. In particular, untapped resources off of Morocco's southern coast will need to be developed. For this purpose, a localized commercial fishing infrastructure will need to be developed and commercial fishing fleet will need to be reinforced. Moreover, if this goal is to be achieved, increased fishing abilities (based on updating the coastal fishing fleets) and the balanced allocation of vessels are indispensable measures.

2. Projected Export Income from Marine Products: US\$1 Million

The current income produced by Morocco's marine exports is about 800 Million US dollar, which represents approximately 14.5% of Morocco's total export income. To achieve the projected income goal, efforts must be made in the following areas: increasing the average volume of catches, improving quality control measures, exploiting higher added value of products, developing new export items and pioneering new export markets. Toward these ends, investment must be made in multi-faceted technologies which

¹⁾ Morocco's Monetary Conversion Rate : 1 DH (Dirham) is approximately 12 Japanese Yen (1997).

need to be put in place, in such areas as: quality control measures for the preservation of catches, improved fish storage facilities, modernized processing facilities, updated distribution systems, improved processing technology and overseas product advertisement. In addition, it must be noted that, since much of the fish caught by artisanal fishermen is for export, the promotion of this sub-sector will directly contribute to the increase in volume of exports.

3. Local Consumption: A Two-fold Increase

In 1993, the per capita consumption of fish in Morocco was 7.5 Kg per annum. This means that 225,00 tons was consumed in Morocco that year. Raising consumption to the level of 400,000 tons will require an aggressive national campaign to increase the general consumption of fish. While fish is readily available to the coastal population, it is very hard to obtain for those living in inland areas. Efforts must be made to improve the distribution system for inexpensive pelagic fish, such as sardines; organize an inland distribution infrastructure; and to promote fish as a staple food, through publicity and education.

4. Increased Employment: additional 100,000 persons

At present, approximately 300,000 persons are employed in occupations that relate to the fisheries sector. Thus, the planned increase of 100,000 persons will bring the total to 400,000. However, since the government has stopped new entry to the fishing boat registration, the new workers will necessarily be restricted to land-based occupations, but for the fishery resources are limited, development in these fields is indispensable to promote the marine products industry as a whole. Thus, the marine products processing industry, fishing vessel repair facilities and marine products distribution are expected to be promising areas for capital investment hereafter; and employment in these fields is expected to increase at an accelerated rate.

Reaching these goals and achieving sustainable production will require a careful examination of development potential and a balanced allocation of fishing efforts. Moreover, enhanced conditions for investment in the marine products industry and the training of outstanding professionals are urgent issues to be addressed.

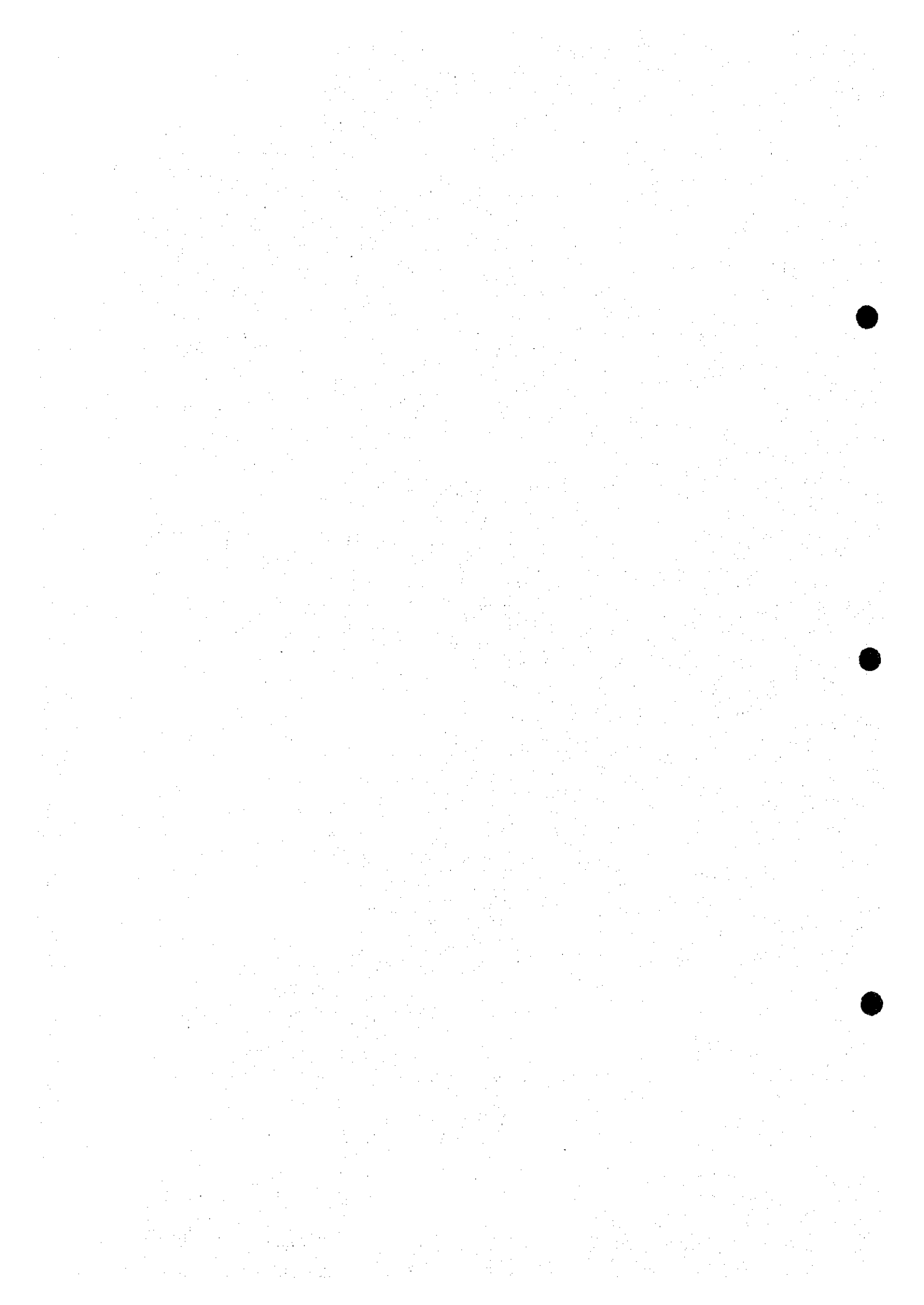
3) Project Plan: Development of the Artisanal Fishery

In 1988, through ONP (Office National des Pêches), artisanal fishery support plan was made to enhance the capabilities of wooden fishing vessels through supplementary equipment, but no noteworthy policies have been made in the field of infrastructural development.

However, the government has now begun to regard the artisanal fishery as a way to end the wide urban-rural gaps in income, levels of education and public sanitation, as well as a means of solving problems of imbalanced population distribution. The artisanal fishery is viewed as an industry with great development potential that can yield high employment and high income; and, yet, require relatively small capital investment. A major policy of the MPM in its Fishing Sector Development Plan for the period 1996 to the year 2000, is the development of fishing villages. In this regard, MPM is proceeding plans for a developmental infrastructure, and is conducting feasibility studies for the development of fishing villages at 12 separate locations. A 2 year study will formulate a Master Plan for Development. Thereafter, "model" fishing villages will be chosen and specifications for detailed development will be drawn up.

Apart from this project, plans for the development of 20 nationwide small-scale refugee harbors are being drawn up by MTP (Ministère des Travaux Publics). At these harbors, commercial fishing support facilities will be provided. The centers are expected to make a great contribution to the development of the artisanal fisheries.

CHAPTER 3



CHAPTER 3 PRESENT CONDITION SURROUNDING THE ARTISANAL FISHERY

3-1 Present Condition of the Artisanal Fishery

3-1-1 Outline of Artisanal Fishery in Morocco

Artisanal fishery is a traditional fishery. Fishermen started to gather on sandy beaches adjacent to the sea with abundant fishery resources, that formed landing beaches and fishing villages naturally. Because there is no natural harbors safe and calm enough to moor fishing boats along the coast line of Morocco, boats must be landed on the sandy beach when they returned from fishing. The size and weight of a fishing boat is limited as the boat is carried by the fishermen themselves (Length 4-6m, Width 1-2m, Weight less than 2 tons). Most of these fishing boats are driven by outboard engines, whose power is mostly from 8HP to 20HP. Three to four fishermen go fishing together on board.

Because of the smallness of the boat size and engine power, it is dangerous to go through a break water zone several tens of meters off the shore even if the sea is just a little rough. Therefore, fishermen can only sail out on limited number of days. Their fishing ground is often limited within about 2 miles off the coast line to avoid danger. Nonetheless, many accidents seem to happen around the break water zone. Such accidents seem to happen continually as their boats turn over just before getting to their home beach after fishing. During this study was conducted, a boat with 3 fishermen aboard turned over and all of them died. According to the MPM, 75 fishermen died of accidents in 1996, 14 of them were of artisanal fishery.

Fishing grounds of artisanal fishery are limited within a radius of 40km of the landing beach, and most of them are less than 4km off the coast. That is so natural when thinking that fishermen gathered at a beach near a good fishing ground in the course of forming a fishing village, but it could be also said that because of the danger in sailing out to off shore on a small boat, they can't help working near the coast. Almost all the beaches have rivers nearby, so the near shore area is supplied with nutrient salts. In addition, along the coast on the Atlantic side there is broad area generating upwelling, so the amount of basic biological production is rich.

According to a recent study by the World Bank, 12,000 artisanal fishing boats are registered all through the country. But 6900 of them are actually operating. As 2,000 of the operating boats are registered in the major ports, 4,900 boats belong to artisanal fishing villages. The number of fishermen was estimated to be 20,700 in the report (the World Bank Report, 1996).

Likewise, a study in 1995 by CID (a semi-governmental consulting company) for the Department of Port of MTP, covered 123 sites of artisanal fishing villages from Saidia on the Mediterranean side to Dakhla on the Atlantic side. They reported the number of all the fishing boats was 6,500. The number of fishermen was estimated to be 25,793 in this report. Later, CID conducted more detailed survey at 12 selected fishing villages for the MPM in 1996, and the initial number was revised. It suggests that because the fishermen and their boats move seasonally, grasping their actual number is very difficult. The tables shown next are the data from 3 studies on artisanal fishing villages since 1985. In 1985 there was no fishing operations in the South Morocco (Zone F). Table 3-1-1 shows that the number of fishing boats in the Mediterranean area (Zone D and E) was almost changeless as a whole, while the fishing boats in the middle of the Atlantic coast (Zone B) increased and fisheries activities in the South Morocco area was increased.

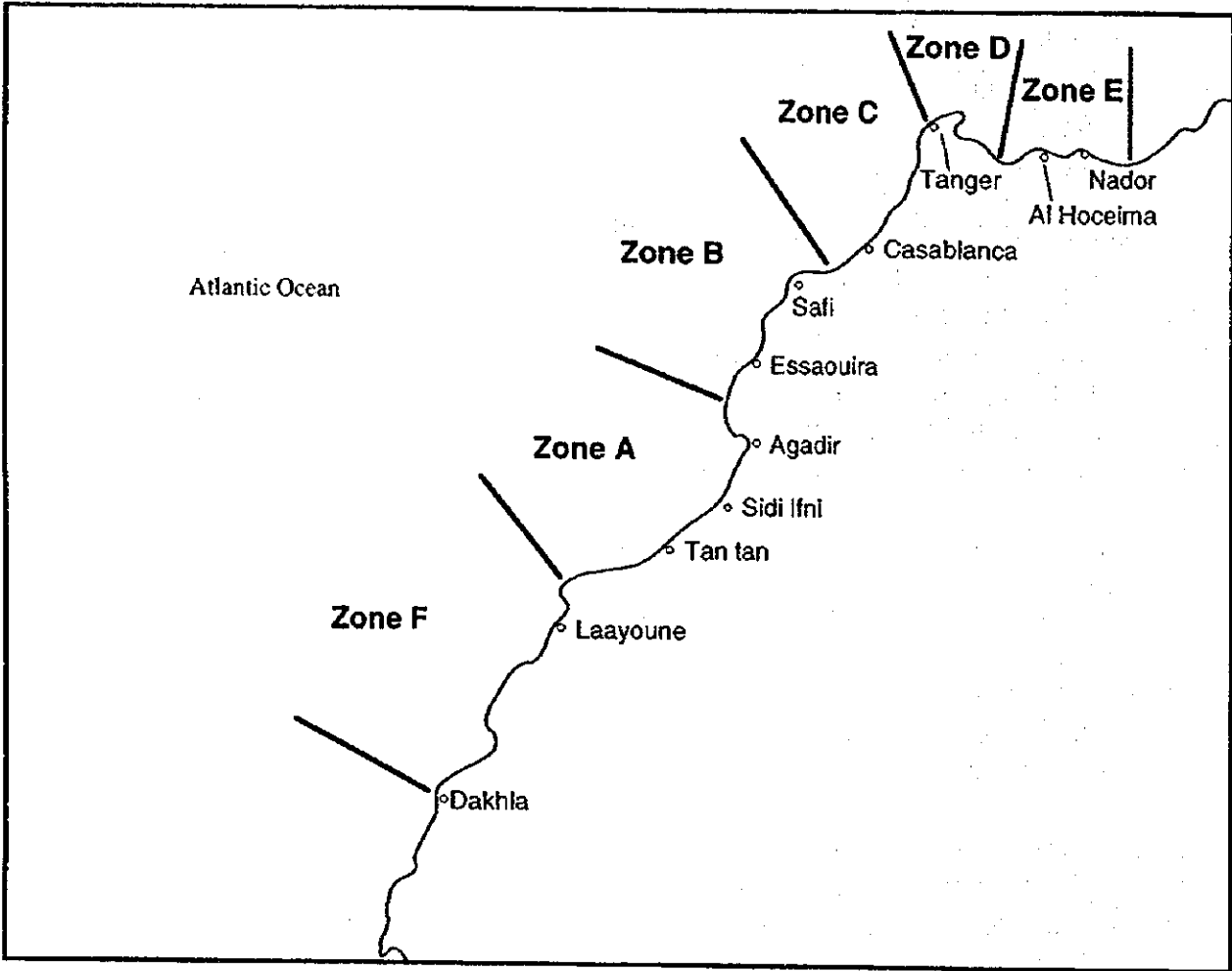


Fig. 3-1-1 Zoning map of Moroccan waters

Table 3-1-1 Number of Operating Artisanal Fishing Boats by the Fishing zone in Morocco

	1985	1990	1996
Zone F		1,300	1,500
Zone A	2,666	1,000	1,000
Zone B		1,300	170
Zone C		1,100	1,100
Zone D	1,575	NA	900
Zone E		NA	700
Total	4,241	NA	6,900

Note

Zone F: Amgiou - Dakhla (South Morocco), Zone A: Tighrte - Tarfaya
 Zone B: Sidi Bouzid - Immesouane Zone C: Tanger - El Jadida
 Zone D: Jebha - Oued Aliance Zone E: Saidia - Takamout

1985: Reported by FAO. In this report the number of boats is only divided into "the Mediterranean sea" and "the Atlantic".

1990: Reported by INRH

1996 (the World Bank): the World Bank Report.

NA: No Data.

Table 3-1-2 Estimated Catch of Artisanal Fishery by Zone (tons)

Year	1985	1990	1996
Zone F	NA	7,300	7,305
Zone A	4,251	5,224	5,200
Zone B	2,418	7,609	7,599
Zone C	3,822	2,332	2,354
Zone D	NA	NA	
Zone E	NA	NA	4,800
Total	20,000 (not a total)	NA	27,258

Note: The sources are the same as Table 3-1-1 above. Totals for the Mediterranean Sea area in 1996 (World Bank) and totals for 1985 are estimate values and differ from the figures given in the above table.

Table 3-1-3 Total Landed Value (thousand DH) by Artisanal Fishery by Zone

	1985	1990	1996
Zone F	NA	NA	65,745
Zone A	39,245	96,610	93,600
Zone B	40,035	110,700	113,985
Zone C	62,973	25,440	25,894
Zone D	NA	NA	38,400
Zone E	NA	NA	
Total	202,000 (not a total)	NA	337,624

Note: The sources are the same as Table 3-1-1 above.

According to the FAO report in 1985, about 20,000 tons of high-priced fish and Crustacea like spiny lobsters were estimated to be landed by artisanal fishery. This catch was 40% of all the landed quantity of high-priced fish by coastal fishery. This corresponds to about US\$20.2 million (202 million DH) as total

beach trade price, and is a match for the total landed value of the coastal fishery except for pelagic fish like sardines (23.5million US dollars).

