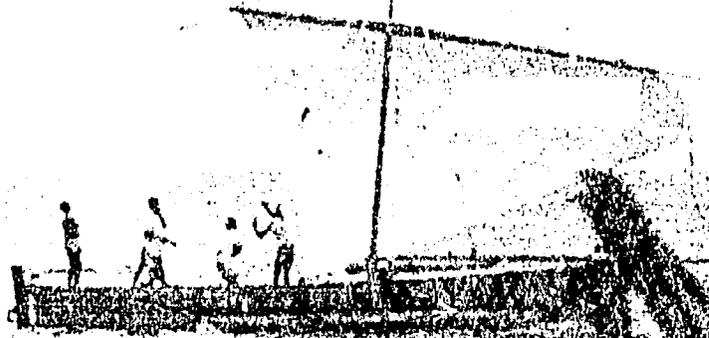


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THE FISHERIES OF GUINEA BISSAU

By

Bruce Epler



ICMRD



**INTERNATIONAL CENTER FOR
MARINE RESOURCE DEVELOPMENT**

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U.S.A.

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Introduction

To date little or at best partial information has been collected and made available concerning the fisheries of Guinea Bissau. This paper is an attempt to remedy the situation. It includes a description of each sector of the fisheries, summarizes historical data, when it exists, and concentrates on presenting data collected during 1981 and 1982. Information is presented in a manner which makes it useful to researchers, for further analyses, to interested parties and decision makers within the country. A brief description of the country's territorial waters precedes a discussion of each sector and the presentation of data.

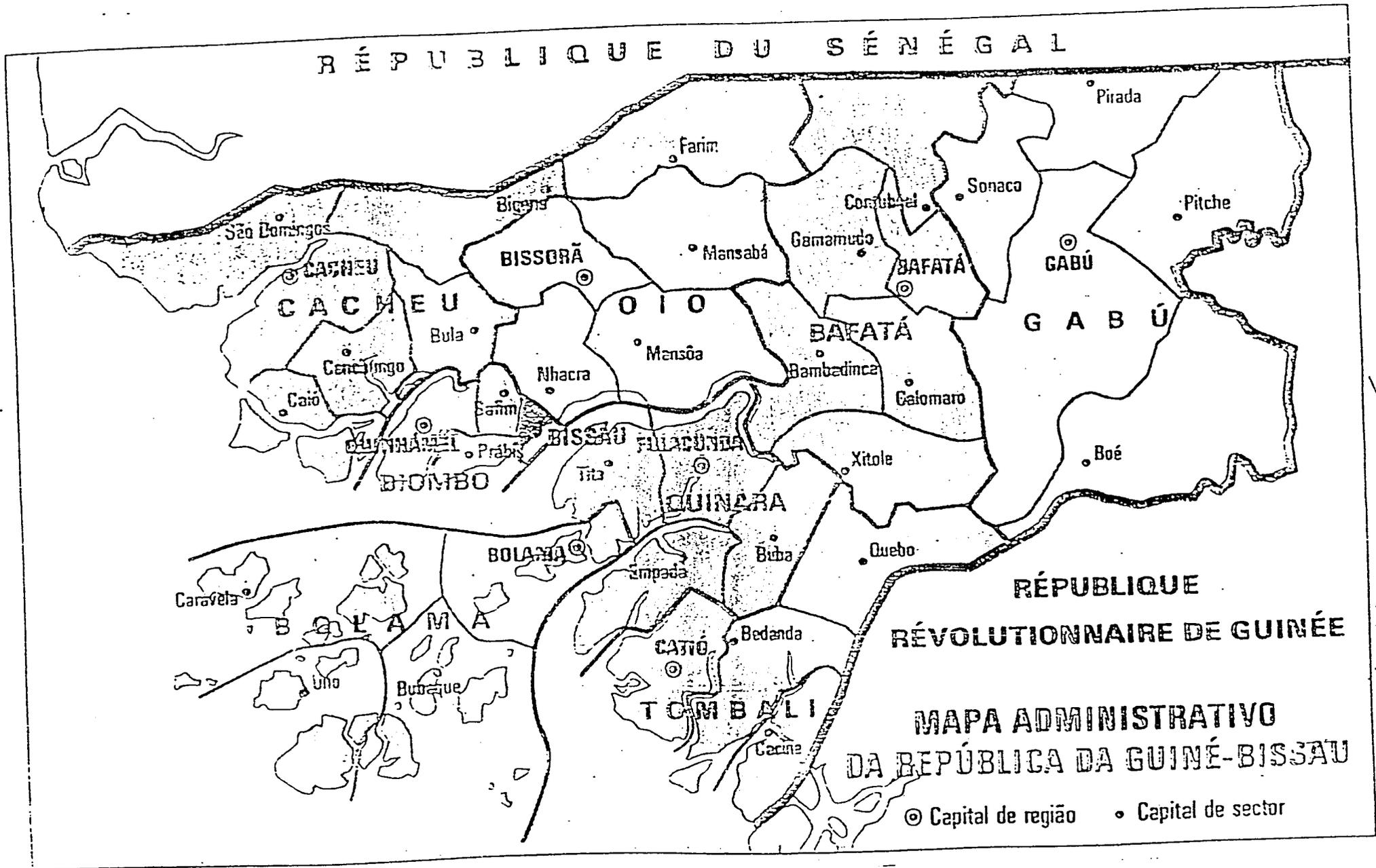
II Guinea Bissau's Territorial Waters

Guinea Bissau's territorial waters are comprised of open ocean, shallow, murky water riddled with sand bars that surround the Bijagos Islands, an archipelago consisting of about 20 islands that extends 80 kilometers out to sea, and a coastal complex of beaches, flat mangrove marshes and large rivers which are brackish at least 200 kilometers inland, (Figure 1). These rivers provide basic nutrients for the food chain and serve as breeding grounds for many species of fish and shrimp.

While the straight coastline measures only about 350 kilometers, the total coastal contour, including indentations, may well exceed 1,000 kilometers. The continental shelf, which is at one of its widest points in West Africa, extends from Bissau, the capital, 200 kilometers out to sea and accounts for 53,000 square kilometers of Guinea Bissau's EEZ (Exclusive Economic Zone) which encompasses approximately 70,000 square kilometers. The country's EEZ extends 150 kilometers out to sea from the outer islands of the Bijagos Archipelago.

This portion of the West African coast is well known for its richness and diversity of marine life. A recent survey by the Research Vessel "Dr. Fridtjof Nansen" estimated that Guinea Bissau's EEZ possesses one of

Figure 1 Map of Guinea Bissau



the largest biomasses of fish encountered off North-West Africa (see Table 1)^(1.)
The maximum annual sustainable yield is approximately 300,000 mt(metric tons)⁽²⁾

Estimates of biomass vary from year to year. Earlier surveys estimated the potential sustainable yield at 200,000 mt.⁽³⁾ The 50% increase is attributable to a recent explosion in the population of triggerfish.

Approximately 90% of the resource is located offshore.⁽⁴⁾ Pelagic species compose 75% of the high seas resource, 16% are demersal, 5% are in the tuna family and the remainder are primarily shrimp. Ten percent of the potential yield is found in coastal waters. Approximately 95% of the coastal stocks are Fin fish and 5% are shrimp. A list of commercially exploited species is presented in table II.

III The Fisheries of Guinea Bissau

The Fisheries of Guinea Bissau can be divided into three categories. The first two are the industrial and artisanal sectors. The third is comprised of foreign fleets which work offshore.

The industrial sector engages in a high seas, capital intensive fishery. Its fleet is composed of vessels purchased through joint ventures that use Bissau as a home port, and by one private entrepreneur. Half its catch is marketed in Guinea Bissau and the other half is exported.

The artisanal sector is comprised of numerous individuals throughout the country that use various types of canoes, only some of which are motorized, and relatively basic fishing techniques. Members of this sector lack capital and access to gear which is needed to update fishing methods and increase landings. There are seasonal fluctuations in the levels of effort expended by artisanal fishermen. Many fish on a subsistence basis.

The Planning Ministry and Pescarte, the government organization responsible for promoting development of the artisanal fisheries, used information collected during the 1980 census to identify the number and locations of

Table 1.
Estimates on Fish Biomass North-West Africa Based on Surveys with R/V "Dr. Fridtjof Nansen" in Dec. 1981 and Feb-Mar. 1982.
Thousand Tons

	Balistes Trigger fish	Pelagic 1 Clupeids and anchov.	Pelagic 2 Carangids	Other fish	Total	Mean den- sity in surveyed area tonnes/km ²	Estimate ⁵⁾ for shallow unsurveyed area	Total area
Mauritania, Dec -81 ³⁾	-				553	75	26	
Mauritania, Mar -82	-	52	350	375	777	112	42	
Senegambia, Feb -82	37	40	83	433	593	93	155	
Guinea-Bissau, Feb -82	590	72	180	337	1,159	164	113	1,
Guinea, Feb -82	716	32	8	12	768	111	465	1,
Sierra Leone, north ¹⁾ Feb -82	12	16	4	42	74	29	20	
West-Sahara, Dec -81 ^{6), 7)}	-	x	x	x	428	34	192	
West-Sahara, Mar -82 ^{6), 7)}	-	x	x	x	1,300	115	733	2,
Morocco, south ²⁾ Mar -82		665	340	22	1,027	252	121	1,
Total Feb-Mar 1982 Maur.-Sierra L.	1,355 ⁴⁾	212	636	1,199	3,402	107	601	4,

Source: CFCAF Project, Dakar, Senegal

1) south to Freetown

2) north to Agadir

3) The figures are not yet split on different fish groups.

4) In May-June -81 the western stock was estimated to 1050 x 10³ tonnes. The increase has occurred both in Guinea-Bissau and G

5) This estimate is based on the assumption that the density in the shallow unsurveyed area is the same as in the surveyed area.

6) No fishing was carried out off West-Africa, and thus the abundance estimates have not been allocated to the different fish groups. In lack of biological data a C-value for a 'standard fish length' of 17 cm has been applied.

7) The big difference between the two estimates off West-Sahara can by far be explained by the fish distribution. In December 1981 heavy fishing was carried out within 15 nm off the coast where "Dr. Fridtjof Nansen" did not survey. In March 1982 the main distribution seemed to be more off-shore.

Table II Pg. 1 Fish Species Commercially Harvested in Guinea Bissau

COMMON NAME	SCIENTIFIC NAME	ENGLISH NAME
Agula	<i>Belone belone</i>	Needle/Garfish
	<i>Makaira</i> spp.	
Albula	<i>Albula vulpes</i>	Lady/Bonefish
Antoni Boca	unidentified sparidae	
Atuz	<i>Thunnus albacores/Auxis</i>	Tuna/Bonito
	Thazard/Katsuwonus	
	<i>Pelamis/Sarda sarda</i>	
Bagre	<i>Arius</i> spp.	Catfish
Balista/Cangulo	<i>Balistes</i> sp.	Triggerfish
Barbo	<i>Galeoides Decadactylus</i>	Threadfin
Bentana	<i>Dentex</i> sp./ <i>Pagrus</i> sp./	
	<i>Sparus</i> sp./ <i>Diplodus</i> sp./	Sea Breams
	<i>Lithognargus</i> sp./ <i>Puntazzo</i> sp.	
Bica	<i>Pagellus coupei/Pagellus erythinus</i>	Sea Breams/Red Pandura
Picuda	<i>Sphyraena</i> spp.	Barracuda
Cachorreta	<i>Euthynnus alleteratus</i>	Little Tuna/Bonito
Camarao	<i>Penaeus duorum</i>	Pink Shrimp
Caranguejo	<i>Cancer</i> spp./ <i>Carcinus</i> spp./	Crabs
	<i>Callinectes</i> spp.	
Carapau	<i>Trachurus</i> sp.	Horse Mackerel
Cavala	<i>Decapterus</i> sp.	Horse Mackerel
Cherne	<i>Epinephelinae</i>	Grouper
Choco	<i>Sepia</i> spp.	Cuttlefish
Cor-cor	<i>Pomadysis jutelini</i>	Grunts
Corvina	<i>Pseudolithus Senegalensis</i>	

Table II Pg. 2 Fish Species Commercially Harvested in Guinea Bissau cont'd.

