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Portuguese Research Report, 1972

by

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The total cod catch in the I.C.N.A.F. Area during 1972 was 129,705 metric tons (table 1), which was mainly provenient from the trawl fleet - 99,831 metric tons - against almost 20,000 from gill nets and 10,000 from dory vessels.

Table 1

Subareas	Side	Trawl		Line Dory vessel	Gill nets	Total
		Stern	Total			
1	-	-	-	-	8,485	8,485
2	13,428	5,957	19,385	-	-	19,385
3	48,183	20,446	68,629	8,852	11,483	88,964
4	4,239	7,578	11,817	1,054	-	12,871
-						-
1+2+3+4	65,850	33,981	99,831	9,906	19,968	129,705
-						-

In 1972 as in 1971 the gill net fleet operated with a higher number of vessels than in 1971 and this fact it was well expressed with a reasonable increase in the catches (almost 20,000 tons in 1972 for 12,000 tons in 1971). In other hand the gill net catch in 1972 was bigger than the dory vessel one, which didn't occurred in 1971.

Concerning the 1972 catches in the ICNAF Area we must point out the followings facts:

- a) The trawlers fished in subareas 2, 3, and 4 a total of 99,831 metric tons over all quarters of the year. The best catch occurred in subarea 3-68,629 tons (48,183 from side trawlers against 20,446 tons from the stern fleet. Quarterly the best catch occurred in second quarter and the lowest along the fourth one.

- b) The side trawl fleet in 1972, as in antecedent year, fished a higher tonnage than the stern one - 65,850 tons fished by side trawlers against 33,981 tons from the stern ones.
- c) The dory vessel fleet fished the minor amount of the tonnage landed by the total Portuguese fleet - only about 10,000 tons, fished in subareas , 3 and 4 (8,852 from subarea 3 and only 1,054 tons from subarea 4).
- d) The gill net fishery took place only in subareas 1 and 3 with 8,485 metric tons and 11,483 tons landed, respectively, but only the last one along over all quarters of the year, while the catch in subarea 1 occurred only in the second and third quarters (June and July more August respectively).
- e) Relatively to the catch from 1971 we can point out the following differences:
  - i) In 1972 the total cod catch was lower than the 1971 one, less about 20,000 tons
  - ii) The main decrease in the catch concerns the trawl fishery which was 24,000 tons lower than in the previous year. The difference concerning the side trawlers was relatively higher than the stern ones - 18,000 tons from the side trawler and only 5,000 tons concerning the stern ones
  - iii) The gill nets fishery improved quite well with a increase of 8,000 metric tons in the landings (almost 20,000 tons on 1972 against about 12,000 in 1971
  - iiii) The dory vessel fishery landed only about 10,000 tons against 17,000 tons fished in 1971 with the same method which is in complet disappearance. In fact only a very short number of ships are yet fishing with dorys. We suppose that in a very short period all the remaining ships belonging to the dory vessel fleet are changed to gill net process.

The present report, in addition to reviewing the status of fisheries, presents also data on length, age maturity and probable age at first maturity obtained from random sampling on board commercial gill net vessel.

Detailed information on length and age samples are included in the ICNAF sampling yearbook.

#### Subarea 1

##### A - Status of the fisheries

In this subarea only fished the gill net fleet with a total catch of 8,485<sup>tons</sup> during the second and third quarters of the year - 374 and 8,111 metric tons respectively (table 4). The fishery took place in Divisions 1 B, 1 C, 1 D and 1 E but with best results in the second and third ones (Table 2). Monthly the best catch amounted to 5,418 tons in July, followed by August with 2,693 metric tons.