The landing was estimated to be increased to 27,000 tons or 338 million DH in 1995 (World Bank 1996). Major change is that there was an additional catch from the South Morocco area, and the quantity in middle Atlantic-side area was increased during this period. It is suggested that because the fishermen in the North Atlantic area moved south, the catch in north Atlantic-side area (Zone C) decreased. It is said that as the price of fish in the North Atlantic was low, they left for the south where both price and catch were good. (Table-1,2,3)

The migration of fishermen seems influenced by seasonal factors and weather. It was observed that fishermen live on the landing beach near their fishing ground (their home place) during the summer time when the sea is calm, while in winter they moved to major fishing ports. Regarding the artisanal fishery on the Mediterranean side, it was reported that migration of the fishermen was not so popular and the situation was comparatively stable (Belkhaouad and others, 1992).

The fish species caught by the artisanal fishery are mainly demersal fish such as European conger (Congre, *Conger conger*), snappers and sea breams (*Sparidae*), soles and flounders (sole, *Soleidae*). In addition to the demersal species, octopuses (poulpe, *Octopidae*), squids (Calmar, *Loligidae*), cuttlefish (*Sepia*, Seich, *Sepidae*) shrimps and prawns (*Crevettes*, *Aristeidae*, *Crangonidae*, *Pandaidae*, *Peneidae*), spiny lobsters (*Langoustes*, *Palinuridae*), European lobster (Homard, *Homarus vulgaris*) contribute a lot as income source. Swordfish (Espadon, *Xiphias gladius*) and bluefin tuna (Thon rouge, *Thunnus thynnus*) are fished seasonally. In the Mediterranean, sardines (Sardine, *Sardinella spp.*), and anchovy (Anchois, *Engraulis encrasicolus*) are caught by artisanal seiners.

The fish is mainly for export, however, small size squid and conger eels (less than 8kg), sardines, and anchovy are also consumed domestically. Scientific names, Moroccan names and Japanese names, French names, Spanish names of major fishes are shown in appendix 3-1-1 to 3-1-3.

To promote artisanal fishery, Moroccan government is taking 2 special measures. One is the exemption from the value added tax on out-board engines. Out-board engines from 4HP to 25HP are regarded as ones for artisanal fishery, and are exempted from 20% TVA (Taxe sur la Valeur Ajoutée). The other measure is the tax exemption of fuel (gasoline) for out-board engines. Basically on condition that a fisherman sell the fish through ONP, he can buy the gasoline without tax. The price per liter would remarkably decrease from the market sales price of 7.6DH to tax free price of 2.2DH (An example in Immessouane). Gas stations with this measure applied are available in coastal fishing ports on the Atlantic side and the fishermen enjoy this measure.

In Safi and Essaouira provinces particularly, representatives of fishermen of artisanal fishing villages can come to a custom at a port to buy gasoline for the fishermen remaining in their home villages. However, in order to operate this system, it requires not only works of the MPM and ONP but also requires permission of the provincial governors as well as cooperation of the customs office. Provinces which have this system now are only 2 mentioned above. On the Mediterranean side, tax exemption of gasoline is not carried out in any provinces mainly because private fuel suppliers which facilitate this system are not available.

3-1-2 Artisanal Fishery Resources

As the development of artisanal fishery proceed, there will be two major problems to be addressed. Those problems are the carrying capacity of the resources and conflict between the coastal fishery and the

artisanal fishery for the fishing grounds. According to the FAO survey in 1985, a quarter of 720 artisanal fishermen answered that illegal operation of trawl-boats near the coast area was a problem. In Addition, it was reported that 64 people have experiences a loss of their fishing gear due to trawl boat operation. In this chapter, total allowable catch of resources and the possible affect of coastal fishery to the artisanal fishery is discussed based on the resource conditions of the Mediterranean Sea and the Atlantic Ocean.

There are two different estimations of MSY (Maximum Sustainable Yield) of fishery resources in Morocco. One is 1.5 million tons, and the other is 2 million tons. 45,000 tons of that is said to be MSY for the Mediterranean part. It is also estimated that 75% of the resources is pelagic fish and 25% is demersal. From this information, it can be estimated that 34,000 tons of pelagic fish and 11,000 tons of demersal fish is available in the Mediterranean sea. On the Atlantic side, demersal fish can be estimated to be from 364,000 to 489,000 tons and pelagic fish is from 1.091 million tons to 1.466 million tons.

The landed quantity from coastal fishery in 1995 was 37 thousand tons on the Mediterranean side (Demersal fish+ Crustacean + Cephalopods = 8,700 tons, Pelagic fish = 28,300 tons) and 692,000 tons on the Atlantic side (Demersal fish+ Crustacean + Cephalopods = 63,000 tons, Pelagic fish = 629,000 tons), so adding the catch from artisanal fishery, the total catch on the Mediterranean could reached MSY level. On the Atlantic side the catch from offshore fishery, mainly octopuses, is adding 113 thousand tons. Although it seems the utilization of resources in the Atlantic Ocean is still within the MSY level as a whole, a number of species are showing the sign of over exploitation. For the sardine resource, the catch was 556 thousand tons and its MSY was 55000 tons. Octopus resource is also diagnosed as over fished (MPM). In addition, hake (*Merluccius merluccius*, *M. senegalensis*) resources are also concerned of the exploitation of in-matured stock. (CECAFE).

The statistical report on fishing in 1996 (ONP) shows, the landed quantity from coastal fishery was 525,850 tons, decreased by 28% from the previous year. This means a significant decrease of 200,000 tons compared to the previous year. Looking at its details, notable decrease of demersal fish is seen only for hake, that decreased by 1,600 tons. But as the catch of other demersal fishes increased, the total catch of the demersal fish slightly increased. A significant decrease come from catch of pelagic species, 180,000 tons less sardines, 15,000 tons less horse mackerel, 13,000 tons less mackerels. Cause for this decline was explained as the fishing ground for pelagic fish moved south to the area off the coast of the South Morocco, as well as the over exploitation. Although human activity factors are thought affecting such a sharp decline, the influence of environment factors including weather, currents, sea water temperature could be a major reason.

Table 3-1-4 Catch from Coastal Fishery in 1995 and 1996 (ONP, 1997 prompt) tons

Fish species		1995	1996	Changes	Changes %
European sea bass	Bar (Loup)	80	168	88	110.0%
Sea bream	Dorado	138	229	91	65.9%
Gurnard	Grondin	2,012	2,293	281	14.0%
Hake	Merlu	5,491	2,814	-2,677	-48.8%
Drum spp.	Ombrine	904	871	-33	-3.7%
Dentex	Pageot	7,568	6,978	-590	-7.8%
Red mullet	Rouget	774	684	-90	-11.6%
John dory	Saint Pierre	561	462	-99	-17.6%
Sole	Sole	1,545	1,343	-202	-13.1%
Other demersal spp.	Autres	36,579	41,542	4,963	13.6%
Demersal total	Sub total	55,652	57,384	1,732	3.1%
Sardine	Sardine	570,914	392,411	-178,503	-31.3%
Mackerel	Maquereau	30,106	17,213	-12,893	-42.8%
Anchovy	Anchois	11,181	12,459	1,278	11.4%
Horse mackerel	Chinchard	30,475	15,812	-14,663	-48.1%
Tunas	Thonides	6,305	5,774	-531	-8.4%
Other pelagic spp.	Autres	8,478	7,017	-1,461	-17.2%
Pelagic total	Sub total	657,459	450,686	-206,773	-31.5%
Squid	Calmar	5,246	1,966	-3,280	-62.5%
Octopus	Poulpe	5,194	8,299	3,105	59.8%
Cuttlefish	Seiche	1,368	3,270	1,902	139.0%
Other Cephalopods	Autres	180	2,151	1,971	1,095.0%
Cephalopods total	Sub total	11,988	15,686	3,698	30.8%
Shrimp	Crevette Royale	133	25	-108	-81.2%
Prawn	Crevette Rose	3,401	1,507	-1,894	-55.7%
Spiny lobsters	Langouste	14	34	20	142.9%
European lobster	Homard	8	19	11	137.5%
Other Crustacean	Autres	66	487	421	637.9%
Crustacean total	Sub total	3,622	2,072	-1,550	-42.8%
Shellfish total	Coquillages	0	21	21	

Grand total	Total General	728,721	525,849	-202,872	-27.8%
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As mentioned above, the trend of the fishery resources should be paid full attention. In following sections the fishery activities in the Mediterranean Sea and in the Atlantic Ocean are examined more in detail.

3-1-2-1 Situation of Resources utilized on the Mediterranean Side

It was impatient to understand how much degree of the landed quantity at coastal fishing ports was from the artisanal fishery. However, little information was obtained because the fishermen seldom sell their fish through auction operated by ONP but directly sell to middlemen on the Mediterranean side. Even so, the fish species caught by the coastal fishery, using longline, bottom gillnet or trawl, are thought to be

fairly common for the artisanal fishery.

At an artisanal fishing villages east of Kaa Sras, there are many fishermen engaged in small purse seine fishery and catching pelagic fish resources such as sardines, anchovy, spanish mackerels (*Trachurus* spp.), mackerels (*Scomber* spp.) and so on. This means that even pelagic species are shared among the coastal and artisanal fishermen in the area. We will examine the change of the catch from the coastal fishery during past five years, then also examine the seasonal change in catch.

On the Mediterranean side there are 8 fishing ports that are the bases for coastal fishery (include Cala Iris, one of the artisanal fishing villages). The landed quantity during 6 years from 1990 to 1995 were between 29 thousand tons and 36 thousand tons, which is considered to be stable. In 1995 the catch reached the highest record, 36,993 tons. The major species caught were pelagic fishes, mainly sardines, which hold from 77% to 84% of the total catch. Demersal fishes are caught between 4,000 tons and 8,000 tons a year. During these years Cephalopods (*Cephalopodes*) such as cuttlefish and octopus increased from 170 tons to 370 tons, and crustacean kept stable between 100 tons and about 200 tons.

Artisanal fishery on the Mediterranean side is clearly divided into the area around the Strait of Gibraltar and the area east of that. According to the survey done by the MPM, the landed fish in 3 artisanal fishing villages by the Strait of Gibraltar was mainly consists of bluefin tuna (*Thunnus thynnus*), Dentex (local name: Vorace) red pandora and sea bream (local names: Pageot and Dorade) mostly through longline fishery (surface and bottom). Around Kaa Sras, artisanal fishermen operating small purse seiner began to be seen and then in Cala Iris (further east of the Strait of Gibraltar) in Al Hoceima province, small purse seiner fishery becomes the main fishing method.

In order to compare the landing at fishing port and artisanal fishery landing beach, landing statistics of 3 fishing port (ONP) and 3 landing beach along the Strait of Gibraltar (MPM) are shown as follows.

Table 3-1-5 Landing of 3 fishing port in the Mediterranean Sea (ton) (ONP, 1996)

Fish species	M'diq		Al Hoceima		Nador		
	weight	percentage	weight	percentage	weight	percentage	
Red mullet	Rouge				341.8	2.4%	
Bogue	Bogue	805.4	13.1%	357.1	2.9%	1,041.7	7.4%
Redpandora(2)	Besugues	217.8	3.5%	343.1	2.8%	598.6	4.2%
Horse mackerel	Chinchards			599.1	4.8%	1,840.1	13.1%
Round sardinella	Allache	228.3	3.7%	295.6	2.4%	1,480.1	10.5%
Pilchard	Sardine	2,095.3	34.1%	916.9	73.8%	3,480.1	24.7%
Swordfish	Espadon					311.8	2.2%
Prawn/shrimp	Crevettes			11.5	0.1%	375.3	2.7%
Squid	Calmar					61.2	0.4%
Cuttlefish	Seiches	20.3	0.3%	13.8	0.1%	134.2	1.0%
Mackerel	Maquereaux	588.5	9.6%	155.7	1.3%		
Octopus	Poulpes	35.4	0.6%				
Frigate tuna	Melva			1,054.4	8.5%		

Source: ONP, 1996

Table 3-1-6 Landing at 3 artisanal fishery beach along the Strait of Gibraltar (ton)

Fish species	Oued R'mel		Dalia		Beyyonech	
	weight	percentage	weight	percentage	weight	percentage
Groupers Merou	1.5	0.4%			5.0	5.6%
Red pandora (1) Pageot	36.0	10.8%	12.0	14.9%	12.5	14.1%
Rockfish Rascasse	8.5	2.5%				
Dentex (1) Sama	3.0	0.9%	1.9	2.4%		
Bluespotted sea bass Tchernia	2.0	0.6%				
Dentex (2) Vorace	107.1	32.1%	21.0	26.1%	5.7	6.4%
Bluefin tuna Thon rouge	175.5	52.6%				
European sea bass Loup			2.0	2.5%	11.8	13.3%
Sea bream (1) Pagre			15.0	18.7%		
Moray eel Murene			1.1	1.4%		
Red pandora (2) Besugues			27.4	34.1%		
Sea bream (2) Dorade					25.0	28.2%
European conger Congre					13.2	14.9%
Red mullet Rouget					5.3	6.0%
Squid, cuttlefish Seiche, Calmar					10.0	11.3%

Source: MPM, 1996

As shown in the tables above, there are a number of species such as red mullet, red pandora, squid and cuttlefish that are shared by artisanal fishery and coastal fishery around the Strait of Gibraltar. There are even more species shared between these fisheries in the eastern portion of Mediterranean Sea, as sardines, anchovies, and spanish mackerels are caught by artisanal purse seiners. Furthermore, for the bottom condition is sandy and the slope is gentle in this area, demersal species such as shrimps and prawn are also shared with the coastal fishery.

Though fishing areas are divided by the law for coastal trawlers and for artisanal fishery, it is not enforced in the practice. There is no exclusive fishing rights for the foreshore of artisanal fishermen's home village. Under this condition, when artisanal fishery is protected and promoted with priority, there could be a discord from the coastal fishermen. It is required urgently that the condition of the resources are grasped and a resources management plan is made with understanding and cooperation of fishermen.

Moreover, as trawl fishery is especially destructive and likely to cause exhaustion of resources, prohibition of trawl fishing within artisanal fishery's fishing area should become strictly enforced as soon as possible. Regarding the longline fishery for bluefin tuna in the Strait of Gibraltar, when that resources were found and tapped by the artisanal fishermen, the catch of tuna by set-net in M'diq area became extremely low (since 1993). This suggests that the migrating route of bluefin tuna was moved offshore by change of natural conditions. Table 3-1-7 shows the catch data of bluefin tuna longline fishing in 1994 collected by the tuna aquaculture project team of Japanese Overseas Fishery Cooperation Foundation (OFCE). This data shows that 80 to 270 bluefin tuna weighed from 120 to 160 kg in average were landed every month. It's easy to understand this caused an increase in the income of artisanal fishermen around the Strait of Gibraltar.

Table 3-1-7 Catch of bluefin tuna in the early stage of longline fishery development in the Strait of Gibraltar of the Mediterranean Sea

Year.Month	Number of fish (pieces)	Minimum-Average-Maximum weight of one fish	Total weight(kg)
1994.8	80	86 - 162.2 - 393	11,356
1994.9	260	49 - 162.3 - 354	42,202
1994.10	127	7 - 140.2 - 366	17,805
1994.11	145	19-135.3-375	19,622
1994.12	238	60-140.1-290	33,343
1995.1	226	15-136.6-223	30,863
1995.2	142	24-130.3-275	18,509
1995.3	274	16-121.1-242	33,194
1995.4	105	52-127.5-271	13,385

Source: OFCF tuna aquaculture project

3-1-2-2 Situation of Resources utilized on the Atlantic Side

On the Atlantic side, there are 19 coastal fishing ports between Tanger and Lagouira. In the area from Tanger to Sidi Ifni, where this research covers, there are 14 ports including one of the artisanal fishing village, Imessouane. The landed quantity during the last 6 years from 1990 to 1995 shows a rapid growth as a whole, and increased from 395,190 tons to 691,728 tons.

At these fishing ports on the Atlantic side, artisanal fishing boats also land much fish. According to the record of ONP in Essaouira, 85% of landed quantity of demersal fish of this port is from artisanal fishery. Though contributing rate of the artisanal fishery in other ports couldn't be confirmed, considerable quantity seemed to be landed by the artisanal fishery in Agadir and Safi.

Nonetheless, the majority of the fish landed in these ports consists of pelagic fish, which hold 84% to 91% in total catch. The increase of catch in these 6 years is also due to pelagic fishery, showing a drastic increase from 390,000 to 690,000 tons. Among pelagic fish, sardines (Sardine) take overwhelming share. As the artisanal fishermen in the Atlantic area do not use small purse seiners, this fish caught is completely by coastal fishing boats.