COMMON NAME	SCIENTIFIC NAME	ENGLISH NAME
Corvina	Pseudotolithus Types Umbrina Canariensis	Croakers
Djoto	Pseudotolithus brachygnatus	Law Croaker
Espada	Trichiurus Lepturus	Cutlassfish
Gambas	Penaeus spp.	Shrimp
Caroupa	Epinephelus spp./Serranidae spp.	Grouper
Langosta	Panulirus sp./Palinurus sp.	Lobster
Linguada	Solea spp./Cynoglossus spp.	African Sole
Lula	Loligo sp./Omatostrephas sp.	Squid
Machado	Drepane africana/Ephippidae/ Monodactylidae/Chaetodontidae	Angel/Butterfly Spadefish
Moreia/congro	Conger spp./Muraena spp.	EELs
Otoperca	Brachydeuterus sp.	Grunts
Polvo	Octopus sp.	Octopus
Prata	Elopidae	Silverfish
Robalo/Robaleito	Polyprion americanus	Grouper/Sea bass
Sarda	Scomber japonicus	Spanish Mackerel
Sardinela	Sardinella aurita Sardinella maderensis	Sardines
Sardinha	Sardinha pilchardus	Sardine/Pilchard
Sereia/Xareu	Caranx spp./Brama spp. Lichia spp./Trachinotus sp./	Jack Crevalle/pompano
Sinapa/Cinapa	Chloroscombrus chrisurus Pseudupeneus prayensis/ Lutjanidae	Snapper

Table II Pg. 3 Fish Species Commercially Harvested in Guinea Bissau cont'd.

COMMON NAME	SCIENTIFIC NAME	ENGLISH NAME
Tainha	Mugil spp.	Mullet
Tubarao	Squalidae	Sharks
Vomer	Vomer setapinnis	Atlantic Moonfish

artisanal fishermen. The data indicated that there were approximately 2,500 fishermen in the country's seven regions. Various development projects have increased the availability of fishing gear so it is reasonable to assume the number is presently near 3,000.

Foreign vessels, primarily from the USSR and EEC, are permitted under bilateral agreements, to fish within the country's territorial waters. Guinea Bissau has not been able to effectively carry out regular surveillance programs and indications are that a number of vessels fish illegally within the country's EEZ. The pilot reports that only three surveillance flights, which resulted in the arrest of two vessels, were made during 1982. These vessels were fined slightly over one million dollars and 130 mt of fish was seized.

A brief historical review reveals that plans were formulated in 1972 to increase fish production to 12,000 mt. These plans were based on an economic situation quite different from the one which prevails today and were characterized by the presence of up to 50,000 Portuguese expatriates (500 are said to be presently residing in Guinea Bissau) with comparatively high purchasing power and a monetary system supported by the Portuguese Escuda which permitted the importation of essential materials, goods and services which are presently not available.

A survey completed in February, 1975 reported almost complete stagnation within the fisheries. Total production was less than 3,000 mt.

The government with international assistance has made substantial gains in increasing the quantity of fish harvested and the economic benefits which the country derives from its fisheries. Total annual production during 1982 was approximately 155,000 mt.

It is impossible to evaluate changes in the quantities of fish available for domestic consumption but total revenues generated by fishing activities have greatly increased and exports have become an important source of foreign

Table III Value of Exports 1980 and 1981 by Product Groups:
(in U.S. Dollars)

	1980		1981	
	Thousands of U.S. Dollars	Percentage	Thousands of U.S. Dollars	Percentage
Agricultural Exports	4,950.0	49.2	5,915.4	44.0
Seafood	3,526.3	35.1	5,264.1	39.1
Wood Products	206.2	2.0	689.8	5.1
Industrial products	1,213.2	12.1	1,484.6	11.0
Others	165.8	1.6	105.1	0.8
TOTAL	10,060.5	100 %	13,459.0	100 %

Source: Planning Department, Guinea Bissau

earnings. Fish ranks behind agricultural products as the country's second most important export, Table III. If revenues paid by foreign offshore fleets were included as part of fish exports, its value would greatly exceed that of agricultural exports.

A. The Industrial Sector

Included within the industrial sector are joint venture agreements with the Soviet Union, the French group Adripeche, and the Algerian government. This section will describe each joint venture and present data summarizing their activities.

Estrela do Mar

An agreement between the Soviet Fisheries Ministry, Sovrybflot, and Guinea Bissau was signed in June, 1975 creating Estrela do Mar. Fifty-one percent of the ownership is retained by Guinea Bissau. The company has two objectives; (1) to increase the domestic supply of fish and (2) to export high valued seafood to earn hard currency.

Under the original terms of agreement, Guinea Bissau leased four vessels (two SRTMS and two HIRTRS) and five similar vessels were provided by Sovrybflot. The fleet has steadily grown (Annex 1) with 14 vessels having supplied the company in 1982. Eight of these vessels are owned by

the company and the rest land fish on an occasional basis. All are medium sized diesel powered Russian trawlers built in the mid 1970's. The SRTii series are 55 meters long with weights of 811 gross registered tons (GRT). The MRTR series measure 27 meters and hold approximately 175 tons. The MTK series are powered by 400 Hp diesels and weigh 128 GRT.

Additional services provided by Sovrybflot include:

- 1) providing fuel, equipment, fishing gear and spare parts.
- 2) providing technical assistance to oversee vessel operations and to assist in managing the company and
- 3) provisions covering minor repairs to be carried out in Las Palmas or Dakar with major repairs being undertaken in the Soviet Union.

Estrela do Mar's total production has increased sporadically from 1,271 metric tons in 1975 to 4,176 metric tons in 1982, Table IV.

Table IV Estrela do Mar: Total Landings 1975 to 1982 (metric tons)

	1975	1976	1977	1978	1979	1980	1981	1982
Fish	1,271	3,443	3,457	3,070	2,414	1,480	3,030	2,948
Shrimp		191	654	772	745	556	1,004	1,228
Totals	1,271	3,634	4,111	3,842	3,159	2,036	4,042	4,176

Source: Personal communication with representatives of Estrela do Mar

On an average, 45% of the company's production is marketed domestically. The quantities of fish and shrimp retailed domestically have risen from 867 metric tons to 1,248.5 metric tons in 1982, Annex II. The value of domestic sales has increased by over 500% from 272,000 U.S.\$ in 1975 to 1,405,000 in 1982. Export figures for 1975 and 1976 are not available but between 1977 and 1982, the quantities exported rose from 2,168 metric tons valued at 2,273,000 U.S.\$ to 2,327 metric tons valued at 4,187,000 U.S.\$.

All domestic sales are made at the retail level. Domestic retail prices are higher than the international ex-vessel prices received by the company but are extremely low in comparison to retail prices in other countries.

Estrela do Mar's primary trading partners have been Portugal, Senegal and Las Palmas, Spain, Table V, but the company is actively seeking to expand its markets into France and Nigeria.

Table V Estrela do Mar: Exports by country of destiny expressed as percentages of the total quantities and total values exported 1977 to 1982.

	Percentage of total Quantity Exported	Percentage of Total Value of Exports
Portugal	4	4
Spain	68	85
Senegal	28	11
Totals	100	100

Source: Personal communication with representatives of Estrela do Mar.

Tables VI and VII present summaries of the species and quantities sold domestically and exported by Estrela do Mar between 1975 and 1980. The corresponding values of exports are presented in Table VIII.

Table VI Estrela do Mar: Quantities Sold Domestically 1975 to 1980 (metric tons)

	1975	1976	1977	1978	1979	1980
Shrimp ⁽¹⁾	1.1	13.7	95.6	2.9	11.7	13.0
Lobster					0.2	
Crab Claws		0.2	3.1		6.3	2.7
Cuttlefish			2.0		5.0	2.6
Squid		11.1		1.2	0.3	
Octopus			0.1			
Fish (first quality)	629.9	828.5	951.9	343.0	365.5 ⁽²⁾	121.1
Fish (second quality)	236.0	609.8	707.9	41.6	594.1	555.1
Fish (third quality)					29.9	113.4
Fish (fourth quality)					627.3	458.2
Totals	867.0	1,473.9	1,760.6	388.7	1,640.3	1,266.1

(1) On the average the composition of the shrimp catch falls in the following categories: 17% c-1, 17% c-2, 14% c-3, 17% c-4, 15% c-5, 17% c-6/7 and 3% without numbers.

(2) In 1979 fish species were grouped into four categories

Source: Personal communication with representatives of Estrela do Mar.

Table VII Estrela do Mar: Quantities of Fish Exported 1977 to 1980
(metric tons)

	1977	1978	1979	1980
Shrimp	522.0	446.0	749.2	352.9
Gambas	12.1	105.7	14.3	9.8
Crab Claws	8.2	82.5	55.5	58.3
Lobster	0.4		.1	0.9
Cuttlefish			7.3	
Croakers		320.3	245.7	0.5
Catfish		77.1	203.3	
Sole		106.6	104.8	15.8
Threadfin		158.3	64.8	
Tuna fillets	1,625.4	57.2	64.6	47.7
Eels		14.2	16.4	
Grouper		24.0	15.2	5.1
Grunts		4.2	6.7	
Cutlassfish		1.4	3.1	
Angelfish			1.1	
Jack Crevalle			0.5	
Baracuda				
Snapper		1.9		
Others		52.8	0.4	
Totals	2,160.1	1,452.2	1,555.9	501.0

Source: Personal communication with representatives of Estrela do Mar.

Table VIII Estrela do Mar: Value of Exports 1977 to 1980
(000's of U.S. Dollars)

	1977	1978	1979	1980
Shrimp	1,604.6	1,602.9	3,360.8	2,548.5
Gambas	16.5	179.6	28.7	20.8
Crab claws	8.1	88.8	76.1	121.6
Lobster	2.0		0.2	4.4
Cuttlefish			11.0	
Croakers		141.7	109.6	0.4
Catfish		22.4	67.3	
Sole		75.6	82.6	13.4
Threadfish		46.5	22.0	
Tuna fillets		48.0	63.1	61.0
Eels		4.1	5.4	
Groupers	641.6	17.4	11.9	4.3
Grunts		0.8	2.2	
Cutlassfish		0.4	1.0	
Angelfish			0.3	
Jack Crevalle			0.2	
Barracuda				
Snapper		0.4		
Others		25.3	0.1	
Totals	2,272.8	2,253.9	3,845.1	2,774.4

Source: Personal communications with representatives of Estrela do Mar.

Semapesca

Semapesca was created in December, 1975 as a joint venture between the Government of Guinea Bissau and the French group, Adripeche. Fifty-one percent of the enterprise belongs to Guinea Bissau.

Shortly afterwards, construction started on a facility which includes one freezer tunnel capable of freezing 10 to 12 metric tons per day, a horizontal blast freezer with a 4 ton per day capacity, two ice makers capable of producing 14 tons of flaked ice daily and two walk-in freezers that can hold 840 metric tons of product at -45° C. The facility also contains an enclosed unloading, sorting and weighing area, a processing room and office space. The company owns 14 vehicles of various descriptions and several vessels, all of which need a considerable amount of repair.

Operations began in 1979 but the company encountered problems and was forced to shut down in early 1981. FAO and Guinea Bissau's Planning Ministry estimate that the company produced approximately 2,000 metric tons during its short life but statistics on the total quantities and values of domestic sales and exports record a total production of 1,361 metric tons, Tables IX and X. Most, if not all, exports were sold in France.

Discussions centered around re-opening Semapesca have been taking place between Adripeche, Guinea Bissau and the French agency Caisse Centrale de Cooperation Economique for well over a year. Present plans call for the company to re-open as a purchaser and exporter of shrimp harvested by the artisanal sector. No decision has been made on whether the vessels will be repaired and later leased or sold. The re-opening will be partially financed by the Caisse Centrale de Cooperation Economique.