B - Special research studies

Samples for biological study were collected from Division 1 C between 9 June and 11 August as follows:

Div.	Samples	Date	Depth (m)	Fish lengths (N <sup>o</sup> )	Fish otoliths (N <sup>o</sup> )
1 C	A	9-13 June	146-156	2,314	150
1 C	B	1-26 July	70-146	9,965	375
1 C	C	2-11 August	73-101	3,291	200
TOTAL				15,570	725

a) Length composition

Length from 52 cm to 118cm (3cm classes). Mean lengths were 84.5 in sample A (June); 85.2 in sample B (July) and 84.5 in sample C (August).

b) Age composition

Ages ranged from 5 to 19 years old with a significant dominance of the ages 7 and 11 and 12 in the three months sampled (June July and August).

According to this the mean ages were in June 9.4, in July 9.5 and in August 9.1 .

c) Growth

Average length (cm) at age of cod caught by gill nets, sampled during the second and third quarters are shown in the table below.

d) Stage of maturity

The study of stages of maturity presented, in males and females a higher percentage of fishes in post-spawning stage, 65% and 49% in females and males respectively in June; in July and August it was observed the same predominance of this stage as follows: in July 83% for females and 85% for males and in August 64% for females and 55% for males.

The others stages were also observed but not in so high percentage. In June were also sampled fishes, which presented the stages of developing and spawning in same percentage in the females; in the males the spawning it was observed in a higher percentage. In the males it was observed also some fishes, but with a very low percentage, in the stage developing.

In July the females also presented the developing stage and the resting or recovering it was also recorded but with a very low percentage 3.2%.

The males in the same month, besides the post-spawning, also showed some fishes in the resting or recovering stage, 32%, and a very small percentage 3%, with spawning fishes.

Age composition and growth of cod samples from the gillnet fishery in Subarea 1.

Division 1C						
Year-class	Age-group	Second quarter		Third quarter		
		Mean length (cm) June	No. of fish	Mean length (cm) July	August	No. of fish
1967	V	66	2	60	62	2
1966	VI	67	16	71	71	47
1965	VII	77	39	78	78	175
1964	VIII	82	18	81	80	62
1963	IX	85	9	85	84	37
1962	X	85	14	90	90	38
1961	XI	90	25	90	89	102
1960	XII	94	21	93	93	84
1959	XIII	95	5	97	97	13
1958	XIV	103	1	98	97	8
1957	XV	-	-	96	95	6
1956	XVI	-	-	-	-	-
1955	XVII	-	-	-	-	-
1954	XVIII	-	-	-	-	-
1953	XIX	-	-	112	112	1
			150			575

In August the females presented also a reasonable percentage of fishes in stage of spawning, 32% and a small number of records of fishes in resting or recovering stage, only 5%.

The males presented a reasonable percentage of specimens in stage resting or recovering, almost 39% and a very low percentages concerning the developing and spawning stages 4% and 2% respectively.

#### e) Age at first maturity

During the study of the age we prosecuted trying the identification maturity rings. In spite of the majority of the otoliths didn't allowed us to achieve good conclusions, some of them showed the age at first maturity as 6, 7 and 8 but mainly at 6 and 7.

#### Subarea 2

##### A - Status of the fisheries

In this subarea like in 1971, only fished the trawlers with a total landed of 19,385 metric tons - 13,428 from the side trawl fleet and 5,957 metric tons from stern trawlers (Tables 1, 2 and 3).

The trawlers (side and stern ones) operated in Divisions 2 H and 2 J but the catch in this last division it was insignificant when compared with the fishery in Division 2 H, which landed a total of 19,212 metric tons while the total fished in Division 2 J was only 173 tons (Table 2).

The trawlers fished during all over the four quarters of the year but the best catches occurred during the fourth (8,206 tons), second (5,945 tons) and first (5,211 tons) - Table 3

### Subarea 3

#### A - Status of the fisheries

Like in 1971 it was in this subarea where the Portuguese cod fishery it was the most intensive.

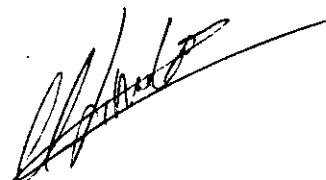
In fact there fished the trawlers (with a total landed of 68,629 metric tons) gill nets vessels (11,483 tons fished) on dory vessels (8,852 metric tons). The total landed from this subarea it was almost 99,000 metric tons which was 68.5% of the total Portuguese cod catch in the ICNAF area.

