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Abstract

The Korean tuna longline fishery has shown a decreasing trend from the late 1970s to recent years in both number of fishing vessels and annual catches. In 2002, total catch amounted to 1,259 mt by 11 longliners, which is the record low in Korean longline fishery in this area. Catch consists of 649 mt of southern bluefin tuna, 332 mt of yellowfin tuna, 186 mt of bigeye tuna and some minor catches of other tunas and billfishes. Korean government initiated fisheries observer program in 2002 to monitor its distant water fisheries including those for tunas and to meet the requirements of regional fisheries bodies.

General Fishery Statistics

Catch

Korean tuna fishery has operated its longline fleet in the Indian Ocean since the mid-1960s. Major target species of tunas include yellowfin, bigeye and albacore tunas. However, in recent years albacore tuna remains as a minor species whereas southern bluefin tuna was enlisted in one of the target species of Korean longliners.

Catches by longline fishery has shown a decreasing trend from a peak at 71,000 tons in 1978 to recent years (Table 1). In 2002, annual total catch amounted to 1,259 mt, which is the record low in Korean longline fishery in this area. Catch consists of 649 mt of southern bluefin tuna, 332 mt of yellowfin tuna, 186 mt of bigeye tuna and some minor catches of other tunas and billfish species (Table 2). Catch of southern bluefin tuna remained similar compared to the previous year but both yellowfin and bigeye tuna decreased remarkably by more than 70% and 80%, respectively. This was mainly due to the shift of longliners from the Indian to the Pacific Ocean. Preliminary data for 2003 shows that some of the vessels returned to the Indian Ocean and catches increased accordingly.

The traditional fishing grounds of Korean tuna longline fishery were mainly formed in the central tropical area between 20^{o}N and 20^{o}S and no significant change in fishing area was observed until 1990. From 1991 onward some longliners moved to the south of the Indian Ocean where they target southern bluefin tuna and some yellowfin and bigeye catch were also recorded.

Size composition data

Fishermen on board are encouraged to collect size data of main target species, bigeye and yellowfin tuna (Fig. 1). However, usually the quantity of sampled tunas is relatively

small and therefore those data should be used with caution.

Fleet structure

Number of Korean tuna longline fishing vessel in the Indian Ocean has shown a decreasing trend from a peak at 185 in 1975 to about 50 to 60 from 1995 onward. In 2002, only 11 vessels were active in the Indian Ocean, which is a decrease by 12 vessels compared to 2001. This is the main cause of the remarkable decrease in total annual catch for the year 2002. The size of Korean tuna longliners ranges from 298 to 525 gross tonnage classes.

National data collection system

Korean longline fisheries in the Indian Ocean usually have operated in all year round since the fishery started. Thus, fisheries statistics are collected and reported for a calendar year. Coverage rate in catch of all species was 52 to 69% during the 1981-1985 period, but it increased to the highest level of 91% in 1987. In recent years, the coverage rates maintained over 50% reaching at around 70% in certain years.

There are two systems for the collection of Korean tuna fisheries data. The first system has been operated by the Korean Deep-Sea Fisheries Association to collect total catch by species. All Korean distant-water fishing vessels report their catch records in terms of weight by species to their companies once a week or at 10-day intervals. The Association compiles the data by month and by FAO fishing area to submit to the Ministry of Maritime Affairs and Fisheries for the final review and publication. Both the Association and the Ministry publish the catch statistics for official use annually.

The second data collection system is to sample catch and effort data based on the logbooks. This system was lawful in 1977 by the Ministry of Agriculture and Fisheries. According to this domestic regulation, distant-water fishing vessels have to submit the reports of their fishing operations within 30 days (home-based) or 60 days (foreign-based) after completion of their operations to the National Fisheries Research and Development Institute (NFRDI).

Implementation of recommendations

As a responsible fishing nation, Korea has implemented recommendations and resolutions adopted by regional fisheries organizations. Legislation of domestic regulations, initiation of observer program, and submission of fisheries statistics are among its efforts to meet the requirements by various fisheries bodies including IOTC.

National Research Program

The NFRDI has responsibility for the collection of catch, effort, and size data for the Indian tunas and tuna-like species from Korean tuna longliners. Those data have been submitted annually to the IOTC secretariat after statistical analyses.