Table IX Semapesca: Quantities and Values of Domestic Sales 1979 to 1981

	1979		1980		1981	
	Quantity in Kilograms	Value in 1,000's of Pesos	Quantity in Kilograms	Value in 1,000's of Pesos	Quantity in Kilograms	Value in 1,000's of Pesos
First class	39,462	1,065	121,300	5,701	1,600	75
Second class	92,952	2,045	290,012	10,730	8,750	324
Third class	38,144	648	128,600	3,472	760	20
Fourth class	93,325	1,120	230,745	4,500	6,300	123
Others	11,000	1,760	12,000	3,840	4,000	1,280
Totals	274,883	6,638	782,657	28,243	21,410	1,822
U.S. Dollar Equivalents		195,235		630,676		50,611

Source: Ministerio do Planificacao, "Evolucao E Ponto De Situacao Do Sector Pesqueiro" Guinea Bissau, November, 1982, unpublished document.

Table X Semapesca: Quantities and Values of Exports 1979 to 1981

	1979		1980		1981	
	Quantity in Kilograms	Value in French francs	Quantity in Kilograms	Value in French francs	Quantity in Kilograms	Value in French francs
Fillet of Sole	7,904	112,560	65,982	923,830	11,472	189,289
Fillet of Corvina	3,792	28,440	11,384	82,703	1,074	7,840
Sole Pac ⁽¹⁾	5,152	51,520	6,252	76,902	1,272	16,663
Sole Pan Ready ⁽²⁾	6,684	131,616	14,618	191,994	2,748	37,098
Whole Shrimp	26,266	831,048	39,882	1,528,073	2,596	99,167
Peeled Shrimp	5,310	110,904	8,948	170,662	156	3,713
Others	19,995	133,129	39,641	281,252	548	2,520
Totals	75,109	1,405,216	186,707	3,255,376	19,866	356,290
U.S. Dollar Equivalent		305,482		707,690		67,865

(1) Sole skinned with head on

(2) Sole skinned and deheaded

Source: Ministerio de Planificacao, "Evolucao E Ponto DE Situacao Do Sector Pesqueiro", Guinea Bissau, November, 1982, unpublished Document.

Guialp

In September, 1975, the Algerian government signed a joint venture agreement with the government of Guinea Bissau creating Guialp. A building containing office space and 12 walk-in freezers, capable of storing, 1,000 metric tons, was constructed and seven bottom trawlers, six of which are 23 meters long, a 115 GRT, powered by 400 Hp diesels and seventh which measures 30.7 meters, with 151 GRT and a 700 Hp diesel, were purchased.

The company, for all practical purposes, never became operational. The facility is currently leased by Estrela do Mar and the vessels rest on the beach or at a dock deteriorating. The quantities harvested were 137 metric tons in 1976, 147 in 1977, 23 in 1978 and 28 in 1981, all of which were marketed domestically.

Paralta

Paralta is the only private company participating in the industrial fisheries in Guinea Bissau. The company dates back to the 1930's, but did not actively engage in fishing until the mid 1950's when four vessels were purchased. In 1965, a 2.5 block ice machine was installed and a marine railway was later constructed.

The company prospered during the colonial period and is said to have supplied fish to the entire country. Since independence, the economic climate has not been conducive to stimulating the private sector so the company has experienced hard times.

Paralta's problems are typical of those encountered by other entrepreneurs in Guinea Bissau. First, there is a severe shortage of hard currency required to purchase equipment and spare parts and second, the prices the company receives for its production are very low.

Statistics on Paralta's landings during the colonial period are not available but it is known that post-independence production dropped from 264,932 kilograms in 1976 to 55,650 in 1982. The present operation consists of one trawler which both fishes and acts as a collection vessel for artisanal fishermen. All of the company's production is marketed locally.

Expansion of the Industrial Sector

Government strategy has been to increase economic benefits from its fisheries resources by (1) encouraging joint ventures and (2) by obtaining a portion of the resource's value through the licensing of foreign vessels. To date, this mixed policy has had disappointing results. With the exception of Estrela do Mar, which has increased both the quantities it sells domestically and exports, other companies have shut down or experienced continuous decreases in production. The lack of an adequate port facility, shortages of supplies, materials and experienced technicians, low domestic prices, an undependable supply of expensive fuel and depressed economic conditions within the country have and will continue to impede development attempts. The absence of regular surveillance and reliable statistics put the country in a disadvantageous position in its negotiation with foreign fishing countries and cast doubts on its ability to regulate the number of licenses, amounts of fees and enforcement procedures. Despite these shortcomings, fish accounted for 39% of the country's export earnings in 1982 and is still viewed as a means of earning hard currency, expanding employment and increasing domestic food supplies.

As an alternative development strategy, two projects are being undertaken to establish on-shore processing capabilities which are intended to attract foreign vessels working inside the country's EEZ and to increase the efficiency of existing companies. The first project was the construction of a large freezer facility, financed by license fees paid by a Russian fleet working offshore, which was completed in November, 1982. The Bolola complex contains 7,600 cubic meters of freezer space, tunnels capable of blast freezing

30 mt per day and two ice makers rated at producing 20 mt of flaked ice and 10 mt of bar ice daily.

Bids are currently being accepted for the second project, a \$37 million port expansion financed by IBRD, BADEA, The Kuwait Fund and OPEC. A portion of the new dock is envisioned as being reserved exclusively for handling fish.

The Fisheries Secretariat is working to re-open Semapesca and Guialp and investigations are being conducted to assess the feasibility of an USAID (United States Agency for International Development) funded project which would promote the harvesting, processing and marketing of the country's triggerfish resource which has been estimated at 590,000 mt.

B. The Artisanal Sector

The Artisanal Sector includes two large projects, three smaller projects, two of which were not operational at the time this paper was written, and approximately 3,000 fishermen. Most artisanal fishermen not associated with a project are poorly equipped and generally fish on a subsistence basis. Nhiomincas, professional fishermen who migrate seasonally from Senegal and The Gambia, are responsible for a large portion of the artisanal landings.

The principal methods of fishing include the use of scoop nets, which are used by women to catch shrimp and small fish, cast nets, gill nets, which are left drifting in midwater, long lines, beach seines and various types of fish traps constructed with cane or bamboo. Encircling techniques, such as purse seining, have been recently introduced and appear to have a lot of potential but are not, as yet, commonly used.

Fish are landed at many points along the coast and interior rivers but a substantial portion, perhaps 70%, are landed at the projects in Bubaque and Cacheu.

The government has excluded industrial and foreign vessels from fishing around the Bijagos Islands and within coastal waters in an attempt to reserve these stocks for exploitation by artisanal fishermen. Their desire is to foster the development of a strong fisheries tradition and to elevate artisanal technology and productivity to the point where it can supply domestic needs. Production by the industrial sector could then be reserved for exportation.

The Bijagos Project

An agreement between the Swedish International Development Agency and the Government of Guinea Bissau, covering the creation of an artisanal fisheries project for the Bijagos Islands, was signed in July 1976. The project is intended to provide employment for inhabitants of the Bijagos Islands through the creation of a marketing facility which will supply fresh fish to Bissau. There are presently about 300 fishermen involved, half of whom actively supply the project. In addition to a market, fishermen have access to gasoline, fishing equipment, materials for building and repairing boats, outboard motors, a repair shop and credit. The project has two five ton flaked ice makers, a large walk-in cooler and three vessels, two with 7.5 mt holds and one which carries 15 mt, that are used for transporting fish and supplies to and from Bissau. The project also markets rice and oil which are in short supply in the islands.

Beach seining is the most common fishing technique encountered. Nets are measured by the number of bundles used in constructing them. Each bundle contains 30 meters of small meshed net and costs 3,500 GP.^{(5) (6)} The average fisherman uses a net constructed from six bundles but a few report using 8 to 10 per net. A completed net with weights, lines and buoys costs approximately 30,000 GP. Nets must be constantly repaired and have a life expectancy of three years, depending on the frequency of use. More active fishermen report that nets are worn out after eight months.

Nhiominka type "pirogues", a boat usually 12 meters in length constructed by adding side planks to a three piece keel, are the most frequently seen vessel but many fish the strong currents surrounding the islands in small dugout canoes. The average cost of a pirogue constructed locally and privately is 45,000 GP and they last about six years. New vessels are often constructed from the old keel. Annual maintenance costs run about 9,000 GP.

Over half of the vessels supplying the project are equipped with engines which range from 7.5 to 40 Hp. Fifteen horse power outboards, costing 45,000 GP, are the most prevalent. These engines have a life expectancy of two to three years during which time 40 to 50% of the engine's value will be put into repairs and maintenance. Many fishermen find that their outboards and boats can be more lucratively employed as transport vessels.

Engines are not employed in the actual fishing activities. Their use is restricted to transporting fishermen to and from their homes, the fishing grounds and the project so fuel costs are dependent on the distance they travel not the amount of fishing effort expended. Fishermen based near the project consume 25 liters per trip. A liter of gasoline costs 30 GP

The crew size is generally six but a few Nhiominka fishermen have 10 in a crew. Sixty percent of the crews are family members. There is no standard system of crew remuneration. In instances where family members are involved, money to cover trip expenses is set aside and the rest is used to buy necessities, usually rice. Crew payment under this system is directly related to the quantity and value of the catch. Others report paying crew members 300 to 500 GP per trip. The most prevalent system is payment of a monthly wage. One thousand GP is standard with more active fishermen paying 2,000 GP per crew member. When asked how the crew was paid when monthly gross revenue was not sufficient to cover all expenses, the reply was that the wage is paid the following month. Providing tobacco, rice and palm wine are considered as trip expenses.

Annual levels of production for the years 1980 through 1982 are presented in Figure II. Production by species by month for the years 1981 and 1982 are presented in Annexes III and IV. It is worth noting that most of the catch is mullet.

Fishing activity is greatest during the dry season, November through May, and falls off during the rainy season, June through October, when fishermen dedicate their time to agricultural activities. Comparing Figure III, number of trips per month, with Figure IV, average monthly catch per trip, reveals that the levels of effort expended tend to co-incide with fluctuations in catch per unit of effort.⁽⁷⁾ The divergence between high rates of catch in October and the low number of trips is explained by the fact that rice matures in October so fishermen are occupied with the harvest.

The average number of trips made annually in 1981 and 1982 was 14. Sixty-five percent of the fishermen fished 10 days or less per year, 12% made between 11 and 20 trips, 9% made from 21 to 30 trips and 8% made between 31 and 70 trips a year. A plausible explanation for the low number of trips is that very few consumer products are available in the islands so there is little incentive to fish on a commercial basis.