Concerning the trawl fleet in this subarea we must point out:

- 1) It was almost 2,000 tons lower than in 1971
- 2) The side trawl catch it was 4,449 tons lower than the same fishery in previous year.  
In other hand the stern trawl catch increased in 1972 2,649 metric tons relatively the same fishery in 1971
- 3) The trawlers operated in Divisions 3 K, 3 L, 3 M, 3 N, 3 PN and 3 PS along all over the four quarters of the year (Table 2 and 3)
- 4) The main catches occurred in Divisions 3 M and 3 L while in the others Divisions the fishery it was not very profitable (6,626,820 and 45 metric tons landed respectively from Divisions 3 K, 3 PN and 3 N). The catch from 3 M and 3 L division were respectively 31,619 and 29,519 metric tons
- 5) The tonnage landed from side trawlers was more than twice the stern ones (48,183 tons and 20,446 tons respectively).
- 6) Quarterly the best catch occurred in the second quarter - 23,533 metric tons (15,265 tons from side trawlers and 8,268 tons fished by stern ones) followed by the third quarter (20,183 metric tons) and first quarter (17,255 tons) - Table 3.

Relatively to the gill net catch in subarea 3 it seems important the following points:

- 1) The total tonnage fished by this gear was 11,483 metric tons, from Divisions 3 N (6,593 tons), 30 (3,055 tons), 3 L (1,830 tons) and 3 PN with only 5 tons
- 2) Quarterly the best catches occurred in second and third quarters of the year with 4,839 and 4,039 metric tons fished respectively the fisheries in the first <sup>and</sup> last quarters of the year were not so important (only 419 tons in the first quarter and 2,186 tons in the last one) (Table 4)
- 3) The best monthly catch occurred in June (3,198 tons) and September (2,741 tons) (Table 4).



B. Special research studies

Samples for biological studies were collected from gill nets catches in Divisions 3L, 30 and 3PS as follows:

Div.	Samples	Date	Depth(m)	Lengths	
				Nº	Average in cm
3L	A	23 August	73	50	93.7
3L	B	4-30 September	27-55	784	83.3
3L	Third quarter			834	
3L	C	2 October	27	665	82.4
3L	Fourth quarter			665	
TOTAL 3L, third and fourth quarters				1,499	
30	D	31 May	82	50	90.8
30	E	2-10 June	70-128	2,485	89.7
30	Second quarter			2,535	
30	F	21-31 August	71-75	1,057	95.7
30	G	1-25 September	70-75	4,213	100.1
30	Third quarter			5,270	
TOTAL 30, second and third quarters				7,805	
3PS	H	26-27 August	97	552	87.4
TOTAL 3PS, third quarter				552	
TOTAL SUBAREA 3				9,856	

Length composition

Lengths ranged from 49 to 133cm (3cm classes); mean lengths of the samples presented in precedent table, relative to the sampling in subarea 3 and in Divisions 3 L (August, September and October), 3 0 (May, June, August and September) and 3 PS (August).

It is evident a very high mean length of the fish sampled, mainly in Division 3 0 and during the third quarter of the year - 95.7 and 100.1cm from August and September respectively. The sampling in Division 3 L, along August, shows also a very high mean length - 93.7cm.

The next table presents the length composition per mille from the same number of samples (A to H).