The catch of demersal fish keeps stable between 40,000 tons and 47,000 tons. The main species of fish are dentex (local name Pageot) of SPARIDAE family and hake (local name Merlu). They are thought to be caught both through coastal trawl fishery and through artisanal fishery. Cephalopods (*Cephalopodes*) fairly increased from 6 thousand tons to 10 thousand tons level, and Crustacean slightly increased from 2,000 tons level to 3,000 tons level.

For artisanal fishery resources in the Atlantic, the landing quantity has been estimated by zone since FAO research in 1985. INRH research in 1990 reported that zone A, B and C has characteristics in fish species. Conger eels, sea bream (*Diplodus spp.*) and Red pandora and Dentex species are the common fish caught in all the 3 zones. In Dakhla - Boujdor area of Zone F, octopuses and meagre (*Argyrosomus spp.*) are fished especially much. In Amgriou - Agadir area of Zone A, spanish mackerel, squids, sea bream (*Sparus spp.*) are started to be seen. Going north in Zone B of Imessouane - Sidi Bouzid area, the catch of conger eel is getting overwhelmingly high, and forkhead (*Phycis spp.*) starts to appear besides diplodus sea bream

and dentex. In Zone C (Tanger-El Jadida), the species not common in other zone such as sea bass (*Dicentrarchus spp.*), salema (*Sarpa sp.*), hake and rays are caught beside diplodus sea bream. Among these zones, the landing of Essaouira (Zone B) during 1992 – 1995 was examined. As mentioned before, the majority of the landing at Essaouira is from artisanal fishery. Among the demersal species, the most common species was conger eel which amounted from 400 tons to over 600 tons. Other main species are forkhead (local name: Mostelle), spanish mackerel (local name: Chien; Chiren), and squids, which have been showing same tendency since 1990. Though the annual landed quantity in Essaouira hugely changes from 4,000 tons to 12,000 tons, this depends on the change of landed quantity of pelagic fish such as sardines. Landing quantity of demersal fish did not have significant changes for 5 years.

The landing of a pure artisanal fishing port of Imesouane in Zone B, which located near the border of Zone A, was also examined. From the 1995 data of landing, though 70% of the total landed quantity of 430.7 tons was categorized in other fishes, 30% were specified. The main species were 56 tons (13%) of squids, followed by 21 tons (4.9%) of forkhead, 10 tons (2.3%) each of octopuses and gurnard. European lobster and spiny lobsters are also significantly contributing in terms of landing value as the unit prices are very high. This artisanal fishing port has an auction hall of ONP, and the landing volume has been moderately increasing (Table 3-1-8). A break water and reconstruction of the port has been under way at the moment of this study.

Table 3-1-8 The changes in landing (weight and value) at Immesouane 1993-1996

Year	1993		1994		1995		1996	
	Weight (kg)	Value (DH)	Weight (kg)	Value (DH)	Weight (kg)	Value (DH)	Weight (kg)	Value (DH)
Jan	0	0	5,914	75,985	23,741	205,545	1,693	19,515
Feb	3,510	66,770	5,203	68,825	21,641	155,210	23,742	256,385
Mar	4,690	116,085	13,397	198,050	11,463	268,855	11392	322,100
Apr	16,186	349,900	18,544	452,940	44,941	754,925	30164	502,510
May	20,556	279,990	17,645	286,880	24,928	342,905	41085	646,650
Jun	13,096	294,665	19,982	394,340	62,201	881,745	73976	841,870
Jul	30,765	659,160	57,010	603,620	53,217	724,490	49427	963,675
Aug	26,471	566,220	46,214	708,635	55,509	921,030	42957	930,600
Sep	18,191	362,795	52,959	785,050	38,073	402,940	36795	760,340
Oct	12,052	299,140	43,239	369,915	38,184	361,265	85906	701,230
Nov	13,359	199,705	12,746	165,080	31,208	193,415	24571	274,545
Dec	15,630	166,675	20,973	216,285	25,665	258,465	17023	156,975
Total	174,506	3,361,105	313,826	4,325,605	430,771	5,470,790	438,731	6,376,395

Source: ONP, 1997

Considering the situation studied above, demersal resources on the Atlantic side are thought to be still in healthy condition. And judging from the submarine topography on the Atlantic side, which has continental shelf (shallower than 200 m) up to 40km away from the seashore. Within the continental shelf, there are rocky sea mounts and fine fishing grounds with upwelling area which might not have been fully utilized.

For pelagic fish, anchovy can be matured in one year, sardine, spanish mackerel and mackerel become matured in 3 to 4 years. Cephalopods such as squid and octopus also mature in one year. These species

are not easy to be overfished. However, these resources are affected by the changes in natural environment as well as fishing activities. If the poor catch of these resources continues, the coastal fishery can not stop but entering into the artisanal fishery's fishing grounds. The condition of these resources should be carefully observed in a context of the overall development of whole fisheries.

At the end of this section we examine the change of monthly landings in 1996 at fishing ports whose main landings are done by artisanal fishery.

In Mediterranean side, statistics from Cala Iris and Oued Laou were examined.

At Cala Iris, there was a gentle peak of landing during May to August. After August, the landing gradually declined till February, then started to increase again in March. Oued Laou did not have clear peaks but there are slight increase of catch in May and October. (Figure 1)

In Atlantic side, there are statistics available from Essaouira and Imessouane. In Essaouira, it is clear to see from the graph that the landing increased from May to November and rapidly declined during December and January. The landing again gradually started to increase from February. In Imessouane, the months of high landing was short (from May to October) and the low landing continued till March.

As the sea weather condition changes more severely in Atlantic Ocean than in Mediterranean, the number of fishing days in Atlantic side seems to be more influenced by the sea condition.

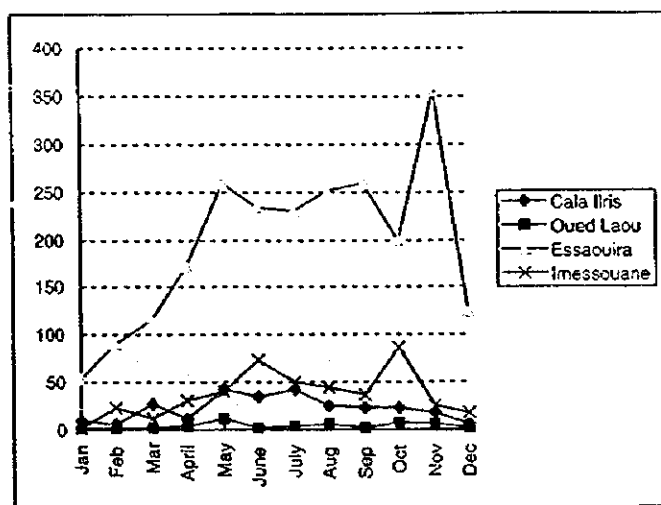


Figure 3-1-2 Monthly landing changes at 4 artisanal fishing port in 1996 (ONP)

3-1-2-3 Unused and Little Used Resources

Of resources that have yet to be exploited, those which can be gathered by coastal artisanal fishermen include oursin, holothurie, ascidie, Neptune (whelk) and seaweed. Concerning seaweed, the existence of algae rouge, ulve, carageenan weed and nemacystus, etc. has been confirmed, but of these only algae rouge has been developed for commercial purposes. The said marine products can easily be gathered by artisanal fishermen and their processing following landing is relatively simple. Moreover, markets for the sale of such products exist overseas. The exact quantities of such resources are unclear, however, they are widely distributed around the southern part of the Atlantic coast. The prime season for catching such products lasts from the end of October through to the end of April.

Concerning resources that have only so far been exploited to a minor degree, those which can be caught by artisanal fishermen are Atlantic horse mackerel and demi bec in particular. The commercial value and price of these two species are low because they are not traditionally eaten and do not attract great demand

in Morocco and surrounding countries, however, these fish can be marketed if simple processing is carried out.

3-1-3 Fishing Gears, Fishing Methods, and Fishing Boats

Fish species living or migrating into the coastal area of Morocco and pursued by artisanal fishery are quite many, and the fishing gears and methods used are varied to fit the environment of fishing ground and the target species.

Fishing gears used generally for the pelagic species are surface gillnet, trolling, handline and purse seine. For the demersal species, bottom gillnet, bottom longline, traps, handline, pots and dredge net are broadly used and are operated effectively. In such way, quite many types of fishing gears are used in the artisanal fishery, because fishing gears are made with wisdom based on the experiences of individual fisherman. This phenomenon is seen not only in Morocco but also all over the world.

Moreover, most of the gears are the types that wait for a shoal of fish to be caught, and differ from the fishing using the motive power like trawl or purse seine. These waiting type of fishing gears are characteristic in utilizing cleverly the knowledge of ecology and the behavior of fish.

The fishing gears used by artisanal fishermen in Morocco are selected reasonably but there still is space for improvement. We examine the structure of the main fishing gears and the way of operation in the following section.

3-1-3-1 The Structure of Fishing Gears and Fishing Methods

(1) Gillnet fishery

Gillnet is the most commonly used by artisanal fishery in Morocco. On the Mediterranean side, because the current is comparatively slow especially in the area from Saidia up to Sidi Hsaine, surface gillnet and bottom gillnet are of quite popular use. On the Atlantic side, bottom gillnet is used broadly from Larache in the north to Al Kount (the south end of this research field) in the south to catch high-priced fish and lobsters in rocky fishing grounds. Structure of these gillnets, fishing seasons, target species are shown in the following tables. The structure of float line and sinker line for these gillnets are also shown in the table.

On the Mediterranean side, there is not so much variation in the structure of nets, but many nets are fairly used out.

On the Atlantic side, bottom gillnet (trammel net) structure varies in the way of putting on the sinkers, or in the weight of the sinkers or so. For example in Essaouira and Souira Kedima, some fishermen use heavy stone of 1 to 2kg as a sinker and the distance between them is about 4 to 7m. On the nets of this structure, water resistance received from the current is different between the part where sinkers are on and the part in-between the sinkers. This makes difference in tension and transforms the shape of the mesh, then the catching rate of the net would drop.

In addition to the ordinary gillnets, a unique gillnet is used in Saidia and Nador on the Mediterranean side. Fishermen use about 200m-long barrier net with about 400m-long bag-shaped enclosure net on its sides. This is a kind of set net. The bottom of the barrier net and the enclosure net are made of trammel net.

Fishing boats used for gillnet operation on the Mediterranean side is 5 to 7 meters long, and the shape is round bottomed Flouka type or flat bottomed Platera type. The engine (outboard engine) is 4HP to 20HP, usually manufactured by YAMAHA or TOHATU.

On the Atlantic side, fishermen use 8HP to 25HP engine which is a little larger than that of the Mediterranean side. This may be caused by the marine weather condition and broadness of the fishing ground.

General way of operating is, after settling the net in the water, haul it at least once every morning. The net is set back again after the fish is removed and bring back only the catch. Judging the damage of the net, fishermen sometimes remove the net from the water to mend it on the beach. In many cases, the net is kept in the water for 1 to 2 weeks. When aiming at spiny lobsters and European lobsters, fishermen intently keep some of fish caught on the net as the baits to lure and catch the lobsters.

Table 3-1-9 Structure of surface gill net (single) in the Mediterranean Sea

Length of float line (m)	Height of net (mesh number)	Mesh size (cm)	Hang in ratio (%)	Unit number of nets	Fishing season (month)	Target fish
50~100	100~120	7~8.5	53~65	10~20	7~8	Skipjack, Frigate tuna

Table 3-1-10 Structure of bottom gill net (single) in the Mediterranean Sea and Atlantic Ocean

Ocean	Length of float line (m)	Height of net (mesh number)	Mesh size (cm)	Hang in ratio (%)	Unit number of nets	Fishing season (month)	Target fish
							Target fish
Mediterranean	100	15	26	62	3~4	3~7	Drum, Spanish mackerel, Sea bream
	50~60	100	4~8	50~63	9~10	3~11	Bogue, Diplodus sp., Dentex, Spanish mackerel
Atlantic	50	66	10	50	10~15	summer	Lobsters
	130~160	100	11~13	40~63	10~16	4~10 year round	Sea bream, Selema, Alosa, John dory, Sea bass, Rock fish

Table 3-1-11 Structure of bottom gill net (trammel) in the Mediterranean Sea and Atlantic Ocean

Ocean	Length of float line (m)	inner net			outer net			Fishing season (month)	Target fish
		Height of net (mesh number)	Mesh size (cm)	Hang in ratio (%)	Height of net (mesh number)	Mesh size (cm)	Hang in ratio (%)		
Mediterranean	60~100	50~53	4~10	40~58	4~8	30~40	45~66	10~20	Red mullet, Sea bream, Lobster, Bogue, Sole, Croakers
Atlantic	50~140	25~33	10~12	47~66	5~8	30~40	50~57	5~20	Lobster, Omar, Sea bream, Sole, Scorpion fish, John dory, Gurnard

Table 3-1-12 Structure of float and sinker line in the Mediterranean Sea and Atlantic Ocean

Ocean	Type of net	Bouyancy of a float (g)	Distance bwn floats (cm)	Weight of a sinker (g)	Distance bwn floats (cm)	Diameter of float line(mm)	Diameter of sinker line(mm)
Mediterranean	surface gillnet (single)	70~89	60~64	100~110	102~128	4~6	6
	bottom gillnet (single)	133~150	80~98	104~140	40~48	5~7	5~7
	bottom gillnet (trammel)	66~69	42~51	71~100	34~54	5~7	5~7
Atlantic	bottom gillnet (single)	155~160	240~420	115~155	120~144	6	5~6
	bottom gillnet (trammel)	200	216	2000 (stone)	58	6	8
		90	196	115	70	5	6
		150	598	100	161	6	6

Table 3-1-13 Operating condition of artisanal fishing boats in Imnessouane

Month	Weight (kg)	Value (DH)	No. of fishing boat went for fishing (boat)	Average catch per trip (kg)	Monthly catch per month (DH)	Average fuel consumption per month (litre)	Total number of trip	Average catch per trip (kg)	Average fuel consumption per trip (litre)	Possible number of days to fish
January	1,693	19,515.00	7	242	2,787.86	557	21	81	27	3
February	23,742	256,385.00	20	1,187	12,819.25	3,711	140	170	27	23
March	11,392	322,100.00	50	228	6,442.00	3,976	150	76	27	25
April	30,164	502,510.00	58	520	8,663.97	9,225	348	87	27	26
May	41,085	646,650.00	75	548	8,622.00	17,565	541	76	32	24
June	73,976	841,870.00	75	986	11,224.93	20,654	655	113	32	30
July	51,152	974,030.00	104	492	9,345.44	15,995	801	64	20	26
August	45,480	962,580.00	103	442	9,345.44	24,394	1,022	45	24	23
September	38,503	779,960.00	93	414	8,386.67	19,640	727	53	27	26
October	85,906	701,230.00	68	1,263	10,312.21	23,695	849	101	28	30
November	24,571	274,545.00	53	464	5,180.09	9,485	363	68	26	23
December	17,023	156,975.00	36	473	4,360.42	5,180	187	91	28	5
Total	444,687	6,438,350.00	742	599	8,677.02	154,077	5,804	77	27	269
Average	37,057	536,529.17	62	605	8,125.88	12,840	484	85	27	22

Source : ONP (1997)

Fishing grounds are 1 or 2 hours away from the fishing villages. On the Atlantic side, it is said that the fishing ground is rocky and influenced by the current easily, and fishermen often have to change the fishing location. The water depth of fishing ground is generally 40 to 50 meters both on the Atlantic and the Mediterranean sides.

Looking at the fishing ground on the Atlantic side, there seem to be some merits that fishermen can locate migration routes of fish on rocky area relatively easy. They can set the net on these migration routes to target high-priced demersal fish occurring nearby their fishing villages. During high fishing season, as shoals of fish come a lot, fishermen sometimes go to haul the net 2 or 3 times a day.

The high season for gillnet fishery is from May to October but operation is going all the year round. The operation of gillnet fishery is done all by hand. The operation should be more efficient by mechanizing in the future.

Furthermore, the multiple fishing gears usage, such as using gillnet and traps together, are important way to increase the income of fisherman. Along with change in the forms of fishery, raising the efficiency by mechanizing, etc. will be required in the future.

(2) Longline fishery

For artisanal fishery, surface longline and bottom longline are used both on the Mediterranean and the Atlantic sides. Bottom longline is especially popular fishing gear.