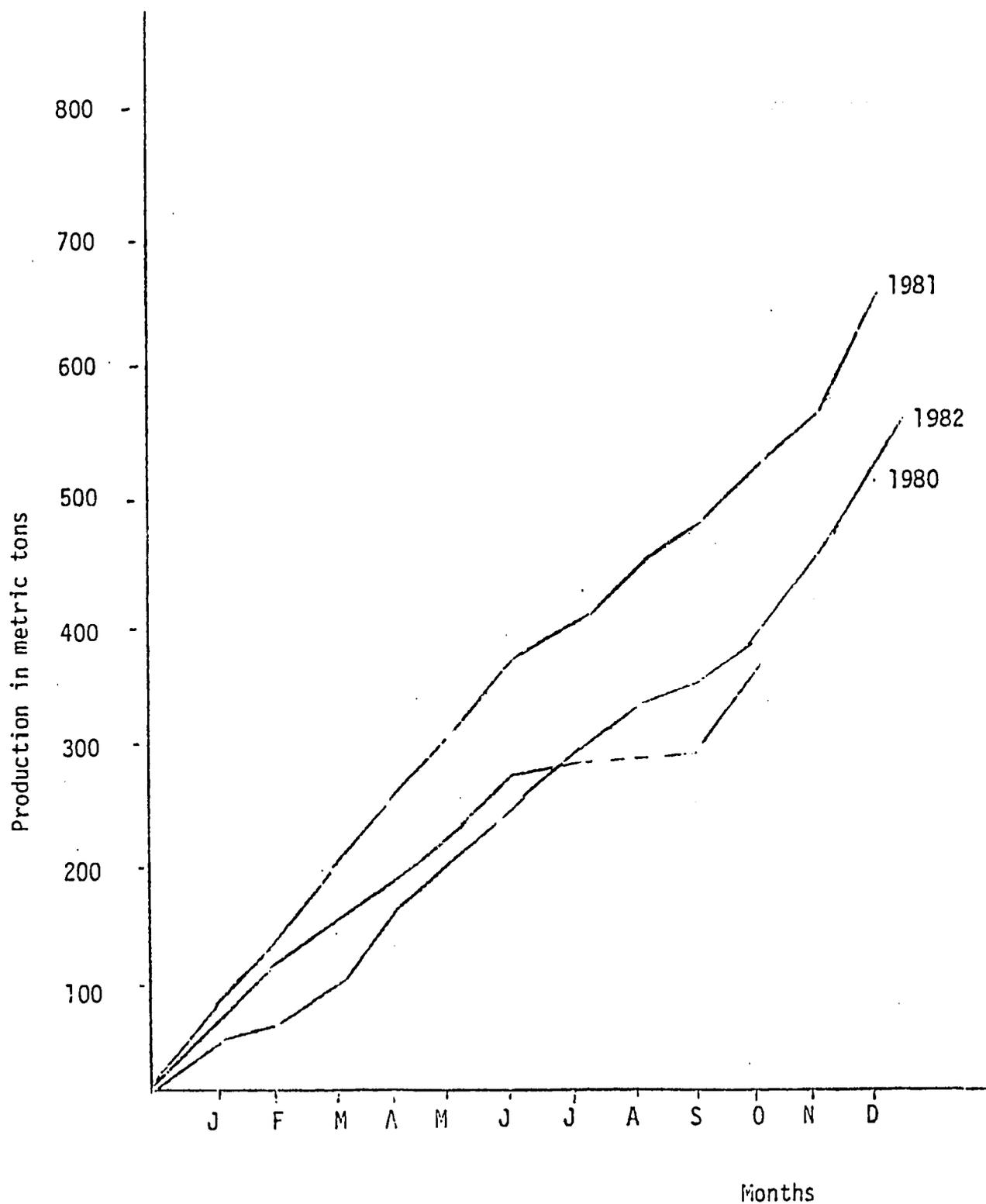
The distribution of annual gross profits for all fishermen is presented in Figure V. On an average, fishermen grossed 36,000 GP in 1982. The average gross profit per trip is 2,575 GP, 190 kilograms. Gross earnings per trip are highest in December, 3,800 GP (270 kilograms) and lowest in August, 1,800 GP (130 kilograms) Figure VI.

The Cacheu Fisheries Project

Two technicians arrived in Bissau in March, 1981 to begin the USAID sponsored small-scale fisheries development project. The project's objectives were twofold:

- 1) To promote small-scale fisheries development and increase the

Figure II Bijagos Fisheries Project: Annual levels of production 1980 through 1982

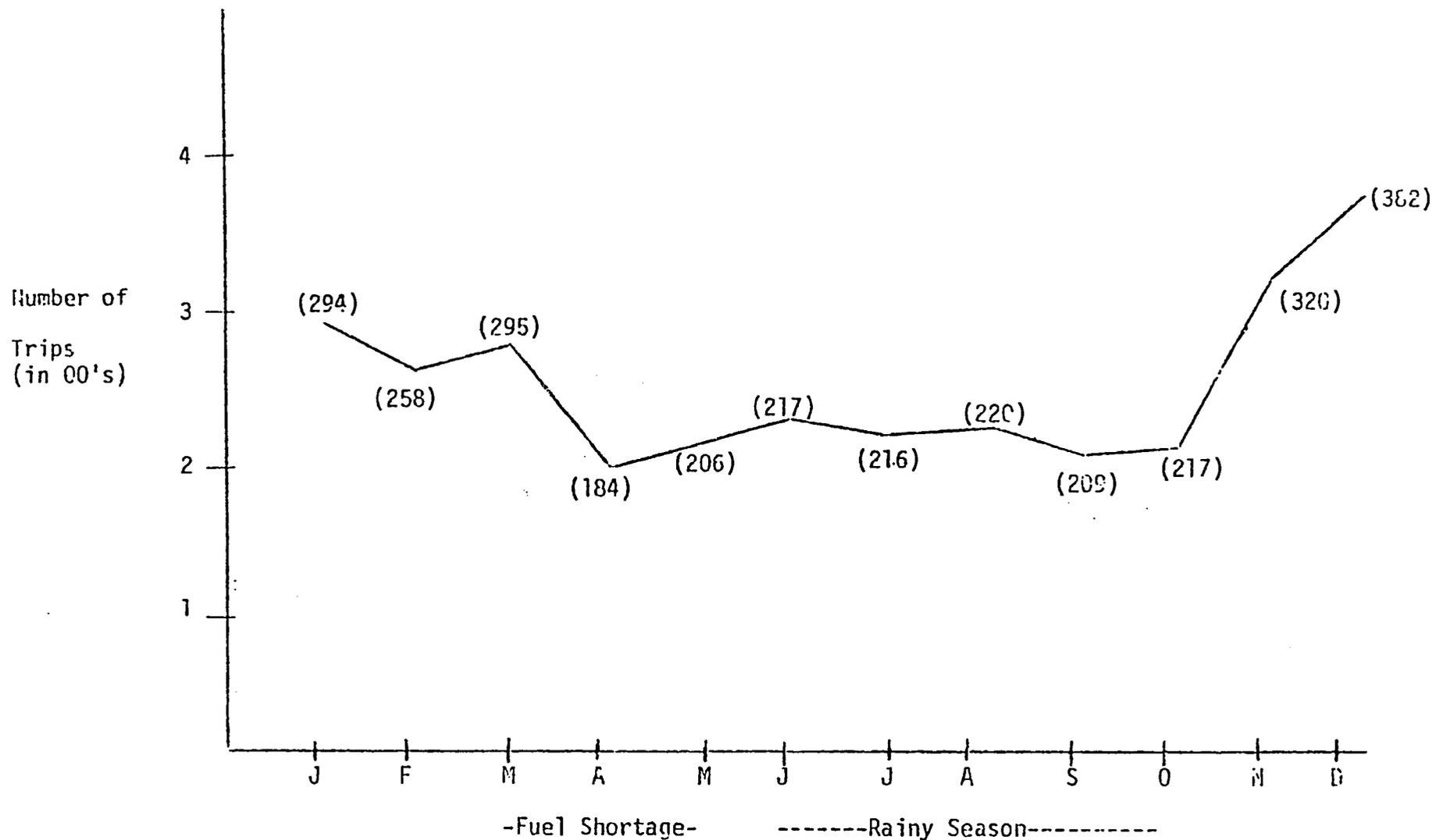


- - - - project closed

Monthly landings for 1981 and 1982 are presented in Annexes III and IV.

Source: Compiled from landings slips.

Figure III Bijagos Fisheries Project: Average Number of Trips per Month (All Fishermen) 1981 and 1982



Source: Compiled from landings slips

Harvest

Months

Figure IV Bijagos Fisheries Project: Average Monthly Catch per Fishing Trip by month 1981 and 1982
(in Kilograms).