In addition to this effort on fisheries statistics, NFRDI maintains a small scale tagging project through which it encourages fishermen to have voluntary tagging practices during their fishing operation. However, due to budgetary constraints this project has shown little success, although a few recovery reports have been received from the eastern Pacific. This voluntary tagging program will be continued until a bigger-scale tagging program has been initiated in the future.

Other relevant information

The Ministry of Maritime Affairs and Fisheries (MOMAF) began to operate fisheries observer program in 2002 to monitor Korean distant-water fisheries including those for tunas and to meet the requirements of regional fisheries bodies. At the initial stage, the size of observer program will be fairly small to cover only for the fisheries to be urgently implemented such as SBT longline fishery in CCSBT Convention Area but will be gradually developed to a bigger scale to cover all required areas of fisheries. The goal of the first stage of observer program development from 2002 to 2006 is to establish a domestic training system to educate national observers. In 2002, a total of 5 observer candidates received a trainship from Hawaii longline observer program provided by Pacific Island Area Office (PIAO), NOAA. Among those 5 trainees, two joined 2-months research survey on-board RV of NFRDI in 2003, as part of the on-board training practices that will be continued in 2004.

Table 1. Number of vessel, catch (ton) and CPUE (no. of fish/100 hooks) by Korean longline fishery in the Indian Ocean, 1966~ 2002

Year	No. of vessel	*Catch (ton)	** CPUE	Year	No. of vessel	Catch (ton)	CPUE
1966	3	761		1991	19	6,317	1.38
1967	46	6,594		1992	50	10,311	1.42
1968	33	11,596		1993	50	14,198	1.20
1969	41	18,612		1994	52	14,581	1.08
1970	36	8,808		1995	52	10,905	1.15
1971	52	16,786		1996	62	18,432	1.34
1972	75	20,967		1997	58	18,100	1.30
1973	112	29,799		1998	59	8,411	0.88
1974	173	41,958		1999	31	3,836	0.82
1975	185	47,908	1.64	2000	38	6,888	0.83
1976	128	43,497	1.86	2001	23	4,033	0.92
1977	165	66,015	2.48	2002	11	1,259	0.47
1978	151	71,123	2.37	°2003	33	2,181	
1979	169	46,176	1.66				
1980	174	38,085	1.28				
1981	142	36,138	1.47				
1982	146	42,531	1.60				
1983	115	36,975	1.38				
1984	75	24,613	1.32				
1985	62	28,185	1.49				
1986	66	30,639	1.73				
1987	81	30,904	1.78				
1988	112	34,469	1.49				
1989	87	23,610	1.00				
1990	77	20,335	1.00				

* Catch included FAO 58 area (FAO areas 51, 57 and 58)
** CPUE : Number/100 hooks
Data source : Ministry of Maritime Affairs and Fisheries (MOMAF)
° preliminary, catch for 2002 is up to October

Table 2. Annual catch by species and FAO statistical area for Korean longline fishery in the Indian Ocean, 1991-2002

	FAO area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Southern Bluefin tuna	51		15		98	216	314	1,402	1,415	463	328	363	513
	57					99	597	181	147	210	112	347	136
	58									563	456		
	sub-tot							1,583	1,562	1,236	896	710	649
Yellowfin tuna	51	2,891	3,861	4,681	3,608	2,426	3,426	3,607	2,218	718	991	1,240	242
	57	113	224		14	18	17	35	47	85	73	161	90
	58									105	747		
	sub-tot	3,004	4,085	4,681	3,622	2,444	3,443	3,642	2,265	908	1,811	1,401	332
Albacore	51		5	4	9	3	14	102	118	26	85	31	7
	57	231			4	3			4	1			3
	58										10		
	sub-tot	231	5	4	13	6	14	102	122	27	95	31	10
Bigeye tuna	51	1,946	4,382	7,146	8,179	6,106	10,737	10,129	3,154	608	1,677	1,145	178
	57	209	154		60	48	48	77	33	479	129	256	8
	58									258	1,414		
	sub-tot	2,155	4,536	7,146	8,239	6,154	10,785	10,206	3,187	1,345	3,220	1,401	186
Other tunas	51	222	464	796	584	577	1,036	1,199	705	182	171	294	22
	57		58				46	5	19	18		29	
	58									44	358		
	sub-tot	222	522	796	584	577	1,082	1,204	724	244	529	323	22
Swordfish	51	17	60	20	17	74	51	196	147	8	42	18	9
	57	15				2		8	2	14		19	3
	58									7	21		
	sub-tot	32	60	20	17	76	51	204	149	29	63	37	12
Blue marine	51	11	32		3	7	1	75	101	10	79	16	
	57								2	6			
	58												
	sub-tot	11	32		3	7	1	75	103	16	79	16	
Striped marine	51	9		3	2	38		65	43		12	2	
	57									1	8	1	
	58												
	sub-tot	9		3	2	38		65	43	1	20	3	
Sailfish	51		6				3	5					
	57												
	58												
	sub-tot		6				3	5					
Black marine	51		2			21	8	40	20	2	12	10	4
	57									7		13	2
	58									4	13		
	sub-tot		2			21	8	40	20	13	25	23	6
Other billfishes	51	623	978	1,548	2,003	1,242	2,125	939	217	4	124	74	38
	57	30	58			25	9	22	15	8	1	4	4
	58									5	23		
	sub-tot	653	1,036	1,548	2,003	1,267	2,134	961	232	17	148	78	42
Sharks	51							13	4			10	
	57		12										
	58										2		
	sub-tot		12					13	4		2	10	