The structure of bottom longline isn't much different between the Mediterranean and the Atlantic. For the main rope, nylon (Polyamide) line or polyethylene line of 2.5 to 4.0mm in diameter is used. For the branch line, nylon (mono-filament) of about 1.0mm in diameter is used. The length is 1500 to 1800m for the main rope and 1.0 to about 1.5m for the branch line, and the interval between the branch line is mostly 2.0 to about 5.0m. The number of hooks is about 300 to 500.

Fishes caught by this fishery are sea bream, soles, red mullet, gurnard, ribbon fish, groupers, conger eel, croakers, sea bass and so on.

The longline gear is, put it in basket (box), with hooks stuck on the edge of basket which is also seen in Japan. The basket (box) of 70 to 80cm in depth and width, and of about 100cm in height is often used. This kind of box is seen around Souira Kedima, Tifnit, etc. on the Atlantic side.

The operation of surface longline fishery is done by 2 to 4 crew on board and cast the line early in the morning, waiting for 1 or 2 hours to haul it. The catch is from a few kilograms to 30 kilograms and mainly tuna and skip jack species. The bait is usually round slices of sardines. The fishing season is approximately from May to September.

The operation of bottom longline is done by 3 to 4 crew on board and cast the line early in the morning or from toward evening. The line is set along the direction of getting the current on back of the boat obliquely. The bait is usually sardine species. The line is hauled with the bow of the boat against the current. The working hours are 3 to 5 hours.

Because of the structure of bottom longline, the main rope and the hooks are nearly lying on the bottom of the sea. In this situation, recognition of the baits by fish gets less than they are properly hanged in the water, and the fishing rate would get lower. When fishing sea bream (SPARIDAE) species, it is advised to float the line by attaching floats on the main rope. The height of hooks hanged would be differed by fish species but could be less than 3 to 4 fathoms from the bottom. The fish catch per operation is 16 to 114kg (ONP).

(3) Trap fishery

Traps are used all over on the Atlantic side, but rarely used on the Mediterranean side. The shape of the trap in Mouley Bouselham in the northern area of the Atlantic side is cylindrical. It is big, 100cm long and 60cm in diameter, and has the entrance on one side with a funnel-shaped entrance about 30cm long. Once

there were the entrances on both sides of the trap, but the fishing performance was not fine, so now it has only one entrance. The frame of the trap is constructed with iron bar of 8mm in diameter, and covered by a wire net.

In Sourira Kedima, Imessouane, and Tafedna of the middle area of the Atlantic, the trap is a half cylinder-shaped about 60cm long and 35cm high, made of iron bar of 7mm in diameter. The entrance is attached on the top middle of the trap, about 20cm in diameter and 15cm in depth, funnel-shaped and made of vinyl. The target species are mainly spiny lobsters, European lobsters, crabs, and 20 to 40 traps are used in one operation.

An old traditional pot shaped trap is also used on the Mediterranean side.

Fishing operation is done by 3 to 4 crew on board. Set the traps toward evening time and the haul them in the next morning or sometimes keep them in the water for 2 to 3 days depending on fishing condition. When using large-sized trap, each trap is affixed to a buoy and rope, and then cast into the sea. The hauling work begins with picking up the buoy on the surface, followed by taking in the trap on the boat. In case of small traps, 2 to 3 traps are fastened to the main rope by branch lines. The number depends upon the manpower, the speed of the current, etc.

(4) Small Purse seine fishery

Small purse seine fishery is operated mainly in Kaa Sras, Cala Iris, Chmaala, Sidi Hsaine, and Kalat. In these villages, beach seine is often operated. The length of purse seine net is 200 to 250m, the depth of the net is about 50 to 60m, the material of net is nylon, the mesh size is 16 to 18mm, and the hung in ratio is about 80%.

A small purse seine fishing fleet is consisted of 3 boats. They are a main boat with net(7 to 10m long, 20-40HP inboard engine, or 25HP outboard engine; in both cases with 50Hz fish finder and wireless radio installed), a boat with lights(6 to 7m long, using 2 to 4 gas lamps) and a skiff.

When the boat is with inboard engine, the purse line is hauled by turning a drum connected to the engine. For a boat with outboard engine, the purse line is hauled by manpower. For both types of boats, the number of crew is 10 to 14, and the target species are spanish mackerels, mackerels and sardines.

(5) Other Fishing Methods

Beach seine is seen often on the beaches on the Mediterranean side. On the Atlantic side it's rarely seen because the beaches are mostly rocky. The length of the float line of the net is about 300 to 400m and about 10 people pull the net in cooperation. The target fish are spanish mackerels, sardines, grunts, and others.

In the area of the Strait of Gibraltar, harpoon fishing is used to catch marline species.

As for the hand line fishing used on the Atlantic side, they catch the high-priced fish like sea bream and groupers by vertical long line. The operation is done by 3 to 4 crew hold one vertical long line each, waiting for fish getting caught with moving the line up and down. The line has 5 to 7 hooks fastened with certain intervals from the bottom of the sea. A little billowy condition on the sea is good for the successful catch. The boat is fixed with anchor while operating. The baits for this fishing are sardines and cuttlefish.

Squid fishing with hand made jig is very popular on the Atlantic coast between Tafedna and Tifnit. This fishing is the main fishing method used in Tigret and Tifnit where squid come nearby fishing ground with sandy bottom.

The longline(towing) fishery operating in the area of the Strait of Gibraltar from Ksar Sghir to Oued R'mer has been rapidly developed since 1994. This fishery mainly aiming at bluefin tuna migrating to the Mediterranean sea. The operation is done by 4 crew on 5 to 6m-long boat. They use 2 sets of longlines(trolling) (about 3.1mm in diameter, 600 to 1000m in length, nylon gut). Stones of 10 to 20kg are attached to the bottom of the longline and 5 branch lines (about 1.2 mm in diameter, nylon monofilament,

1.5m in length) are connected with 5m intervals. Cuttlefish is said to be the best as the bait. One fishing boat, or 2 to 3 fishing boats sail side by side to tow the longlines. All work is done with manpower.

3-1-3-2 The Skill of Fishermen and the Economy of Fishing Operation

Concerning the skill level of fishermen, at least some people in a community have good knowledge about fishing methods and technique to make fishing gears. It seems, there's no inconvenience for everyday fishing work. However, because they are lacking the knowledge of fundamental characteristics of material, they have not found out how to improve fishing gears to raise the fishing efficiency. We strongly feel the necessity of education on this issue to the fishermen.

Judging from the condition of the fishing operation of artisanal fishery in Imessouane (ONP 1997), the possible operating days (even if only one boat sailed out, that day is included in possible operating days) is 269 days in a year, and the average annual fishing days for a boat was estimated as 82 days. The average catch per operation was 85kg, consumption of the fuel for 1 operation was 27 liter in average (Table).

To examine the operation of multiple fishing gears in Imessouane, the relationship among the number of horse power of the engine, the average catch per operation, the average total landed value, and the average fuel consumption are examined. For the boats with 8HP outboard engine, we ranked from the 1st to 7th in each category (Table).

The total effect of the operating method with using multiple fishing gears is indicated by how few the total of the ranking number is in this table. Concretely saying, low number indicates higher amount of the catch, higher value of the fish caught, and less fuel consumption.

The result in the order of high performance are; (1) trap + jigging, (2) jigging, (3) bottom gillnet, (4) trap + bottom gillnet, (5) trap + trammel net (surface), (6) trap, (7) trap + trammel net (bottom).

Considering this result, high ranked "trap and jigging" means trap fishery aim at the high-priced catch such as spiny lobsters, European lobster, and jigging aims at squid. The fact that the fishing boat go only nearby fishing grounds and the fuel consumption is so little. This result could be a suggestion for composing multiple fishing gear operation that will grow more and more in the future.

Table 3-1-14 Ranking of catch per one fishing operation by engine horse power and fishing method and fuel consumption in Immessuane in 1996 (ONP 1997)

Engine HP	Fishing Methods	Average catch (kg)	Rank	Average catch (Dh)	Rank	Ave.consumption (liter)	Rank
3 p.s.	Trap	24.1	7	306.5	7	17.8	3
	Trap+	73.0	4	967	4	25.8	7
	Bottom gillnet						
	Trap+ Jigging	113.4	2	2,164.5	1	13.2	1
	Trap + Trammel net (surface)	32.3	5	588.8	5	21.4	4
	Trap + Trammel net (bottom)	25.2	6	423.6	6	21.4	4
	Gillnet (bottom)	119.2	1	1,224.9	2	23.4	6
	Jigging	99.9	3	1,140.0	3	14.8	2
15 p.s.	Gillnet	46.3		706.2		31.8	
	Bottom longline	428.9		4,568.1		54.21	
	Trammel net (bottom)	77.5		998.1		54.2	
20 p.s.	Tarp + Trammel net (bottom)	83.3		1,230.2		27.9	
	Bottom longline	62.5		1,010.0		47.2	

Source : ONP (1997)

Note)

Trap (Local name: Casier)

Trammel net (Bottom) (Tremail de Fond)

Jigging (Turlutte)

Trammel net (Surface) (Tremail de Derivant)

Bottom Gillnet (Filet Maillant de Fond)

Bottom Longline (Palangre de Fond)

3-1-3-3 The Fishing Boat

(1) The engine of fishing boat

The engine of fishing boat is mostly the outboard engine with 4 to 25HP. Inboard one is only used by some of the fishing boats operating longline (towing) for tuna in Ksar Sghir, small purse seiners in the Mediterranean Sea (Such as Sidi Hsaine), and some bottom gillnet boats in Azla. The inboard engine boats are only used on the Mediterranean side, and none of the artisanal fishery use them on the Atlantic side.

According to the fishermen interviewed, a reason for this unpopularity of inboard engine boat is the heaviness of the boat. It is hard and troublesome to carry a heavy boat on the beach. In order to pull up the boats with inboard engine, manpower operated winch is used in some places. To promote the modernization of fishery, mechanization is necessary, and as a means to get their motive power, transition from outboard to the inboard engine is an important subject.

(2) Hull of fishing boats

The fishing boats now used are mostly in the size of 4 to 7m in length, 1.8 to 2.0m in breadth, and 0.9 to 1.1m in depth, while small purse seiners are about 9m in length, 2.0m in breadth, and 1.1m in depth. All the bodies of the fishing boats are made of wood. Though some of the fishing boats are flat-bottomed (such as in Ben Younech), most of them are Y-shape bottomed.

The indicators of the fishing boat's body shape are calculated as follows

- (1) Length of the Boat(L) / Breadth of the Boat(B) $\approx 5 / 1.8 \approx 2.78$
- (2) Length of the Boat(L) / Depth of the Boat(D) $\approx 5 / 0.9 \approx 5.56$
- (3) B/D $\approx 1.8 / 0.9 \approx 2.0$

Looking at these figures about an example of small fishing boat in Japan (less than 18m in length, with the inboard engine), L/B is less than 4.63, L/D is less than 9.90, and B/D is over 2.1.

From the figures above, the shape of the boats used by artisanal fishery could be inferred to be of much stream resistance, of bad running efficiency and of much fuel consumption.

The modernization of fishery must be promoted on the basis of the remodeling of the fishing boats. Key points of the remodeling are (1) Use of the inboard engine (2) Transition to the shape with good running efficiency (3) Transition to light and durable FRP boat (4) Enlargement of the boat to raise the safety and efficiency of work on board

As mentioned before, winch is needed on the beach for the boat with inboard engine. It is also recommended to construct some fishing port to moor the boats inside.

3-1-3-4 Fishery Regulation

Under the current fishery regulation, all the fishing boats must be registered with their home port and receive the operation license every year for each fishing method. By this regulation the system to administer the number of fishing boats and the fishing methods is established. However, in the case of artisanal fishery, the landing beach as the home port is often far away in a remote place, there seems to be some unregistered boats.

In order to conserve and protect the fishery resources and to conduct sustainable fishery, fishery regulations are enacted without distinction of offshore, coastal or artisanal fishery. These regulations prescribing the closed season, the prohibited size limit, and so on should be strictly observed. In addition, according to the condition of the resources, the Total Allowable Catch (TAC) or the regulation on the limiting the number of fishing boats need to be carried out.

1) Current Fishery Regulations to conserve the resources

There are regulation to control fishing activities for coastal and off-shore trawl fisheries. Regarding the regulation on the offshore trawl, closed fishing season is introduced because of the danger of overfishing of the octopus resource.

As for the coastal trawl fishery, in order to protect the shallow water resources, trawl operation within 3 miles from the coast is prohibited. There's a special exception set on the trawl fishery in a part of the Mediterranean sea. It doesn't prohibit within 3 miles, instead, it prohibits the operation in shallower waters less than 80m in depth along the coast line from Port Al Mina (Cebta) to Al Hoceima. This is because, in the place near the entrance to the Mediterranean sea, the water sharply deepens and going out of 3 miles from the coast, the water is too deep to drag the trawl-net. Resource protection limits for each fish type are as indicated in the attached Table 3-1-4.

Though the size limits are prescribed as above, as is often the case with some fish species and some fishing methods, fish is already damaged and dying when caught. In this case, it is meaningless to return the fish for conservation of the resources. For example the hake caught in the trawl-net would be almost dying, and the sardines or anchovies would be in difficult condition for recovering when the net is hauled. On the contrary, the spiny lobsters caught in traps are completely flawless, and it's possible and they will survive

after the release .

Thus several fishery regulations are needed to be combined so that the size regulation on fish caught should be meaningful. Trawl and purse seine should be allowed only in the time and the place in which there lives no fish under the size limit. And as for the gillnet, it is effective to make mesh size wider.

3-1-3-5 Education and Training for Fishermen

(1) The Needs and Objectives of Education and Training

The history of development of the fishery in Morocco besides the artisanal fishery is only about 20 years. Moroccanization and modernization are rapidly proceeding both on the coastal and the offshore fishery. However the artisanal fishery, though it has been existing for a very long time, has never been receiving attention until quite recently. Artisanal fishery has been of old fishing methods, and of low efficiency and low safety in operation as ever until now. Though they seem to feel the necessity to improve the fishing gears or fishing methods, they are not well understanding the fundamental characteristics of material to find a way. Their living standard is lower level than the average Moroccan. It is essential to have the a basic ability to raise their overall level of life, by improving their skill. Those skills include fishing, navigation, as well as methods and technique of keeping the freshness of the catch, processing, financial management of fishery, and conserving resources.

(2) The present situation of training and education for fishermen

Moroccan government is actively promoting the fishery education. They have established Institut Spécialisé de Technologie des Pêches Maritimes (ISTPM : college level) in Agadir as the summit, Institut de Technologie des Pêches Maritimes (ITPM) in Al Housseima, Safi and Tan tan, and Centre de Qualification Professionnelle Maritimes (CQPM) in Casablanca and Raayoune. These institutes and training centers certainly helping popularization and Moroccanization of the offshore and coastal fishery. Now. A plan is being realized to establish a Fishery Technology Improving Center in Lalach and CQPM in Dakhla, so fishery educational facilities will be established in the key points along the coast of Morocco. Each fishery school and center, now conducts the classes for re-education for the coastal fishermen besides the regular training for fishermen and boat crew. Two courses each on fishing and the marine engine are conducted from 5:30 (6:00) to 7:30 (8:00) in the evening. Moreover, they are planing to conduct special seminars such as usage of navigation equipment, electric system, refrigeration equipment, net mending, fishery regulation and so on.

The Government intends to tackle the education and the training for the artisanal fishermen, and thinking of setting up the courses for re-education of the artisanal fishermen in each school of the above. Basically the fishermen could attend the course in the nearest school but to cope with the case even the nearest school is too far, a dormitory for the fishermen is included in planing of Lalach school.

And to improve the skills and the knowledge of the artisanal fishermen who couldn't join these courses, fisheries extension workers assistance is needed. The Larach school is planing to open a extension worker training course too.

The contents of the education for artisanal fishermen include fishing technique, engine and navigation technique. Licenses will be obtained after completion of a course. Since many artisanal fishermen are illiterate (the rate of illiteracy is said to be 50% or more in the age group of 40-year and older in Morocco), the education to read and write is also thought to be given.

(3) The education and training for artisanal fishermen and fishery successors

As mentioned above, the Moroccan government has will to develop the education for artisanal fishermen. Realistic and effective educational training plans must be made.

First of all, the training for extension workers should be considered as priority. It is necessary to make a plan on the nature required to be an extension worker and on what technique must be conveyed to fishermen and in what way they would be educated.

As for the actual application of the extension worker, the system used by The Ministry of Agriculture should be examined. It has 40-year history and has helped to improve and diffuse the agricultural technique, established the agricultural cooperative association, improved economic conditions of the farming family through the agricultural financing system, and so on. There are extension offices all over the country, and the extension workers go round the villages in their district in charge and contribute to the improvement of agricultural management.