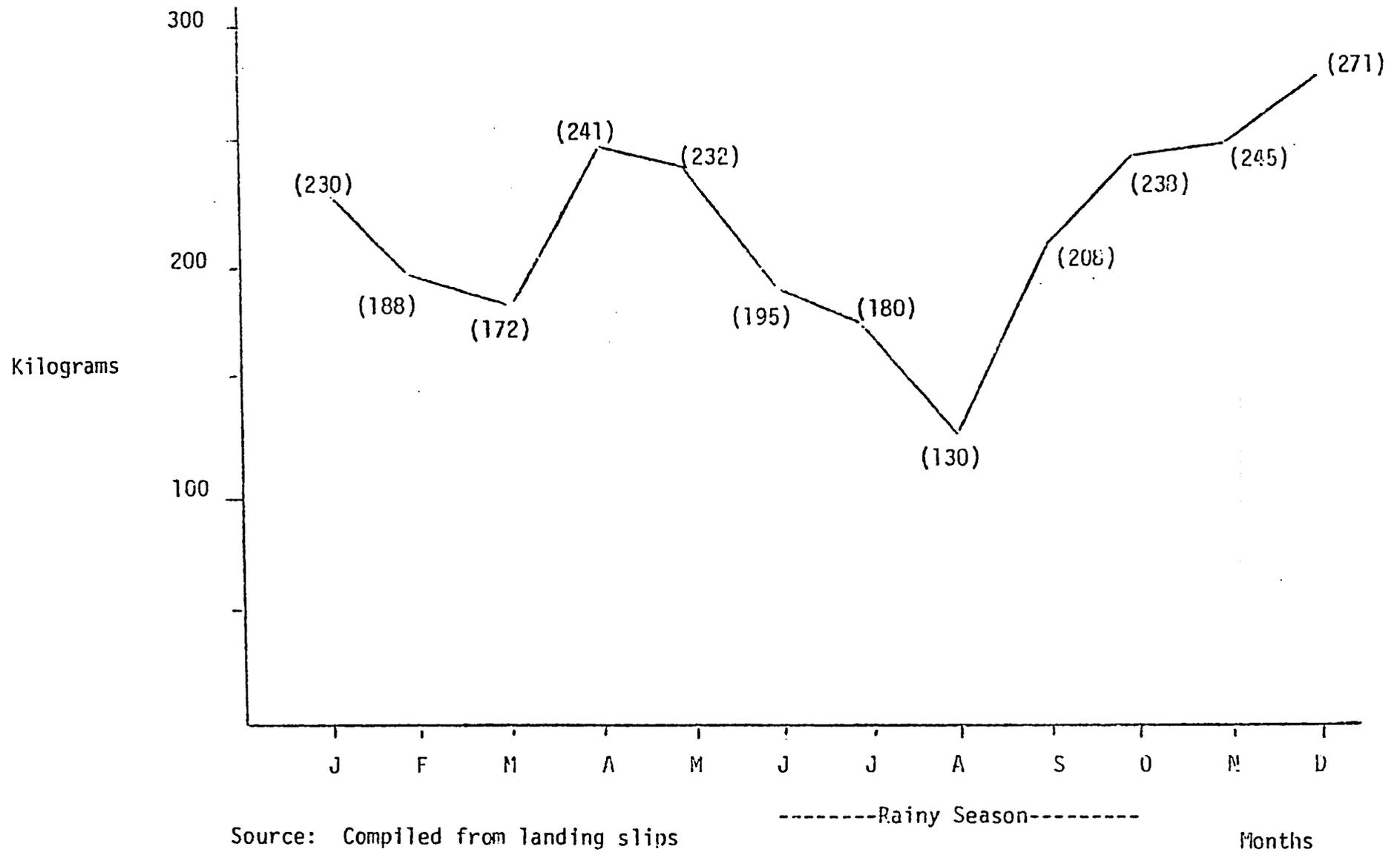
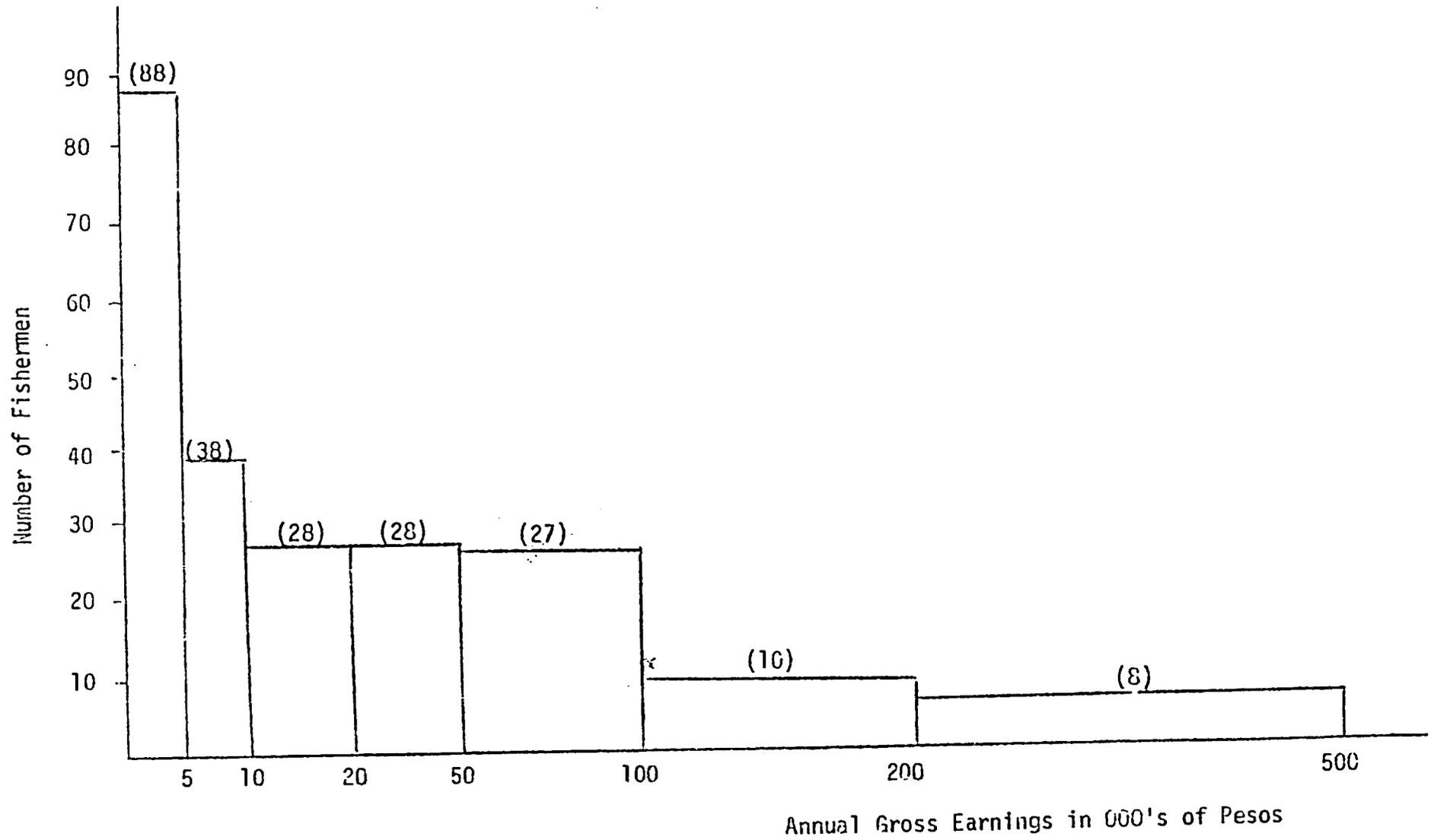
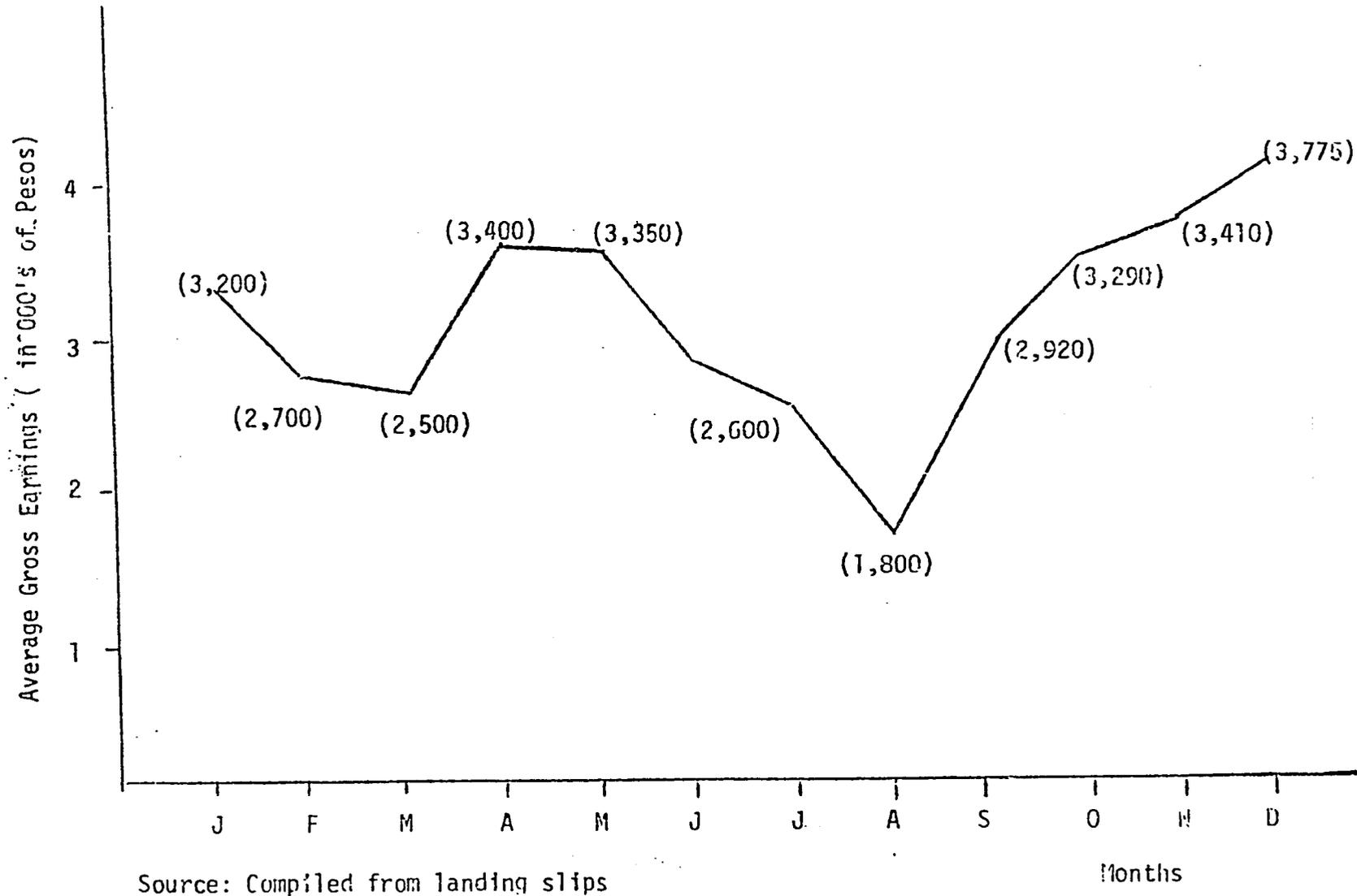


Figure V Bijagos Fisheries Project: Distribution of Annual Gross Earnings 1981 and 1982
(in Guinean Pesos)



Source: Compiled from Landings Slips

Figure VI Bijagos Fisheries Project: Average Monthly Gross Earnings per Fishing Trip by month 1981 and 1982 (in Guinea Pesos)



domestic supply of fish through the establishment of a pilot fisheries project in the town of Cacheu, and

2) To foster the development of a statistical system designed to identify, monitor and assess fisheries resources.

The outputs of the second objective were the establishment of procedures used in data collection, the training of counterparts, who continue the system, and the collection and summary of data, most of which are presented in this paper.

The specific outputs of the pilot fisheries project were as follows:

- a) The creation of a fishermen's supply store which sells nets, gear and various supplies.
- b) The initiation of a credit system and revolving fund used in supplying gasoline, oil and boat building materials.
- c) Furnishing 25 outboard motors with spare parts.
- d) The promotion of a project sponsored by CECAF (Commission for Eastern Central Atlantic Fisheries) which has introduced the use of sails to artisanal fishermen, and
- e) The training of counterparts to continue the project.

The pilot project was turned over to the EEC (European Economic Community) for continuation in June, 1983. The EEC envisions the injection of \$2.1 million in foreign aid, eighty percent will go into fixed investments and equipment and 20% will go toward foreign technical assistance.

Inquiries by EEC consultants in 1979 estimated that 200 fishermen resided in the town of Cacheu. This is confirmed by the project's list of fishermen. The 1980 census states that 112 canoes were registered in the town and that the Cacheu region was populated by 1,000 fishermen that owned 800 canoes. The town of Santo Domingos accounts for over half the fishermen.

Until the arrival of the project, many local fishermen worked for Nhiominkas that migrate to Cacheu during the dry season. Most of the gear used by Guineans were used nets and equipment sold by the Nhiominka's before they returned to their homeland.

Much of the behavior displayed by Cacheu fishermen can be attributed to different levels of capital investment and ethnic origin.⁽⁸⁾ For example, the Manjaco do not use boats. They prefer to fish by wading along the river bank with scoop nets, by constructing various types of traps and/or by suspending gillnets across small feeder streams.

The next level, in terms of capital investment, involves the Felupe, who use cast nets and longlines to fish from dugouts. The price of a new, small dugout ranges from 3,000 to 4,000 GP. One thousand pesos is invested in gear.

Barbo nets, large meshed mid-water gillnets named after their target species, were introduced to the region by migratory Senegalese fishermen in the early 1970's and have become very popular. A hundred meters of barbo net complete with buoys, ropes and leads costs between seven and nine thousand pesos. Fishermen in a non-motorized dugout use between 100 and 300 meters of net. Motorized vessels use at least 400 to 500 meters.

As Cacheu fishermen become motorized they purchase large dugouts, whose freeboard has been increased by the addition of planks on either side or, preferably, Nhiominka pirogues. A large dugout with sideboards costs between 12 and 15,000 GP. The cost of a locally constructed piroque is 45,000 GP. Piroques are a bit more difficult to fish from but are more seaworthy thus enabling fishermen to make more trips and follow seasonal migrations into rough waters.

As is the case with Bijagos fishermen, outboards are used only to transport fishermen to and from the fishing grounds. Motors range from 8 to 40 Hp.

An eight HP outboard costs 25,000 GP and 40 HP outboards average 55,000 GP.

Fishermen report cyclical, depending on the tides, and seasonal fluctuations in the quantities and species composition of catch. Threadfin, Barbo, run in six to seven day cycles. Captures are good for a week and off a week. Some Barbo fishermen switch to beach seining during the lull. It is not uncommon to catch 300 to 400 kilograms of fish during a day of beach seining. A 200 meter beach seine costs 27,000 GP.

During April and May fishing grounds upstream are productive for Barracuda and Catfish. During the rest of the year three to six day trips, "Campaigns", are made to the mouth of the Cacheu river or the island of Jeta. The long distance prevents fishermen from returning each day.

Estimates of total monthly landings are presented in Table XI. At the time this paper was written, the Cacheu project had not begun marketing operations.

The largest portion of the catch is dried. Some is taken home for consumption by the family of crew members. Thirty six percent of the catch is first class, 14% is second class, 11% is third class and 39% is fourth class. (Commercial classification is discussed in Section IV.) The difference in the composition of catch between the Bijagos and Cacheu may be attributed to variations in the species and concentrations of species inhabiting the two areas. Differences in fishing techniques and gear is another consideration.

Minor Projects

Three Artisanal fisheries projects, which are smaller than the two previously mentioned, have recently received funding.

The first is the Ga Samina project, funded by Oxfam, which intends to supply 16 fishermen with gear, nets and line. Four bicycles will be purchased and used in distributing fish.