Length composition per mille								
Lengths (3 cm classes)	3L			30				2PS
	August	September	October	May	June	August	September	August
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
49			2		1			
52			3		-			
55			6		2			4
58			6		1			11
61			8		4			16
64		6	14		2			24
67		33	41	20	9			27
70	20	64	90	-	43	10	7	36
73	40	112	107	40	44	25	14	62
76	-	131	110	40	88	45	30	69
79	100	140	126	60	109	63	46	127
82	160	105	110	160	97	61	54	98
85	-	83	98	140	95	55	54	63
88	100	86	72	80	81	71	65	71
91	60	55	41	100	62	80	62	58
94	40	47	21	100	59	80	56	63
97	100	32	29	60	58	80	54	38
100	80	36	24	-	42	89	67	54
103	40	15	21	20	33	88	83	36
106	60	10	14	-	30	65	71	34
109	120	18	24	60	30	55	78	24
112	60	10	9	60	31	46	67	15
115	-	5	14	20	29	42	60	24
118	20	6	8	20	27	34	56	22
121		3	6	-	8	6	33	9
124		3	2	-	11	6	22	9
127				20	4	-	14	4
130					2	1	9	4
133					1		1	
136							-	
	1,000	1,000	1,006	1,000	1,003	1,002	1,003	1,002

TABLE 2-COD CATCH (metric Tons) AND EFFORT BY PORTUGUESE FLEET, BY ICNAF DIVISIONS-1 9 7 2-

	DORY VESSEL		GILL NET		SIDE			STERN			TOTAL TRAWL			TOTAL GENERAL	
	Tons	Dory hours	Tons	Hours out	Tons	Hours Fishing	Tons	Hours Fishing	Tons	Hours Fishing	Tons	Hours Fishing	Tons	Tons	Tons
1 B	-	-	1,966	1,568	-	-	-	-	-	-	-	-	-	1,966	
1 C	-	-	2,932	1,973	-	-	-	-	-	-	-	-	-	2,932	
1 D	-	-	3,515	2,148	-	-	-	-	-	-	-	-	-	3,515	
1 E	-	-	72	42	-	-	-	-	-	-	-	-	-	72	
TOTAL	-	-	8,485	5,731	-	-	-	-	-	-	-	-	-	8,485	
2 H	-	-	-	-	73	86	100	96	173	182	173	182	173	173	
2 J	-	-	-	-	13,355	10,784	5,857	4,234	19,212	15,018	19,212	15,018	19,212	19,212	
TOTAL	-	-	-	-	13,428	10,870	5,957	4,330	19,385	15,200	19,385	15,200	19,385	19,385	
3 K	-	-	-	-	3,836	3,486	2,990	1,584	6,626	5,070	6,626	5,070	6,626	6,626	
3 L	6,751	3,080	1,830	2,315	22,063	26,640	7,456	7,357	29,519	33,997	38,100	33,997	38,100	38,100	
3 M	131	110	-	-	22,064	23,962	9,555	9,021	31,619	32,983	31,750	32,983	31,750	31,750	
3 N	1,844	887	6,593	6,688	45	69	-	-	45	69	8,482	-	8,482	8,482	
3 O	-	-	3,055	3,460	-	-	-	-	-	-	3,055	-	3,055	3,055	
3PN	17	12	5	10	375	491	445	471	880	962	842	962	842	842	
3PS	109	95	-	-	-	-	-	-	-	-	109	-	109	109	
TOTAL	8,852	4,184	11,483	12,473	48,183	54,648	20,446	18,433	68,629	73,081	88,964	73,081	88,964	88,964	
4 R	-	-	-	-	2,227	1,675	5,773	2,098	8,000	3,773	8,000	3,773	8,000	8,000	
4 S	-	-	-	-	119	117	494	406	613	523	613	523	613	613	
4 T	115	63	-	-	216	315	33	33	249	348	364	348	364	364	
4VN	459	225	-	-	1,301	1,539	1,278	1,039	2,579	2,578	3,038	2,578	3,038	3,038	
4VS	480	104	-	-	376	433	-	-	376	433	856	433	856	856	
TOTAL	1,054	392	-	-	4,239	4,079	7,578	3,576	11,817	7,655	12,871	7,655	12,871	12,871	
TOTAL	9,906	4,576	19,968	18,204	65,850	69,597	33,981	26,339	99,831	95,936	129,705	95,936	129,705	129,705	

Table 3. Portuguese cod catch and effort - trawl fleet - 1972.