To develop artisanal fishing villages, it is necessary for the extension workers to go into the field, gain the fishermen's trust and offer various educational training activities. Especially about the know-how of diffusing on forming of the cooperative association or utilizing of banking facilities, we should learn from the experiences of agriculture. However, as fishermen would feel some resistance against resting from fishing, and there is a matter of age and low literacy, a little different approach would be needed from Agricultural experience. It is better to consider the education and training of fishermen by two different groups separately.

For the fishermen now working as the main force (older and would be of low literacy), they should be given a quite practical education and training. And for the younger generation as the successor (of a little higher educational level), they should be given education and training based on the middle-term or long-term view over the future development of artisanal fishery.

The following regulations are enacted in Morocco in accordance with the characteristics of fish and living marine resources.

Fisheries Resources in Morocco 1

Family name	Scientific name	Moroccan	Ferrench	Common name	Spanish	Jananese
CLUPEIDAE	<i>Species name</i>	Chabel	Alosa varie	Allis shad	Sabalo comun	nishin-ka, alosa-zoku
CLUPEIDAE	<i>Alosa alosa</i>	Chabel	Alosa feinte	Twaite shad	Sboga	nishin-ka, alosa-zoku
CLUPEIDAE	<i>Alosa fallax</i>	Sardine	Sardine commune	European pilchard	Sardina europea	nishin-ka; iwashi no rui
CLUPEIDAE	<i>Sardinella pilchardus</i>	Latcha	Allache	Round sardinella	Alacha	nishin-ka; sappa no rui
CLUPEIDAE	<i>Sardinella aurita</i>	Lacha, Lakkira	Grande allache	Medeiran sardinella	Machuelo	nishin-ka; sappa no rui
CLUPEIDAE	<i>Sardinella maderensis</i>	Cheton(T,L)	Anchois commune	European anchovy	Anchova europea	katakuchi iwashi no rui
CLUPEIDAE	<i>Engraulis encrasicolus</i>	Boqueron(L)	Anchois commune	European anchovy	Anchova europea	katakuchi iwashi no rui
CLUPEIDAE	<i>Engraulis encrasicolus</i>	Lanchouba(M)	Anchois commune	European anchovy	Anchova europea	katakuchi iwashi no rui
CONGRIDAE	<i>Conger conger</i>	Congre, Ghrang (T,L), Sennour(Es, S. A. C)	Congre d'Europe	European conger	Congrio comun	anago no rui, yoroppa
MURAENIDAE	<i>Muraena helena</i>	Lamrina, Murene Noune(T,L,M-B), Farghe(M), Givelle(T,L,M) Eperlan(T,C), Belonzi(L), Laousi(T+C48) Crapaud de mer(EJ), Gaougaou(T), Jrad Labhar(Ej) Rape(T,L), Barbore(Mb), Baudrooie(M,S,A) Bacalau, Merlan(R), Morue(T), Poutassou(C) Mostela (M,C), Mouya(T), Bartola(Mb),	Murene de Mediterranee	Mediterranean moray	Morena mediterranea	utsubo no rui
ANGUILLIDAE	<i>Anguilla anguilla</i>		Anguille d'Europe	European eel	Anguila	unagi no rui, yoroppa unagi
ALGENTINIDAE	<i>Argentina sphyraena</i>		Argentine	Argentine	Pez plate	nigisu-ka kagosimanigisu no rui
BATRACHOIDIDAE	<i>Halobatrachus didactylus</i>		Crapaud lusitanien	Lusitanian toadfish	Sapo lusitanico	batorakoidesu-ka, tara, itachiuo no kin-en
LOPHIDAE	<i>Lophius budegassa</i>		Baudroie rousse	European anglerfish	Rape rojizo	ankou no rui
GADIDAE	<i>Micromesistius poutassou</i>		Merlan bleu	Blue whiting	Bacaladilla	tara-ka; tara no rui
GADIDAE	<i>Phycis blennoides</i>		Phycis de fond	Greater forkhead	Brotola de fango	tara-ka, phycis zoku sp.

GADIDAE	<i>Phycis phycis</i>	Monstela(M,S,Es), Mouya(L,T), Batola(Mb) Faneka(T,L,M- B,M,A), Merlan, Peckhota (<15cm), Pescadilla(<30cm), Merluza(>30cm)	Phycis de roche Tacaud commun	Forkhead Pouting	Brotola de roca Faneca	tara-ka, phycis zoku sp. tara-ka, trisopterus zoku sp.
GADIDAE	<i>Trisopterus luscus</i>					
MERLUCCIIDAE	<i>Merluccius merluccius</i>		Merlu commun	European hake	Merluza europea	merurusa zoku yoroppa heiku sp.
MERLUCCIIDAE	<i>Merluccius senegalensis</i>	Colin(R,C)	Merlu du Senegal	Senegalese hake	Merluza senegalesa	merurusa, senegaru heiku sp.
MORIDAE	<i>Mora moro</i>	?	Moro commun	Common mora	Mollera moranella	merurusa
BELONIDAE	<i>Belona svetovidovi</i>	Boumakyate(L,S)	Orphie, Aiguille	Garfish	Aguja	datsu-ka, belone zoku
BERYCIDAE	<i>Beryx decadactylus</i>	Pageot, Coq rouge, Dorade rose(C)	Beryx commun	Alfonsino	Alfonsino palometon	nanyoukinime
BERYCIDAE	<i>Beryx splendens</i>	Pageot, Coq rouge, Dorade rose(C)	Beryx long	Slender Alfonsino	Alfonsino besugo	kinmedai
TRACHICHTHYIDAE	<i>Gephyroberyx darwini</i>	?	Hoplostete de Darwin	Darwin's slimhead	Reloj de Darwin	hiuchidai-ka; hashikinme no rui
TRACHICHTHYIDAE	<i>Hoplostethus cadenati</i>	?	Hoplostete noir	Black slimhead	Reloj negro	hiuchidai-ka, hoplostethus zoku
TRACHICHTHYIDAE	<i>Hoplostethus mediterraneus</i>	Montre, Magana(C)	Hoplostete argente	Mediterranean slimhead	Reloj mediterraneo	hiuchidai-ka, hoplostethus zoku
ZEIDAE	<i>Zenopsis conchifer</i>	Saint Pierre Chatra(T,L), Moussa(M), Boukhatam(S,A,O)	Saint Pierre argente	Silverly John dory	San Pedro plateado	kagamidai
ZEIDAE	<i>Zeus faber</i>	Trompetero(L), Raboza(M)	Saint Pierre	John dory	Pez de San Pedro	matoudai
MACRORAMPHOSIDAE	<i>Macroramphosus scolopax</i>		Becasse de mer	Longspine snipefish	Trompetero	sagfue
SCORPAENIDAE	<i>Helicolenus dactylopterus</i>	Rascasse, Eagrab	Rascasse de fond	Rockfish	Gallineta	okikasago
SCORPAENIDAE	<i>Scorpaena porcus</i>	Rascasse	Rascasse brune	Black scorpionfish	Rascacio	okikasago no rui
SCORPAENIDAE	<i>Scorpaena scrofa</i>	Rascasse	Rascasse rouge	Red scorpionfish	Cabracho	husakasago houbou-ka,
TRIGLIDAE	<i>Chelidonichthys cuculus</i>	Roubiot, Grondin	Grondin rouge	Red gurnard	Arete	chelidonichthys zoku sp. houbou-ka,
TRIGLIDAE	<i>Chelidonichthys lastoviza</i>	Roubiot, Grondin	Grondin camard	Steakhead gurnard	Rubio	chelidonichthys zoku sp.

TRIGLIDAE	<i>Chelidonichthys obscurus</i>	Roubiot, Grondin	Grondin morrarde	Longfine gurnard	Areta aleton	houbou-ka, chelidonichthys zoku sp.
TRIGLIDAE	<i>Chelidonichthys lucerna</i>	Roubiot, Grondin	Grondin perlon	Tub gurnard	Bejel	houbou-ka, chelidonichthys zoku sp.
TRIGLIDAE	<i>Lepidotrigla diezeidei</i>	Roubiot, Grondin	Grondin de Dieuzeide	Spiny gurnard	Cabete espinudo	houbou-ka, lepidotrigla zoku sp.
TRIGLIDAE	<i>Trigla lyra</i>	Roubiot, Grondin Daru, Lahrache(T.L.) Drei(Mb,M), Lopaira(T,L,As), Bounakta((Mb, Ej), Loup-Bar(A,R), Darif(R)	Grondin lyre Bar european	Piper gurnard	Garneo	houbou-ka, trigla zoku sp.
MORONIDAE	<i>Dicentrarchus labrax</i>			European seabass	Lubina	morone ka, suzuki no kin-en, yoroppa suzuki
MORONIDAE	<i>Dicentrarchus punctatus</i>		Bar tachete	Spotted seabass	Baila	morone ka, suzuki no kin-en
SERRANIDAE	<i>Cephalopholis taeniops</i>	?	Merou a points bleu	Bluespotted seabass	Cherna colorada	yukatahata no rui (aonomehata?)
SERRANIDAE	<i>Epinephelus aeneus</i>	Mirou biad, Merou bronze	Merou blanc	White grouper	Cherna de ley	mahata no rui
SERRANIDAE	<i>Epinephelus alexandrinus</i>	Tcharna	Merou badeche	Golden grouper	Falso abadejo	hata-ka sp.
SERRANIDAE	<i>Epinephelus caninus</i>	Badejo, Tcharna	Merou gris	Dogtooth grouper	Mero denton	hata-ka sp.
SERRANIDAE	<i>Epinephelus guaza</i>	Mirou	Merou noir	Dusky grouper	Mero	hata-ka sp.
SERRANIDAE	<i>Mycteroperca rubra</i>	?	Merou royal	Comb grouper	Gitano	hata-ka sp.
SERRANIDAE	<i>Polyprion americanus</i>	Tcharna	Cernier commun	Wreckfish	Cherna	hata-ka sp.
SERRANIDAE	<i>Serranus atricauda</i>	?	Serran a queue noir	Blacktail comber	Serrano imperial	hata-ka sp.
SERRANIDAE	<i>Serranus cabrilla</i>	Labguira, Hajila(S,Es), Choukhat(T)	Serran chevre	Cember	Cabrilla	hata-ka sp.
SERRANIDAE	<i>Serranus hepatus</i>	?	Serran tambour	Brown comber	Merillo	hata-ka sp.
SERRANIDAE	<i>Serranus scriba</i>	Hajila(R), Cadi(As)	Serran ecriture	Painted comber	Serrano escribano	hata-ka sp.
POMATOMIDAE	<i>Pomatomus saltatrix</i>	Tassergal, Sargana	Tassergal	Bluefish	Anchova de banco	suzuki amoku sp.
CARANGIDAE	<i>Alectis alexandrinus</i>	?	Cordonnier bossu	Alexandria pompano	Jurel de Alejandira	itohikiaji no rui
CARANGIDAE	<i>Campogramma glycos</i>	Aouragh(A)Labchia (A), Lirio(C,L)	Liche lirio	Vadigo	Lirio	aji-ka sp.
CARANGIDAE	<i>Caranx hippos</i>	?	Carangue crevalle	Crevalle jack	Jurel comun	gingameaji no rui
CARANGIDAE	<i>Decapterus rhonchus</i>	Chren	Comete coussaut	False scad	Macarcia rea	muroaji no rui
CARANGIDAE	<i>Lichia amia</i>	Liche	Liche ne-be	Leerfish	Palometon	aji-ka sp.

CARANGIDAE	<i>Naucrates ductor</i>	Baghbagh	Poison pilote	Pilotfish	Pez pilot	burinodoki
CARANGIDAE	<i>Seriola dumerilii</i>	?	Seriote couronnee	Greater amberjack	Pez de limon	kanpachi
CARANGIDAE	<i>Trachinotus ovatus</i>	Liche	Palomine	Pompano	Pampano blanco	koban aji no rui
CARANGIDAE	<i>Trachurus picturatus</i>	Chrenne	Chinchard du large	Blue jack mackerel	Jurel de altura	maaji no rui
CARANGIDAE	<i>Trachurus trachurus</i>	Chrenne	Chinchard d'Europe	Atrantick horse mackerel	Jurel	maaji no zoku sp.
		Hringa(Es).				
CARANGIDAE	<i>Trachurus trachurus</i>	Saurel(C), Jurel(T)	Chinchard d'Europe	Atrantick horse mackerel	Jurel	maaji no rui
CARANGIDAE	<i>Trachurus mediterraneus</i>	Chrenne	Chinchard a queue jaune	Mediterranean horse r	Jurel mediterraneo	maaji no rui
CORYPHAENIDAE	<i>Coryphaena hippurus</i>	Msi'a amerikano	Coryphene commune	Common dolphinfish	Dorado comun	shiira
CORYPHAENIDAE	<i>Coryphaena equiselis</i>	?	Pompano dolphinfish	Dorado	Coryphene dauphin	ebisushiira
BRAMIDAE	<i>Brama brama</i>	?	Grande castagnole	Atlantic pomfret	Japuta	shimagatsuo no rui
BRAMIDAE	<i>Taractichthys longipinnis</i>	?	Castagnole fauchoir	Bigscale pomfret	Cangullo	hirejiro manzaiuo no rui
CENTRACANTHIDAE	<i>Centracanthus cirrus</i>	?	Picarel guetteur	Curled picarel	Jerret imperial	Centracanthus zoku sp.
CENTRACANTHIDAE	<i>Spicara maena</i>	?	Mendolo	Blotched picarel	Chucia	Spicara zoku sp.
CENTRACANTHIDAE	<i>Maena smaris</i>	?	Picarel	Picarel	Caramel	Maena zoku sp.
HAEMULIDAE	<i>Parapristipoma humile</i> +++	?	Grondeur bouche d'or	Guinea grunt	Burro boca de oro	isaki no rui
HAEMULIDAE	<i>Parapristipoma octolineatum</i> ?	?	Grondeur raye	African striped grunt	Burro listado	isaki no rui
		Tigholiine.				
		Tamatache(M).				
HAEMULIDAE	<i>Plectorhynchus mediterrane</i>	Abadeche(A,C,R)	Diagramme gris	Rubberlip grunt	Burro chiclero	kosyodai no rui
		Chekhar.				
HAEMULIDAE	<i>Pomadasys incisus</i>	Chbouk(C)	Grondeur metis	Basterd grunt	Ronco mestizo	mizoisaki no rui
HAEMULIDAE	<i>Pomadasys peroteti</i>	?	Grondeur perroquet	Parrot grunt	Ronco loro	mizoisaki no rui
		Targhzaï(T,L,As).				
		Bokka(L,M,As,T).				
		Hamreda(Mo)				
SPARIDAE	<i>Boops boops</i>	?	Bogue	Bogue	Boga	mutsu =
SPARIDAE	<i>Dentex angolensis</i>	Sabia	Dente angolais	Angola dentex	Denton angoles	kidai(renkodai) no rui
SPARIDAE	<i>Dentex dentex</i>	Pageot	Dente commun	Common dentex	Denton comun	kidai(renkodai) no rui
SPARIDAE	<i>Dentex gibbosus</i>	Katachou(S).	Gros dente rose	Pink dentex	Sama de pluma	kidai(renkodai) no rui
		Coq rouge(A,Es).				
		Katchoucho(T).				
		Galette(A).				
		Pageot(R).				
		Paghar(L)				
SPARIDAE	<i>Dentex macrophthalmus</i>		Dente a gros yeux	Large-eye dentex	Cachucho	kidai(renkodai) no rui

SPARIDAE	<i>Dentex maroccanus</i>	Vorace, Katchoucho(T), Breka(L,M), Koko rouge(Mo) Chejoun(L), Karfuli(Mo), Sargho(C) Boubradaa(T,EJ,A, C,L), Sargho, Berdeii(Mb), Charro(M) Boubradaa(T), Sargho(Mb,R,L), Chilia(C) Boubradaa(T,L), Sargho(Mb,EJ,C), Hambal(M), Chraghi(A) Sargho, Charro(T), Boubradaa(M), Addad(EJ,S,R,As) Hambal, Bermelo(L,Mb), Takba(A), Kahla Besugo, Bokha(T), Pageot(M,S,Es,C,R) Besugue Zougah, Vorace(T,L), Pageot(EJ), Boka(EJ,A) ++ Paghar, Pageot(T), Coq rouge(M), Brecha(Mo) ++ Hallama.	Dente du Maroc	Morocco dentex	Sama marroquif	kidaj(renkodai) no rui
SPARIDAE	<i>Diplodus bellottii</i>		Sparailon africain	Senegal seabream	Raspallon senegales	tai-ka Diplodus zoku sp.
SPARIDAE	<i>Diplodus cervinus cervinus</i>		Sar a grosses levres	Zebra seabream	Sargo breado	tai-ka Diplodus zoku sp.
SPARIDAE	<i>Diplodus puntazzo</i>		Sar a museau pointu	Sharpsnout seabream	Sargo picudo	tai-ka Diplodus zoku sp.
SPARIDAE	<i>Diplodus sargus cadenati</i>		Sar a museau pointu	Sharpsnout seabream	Sargo picudo	tai-ka Diplodus zoku sp.
SPARIDAE	<i>Diplodus vulgaris</i>		Sar a museau pointu	Sharpsnout seabream	Sargo picudo	tai-ka Diplodus zoku sp.
SPARIDAE	<i>Lithognathus mormyrus</i>		Marbre	Striped seabream	Herrera	tai-ka sp.
SPARIDAE	<i>Oblada melanura</i>		Oblade	Saddled seabream	Oblada	tai-ka sp.
SPARIDAE	<i>Pagellus acarne</i>		Pageot acarne	Axillary seabream	Alligote	tai-ka Pagellus zoku sp.
SPARIDAE	<i>Pagellus bellottii</i>		Pageot a tache rough	Red pandora	Breca colorade	tai-ka Pagellus zoku sp.
SPARIDAE	<i>Pagellus bogaraveo</i>		Drade rose	Blackspot seabream	Goraz	tai-ka Pagellus zoku sp.
SPARIDAE	<i>Pagellus erythrinus</i>		Pageot comun	Common pandora	Breca	tai-ka Pagellus zoku sp.
SPARIDAE	<i>Sarpa salpa</i>		Saupe	Salema	Salema	tai-ka Sarpa zoku sp.