The second project, which is being financed by a 300,000 Franc contribution from Swiss Aid, is located in the Biombo region. Plans call for the

Table XI Cacheu Fisheries Project: Estimated⁽¹⁾ Total Monthly Landings 1982 (in Kilograms)

Month	First Class	Second Class	Third Class	Fourth Class	Totals
January	13,750	3,566	3,933	24,266	45,515
February	6,097	8,168	5,744	18,182	38,191
March	15,790	6,097	5,081	16,177	43,145
April	26,104	4,898	7,902	22,760	61,664
May	28,784	9,873	7,842	24,240	70,739
June	11,738	6,670	5,524	10,363	34,295
July	7,516	3,167	432	4,648	15,833
August	4,545	1,382	982	3,730	10,639
September	3,610	1,422	1,200	5,590	11,722
October	8,005	3,796	2,281	4,362	18,444
November	8,275	1,681	400	5,660	16,016
December	3,380	3,830	216	8,858	16,284
Totals	137,594	54,570	41,587	148,736	382,487

(1) Total landings have been estimated from statistics gathered by a tax collector who records the quantities of each class of fish sold daily in the Cacheu market and collects a one peso per Kilogram market tax. The quantity of fish sold in the Cacheu market is estimated to be 30% of total landings.

purchase of eight piroques equipped with small outboards and gear and the installation of five small gas or diesel powered coolers. The principal objective is to train unemployed war veterans to become fishermen.

The Su Catio project began in 1980 with the support of a local Catholic mission. The project is cooperative in nature and deals principally with eleven fishermen in Sua and six in Caiar. Aluminum boats equipped with small outboards have been furnished. The fishermen of Sua made 99 trips in 1981 averaging 90 kilograms per trip. Fishermen from Caiar reportedly made an average of 44 trips in 1981 with an average catch rate of 94 kilograms. Total catch during 1981 was approximately 120,000 kilograms and may have increased in 1982 as the project planned to supply nets and motor to two other groups.

IV Marketing

The most important characteristics of the marketing system in Guinea Bissau are that fish prices are fixed and, in most cases, marketing is carried out by project or company employees. The "Mammy system", which is prevalent in many West African countries, exists but is primarily restricted to the marketing of dried fish. There are few instances when intermediates are encountered performing marketing services which link fishermen to retailers.

Ex-vessel and retail prices for each species of fresh fish, are fixed according to commercial classes and enforced by the government, Table XII. Dried fish is also subject to price controls but enforcement is lax so prices fluctuate freely. The official price is 25 GP per kilogram of dried or smoked fish.

When a fisherman elects to sell his catch in a local market, he usually gives women, who carry 30 to 50 kilogram baskets of fish into the market, one or two kilograms of fourth class fish per basket. The fisherman retains ownership and sells directly to consumers but receives the official ex-vessel price, not the retail price. He is also obliged to pay a two peso tax on

Table XII Commercial Classification by Species and Official Ex-vessel and Retail Prices. (in Guinean Pesos)

Commercial Class	Species	Ex-vessel Price/kg	Retail Price/kg
I	Threadfin, Sea Breems, Sole, Barracuda and Grouper	30	50
II	Croakers and Snapper	25	40
III	Needlefish, Sea Breems, Little Tuna, Tuna, Large Grunts, Horse Mackerel And Pompano	15	30
IV	Catfish, Angelfish, Grunts, Eels, Silverfish and Mullet	13	22.50

Source: Boletim Oficial, March 24, 1979, No. 24, Guinea Bissau

each kilogram of fish, regardless of its class and value. One peso is intended to cover the costs incurred in operating a public market and the other is a landings tax. Fishermen in the Bijagos have avoided paying the landings tax.

The Bijagos project, Paralta and Estrela do Mar, use public markets to sell directly to the consumer. Upon landing, fish are separated by commercial class and iced in 25 kilogram containers⁽⁹⁾ or, in the case of Estrela do Mar, which sells frozen fish, packed in 30 kilogram boxes. The containers are delivered to salaried employees in various markets and the total value left at each market is calculated. Fish are sold whole, with the exception of Barracuda which is eviscerated, or cut into pieces which are sold with entrails, by the kilogram. After all sales have been made, an official returns and collects the amounts owed and pays the market tax.

A. Dried Fish Marketing

Fish are dried for three reasons. First, fishing grounds are often distant from landing sites so fishermen camp nearby for three to six days and use drying as a means of preservation. The second reason is that dried fish brings a higher equivalent weight price than fresh fish. The third reason is for export to Senegal to earn "hard" currency. In this instance, it is usually large, first class Threadfin which is dried for export. At the official exchange rate, fishermen selling in Senegal receive less than half of what they would receive in Guinea Bissau but they are able to use Senegalese currency to buy essential items such as rice and tools. The price of rice, at the official exchange rate, is the same in Guinea Bissau and Senegal so fishermen prefer to market their catch in Guinea Bissau when rice is available.

Fishermen from Cacheu and the island of Bolama dry fish to be sold in Bissau and the interior. Drying does not appear to be carried out on a large scale by fishermen supplying the Bijagos fisheries project.

B. The Influence of Fish Prices

The Government of Guinea Bissau has imposed fixed prices on many domestically produced foods which are generally too low to provide economic incentive to increase production or to market excess production, production which exceeds subsistence requirements. These prices do not reflect seasonal variations in supply and demand. This premise can be supported by quick analyses of the dried fish market and the costs and earnings associated with fishing and marketing in the Bijagos.

Many argue that the high price of dried fish is an indication that the demand for dried versus fresh fish is higher but the author and members of Pescarte's Statistics Department conducted a survey in Bissau which asked 200 people whether they preferred dried or fresh fish. One hundred and eighty one responded in favor of fresh fish. The reasons most commonly given were that they perceived fresh fish to be easier to prepare, to have more flavor and nutritional value. Eleven were indifferent and seven stated a preference for dried fish.

Higher prices for dried fish appear to be attributable to lax enforcement of government prices for dried fish and most likely provide a good reflection of supply and demand. Equivalent weight ex-vessel prices for dried fish are usually double those of fresh fish so fishermen at least double the value of their catch by drying. Equivalent weight retail prices run four times higher than fresh fish prices.

The average gross earnings per trip in 1982 was 2,575 GP which is barely sufficient to cover the average variable costs of crew and fuel (6 crew members @ 300 GP each + 25 liters of gasoline @ 30 GP per liter = 2,550 GP). Only during the months of November and December, which account for 40% of annual catch, does the average gross earnings cover average variable cost and at least a portion of fixed cost.

A similar situation exists in marketing. The average marketing margin (retail price minus ex-vessel price) is ten pesos. The average cost incurred by the project in transporting and marketing a kilogram of fish was thirteen pesos. The Bijagos project was able to cover its marketing costs only during November and December when average cost, in response to increased volumes, fell below ten pesos.

C. Per Capita Consumption

In addition to the quantities supplied domestically by the artisanal and industrial sectors, three shipments amounting to 322,852 kilograms were purchased from Russian vessels working offshore. An additional 130 metric tons, taken from the two vessels seized for violating Guinea Bissau's territorial waters, were marketed domestically.

The total domestic supply in 1982, Table XIII, was 3,643,489 kilograms and the per capita consumption of fish was approximately 4.4 kilograms.⁽¹⁰⁾

Offshore Foreign Fleets

Monoyer, M'fina and Sarr (1981) identified six types of vessels from 12 countries as having fished off Guinea Bissau between 1974 and 1980, Table XIV. Foreign landings are presented in Table XV. A quick comparison of the number of vessels reported each year and corresponding landings make it evident that, if the number of vessels recorded is correct, their landings were not totally reported. This type of discrepancy is prevalent in all historical data.

The absence or reporting of only a portion of the landings by foreign fleets and the failure of Pesca's Statistics Department to actively pursue, record and file data must be rectified if Guinea Bissau is to effectively manage its fisheries and logically plan and implement development strategies designed to increase the benefits the country can derive from this resource. Existing data, at best, provides only an indication of the catch and effort of

Table XIII Total Domestic Supply and Per Capita Consumption 1982

<u>Source</u>	Quantity in Kilograms
Industrial	1,904,187
Artisanal	948,450
Seized from vessels violating Guinea Bissau's EEZ	130,000
Purchased from the offshore Russian Fleet	322,852
Imports	<u>338,000</u>
<u>Total Domestic Supply</u>	<u>3,643,489</u>
Population	830,000
<u>Per Capita Consumption</u>	<u>4.4</u>

Table XIV Numbers, Types and Origins of Vessels Fishing Within Guinea Bissau's EEZ 1974 to 1980

Vessel Types and Origins	1974	1975	1976	1977	1978	1979	1980
Tuna seiners							
France				24	24	24	
Bottom trawlers							
France				1	2	7	6
USSR					43	29	24
Portugal				3	4	4	1
Italy				5	9	6	2
Japan							1
Senegal					3	3	
Panama					6	6	
South Korea				2	2		
Ghana				1	1		
Holland							4
Greece							2
Sweden							1
EEC							8
Sub-totals				12	70	55	49
Seiners							
France				1	4	3	
USSR					42	27	9
Ghana				3	3		
Holland		14	14	14	14		
Sub-totals		14	14	18	63	30	9

Table XIV cont'd.

Vessel Types and Origins	1974	1975	1976	1977	1978	1979	1980
Pelagic trawlers							
France					2	3	1
Mixed (shrimp & fish) trawlers							
Guinea Bissau	7	14	14	14	5	4	9
France				2	3	9	8
USSR		2	1	7	7	6	
Japan					1	3	
Sub-totals	7	16	15	23	16	24	67
Shrimp trawlers							
France				12	15	7	7
Portugal				1	1		
Senegal				8	12	9	
EEC							3
Sub-totals				21	28	16	10
Totals (all vessels)	7	30	29	98	203	152	86

Source: Monoyer, Ph. J, Prosper M'Fina and M. Lamin Sarr.

Rapport De Mission En Guinea Bissau, Project Copace,

INT/79/019 CE. No. 124, Dakar, Senegal

Table XV Landings by Country within Guinea Bissau's EEZ 1978 to 1980

Country	1978	1979	1980
USSR	70,823	35,274.4	60,204.1
Japan	1,125.5	148.9	47.2
South Korea	2,446.0		
Holland	19,284.4		
France		1,409.0	193.7
Portugal		432.8	
EEC			3,977.7
Totals	93,678.9	37,265.1	64,422.7

Source: Monoyer, Ph.J., Prosper M'Fina and M. Lamin Sarr,
"Rapport De Mission en Guinea Bissau", Project
Copace, INT./79/019 CE. No. 124, Dakar, Senegal

foreign vessels.

The only foreign vessels reporting landings during 1981 and 1982 were operating under bilateral agreements between the Government of Guinea Bissau and the USSR and EEC. Unfortunately, data covering the activities of the Russian fleet during 1981 were unavailable. Likewise, there are no data on European tuna vessels.

A. The EEC

Vessels from EEC member countries, usually based in Dakar, have traditionally fished the waters which have been incorporated within Guinea Bissau's EEZ. An agreement covering the licensing of EEC vessels expired in early 1982 and was not renegotiated until January, 1983. Nevertheless, trip sheets are available which verify that fishing activities continued between agreements.

Available information summarizing the activities of EEC vessels for 1981 and January to September, 1982 is presented in Tables XVI and XVII. Information on each vessel is presented in Annex V. The total recorded catch was 1,541 mt in 1981. The estimated catch for 1982 is 2,700 mt. Six percent of the catch is shrimp, ten percent is sole and 34% is recorded under the category diverse.

The new agreement specifies that vessels must purchase a license, the cost of which is dependent on the vessel's GRT and the amount of time the vessel is anticipated to fish off Guinea Bissau. The owner is responsible for 33% of the fee and the EEC pays the remainder. It is reasonable to assume that the new agreement will result in greater effort by EEC vessels. These vessels concentrate on shrimp, sole and tuna.

B. The USSR

The Soviet Union, in addition to its joint venture, has an agreement which permits its vessels to fish offshore. The present agreement reportedly

Table XVI EEC: Recorded Monthly Landings 1981

Month	Number of vessels	Number of days fished	Number of trawls	Number of hours fished	Shrimp (kilograms)	Sole (kilograms)	Diverse	Totals
January(1)								
February	8	129	1,354	3,165	13,811	43,335	302,620	359,966
March	9	177	1,479	3,472	54,115	33,193	245,990	333,297
April(1)								
May(1)								
June(1)								
July(1)								
August(1)								
September(1)								
October	5	82	698	1,765	1,605	41,345	219,565	262,515
November	5	107	804	2,131	5,680	38,800	268,590	313,070
December	7	141	1,116	2,758	7,415	39,390	275,755	272,560
Totals	13	636	5,451	13,291	82,626	196,062	1,267,720	1,541,408

Source: Compiled from EEC trip sheets

(1) The EEC representative in Bissau reports that no EEC vessels fished during these months.