		SUBAREAS							
		2		3		4		TOTAL	
		Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing
Jan.	Side	3,366	2,634	2,212	1,539	453	452	6,031	4,625
	Stern	1,845	1,028	906	498	819	548	3,570	2,074
	Total	5,211	3,662	3,118	2,037	1,272	1,000	9,601	6,699
Feb.	Side	-	-	4,128	3,632	2,280	1,553	6,408	5,185
	Stern	-	-	2,178	1,274	4,846	1,448	7,024	2,722
	Total	-	-	6,306	4,906	7,126	3,001	13,432	7,907
March.	Side	-	-	5,311	6,639	691	964	6,002	7,603
	Stern	-	-	2,520	2,437	793	660	3,313	3,097
	Total	-	-	7,831	9,076	1,484	1,624	9,315	10,700
1 <sup>st</sup> quarter	Side	3,366	2,634	11,651	11,810	3,424	2,969	18,441	17,413
	Stern	1,845	1,028	5,604	4,209	6,458	2,656	13,907	7,893
	Total	5,211	3,662	17,255	16,019	9,882	5,625	27,010	25,306
Apr.	Side	4,356	2,421	2,258	2,391	815	1,110	7,429	5,922
	Stern	1,036	618	2,441	1,318	1,120	920	4,597	2,856
	Total	5,392	3,039	4,699	3,709	1,935	2,030	12,026	8,778
May	Side	238	113	6,013	6,737	-	-	6,251	6,850
	Stern	1	4	2,216	1,876	-	-	2,217	1,880
	Total	239	117	8,229	8,613	-	-	8,468	8,730
June	Side	270	203	6,994	6,890	-	-	7,264	7,093
	Stern	44	36	3,611	2,914	-	-	3,655	2,950
	Total	314	239	10,605	9,804	-	-	10,919	10,043
2 <sup>nd</sup> quarter	Side	4,864	2,737	15,265	16,018	815	1,110	20,944	19,865
	Stern	1,081	658	8,268	6,108	1,120	920	10,469	7,686
	Total	5,945	3,395	23,533	22,126	1,935	2,030	31,413	27,551
July	Side	4	6	7,148	7,050	-	-	7,152	7,056
	Stern	-	-	2,334	2,078	-	-	2,334	2,078
	Total	4	6	9,482	9,128	-	-	9,486	9,134
Aug.	Side	-	-	5,371	6,333	-	-	5,371	6,333
	Stern	-	-	1,857	2,093	-	-	1,857	2,093
	Total	-	-	7,228	8,426	-	-	7,228	8,426
Sep.	Side	19	43	2,299	4,037	-	-	2,318	4,080
	Stern	-	-	1,174	1,929	-	-	1,174	1,929
	Total	19	43	3,473	5,966	-	-	3,492	6,009

../continued

Table 3. continued

Subareas									
		2		3		4		Total	
		Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing
3 <sup>rd</sup> quarter	Side	23	49	14,818	17,420	-	-	14,841	17,469
	Stern	-	-	5,365	6,100	-	-	5,365	6,100
	Total	23	49	20,183	23,520	-	-	20,206	23,569
Oct.	Side	735	1,287	2,419	3,786	-	-	3,154	5,073
	Stern	423	610	948	1,438	-	-	1,371	2,048
	Total	1,158	1,897	3,367	5,224	-	-	4,525	7,121
Nov.	Side	1,040	1,359	2,186	3,764	-	-	3,226	5,123
	Stern	495	477	196	515	-	-	691	992
	Total	1,535	1,836	2,382	4,279	-	-	3,917	6,115
Dec.	Side	3,400	2,804	1,844	1,850	-	-	5,244	4,654
	Stern	2,113	1,557	65	63	-	-	2,178	1,620
	Total	5,513	4,361	1,909	1,913	-	-	7,422	6,274
4 <sup>th</sup> quarter	Side	5,175	5,450	6,449	9,400	-	-	11,624	14,850
	Stern	3,031	2,644	1,209	2,016	-	-	4,240	4,660
	Total	8,206	8,094	7,658	11,416	-	-	15,864	19,510
Total Side Trawl		13,428	10,870	48,183	54,648	4,239	4,079	65,850	69,597
	Total Stern Trawl	5,957	4,330	20,446	18,433	7,578	3,576	33,981	26,339
TOTAL TRAWL		19,385	15,200	68,629	73,081	11,817	7,655	99,831	95,936