SPARIDAE	<i>Sparus aurata</i>	Meharksa(M-B,T), Zraika(M,Es,T), Dorado(Es,L) Berdad(S), Pageot(S,A,L), Zougah(C,A) Zougah, Pageot/Chama(T,M, Mo), Pageot(A,C,R,T), Azougah(A), Zougah(Ej) Zigzag, Ananaz(R), Griset(S,C,R), Chopa(L) Courbine(M), Korb (C), Zalmza(A,Es) Ombrine(A,R,Es) ? Otolithe Pseudotolithus senegalensis Pseudotolithus types	Dorado royale Pagre raye Pagre a points bleus Pagre commun Dorado grise Maigre commun Teragin Otolithe senegalais Otolithe nauka Corb commun Maaza, Ombrina(L), Chevrette(A,R), Courbina(T) Maaza(R,L), Corvina(T) Maaza(L) Rouget Rouget, Salmonete(T,L), Soltan al houte(T), El cadi(Mb), Boulahya(Ej) Bouri, Mulet	Gilthead seabream Redbanded seabream Bluespotted seabream Common seabream Black seabream Meagre African weakfish Cassava croker Longneck croaker Brown meagre Canary dram Shi drum Fusca drum Red mullet	Pargo dorado Pargo semola Pargo zapata Pargo Pargo chopa Corvina Corvinata prieta Corvina casava Corvina bosoro Corvallo Verrugato de Canaria Verrugato comun Verrugato fusco Salmonete de fango	hedai no rui hedai no rui hedai no rui hedai no rui hedai no rui nibe-ka siroguchi no rui nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. nibe-ka sp. himeji-ka bora-ka sp.
SPARIDAE	<i>Sparus auriga</i>					
SPARIDAE	<i>Sparus caeruleostictus</i>					
SPARIDAE	<i>Sparus pagrus pagrus</i>					
SPARIDAE	<i>Spondylisoma cantharus</i>					
SCIAENIDAE	<i>Argyrosomus regius</i>					
SCIAENIDAE	<i>Atractoscion aequidens</i>					
SCIAENIDAE	<i>Pseudotolithus senegalensis</i>					
SCIAENIDAE	<i>Pseudotolithus types</i>					
SCIAENIDAE	<i>Sciaena umbra</i>					
SCIAENIDAE	<i>Umbrina canariensis</i>					
SCIAENIDAE	<i>Umbrina cirrosa</i>					
SCIAENIDAE	<i>Umbrina ronchus</i>					
MULLIDAE	<i>Mullus barbatus</i>					
MULLIDAE	<i>Mullus surmuletus</i>					
MUGILIDAE	<i>Chelon labrosus</i>					

MUGILIDAE	<i>Liza aurata</i>	Bouri, Mulet	Mulet dore	Golden mullet	Galupe	bora-ka sp. menada no rui
MUGILIDAE	<i>Liza ramada</i>	Bouri, mullet	Mulet porc	Thinlip mullet	Morragute	bora-ka sp. menada no rui
MUGILIDAE	<i>Mugil cephalus</i>	Bouri, mullet	Mulet cabot	Flathead grey mullet	Pardete	mabora
MUGILIDAE	<i>Mugil capurrii</i>	Bouri, mullet	Mulet sauteur d'Africa	Leaping African mullet	Galua africana	bora-ka sp. mabora no rui
SPHYRAENIDAE	<i>Sphyraena sphyraena</i>	?	Becune europeenne	European barracuda	Espeton	kamasu no rui
LABRIDAE	<i>Coris julis</i>	Haja	Girelle	Rainbow wrasse	Doncella julia	kamuribera no rui
LABRIDAE	<i>Xyrichtys novacula</i>	Haja	Donzelle lame	Pearly razorfish	Doncella cuchilla	tensu no rui
SCARIDAE	<i>Sparisoma cretense</i>	=Scarus	Perroquet vieillard	Parrotfish	Loro viejo	aobudai no rui
TRACHINIDAE	<i>Trachinus araneus</i>	Agrab, Vive, Belem (T,L), Araigna(L)	Vive araignee	Spotted weever	Anana	Trachina ka sp ginpo no kin-en
TRACHINIDAE	<i>Trachinus draco</i>	Agrab, Vive, Belem (T,L), Araigna(L)	Grande vive	Greater weever	Esocorpion	Trachina ka sp ginpo no kin-en
TRACHINIDAE	<i>Trachinus radiatus</i>	Agrab, Vive, Belem (T,L), Araigna(L)	Vive de tete rayonnee	Starry weever	Vibora	Trachina ka sp ginpo no kin-en
TRACHINIDAE	<i>Trachinus vipera</i>	Agrab, Vive, Belem (T,L), Araigna(L)	Petite vive	Lesser weever	Salvarego	Trachina ka sp ginpo no kin-en
SCOMBRIDAE	<i>Auxis thazard</i>	Melba, Auxide	Auxide	Frigate tuna	Melva	Trachina ka sp ginpo no kin-en
SCOMBRIDAE	<i>Euthynnus alletteratus</i>	Melba, L'bacora(M), Bacorette, Minerva,				hirasoda
SCOMBRIDAE	<i>Katsuwonus pelamis</i>	Thonine	Thonine commune	Little tunny	Bacoreta	suma no rui
SCOMBRIDAE	<i>Orcynopsis unicolor</i>	Listao	Bonite a ventre raye	Skipjack tuna	Listado	katsuo
SCOMBRIDAE	<i>Sarda sarda</i>	Ir'raal, Palomette, Tazars	Palomette	Plain bonito	Tasarte	katuo no rui
SCOMBRIDAE	<i>Scomber japonicus</i>	Bonito(T,L), Sarda(M), Cerda, Bacora,	Bonito a dos raye	Atlantic bonito	Bonito atlantico	hagatuo no rui
SCOMBRIDAE	<i>Scomber scombrus</i>	Kabaia, Zaroug(M), Maquereau	Maquereau espagnol	Chub mackerei	Estornino	masaba
SCOMBRIDAE	<i>Scomberomorus maculatus</i>	Kabaia, Zaroug(M), Maquereau, Tourmina(T,L), Palomette de Dakar (M), Ir'ral	Maquereau commun	Atlantic mackerel	Caballa de Atrantico	saba no rui
SCOMBRIDAE			Thazard blanc	West African Spanish	Carite lusitanico	sawara no rui

SCOMBRIDAE	<i>Thunnus alalunga</i>	Toun el hor,	Germon	Albacore	Atun blanco	binnaga
SCOMBRIDAE	<i>Thunnus albacares</i>	Germon, Bacora	Albacore	Yellowfin tuna	Rabil	kihada maguro
SCOMBRIDAE	<i>Thunnus obesus</i>	Thon	Thon obese	Bigeye tuna	Patudo	mebachi maguro
SCOMBRIDAE	<i>Thunnus thynnus</i>	Thon, Minerva(Ej)	Thon rouge	Atlantic bluefin tuna	Atun	kurobmaguro
GEMPYLIDAE	<i>Promethichthys prometheus</i> ?	?	Escolier clair	Promethean escolar	Escolar prometeco	kuroshibikamasu
GEMPYLIDAE	<i>Lepidocybium flavobrunneum</i> ?	?	Escolier noir	Escolar	Escolar negro	aburasokomutsu
GEMPYLIDAE	<i>Ruvettus pretiosus</i>	?	Rouvet	Oilfish	Escolar ciavo	baramutsu
TRICHIURIDAE	<i>Aphanopus carbo</i>	Semta, Sif,	Sabre noir	Black scabbardfish	Sable negro	kurotachimodoki
TRICHIURIDAE	<i>Lepidopus caudatus</i>	Semta, Sif,	Sabre argente	Silver scabbardfish	Pen cinto	tachiuo-ka sp.
TRICHIURIDAE	<i>Trichiurus lepturus</i>	Semta, Sif,	Poison sabre commun	Largehead hair tail	Pez sable	tachiuo
		Espadon, Spada(T), Boukhopala(L),				
XIPHIDAE	<i>Xiphias gladius</i>	Espadon	Espadon	Swordfish	Pez espada	mekajiki
ISTIOPHORIDAE	<i>Istiophorus albicans</i>	Snif(Mb), Bousif(M)	Voilier de l'Atlantique	Atlantic sailfish	Pez vela del Atlantico	bashokajiki no rui
ISTIOPHORIDAE	<i>Makaira nigricans</i>	Espadon	Makaire bleu	Blue marlin	Aguja azul	kurokajiki no rui
ISTIOPHORIDAE	<i>Tetrapturus georgei</i>	?	Makaire epee	Roundscale spearfish	Marlin peto	makajiki no rui
ISTIOPHORIDAE	<i>Tetrapturus albidus</i>	Espadon	Makaire blanc	White marlin	Aguja blanca	makajiki no rui
STROMATEIDAE	<i>Stromateus fistola</i>	Chairia	Fiatole	Butterfish	Palometa fiatola	managatsuo ka sp.
CITHARIDAE	<i>Citharus linguatula</i>	Limande	Feuille	Spotted flounder	Solleta	kokebirame-ka sp.
CITHARIDAE	<i>Citharus linguatula</i>	Palaya(A), Sole	Feuille	Spotted flounder	Solleta	kokebirame-ka sp.
BOTHIDAE	<i>Citharus linguatula</i>	?	Arnoglosse de Thor	Thor's scadfish	Peludilla	nagadarumagarei no rui
BOTHIDAE	<i>Arnoglossus thori</i>	?	Arnoglosses imperial	Imperial scadfish	Serrandei imperial	nagadarumagarei no rui
BOTHIDAE	<i>Arnoglossus imperialis</i>	?	Arnoglosses imperial	Imperial scadfish	Serrandei imperial	karei-moku,
SCOPHTHALMIDAE	<i>Lepidorhombus whiffiagonis</i>	Sole	Cardine blanche	Megrin	Gallo	Scopthalmus-ka sp.
SCOPHTHALMIDAE	<i>Psetta maxima</i>	Turbot, Lakara, Kobaa, Rodabalo	Turbot	Turbot	Rodaballo	karei-moku,
SCOPHTHALMIDAE	<i>Scopthalmus rhombus</i>	Barbue, Lkara, Turbot, Kobaa Langue(C,R,M), Lenguato(L,T), Maela(Mb), Sole(M)	Barbue	Brill	Remol	Scopthalmus-ka sp.
SOLEIDAE	<i>Dicologlossa cuneata</i>	Hou-moussa(T,L)	Ceteau	Wedge sole	Acedia	sasaushinosita-ka sp.
SOLEIDAE	<i>Microchirus theophila</i>	Hout-moussa	Sole-predix juive	Bastard sole	Aceova	sasaushinosita-ka sp.
SOLEIDAE	<i>Microchirus variegatus</i>	Holut-moussa	Sole-predix commune	Thickback sole	Golleta	sasaushinosita-ka sp.

SOLEIDAE	<i>Pegusa lascaris</i>	Lenguato(L, T), Maela(Mb), Sole(M) Hout-moussa(T, L)	Sole-pole	Sand sole	Sortija	sasaushinosita-ka sp.
SOLEIDAE	<i>Solea senegalensis</i>	Hout-moussa, Sole, Sole bouclee	Sole du Senegal	Senegalese sole	Lenguado	sasaushinosita-ka sp.
SOLEIDAE	<i>Solea vulgaris</i>	Hout-moussa, Sole,	Sole commune	Common sole	Lenguado comun	sasaushinosita-ka sp.
SOLEIDAE	<i>Synaptura lusitanica</i>	Hout-moussa	Sole-ruardon commune	Portuguese sole	Lenguado portugues	sasaushinosita-ka sp.
CYNOGLOSSIDAE	<i>Cynoglossus canariensis</i>	Langue(E, J, Es), Sandiya(S)	Sole-langue canarienne	Canary tonguesole	Langua de Canarias	ushinosita-ka sp.
BALISTIDAE	<i>Balistes vetula</i>	?	Baliste royal	Queen triggerfish	Pejepureco cachuo	mongarakawahagi no rui
		Baghia(T, As), Halouf (L), Far(Mb, S, E, J)	Baliste cabri	Grey triggerfish	Pejepuerco blanco	mongarakawahagi no rui
BALISTIDAE	<i>Balistes capriscus</i>					

Fisheries Resources in Morocco2

Family name	Scientific name	Moroccan	French	English	Common name	Spanish	Jananese
SQUALIDAE	<i>Centroscyllium crepidater</i>	Kalb, Chien de mer	Paitona a long nez	Long nose velvet dogfish	Sapata negra	Carocho	yumezame no rui
SQUALIDAE	<i>Dalatias licha</i>	Kalb, Chien de mer	Squale liche	Kite fin shark			yeroizame
SQUALIDAE	<i>Dalatias calcea</i>	Kalb, Chien de mer	Squale savate	Bird beak dogfish		Tollo pejarito	heratunozame
SQUALIDAE	<i>Etmopterus spinax</i>	Kalb, Chien de mer	Sagre commun	Velvet belly		Negrilo	karasuzame
SQUALIDAE	<i>Symnodon ringens</i>	Kalb, Chien de mer	Squale grogneur	Knifetooth dogfish		Bruja	birudozame no rui
SQUALIDAE	<i>Squalus acanthias</i>	Kalb, Bouchouika	Aiguillat commun	Piked dogfish		Mieliga	aburatsunozame
SQUALIDAE	<i>Squalus blainvillei</i>	Kalb, Bouchouika	Aiguillat coq	Long nose spurdog		Galludo	hirketka tunozame
SQATINIDAE	<i>Squatina aculeata</i>		Ange de mer	Sawback angelshark		Angelote espinudo	kasuzame,korozame
SQATINIDAE	<i>Squatina squatina</i>	Jailote, Cadei	epineux	Angelshark		Ange de mer	no rui
SQATINIDAE	<i>Squantina oculata</i>		Ange de mer	Smoothback angelshark		Rez angel	kasuzame,korozame
ODONTASPIDIDAE	<i>Eugomphodus taurus</i>		Requin teureau	Sand tiger shark		Toro bacota	no rui
ODONTASPIDIDAE	<i>Odontaspis ferox</i>		Requin feroce	Smalltooth sand shark		Solrayo	Odontaspis ka sp.
ALOPIIDAE	<i>Alopias vulpinus</i>		Renard	Thresher shark		Zorro	Odontaspis ka sp.
CETORHINIDAE	<i>Cetorhinus maximus</i>		Pelerin	Basking shark		Peregrino	niteri no rui
LAMIDAE	<i>Carcharodon carcharias</i>		Grand requin blanc	Great white shark		Jaqueton blanco	ubazame
LAMIDAE	<i>Isurus oxyrinchus</i>	Alkers	Taupe bleu	Shortfin mako		Marrajo dientuso	hohojirozame
LAMIDAE	<i>Lamna nasus</i>		Requin taupe	Porbeagle		Marrajo sardinero	aozame
SCYLIORHINIDAE	<i>Geleus melastomus</i>	Hartouka,	Chien espagnol	Blackmouth catshark		Pintarroja bocanegra	nezumizame no rui
SCYLIORHINIDAE	<i>Scyliorhinus canicula</i>	Roussette,Gata	Petite roussette	Smallspeckled catshark		Pintarroja	yamorizame no rui
SCYLIORHINIDAE	<i>Scyliorhinus stellaris</i>	Hartouka, Gata	Grande roussette	Nursehound		Aifitan	torazame no rui
TRIAKIDAE	<i>Galeorhinus galeus</i>	Chien de mer	Requin ha	Topo shark		Cazon	torazame no rui
TRIAKIDAE	<i>Mustelus asterias</i>	Chien de mer	Emissole tacheteo	Starry smoothhound		Musola estrellada	dochizame ka sp.
TRIAKIDAE	<i>Mustelus mustelus</i>	Cazon(L), Chien de mer,	Emissole lisse	Smoothhound		Musola	dochizame ka sp.
CARCHARHINIDAE	<i>Carcharhinus leucas</i>	Kalb,ibhar	Requin bouledogue	Bull shark		Tiburón ssarda	mejirozame ka sp.
CARCHARHINIDAE	<i>Carcharhinus longimanus</i>	Kalb-kbir(C)	Requin oceanique	Oceanic white shark		Tiburón oceanico	mejirozame ka sp.
CARCHARHINIDAE	<i>Carcharhinus obscurus</i>		Requin sombre	Dusky shark		Tiburón arenero	mejirozame ka sp.