Table XVII EEC: Recorded Monthly Landings 1982

Month	Number of vessels	Number of days fished	Number of Trawls	Number of hours fished	Shrimp (kilograms)	Sole (kilograms)	Diverse (kilograms)	Totals (kilograms)
January	7	96	751	1,897	8,021	33,605	202,495	244,121
February	7	124	935	2,214	8,377	49,715	161,317	219,409
March	10	180	1,215	3,306	16,259	12,739	461,524	490,522
April	13	272	1,796	4,710	49,119	24,048	386,381	459,548
May	13	238	1,624	4,356	26,141	27,147	423,466	476,754
June	NA							
July	3	39	296	716	8,845	4,740	39,973	53,558
August	3	50	401	956	8,017	7,479	15,790	31,286
September	3	35	277	720	7,165	4,865	42,193	54,228
October	NA							
November	NA							
December	NA							
Totals	NA							

NA = Not Available

Source: Compiled from EEC trip sheets.

allows 22 vessels to be operating within Guinea Bissau's EEZ at any given time. The exact terms of the agreement are not known by the author but it appears that Guinea Bissau receives a percentage of the total value of the catch.

Data covering the activities of the Russian fleet comes from two sources. The first is trip sheets which are sent to Pesca's Statistics Department. Each trip sheet identifies the vessel and presents characteristics such as Gross Registered Tonnage, motor size, etc. along with information on fishing effort and catch, Annex VI. A list of Soviet vessels working offshore is presented in Annex VII.

The second source of data is letters sent by the Russian fisheries representative in Bissau. Each letter covers a ten day time span and reports the registration numbers of Soviet vessels working offshore, the total catch by gear type, the quantity of fish meal produced and the quantities of frozen fish processed by species. Unfortunately, information from the latter source was only available for a seventy day time span. This information has been summarized and is presented in Tables XVIII and XIX.

Comparing the total catch and number of vessels reported by the Soviet fisheries representative to a summary compiled from the trip sheets, Table XX, indicates that the trip sheets represent an 80% sample. The total catch by the Russian fleet in 1982 is estimated as 150,000 mt. Fifty percent of the catch is processed and frozen and 50% is converted to fish meal.

Table XVIII USSR Offshore Fleet: Numbers and Types of Vessels, Total Catch, Quantities Frozen and Quantities of Fish Meal Produced September and October 11 to December 20, 1982. (metric tons)

	September 1 to 30	Oct. 11 to Dec. 20
Vessels		
Number of trawlers (BARTs)	10	18
Number of seiners (SRTMs)	5	10
Total catch	12,701	18,588
Catch by trawlers	12,055	17,393
Catch by seiners	646	1,195
Processing		
Quantity frozen	6,052	10,259
Quantity of fish meal produced	1,229	1,496

Source: USSR Fisheries Ministry, Bissau, Guinea Bissau.

Table XIX Pg. 1. Composition of Frozen Fish Harvested and Processed by Soviet Vessels Fishing within Guinea Bissau's EEZ September and October 11 to December 20, 1982. (metric tons)

Frozen Fish	September 1 to 30	Oct. 11 to Dec. 20
Group III not treated	3,771	6,345
Group III headed and gutted	26	
Triggerfish not treated	779	1,260
Triggerfish non-edible	59	799
Horse Mackerel not treated ⁽¹⁾	3	43
Horse Mackerel ⁽²⁾ gutted	8	20
Horse Mackerel ⁽³⁾ headed and gutted	33	50
Horse Mackerel ⁽²⁾ fillets	5	
Tuna not treated	2	3
Tuna gutted	2	
Tuna gutted and headed	3	1
Tuna fillets	5	1
Bonito not treated		1
Bonito headed and gutted		1
Barracuda not treated		1
Barracuda headed and gutted	19	2
Cutlassfish not treated	48	72
Cutlassfish headed and gutted	15	6
Pompano/Jack not treated	24	60
Pompano/Jack gutted	2	11
Pompano/Jack headed and gutted	46	46
Pompano/Jack fillets		11
Catfish not treated	224	134
Catfish headed and gutted	3	26

Table XIX Pg. 2 Composition of Frozen Fish Harvested and Processed by Soviet Vessels Working within Guinea Bissau's EEZ September and October 11 to December 20, 1982. (metric tons)

Frozen Fish	September 1 to 30	Oct. 11 to Dec. 20
Croakers not treated	80	156
Croakers gutted		4
Croakers headed and gutted		35
Threadfin not treated	134	219
Moonfish not treated	1	
Moonfish headed and gutted	11	
Bonefish not treated		28
Bonefish headed and gutted	1	9
Sardines non-edible		9
Sardines not treated	423	167
Sardines headed and gutted		1
Grunts not treated ⁽⁴⁾	85	34
Grunts not treated ⁽⁵⁾	10	91
Grunts headed and gutted ⁽⁶⁾	4	4
Angel/butterfly fish not treated	29	147
Angel/butterfly fish headed and gutted	2	6
Whitefish not treated	1	11
Whitefish headed and gutted	3	
Squid	5	7
Sole not treated	1	4
Cuttlefish not treated		3
Snapper non-edible	13	
Snapper not treated		1
Pargo not treated		17
Pargo headed and gutted		2

Table XIX Pg. 3 Composition of Frozen Fish Harvested and Processed by Soviet Vessels Working within Guinea Bissau's EEZ September and October 11 to December 20, 1982. (metric tons)

Frozen Fish	September 1 to 30	Oct. 11 to Dec. 20
Drepana ⁽⁷⁾ not treated		103
Sea Breams not treated		3
Others non edible	78	35
Others	81	235
Others headed and gutted	8	33
Other fillets		2
Totals	6,052	10,259

(1) Carapau

(2) Cavala

(3) Carapau and Cavala

(4) Otoperca

(5) Cor-cor

(6) Otoperca and cor-cor

(7) English and scientific name not known

Source: Official communication from Soviet Fisheries Ministry-Bissau.

Table XX USSR Offshore Fleet: Trip Sheet Summaries of Catch and Effort (1) 1982

Source: Compiled from Soviet trip sheets.

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Months	Number of Vessels	Number of Fishing days	Pompano/Jack Lichia spp.	Triggerfish	Horse Mackerel (Carapau)	Moonfish	Horse Mackerel (Cavala)	Tuna	Sardines	Catfish	Croakers	Threadfin	Sole	Cutlassfish	Shrimp	Shark	Sardines	Pompano/Jack	Others	Totals
January	18	253	7	2926.5	5,293.5	81	98.5	8	1,170	4							66	100	37	9,965.2 ⁽²⁾
February	27	396	44	821	11,822.2	161	16	6	494								70	74	507	14,020.2 ⁽²⁾
March	25	146	113	1321	8,411.4	41	3	7	367					15		50	162	235	504	11,229.4 ⁽²⁾
April	21	291	12	8911	889.0	83	7	12	1,301					63			20	45	209	11,552.0 ⁽²⁾
May	14	224	12	8899.5	482.5	60.5	25.5	6	668					74.5			10	46		10,204.5 ⁽²⁾
June	7	157	13	8888	76	30	44		35		1			86		168		47	108	9,504.0 ⁽²⁾
July	10	129		5095	25	3	4	3								767		22	1,133	7,052.0 ⁽²⁾
August	11	194		1589	27	3	14	1	152	166.5	105.8		6.3	55.6		924		38.5	2,607.4	5,976.0 ⁽²⁾
September	16	371	6	6283	23.5	42.2	20.4	9	453	175	75	133.7	2.5	56.4		221	0.5	90.4	2,702.5	10,302.1 ⁽²⁾
October	22	421	6	8049	156.6	105.5	4.7	2	188	212.1	171.9	247.2	4	54.0		530.4	6	90.5	4,008.5	13,929.2 ⁽²⁾
November	21	408	15.4	6890.5	42	89.6	10	9	110	123	114.2	84.3	6.1	69.6		186		112.2	6,627.8	14,489.4 ⁽²⁾
December																				12,606.0 ⁽¹⁾

(1) On the average vessels fished 9 hours and fifty minutes per day and made 3.0 trips.

(2) 80% sample

(3) Trip sheets were not available for December so the catch was estimated from reports submitted by the Russian Fisheries Representative in Bissau.

VI Summary

During 1982, 153,000 mt of fish were harvested from Guinea Bissau's EEZ. The offshore foreign fleet accounted for 96.7% of the total catch, the industrial sector contributed 2.7% and the artisanal sector was responsible for .6%. The total domestic supply was 2.4% of total catch.

It is evident that the fisheries hold great potential and their rational exploitation can significantly contribute to the overall development. In fact, the fisheries may be the country's most readily available resource but their development is not a simple task and will not be achieved rapidly.

A large freezer complex has recently been completed and construction should begin soon on a new port facility but the development of any sector is linked to prevailing economic conditions. For example, shortages of food and beverages, the absence of repair and maintenance facilities, fuel shortages and the lack of establishments where crew members can spend their leisure time are not conducive to attracting foreign fleets. In addition, Guinea Bissau does not possess the technical expertise, business know-how and hard currency required to successfully compete by itself in international markets.

The country should endeavor to identify a long term development strategy and place experienced personnel and competent technicians in positions of authority. Realistic goals must be set and projects should employ appropriate technology. Continuing and updating the statistical system to provide decision makers with information, encouraging the training of students in foreign universities, instigating an effective system of monitoring and surveillance and re-evaluation of government pricing policies are areas which can be addressed immediately.

END NOTES

- 1) Waters less than 8 meters deep were not surveyed so estimates of the biomass are underestimated.
- 2) Maximum sustainable yield is calculated as 25% of the estimated biomass in Table 1.
- 3) COPACE, April, 1982, "The Fisheries of Guinea Bissau", Dakar, Senegal
- 4) Figures presented in this paragraph were taken from the "Programa Bienal" 1980-1981, Author and date unknown.
- 5) Equipment and gear prices are those charged by the projects. Thirty eight Guinean pesos (GP) = \$1.00 U.S. Little equipment is available from other sources.
- 6) Information on gear and equipment and the size and systems of crew remuneration are based on interviews with 62 Bijagos fishermen.
- 7) Fuel shortages from March through May distort this relationship.
- 8) Most information on fishing techniques, equipment and gear costs were taken from Martin Vincent's, Fisheries Field Advisor for the Cacheu Project, Final Report.
- 9) The Bijagos project assumes a 7.5% loss through shrinkage and packs 27 kilograms per container. Fishermen absorb the loss as they are only paid for 25 kilograms.
- 10) Per capita consumption is slightly underestimated as dried fish and fish supplied by artisanal fishermen not associated with a project could not be included.

ANNEXES

Annex I Estrela do Mar: Numbers and Types of Vessels 1975 to 1982

Type / Year of Vessel	1975	1976	1977	1978	1979	1980	1981	1982
SRTM	5	5	7	8	7	6	8	7
MRTR	5	5	5	4	4	5	4	4
MTK						1	1	1
MRTK							1	
PR-1336								2
Totals	10	10	12	12	11	12	14	14

Source: Monoyer, Ph. J., Prosper M'Fina and M. Lamin Sarr, "Rapport De Mission En Guinea Bissau," Project Copace, INT. 179/019 CE. No. 124, Dakar, Senegal.