TABLE 4-COD CATCH AND EFFORT BY PORTUGUESE GILL NET FLEET

-1 9 7 2-

<u>Months</u>	<u>Subarea 1</u>		<u>Subarea 3</u>		<u>Subarea 1+3</u>	
	<u>Tons</u>	<u>Hours out</u>	<u>Tons</u>	<u>Hours out</u>	<u>Tons</u>	<u>Hours out</u>
Jan.	-	-	95	189	95	189
Feb.	-	-	123	231	123	231
Mar.	-	-	201	162	201	162
1st Quarter	-	-	419	582	419	582
Apr.	-	-	167	289	167	289
May	-	-	1,474	1,577	1,474	1,577
June	374	180	3,198	3,347	3,572	3,327
2nd Quarter	374	180	4,839	5,013	5,213	5,193
July	5,418	3,218	307	206	5,725	3,424
Aug.	2,693	2,333	991	893	3,684	3,226
Sept.	-	-	2,741	2,725	2,741	2,725
3rd Quarter	8,111	5,551	4,039	3,824	12,150	9,375
Oct.	-	-	1,747	2,593	1,747	2,593
Nov.	-	-	324	290	324	290
Dec.	-	-	115	171	115	171
4th Quarter	-	-	2,186	3,054	2,186	3,054
TOTAL	8,485	5,731	11,483	12,473	19,968	18,204

Table 5. Cod catch and effort by Portuguese line fleet (dory vessels), 1972.

	<u>Subarea 3</u>		<u>Subarea 4</u>		<u>Subareas 3+4</u>	
	<u>Tons</u>	<u>Dory-hour</u>	<u>Tons</u>	<u>Dory-hour</u>	<u>Tons</u>	<u>Dory-hour</u>
April	26	16	-	-	26	16
May	875	531	217	53	1,092	584
June	736	746	837	739	1,573	1,085
2nd quarter	1,637	1,293	1,054	792	2,691	1,685
July	2,239	1,433	-	-	2,239	1,433
August	3,429	989	-	-	3,429	989
September	1,547	469	-	-	1,547	469
3rd quarter	7,215	2,891	-	-	7,215	2,891
Total	8,852	4,184	1,054	792	9,906	4,576

TABLE 6-COD CATCH AND EFFORT BY PORTUGUESE DORY VESSELS AND GILL NET

FLEETS

-1 9 7 2-

	<u>DORY VESSELS</u>		<u>GILL NETS</u>		<u>DORY VESSELS AND GILL NETS</u>
	<u>Subarea 3+4</u>		<u>Subarea 1+2</u>		
<u>Months</u>	<u>Tons</u>	<u>Dory hour</u>	<u>Tons</u>	<u>Hour out</u>	<u>Tons</u>
Jan.	-	-	95	189	95
Feb.	-	-	123	231	123
Mar.	-	-	201	162	201
1st Quater	-	-	419	582	419
April	26	16	167	289	193
May	1,092	584	1,474	1,577	2,566
June	1,573	1,085	3,572	3,327	5,145
2nd Quater	2,691	1,685	5,213	5,193	7,904
July	2,239	1,433	5,725	3,424	7,964
Aug.	3,429	989	3,684	3,226	7,113
Sept.	1,547	469	2,741	2,725	4,288
3rd Quater	7,215	2,891	12,150	9,375	19,365
Oct.	-	-	1,747	2,593	1,747
Nov.	-	-	324	290	324
Dec.	-	-	115	171	115
4th Quater	-	-	2,186	3,054	2,186
TOTAL	9,906	4,576	19,968	18,204	29,874