CARCHARHINIDAE	<i>Prionace glauca</i>	Chien de mer, Kalb labhar, Mouch labhar	Peau bleue	Blue shark	Tiburón azul	mejizozame ka sp.
SPHYRNIDAE	<i>Sphyrna lewini</i>	Guardiacivil(L), Karnoda(M), Jadarmi(C)	Requin marteau halcorne	Scalloped hammerhead	Cornuda comun	syumokuzeme ka sp.
SPHYRNIDAE	<i>Sphyrna mokarran</i>	Guardiacivil(L), Karnoda(M), Jadarmi(C)	Grand requin marteau	Great hammerhead	Cornuda gigante	syumokuzeme ka sp.
SPHYRNIDAE	<i>Sphyrna zygaena</i>	Guardiacivil(L), Karnoda(M), Jadarmi(C)	Requin matreau commun	Smooth hammerhead	Cornuda cruz	syumokuzeme ka sp.
RAJIDAE						ei moku
DASYATIDAE						ei moku
CYMNURIDAE						ei moku
MYLIOBATIDAE						ei moku
RHINOPTERIDAE						ei moku
RHINOBATIDEA						ei moku
TORPEDINIDAE						ei moku
NEPHROPIDAE	<i>Homarus gammarus</i>	Homard, Taroucht, Bougavanti	Homard eurpeen	European lobstr	Bogavante	akazaebi ka omaru lobster no rui
NEPHROPIDAE	<i>Nephrops norvegicus</i>	Langoustine, Azeffane	Langoustine	Norway lobster	Cigala	akazaebi ka sp.
PALINURIDAE	<i>Panurillus elephas</i>	Bakhouché(Mb,M), Langousta(T,L), Azeffane	Langousta rouge	Common spiny lobster	Langosta comun	iseebi-ka iseebi zoku sp.
PALINURIDAE	<i>Panurillus mauritanicus</i>	Bakhouché(Mb,M), Langousta(T,L), Azeffane	Langousta rose	Pink spiny lobster	Langosta rosada	iseebi-ka iseebi zoku sp.
PALINURIDAE	<i>Panurillus regius</i>	Langousta(T,L), Azeffane	Langousta royale	Royal spiny lobster	Langosta real	iseebi-ka iseebi zoku sp.
SCYLLARIDAE	<i>Scyllarides latus</i>	Foritah	Grande cigale	Mediterranean locust lobs	Cigarra	zouriebi ka sp.
SCYLLARIDAE	<i>Scyllarus arctus</i>		Petite cigale	Small european locust lol	Santiaguino	zouriebi ka sp.
ARISTEIDAE	<i>Aristeus antennatus</i>	Crevette royale	Crevette rouge	Blue and red shrimp	Gamba rosada	chihiroebi-ka hikarichihiroebi zoku sp.

	<i>Plesiopenaeus edwardsianus</i>	Crevette royale	Gambon ocerlat	Scarlet shrimp	Gamba carabinero	mitsutogechihiroebi zoku sp.
CRANGONIDAE	<i>Crangon crangon</i>	Crevette grise Kimroun(Es), Boukhaït, Crevette de roche	Crevette grise	Common shrimp	Quisquilla	ebijyako-ka ebijyako zoku sp.
PALAEEMONIDAE	<i>Palaemon serratus</i>		Bouquet (commun)	Common prawn	Camaron comun	tengagaebi-ka sujiabi zoku sp.
PANDALIDAE	<i>Heterocarpus ensifer</i>		Crevette nylonne armee	Armed nylon shrimp	Camaron nylon armado	tarabaebi-ka akamoniminoebi okinosujiabi zoku sp.
PANDALIDAE	<i>Parapandalus narval</i>		Crevette narval	Narval shrimp	Camaron narval	tarabaebi-ka jinkenebi zoku sp.
PANDALIDAE	<i>Plesionika heterocarpus</i>	Crevette aux oeufs bleus	Crevette fleche	Arrow shrimp	Camaron flecha	tarabaebi-ka jinkenebi
PANDALIDAE	<i>Plesionika martia</i>	Cameon, Gamba (T, L, M,R), Kimroun(A), Crevette rose	Crevette doree	Golden shrimp	Camaron de oro	
PENEIDAE	<i>Parapenaeus longirostris</i>		Crevette rose du large	Deepwater rose shrimp	Camaron de altura	kurumaebi-ka sakeebi zoku sp.
PENEIDAE	<i>Penaeopsis serrata</i>		Crevette megalops	Megalops shrimp	Camaron magalops	kurumaebi-ka binigareebi zoku sp.
PENEIDAE	<i>Penaeus kerathrus</i>	Langoustine	Caramote	Caramote prawn	Camaron langostino espanol	kurumaebi-ka kurumaebi zoku sp.
SOLENOCERIDAE	<i>Solenocera membranacea</i>	Crevette rose Aukricha(Mb), Cangrejo(T)	Salicoque de vase	Atlantic mud shrimp	Gamba de fango del Atlantico	kudahigeebi zoku sp.
CALAPPIDAE	<i>Calappa granulata</i>		Crabe honteux	Shamefaced crab	Calapa real	karappa ka sp.
CANCRIDAE	<i>Cancer bellianus</i>		Tourteau dente	Toothed rock crab	Jabia de roca	
	<i>Cancer pagurus</i>		Tourteau poupart	Ox crab	Jabia de roca masera	
MAJIDAE	<i>Paromola cuvieri</i>	Boujiniba	Paromole	Paromola	Centolla de fondo	kumogani no rui
	<i>Maja squinado</i>	Araigne, Cangrejo, Koaaricha, Boujiniba	Araingee europeene	Spinous spider crab	Centolla europea	kumogani no rui
	<i>Alloteuthis subulata</i>	Petit calmar (Es,A,C,R), Mendrita(T)	Casseron commun	European commun squid	Calmar comun	yariika no rui
LOLINGINIDAE	<i>Loligo vulgaris</i>	Varis calmar	Encornet	European squid	Calamar	yariika no rui
	<i>Loligo gorbessi</i>	Calmar	Encornet de forbes	Forbes' squid	Calmar de Forbes	yoroppaocyariika

OCTOPODIDAE	<i>Eledone cirrosa</i>	Poulpe	Poulpe blanc	Curled octopus	Pulpo blanco	tako no rui
OCTOPODIDAE	<i>Octopus macropus</i>	Poulpe Charlotte(T), Rottala (Ej, M,Mo), Pulpe, Azaiz(Es) Pota(T,L), Passamar(M)	Poulpe tachete	White spotted octopus	Pulpo manchado	tako no rui
OCTOPODIDAE	<i>Octopus vulgaris</i>		Pieuvre	Common octopus	Pulpo comun	tako no rui surumeika-ka
OMMASTREPHIDAE	<i>Illex coindetii</i>		Encornet rouge	Shortfin squid	Pota voladora	irekkusu-aka sp. surumeika-ka
OMMASTREPHIDAE	<i>Todarodes sagittatus sagit</i>	Passamar	Toutencu commun	European flying squid	Pota europea	surumeika-aka sp. surumeika-ka
OMMASTREPHIDAE	<i>Todaropsis eblenae</i>		Encornet souffleur	Lesser flying squid	Pota sopladora	surumeika-aka sp. kouiika-ka
SEPIIDAE	<i>Sepia bertheloti</i>	Sepia Sepia(M,S,Es,A, L), Choko(L,T),	Seiche africaine	African cuttlefish	Jibia africana	yasekouika
SEPIIDAE	<i>Sepia officinalis officinalis</i>	Seiche(L) Chokito(L),	Seiche commune	Common cuttlefish	Jibia	kouiika-ka yoroppakouiika
SEPIIDAE	<i>Sepia orbignyana</i>	Sepia(Tif)	Seiche rosee	Pink cuttlefish	Jibia rosada	kouiika-ka orubinikoika dangoika-ka
SEPIOLIDAE	<i>Rossia macrosoma</i>	Sepiote	Sepiote melon	Ross' bob tailed squid	Chopito	yoroppabouzuika dangoika-ka himedanngoika no rui
SEPIOLIDAE	<i>Sepiote rondeleti</i>	Sepiote	Sepiote	Dwarf cuttlefish	Globito	rui
CARDITIDAE	<i>Cerastoderms edule</i>	Coque	Coque (commune)	Common edible cockle	Berbercho comun	yoroppazarugai
DONACIDAE	<i>Donax trunculus</i>	Haricot de mer	Filon tronque	Truncate donax	Coquina truncaoa	furansunaminokogai ikai-ka hibarigai no rui
MYTILIDAE	<i>Modiolus rhomboideus</i>	Moule	Modiole losangique	Rhomboid mussel	Mejillon romboidal	
MYTILIDAE	<i>Mytilus galloprovincialis</i>	Moule	Moule mediterraneenne	Mediterranean mussel	Mejillon mediterraneo	chireniagai sudara-surigahamag ai
VENERIDAE	<i>Tapes decussatus</i>	Palourde, Nmia	Palourde commune	Decussate venus	Almeja fina	
VENERIDAE	<i>Venus verrucosa</i>	Praire	Praire commune	Warty venus	Escupina grabada	kabutonosikorogai fujitugai-ka
CIMATIIDAE	<i>Charonia nodifera</i>		Triton nouveau	Knobby triton	Triton buido	yoroppabora no rui
HALIOTIDAE	<i>Halotis tuberculata</i>		Ormeau tuberculeux	Tuberculate abalone	Oreja marina tuberculosa	seiyoutokobusi

MURICIDAE	<i>Thais haemastoma</i>	Overque bouche de sang	Red-mouthed rock shell	Purpura do boca roja	furoridakuchiberirei
NATICIDAE	<i>Natica adansonii</i>	Natica d'Adanson	Adanson's moon snail	Natica de Adanson	sigai
	<i>Natica marochiensis</i>	Natica du Maroc	Morocco moon snail	Natica marroqui	adansontamagai
	<i>Natica vittata</i>	Natica a bandelottes	Banded moon snail	Natica listuda	kudamonotamagai
PATELLIDAE	<i>Patella safiana</i>	Patelle safian	Safian limpet	Lepada saifana	tamagai no rui
	<i>Strombus latus</i>	Strombus d'Afrique occidentale	West African stromb	Cobo de Africa occidental	yohikasagai
STROMBIDAE					sodebora-ka
	<i>Cymbium marmoratum</i>	Volute marbree	Marmorate volute	Voluta marmorada	angorasodogai
VOLTIDAE					gakuhubora-ka
					natsumeyashigai no rui

Annex Table 3-1-3 List of Fisheries Regulations

Red algae(Gelidium, etc.) (on the shore of the Atlantic)	Closed from October 1 to June 30.
Seals(Phoque-Moines)	Prohibited to harvest from 20°54'40" N.L. to 21°23'0" N.L. The prohibition period is from November 7 in 1993 to November 16 in 1999. The period may be extended if the resource is still in danger.
Fishes of herring family (Alose, Alosa spp.)	All the year round, closed for 2 years since November 1994 as one term. It is now on the 2nd term.
Fishes of grouper family (Merou)	Closed from July 1 to August 31
European lobster and spiny lobsters	Closed from October 1 to February 1
Octopus	Trawl for octopus is closed during the breeding season (April, May, September, October). The number of pot is limited in the South Morocco.

The minimum fishable size limit of each species are prescribed as follows.

(FL: Fork length, TL: Total length, PCS: Pieces, CL: Carapace Length, SW: Shell Width, TW: Total Weight,)

Minimum allowable fish catching sizes are prescribed for each fish species as follows.

French name	Scientific names	Common names	Minimum size
Fish species			
Bar ou loup	<i>Dicentrarchus labrax</i>	European sea bass	FL 17cm
Bar Tachete	<i>Dicentrarchus punctatus</i>	Spotted sea bass	FL 15cm
Congre	<i>Conger conger</i>	European conger	TL 55cm
Chinchard ou saurel	<i>Trachurus trachurus</i>	Spanish mackerel	FL 14cm
Chren	<i>Decapterus rhonchus</i>	False scad	FL 14cm
Dentes	<i>Dente sp</i>	Dentex	FL 12cm
Grondins	<i>Trigla sp., Chelidonichthys spp.</i>	Gurnard	TL 14cm
Merlu blanc	<i>Merluccius merluccius</i>	European hake	TL 20cm
Merlu noir	<i>Merluccius senegalensis</i>	Senegalese hake	TL 20cm
Mulet	<i>Liza spp, Mugil sp.</i>	Mullet	TL 14cm
Dorade	<i>Sparus aurata</i>	Gilthead sea bream	FL 15cm
Pageot	<i>Pagellus spp.</i>	Sea breams	FL 14cm
Pagre	<i>Sparus pagrus</i>	Common sea bream	FL 14cm
Rouget	<i>Mullus spp.</i>	Red mullets	TL 11cm
Sar	<i>Diplodus sargus, D.cervinus</i>		
	<i>Sparus caeruleostictus</i>	Sea breams	FL 14cm
Sargue	<i>Diplodus vulgaris, D. annularis</i>	Sea breams	FL 14cm
Sole	<i>Solea vulgaris, S. senegalensis</i>	Soles	TL 14cm
Langue	<i>Cynoglossus canariensis</i>	Canary tonguesole	TL 14cm
Turbot	<i>Pseta maxima, Scophthalmus rhombus</i>	Turbots	TL 23cm
Sardine	<i>Sardina pilchardus</i>	European pilchard	50 pcs/kg
Maquereaux	<i>Scomber spp.</i>	Atlantic mackerel	20 pcs/kg
Anchois,	<i>Engraulis encrasicolus</i>	European anchovy	70 pcs/kg
Thone rouge	<i>Thunnus thynnus</i>	Bluefin tuna	6.4 kg/pc

It is allowed to catch smaller than this size if the number of the small fish is up to 15 % of the total numbers caught. Same rules apply to the other tuna species too.

Albacore	<i>Thunnus albacares</i>	Yellowfin tuna	3.2kg/pc
Thone obese	<i>Thunnus obesus</i>	Bigeye tuna	3.2kg/pc
Espadon	<i>Xiphias gladius</i>	Swordfish	25kg or 125cm

Crustaceans

Homard	<i>Homarus gammarus</i>	European lobster	CL 17cm
Langouste	<i>Panulirus spp.</i>	Spiny lobsters	CL 17cm

Mollusks

Amande de mer	<i>Clypeymeris sp.</i>	SW 4cm	
Coque	<i>Cardium sp.</i>	Common edible cockle	SW 3cm
Moule	<i>Mytilus galloprovincialis</i>	Mediterranean mussel	SW 4cm
Oursin	<i>Paracentrotus levidus</i>	SW 3cm	
Palourde	<i>Tapes decussatus</i>	Decussate venus	SW 3cm
Paire	<i>Venus verrucosa</i>	Warty venus	SW 3cm
Poulpe	<i>Octopus vulgaris</i>	Octopus	TW 400g
Seiche	<i>Sepia spp.</i>	Cuttlefish	TW 100g
Calmar	<i>Loligo vulgaris</i>	Squid	Mantle 11cm

3-2 Marine Food Products: Economics and Distribution

In 1995, the total value of marine product exports of Morocco was 689,814,800 DH. Marine products ranked second in terms of total export value, following phosphate rock, and accounted for 15% of the total export income for the year. While the export volume for marine products may vary from year to year, in recent years, a favorable market has led to a constant rise in their export value.