Annex II Quantities Exported (Exp.) and Sold Domestically (Dom) by Companies in the Industrial Sector
1975 to 1982 (metric tons)

	1975		1976		1977		1978		1979		1980		1981		1982	
	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.	Exp.	Dom.
Estrela do Mar	Exp.				2,168		1,452		1,553		501		2,265		2,327	
	Dom.	867		1,474		1,761		389		1,640		1,260		1,803		1,849
Semapesca	Exp.								75		187		20			
	Dom.									275		733		21		
Guialp	Exp.															
	Dom.			137		147		23						28		
Paralta	Exp.															
	Dom.			265		203		119		90		69		70		50
Sub-Totals	Exp.				2,168		1,452		1,628		688		2,285		2,327	
	Dom.	867		1,876		2,111		531		2,013		2,118		1,922		1,905
Total Annual Production		867		1876		4279		1933		3541		2806		4217		4232

Sources: Personal communication with representatives of Estrela do Mar and Ministerio de Planificacao, Evolucao E Ponto De Situacao Do Sector Pesqueiro", Guinea Bissau, November, 1982, unpublished document.

Annex III Lijagos Fisheries Project: Monthly Landings by Species 1981 (Kilograms) - 57 -

Fies/Especia	Jan. ⁽¹⁾	Feb. ⁽¹⁾	March ⁽¹⁾	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Barbo				148.5	73.5	124.5	123.5	172.5	98.5	96.5	77.5	177.5	
Bicuda				698	763	836.5	176.5	271.5	125	394.5	270.5	377.5	
Groupa				3.5	1.5	3	11	2	23.5	11.5	24.5	43	
Linguado				94.5	78	74.5	109	101	116.5	19	60	150.5	
Bica				179	125	107	151.5	166.5	525.5	1,140.5	1,617	806	
Sinapa				142	33	6	122.5	249.5	877	4,266.5	3,811.5	1,142	
Antoni Boca				93	85	98.5	64.5	93.5	274	43	31.5	110.5	
Tainha Fidalgo				294.5	674.5	55	258						
Tainha				52,478	40,696	41,740.5	33,749	16,145	23,222	31,387	40,000.5	65,434	
Bagre				923	665	1,111.5	985.5	1,073	1,200	347.5	671.5	1,080.5	
Djoto				742	579	587	678.5	900.5	1,209.5	324.5	667.5	1,177.5	
Sereia				1,940	1,396	608.5	1,242	639	1,435	336	2,624.5	2,593	
Cor-cor				1,203.5	814	1,292	2,220	1,021	1,394	117	903	1,254	
Bentana				846	764.5	564	1,355.5	526	1,457.5	508.5	1,166	1,031	
P. Prata				33	43	50.5	105.5	101.5	103.5	141	69	287.5	
P. Mantchado				91.5	54	166	128.5	78	137.5	79.5	279.5	173	
Tchalumbe				858	182	12	15	33.5	99.5	995	204	61	
Aguma				534	350.5	336.5	320	472.5	526	235.5	231.5	554.5	
Cachobreta				108.5	77.5	48.5	71.5	27.5	69	55.5	62.5	105	
Babbinho				99.5	70.5	75	101	211.5	1,133.5	167.5	157	197.5	
Robalo Vermelha							108.5						

Annex III Cont'd. Bijagos Fisheries Project: Monthly Landings by Species 1981 (Kilograms)

Mes/Especia	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Diversos						374		394	102	590	4	65	
Total	65,503	50,863	63,961	61,560	55,525.5	48,275	42,150	24,699.5	39,209	43,519	53,107	96,748.5	647,751.5

Source: Compiled from Landings slips

(1) Information on the Quantities of Each Species Caught During these Months is not Available.

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Annex IV Bijagos Fisheries Project: Monthly Landings by Species 1982 (Kilograms)

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Species / Months	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Threadfin	124	205	133	44	95	50	4		21	476	250	176	1,569
Carracuda	510	2,320	4,143	2,377	4,377	198	29		159	407	512	640	15,760
Grouper	76	14	20	1		4			20	7	15	45	201
Sole	90	165	66	45	19	56	3		49	68	106	140	517
Sea Breams (Uico)	426	252	273	179	136	74	65		55	173	800	461	2,569
Snapper	683	130	209	35	65	61	149		4	54	718	655	2,802
Bullet	56,647	39,592	33,938	21,914	31,971	26,765	3,786		17,502	37,504	35,176	160,194	465,087
Catfish	590	613	1,991	401	777	458	120		300	820	2,062	1,296	8,533
Sea Breams (ventana)	1,012	373	407	264	349	420	120		781	551	1,303	961	6,481
Paripano/Jack	1,572	657	1,051	692	2,194	371	86		451	4,967	3,312	1,771	16,664
Grunts	1,327	1,450	1,255	236	610	1,454	67		491	1,672	1,259	570	10,300
Silverfish	214	427	80	6	5	35	2		40	6	262	52	1,141
Angel/Butterfly Fish	348	216	328	18	145	60	6		393	120	422	127	2,163
Gar/Needle Fish	193	151	269	141	272	145	24		246	278	243	166	2,150
Little Tuna bonito	59	117	146	53	131	50	25		54	132	136	241	1,140
Law Croaker	1,014	1,032	1,281	456	602	918	93		562	1,694	1,536	1,509	10,250
Misc.	2,556	990	854	397	1,322	1,447	118		1,125	2,960	1,611	1,350	14,952
Totals	67,553	48,716	47,306	27,399	43,150	32,506	4,716		22,322	51,291	117,427	110,400	565,302

Source: Compiled from landing slips

Annex V EEC: Vessels Reporting Landing within Guinea Bissau's EEZ 1981 and 1982.

Vessel Names	Nationality	Engine Hp	GRT ⁽¹⁾	Gear	Port
Argo					
Concordia Anne	French	480	156	Trawler	Dakar
Corven	French	600	150		Dakar
Christian Yveline	French	600	148		Dakar
Delia Prima	Italian	220			Dakar
Ile Aux Diseaux					
Krista	Italian	1,250	402		Dakar
Laurus	Italian	750	404		Dakar
Laurence Marie					
Natale Senor	Italian	970	454	Trawler	Dakar
Pere No					
Pionier	French	600	147	Trawler	Dakar
Tornado	Italian	1,326	488	Trawler	Dakar

(1) GRT = Gross Registered Tonnage

Source: Compiled From EEC Trip Sheets.

Название судна ВМРТ-311

Деятельность _____

Место промысла рыба

Национальная принадлежность _____

Мощность главного дв. _____

Порт отгрузки _____

USSR

Дата: Сотв промысла: Кол-во: Кол-во: В И Д О В О Й С О С Т А В У Л О В А /тн/

: Долго- : Широта: поста- : часов:

: та : : новок : на :

: : : трала : лову:

Balista *Carapax* *Sargus* *Sardinia*

: ПРОЧМЕ: ИТОГО

Дата	Широта	Долгота	Кол-во трала	Кол-во лову	В	И	Д	О	В	О	Й	С	О	С	Т	А	В	У	Л	О	В	А	ПРОЧМЕ	ИТОГО
21.10.82	11°00'N	16°59'W	3	9	40																			40
22.10.82	11°05'N	17°03'W	4	10	37																			37
23.10.82	11°04'N	17°00'W	2	11	37																			37
24.10.82	11°00'N	17°01'W	3	8	40																			40
25.10.82	11°01'N	17°01'W	3	5	40																			40
26.10.82	11°00'N	16°59'W	3	7	40																			40
27.10.82	11°02'N	17°01'W	4	10	40																			40
28.10.82	11°04'N	17°03'W	4	10	39	1																		40
29.10.82	11°08'N	17°08'W	3	8	26	1																		29
30.10.82	11°09'N	17°03'W	1	3	15																			15
31.10.82	11°08'N	17°04'W	1	4	15					10														25
																								444

Капитан-директор
ВМРТ "Молчан" : *А.В. / В. Антонович*

Annex VII Pg. 1 Soviet Vessels Reporting Landings within Guinea Bissau's EEZ 1982.

Vessel Registration Number and Name	Motor Size (Hp)	Gross Tonnage	Gear Type	Delivery Point
Alekonis	2,000	2,437		
BMRT 555	2,000	2,323	Trawler	
BMRT 181 Akvanarin	2,000	2,424	Trawler	
BMRT 182 Labrador	2,000	2,243		
BMRT 184 Kuarts	2,000		Trawler	
BMRT 185			Trawler	
BMRT 186 Ivan Gren	2,000			
BMRT 244	2,000		Trawler	
BMRT 0250	2,000	2,407	Trawler	
BMRT 308 Turguenev	2,000		Trawler	
BMRT 332 Granat	2,000	2,433	Trawler	
BMRT 0350			Trawler	
BMRT 0366 Alekonis	3,000		Trawler	
BMRT 536	2,000	2,689	Pelagic	
BMRT 604 Rudulfo Sirge	2,000	2,323		
BMRT 605				
BMRT 598 R. Mirring	2,000	2,323	Trawler	
BMRT 7022	1,340	2,435	Trawler	
BMRT 7031 Lisa	1,340	2,435	Trawler	
BMRT 7066	1,340		Trawler	
BMRT 8149 Voznichy	1,000	647	Trawler	Santa Ouz
CPTP-SRTR 9062	540	507	Seiner	
EB 0227	2,000	2,715	Trawler	Tallin

Annex VII Pg. 2 Soviet Vessels Reporting Landings within Guinea Bissau's EEZ 1982.

Vessel Registration Number and Name	Motor Size (Hp)	Gross Tonnage	Gear Type	Delivery Point
EB 0227	2,000	2,715	Trawler	Tallin
EB 0246	2,000			Tallin
EB 0355	2,000	2,433	Trawler	Tallin
EB 055 = BMRT 555				
EI Dn 1451 = SRTR 1451	1,000	635	Seiner	Tallin
EI 1462 Hiiumau	1,000	635	Seiner	Tallin
EI 9050	540	507	Seiner	Tallin
Kursegraf RB 7235	2,360	2,211		
LB 0225	2,000	2,407	Trawler	Klaipeda
Mirkran	1,000			
MYS Cheluskina	2,000	2,326		Dakar
MTS 601	1,200	2,400?		Dakar
RI 9025	670	502	Seiner	
RN 9025 Forel,	670	502	Seiner	
RTM Eridan	1,340	2,435	Trawler	
RTU	1,340	2,435	Trawler	
SRTRM-BIIRT 0311 Koltov	2,000	2,433	Trawler	
SRTM 1453	1,000	635	Seiner	
SRTM 8135 Algenib				
SRTM 8145	1,000			
SRTR 8225				
SRTM 9057 Kunda	540	508	Seiner	
SRTR 9062				
SRTR 1462				
SRTR 1490 Metelitsa	1,000	635	Seiner	Tallin

Annex VII Pg. 3 Soviet Vessels Reporting Landings within Guinea Bissau's EEZ 1982.

Vessel Registration Number and Name	Motor Size (Hp)	Gross Tonnage	Gear Type	Delivery Point
SRTR-SRTM 7142	2,320	2,177		
SRTR-SRTM 8130 Algenib	1,000	775	Trawler	Klaipeda
SRTR-SRTM 8134	1,000			
SRTR 9063	800	508	Seiner	
SRTR 9063 Tori	670	508	Seiner	Puza
SRTR 9082 Ristna	540		Seiner	Tallin
SRTR 9097	540	508	Seiner	
SRTR 9102	840	508		Tallin
SRTR-CPTP 9122	540	508	Seiner	
SRTR 9130 Kabli	800		Seiner	
SRTR 9130 Pidula	540	505	Seiner	Tallin
SRTR 8220 Skap	1,320		Seiner	
SRTM-CPTM 1454	1,000	635	Seiner	
SRTR 8225	1,320		Seiner	
SRTR 822 = KB 822 Batterfist	1,320		Seiner	
BMRT KB 311 = SRTRM 0311 Koltov				
BMRT 227	2,000	2,715	Trawler	
SRTM 601				
SRTM 8152 liepkas	1,000	632		
PIMT 7031				
MYS Cheluskini = SMRT 605	3,000	2,326		Dakar
BMPT 186	3,000			
SRTM 8142	1,000	629	Seiner	
BMRT 185	2,000	2,243	Pelagic	Tallin
SRTM 8122	1,000	772	Seiner	
SRTM 8035	800	696	Seiner	

Source: Compiled from Soviet Trip Sheets

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