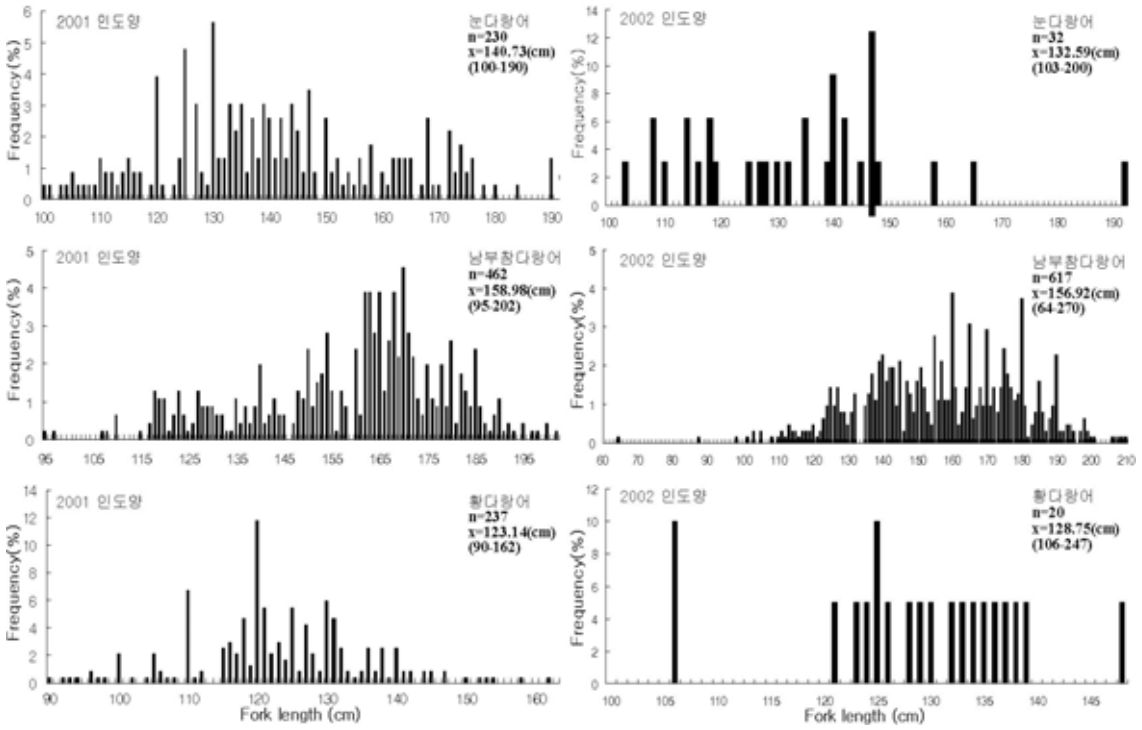

Fig. 1. Length frequency distribution of longline-caught tunas for the years 2001(left) and 2002(right), from the top bigeye, southern bluefin, and yellowfin tuna, respectively.