Morocco's major exports of marine products are octopus, squid and shrimp, which account for 62.1% of the total marine export value. Eighty percent (80%) of the octopus exported is for the Japanese market. Next, in terms of export volume, are canned sardines and mackerel, which account for 22.6% of the total marine export volume. Fresh and frozen fish are exported to Spain, Portugal, France, Italy and various countries in Africa. The total marine products export volume for 1990 was 188,060 tones. This represented a total marine export value of 4,445,150,000 DH for the year. From 1990 to 1995, the volume of marine product exports was increased by 26%, while the total value of marine product exports was increased by 50%. While there are no statistics available on production of the artisanal fishery, generally they are for fresh and frozen export products.

3-2-1 Distribution Channel

Morocco's routes for fresh marine products are generally as described in cases 1-10, below. The distribution of catches of the artisanal fishery is along routes described in items 5-10. A high proportion of the fish landed by artisanal fishermen is high value fish and is either exported or sold at upper class restaurants and hotels in Morocco. The quality of products sold locally to the patrons of upper class restaurants and hotels is generally the same as that of products sold for export.

Cases	(1)	Fishermen	Shipboard Sales	Middleman	Retail	Consumers (Coastal Fishing)
	(2)	Fishermen		Middleman	Marketplace	Consumers (Coastal Fishing)
	(3)	Fishermen				Processors (Coastal Fishing)
	(4)	Fishermen		Middleman		Exporters (Coastal Fishing)
	(5)	Fishermen		Middleman	Marketplace	Consumers (Artisanal Fishing)
	(6)	Fishermen			Marketplace	Consumers (Artisanal Fishing)
	(7)	Fishermen			Fish Shops	Consumers (Artisanal Fishing)
	(8)	Fishermen		Middleman	Exporters (Artisanal Fishing)	
					High value products : e.g. sea bream, Japanese shrimp	
	(9)	Fishermen		Exporters (Artisanal Fishing)		
				High value products : e.g. tuna		
	(10)	Fishermen				Consumers (Artisanal Fishing)

Note : For Case (11), sales are not counted in terms of monetary economy.

1) Exporters of Marine Products of the Artisanal Fishery

A leading exporter in Agadir has 7 offices at Tanger, Nador and Tetouan in the north, Tantan and Laayoune in the south, and other cities, and has contracts with offices at 2 locations who deal with a number of local brokers through exclusive buying agreements.

The products are collected and stored through out the year using cold storage cars. The catch is to be collected and loaded by 5:00 p.m. Sorting, washing, sterilization, packing and wrapping is done between 5:00 and 7:30 p.m. The product is then sent to the Agadir Airport for direct shipment to Paris on the flight departing at 9:00 p.m. Despite varying shipping weights, shipments are made each day. The average

daily volume of exports during the fishing season is 1.5 to 2 tons, and about 1 ton during the off season. One fish is packed in a styrene foam box with crushed ice. The content of shipments is limited to high value fish of the 5kg class, such as sea bream, sea bass and African weakfish.

Standard of sanitation is maintained by the factory. This is the first facility in Agadir to match European sanitation standard. The company has made much effort for quality control and devotes considerable time for the education of employees. Since export processing was begun at this factory, there has not been a single product-related claim.

2) Moroccan Retailers of the Catches of Artisanal Fishery

There are no comprehensive government controls or regulations on entry to this domestic market. Anyone is free to do business in this field. Since this is a field requiring little capital investment, local entrepreneurs with modest resources often enter this business. Although they are small in number, Korean and Chinese wholesalers have been buying fresh fish at fishing ports in the southern Morocco in recent years, conducting their wholesale businesses using cold storage cars. Moroccan fresh fish wholesalers have been serving as "middlemen" in buying fresh fish caught by artisanal fishermen at landing sites and selling it to hotels and restaurants.

3) Sales at Fishing Villages and Local Markets

Example 1 The Sale of Fresh Fish in the Ksar Sghir

On a market day in Ksar Sghir, a city that fronts on the Straits of Gibraltar, fresh fish was being sold right from the boat in an open-air market, still in the wooden fish boxes. The three varieties being sold were: sole, blue whiting and European anchovies. Each of the three fish merchants had 2 to 3 boxes, from which they were selling the fish. This visit was done at the coldest time of the year in Morocco; the least likely season for freshness to be lost, and the least likely time for flies and other insects to frequent in the area. Nevertheless, exposure to the sun, wind and outside dust gave rise to unsanitary conditions. Moreover, since flies will be flying around on sunny days, the merchants should at least try to cover the fish with vinyl sheets and keep it fresh by using ice.

Example 2 Fish Sales at Moulay Bouselham

Sales in this fishing village are done by beach auction. For the fish which is quickly placed on the distribution system, the middlemen take care to preserve the fish being shipped to distant locations using ice. Among fish dealers who have shops in the local market, one is taking care to preserve the fish by use of a refrigerator; and another sells fish arranged on a concrete platform in his small shop, sprinkling the fish from time to time with water. The fish market is not much different than a market for meat or poultry, and drainage facilities are inadequate. The entire marketplace is old and sanitation facilities are outdated.

Example 3 The Agadir Municipal Market

At this market, the shops are arranged on one floor of a building, being divided into sections according to the type of merchandise being sold, such as meat, fish, vegetables, flowers and spices. There are 5 fish shops, in all. Since the market is close to a foreigners' residential area, hotels and restaurants, such high value items as sea bream, sea bass, African weakfish and shrimp are being sold. The fish is displayed on platforms. Crushed ice and water are used to preserve the fish. The dealers are also required to use ice when it is being sent from the landing sites to the shops. Dealers also have refrigerators in their shops and quickly store the fish received therein. They also observe the sale by fish species for sale adjustment. The building itself is quite dated and is in the middle of down town. Though sanitation in such a locality

could hardly be called "perfect", the water and drainage facilities are adequate. The employees of the fish shops are well experienced in handling fish and know-how to keep freshness of the fish. They are also able to judge freshness, based on their years of experience. At this market, the fish is sold at high retail prices on a par with those of the Rabat or Casablanca, even though the fish come from the Agadir Port.

Example 4 The Retail Sale of Sardines

Sardines are a popular seafood product in Morocco, and compared to other seafoods, lead the field in terms of the quantity caught, market price and amount consumed. When it comes to the subject of popularizing seafood in Morocco, sardines are bound to be a major topic for discussion.

Sale at landing sites

Loading 2 or 3 boxes of fish on the racks of bicycles or lightweight motorcycles, fish merchants ply the streets of residential areas, calling out in a loud voice: "Fish! Fish! Get the lowest price on fish!" They cover the fish with salt to preserve its freshness. They generally sell the fish by weight, the unit of measure being kilograms.

The Market in Remote Areas

For this market, the sardines are smeared with salt, mixed with crushed ice and transported in refrigerated cars. Since consumption is limited in inland areas, the fish market is opened at different market places on different days of the week.

3-2-2 Price Determination

Just as in any free-market economy, prices in the fish market should change according to supply and demand. In reality, however, there are many intervening factors that do not conform to "free-market" principles. Thus, it cannot be said that prices necessarily change according to the theory.

Margins for fish dealers are different from region to region, 15-20% for dealers at the landing sites, 25-30% for dealers of suburban consumption areas, finally the price nearly doubles for consumers living in inland areas.

Fishermen in some areas have formed unique organizations. Such organizations excel at implementing quality control measures, and the prices of their products are higher. It should also be noted that, in tourist resort areas, for example, where the fish is sold to tourists, the fish dealer can gain foreign currencies.

Factors which determine the prices of marine food products are: conditions such as quantity of the catch, fish species, and quality; and the marketing factors, including the middlemen, consumers and distributors. Among them, a significant factor for the artisanal fishery is the existence of middlemen. Middlemen do not merely buy and sell marine products. They also support the fishermen by extending cash advances ("loans") to help them meet their living expenses, providing ice and fuel for their vessels; and, sometimes, by giving loans for the purchase of fishing gears. On the negative side, they may take advantage of fishermen's weak position by buying their catch at rock bottom prices, gaining unfair leverage in the control of the market. This has been the source of major dissatisfaction of fishermen. In the Mediterranean area, middlemen receive fish from fisherman on a consignment basis, paying them after the fish has been sold. There have been instances wherein payment was never made and accounts were never clearly settled. Therefore, most of the fishermen, with insufficient funds to meet their cost of living, desired, cash transactions. In addition, in the Mediterranean areas, there have been reports of "buying price" conferences being held by middlemen. The advantages and disadvantages of a system

whereby a middleman serves in the sale of fresh fish are as follows:

Advantages

- (1) Fuel is more easily procured.
- (2) Loans are available and fisherman may receive aid in emergency situations.
- (3) Ice supplied by them helps to preserve catches, especially during the summer season.

Disadvantages

- (1) Middlemen may procure catches too cheaply, through unfair bargaining.
- (2) Middlemen may exercise price control through conferences. (in the Mediterranean areas)
- (3) Fish may be "purchased" on consignment (and payment may never be made). (in the Mediterranean areas)
- (4) Middlemen may not offer payment when it is needed.
- (5) The cost of fuel may higher by 15-25% in comparison to the prices offered in cities.

To make reforms and improve conditions, fishermen in Ksar Sghir and Oued R'mel have transported products from the landing site to auction halls through "cost sharing", and are thereby planning to undermine the "system" by eliminating the "middleman" and increasing the profits of the producers (i.e., the fishermen themselves). At fishing villages on the Atlantic Coast, catches are transported from the landing sites to the auction halls by groups of fishermen, which will then be able to make their fishing operation independent from the fixed freight collection times of middlemen.

3-2-3 Problems of Distribution System for the Artisanal Fisheries

1) Inadequate Freshness Preservation and Quality Control

Artisanal fishing villages are located at rural areas which lack the social infrastructure to provide adequate electrical power and water supplies. At the landing sites and surrounding areas, refrigerators and ice production facilities are almost non-existent. While some middlemen use small vehicles equipped with refrigeration units and others transport fish packed in ice, most middlemen are transporting fish under substandard conditions. It is also true that, once the catch is landed, almost no effort is made to keep the freshness. Only sardine is sometimes slaked for transportation. High value fish which is the major catch of artisanal fishery not subject to any treatment for quality control.

2) Scarcity of Middlemen

Since there are so few middlemen, there is little competition among them. This situation does not create an environment for the nurturing of middlemen who are honest and trustworthy. With the exception of two or three, the ordinal middlemen are not welcomed by local fishermen. Either by force of circumstance or for economic reasons, the fishermen have been forced, against their will, into dealing with them. Most of the fishermen have received cash advances from brokers which will be deducted from the payment for their catches.

Since credit system for artisanal fishermen is not established yet, fishermen have relied on middlemen as a matter of economic convenience. Objectively speaking, there is no great difference between the middlemen and general merchants. Moreover, considered the risk of dealing with fish, a commodity which quality changes quickly, their profit margin is not unfair. Yet, there is still much room for improvement. The consignment system of middlemen on the north Atlantic coast is a burden for fishermen, both financially and mentally. Fishermen in the Mediterranean coastal area regard the middlemen's conferences keep beach prices low. Many middlemen on the south Atlantic coast are newcomers who lack

substantial experience. At the same time, however, many of them have good business sense, and most of these are dealing fish, just as a commodity. For the fishermen, a "good" middleman is one who is good at quality control and marketing; and one who moves merchandise quickly, pays promptly, pays a fair price (based on a good sales price) and doesn't do unnecessary price bargaining.

The middlemen are not receiving any type of assistance from the government and are not subject to regulations. They can enter and leave freely, and all do their business based on a mutual relationship of trust with their clients.

3) Fish Market

(Landing Sites)

At the landing sites of artisanal fishing villages, there are no market places with roofs blocking the sun's rays. The fish is sold under a clear blue sky. From the viewpoint of preserving fish, however, the selling fish laid on hot sands, letting it lay till customers appear, is not a desirable practice. The quality of sun bleached fish changes naturally; and, as the change progresses, flies appear.

Market Maintenance System

Maintenance programs for fish markets in major cities are running smoothly under the supervision of the ONP. However, in the fresh fish markets of rural marketplaces, fish is being handled by private dealers. They have no special scientific knowledge. They are doing business based on experience. In setting prices for various kinds of fish each day, they can rely on no more than a trained eye for fresh fish. In their ardent desire to make a sale, however, they are apt to put business before quality and sell poor quality fish, if it can be sold. To increase fish consumption hereafter, establishment of a system for market maintenance will be required. This will not end with the installation of more equipment and the completion of more facilities, but will also require careful consideration of human resource development to be achieved through the education and training of marketers, fresh fish merchants and others --- imparting knowledge of their rights and duties, and giving them professional qualifications.

4) Artisanal Fishery and Office National des Pêches (ONP)

ONP is a general marine fisheries public corporation under the direct control of MPM. It handles all affairs that pertain to the industry today, including: labor, fish breeding, the fish market management, trust associations, publicity, distribution, increasing fish consumption, sanitary education for workers in the fresh fish market, guidance, administrative matters (from labor to consumption), operations management; and, tests, research and development pertaining to new specialties. Particularly in the field of distribution management, establishes wholesale fish markets at major fishing ports; and, securing satisfaction to European sanitation standards, it is also in charge of management of the markets. It is not directly involved in the buying and selling of fresh fish, but has imposed a sales tax on fishermen of 5%. From a middle and long range point of view, it will be concerned with the development of a fresh fish marketing infrastructure for ports and landing sites. Its most immediate concern, however, is the rehabilitation of existing facilities, bringing them into compliance with European sanitation standards. Its long range plans involve redevelopment of landing sites in various parts of the country, to which officers will be dispatched.

5) Consumption Trends

Change of Domestic consumption is indicated as table 3-2-1.

Table 3-2-1 Change of Domestic Consumption and Total Catch

Year	1990	1991	1992	1993	1994	1995
Domestic Consumption (ton)	172,888	150,360	183,022	175,764	189,700	188,347
Consumption per Person (kg/per)	7.06	6.00	7.16	6.74	7.27	7.03
Total Catch (ton)	568,771	600,082	554,936	628,116	750,686	852,048
Percentage of Domestic Consumption in Total Catch	30	25	33	28	25	22

Source : La mer en chiffres 1995 (Fisheries statistics 1995)

The total consumption of marine products in Morocco in 1995 was about 188,000 tons, which represented 26% of the total catch. The average per capita annual consumption rate was 7.03 kg. Statistics of the last 10 years show an annual per capita consumption rate of 6-7 kg. To some extent, variations correlate to the annual catch of sardines.

The highest per capita annual consumption rate for marine products is 7.27 kg, and the highest total volume for an annual catch is about 190,000 tons. These rates were recorded in 1994. The lowest per capita annual consumption rate is 6.0 kg, and the lowest total volume for an annual catch is 150,000 tons. These rates were recorded in 1991. In general, marine product consumption rates are high in the northern coastal region where influence of Mediterranean culture, is substantial, and old Spanish and Portuguese territories along the Atlantic coast; and progressively lower as moved into inland. In remote inland areas, there are many people who have a preference for store-bought meat for many years and have never tasted seafood. With the rapid development of the mass media and transportation networks; and, due to the presence of foreign tourists and Moroccans returning from abroad, the potential for the increase in consumption of marine products is rising little by little; though this is a problem that can only be solved over a period of time.

3-2-4 Increasing the Consumption of Marine Products

Basically, the movement to increase the consumption of marine products in Morocco started in 1985. Since that time, with the cooperation from FAO and countries such as Canada, Belgium and Japan, the local consumption of marine products increased from a level of less than 5 kg per person each year to 7 kg. Thus, the government's current mid range goal of 8 kg per person, a mere increase of 1 kg per person each year, is well within reach. At present, seafood dishes are being promoted in newspaper columns and are a part the curriculum at junior high schools. Moreover, the Overseas Fishery Cooperation Foundation (OFCF) of Japan has been implementing a technical cooperation for quality control program for sardines, and popularization of consumption of sardines in Morocco since 1996. The Moroccan government has set a goal for the year 2000 of increasing the domestic consumption of marine products to double the level of 1995. To reach this goal, the government needs to insure that about 40 tons of low cost seafood items of various kinds, but mainly sardines, is available for local consumption; and needs to install distribution networks. Looking ahead, the government has a plan to have an aggressive program to strengthen private refrigeration facilities, reform transport systems.