National Report of JAPAN, 2004

Fisheries Agency, Government of Japan
and
National Research Institute of Far Seas Fisheries

November, 2004

1. General Fisheries Statistics

1-1. Longline fishery

The latest available longline data is that of 2003 although the data of 2003 is quite preliminary. The data of 2002 is near final, but also preliminary one. All catch and effort statistics were compiled using logbook data.

1-1-1. Fishing vessels

Japanese longline fishery is classified into three categories (coastal, offshore and distant water) according to the license and boat size (coastal: 10-20 GRT (gross tonnage), offshore: 10-120GRT, and distant: 120-500GRT). Basically, longline vessels of distant water category have been operated in the Indian Ocean. Although some offshore longliners are also allowed their operations in this Ocean, there is no operation by them recently. In the last fifteen years, the number of vessels operated in this Ocean was around 180-250 vessels per year. Although it was relatively large in number (224-251) during 1995-1999, it decreased to less than 200 in 2000 and 2001, and slightly increased to 213 in 2002 (Table 1).

1-1-2. Fishing effort

Total fishing effort (the number of hooks) by Japanese longliners (including offshore and distant water longliners) in the Indian Oceans, have decreased and been around 100 million hooks since 1999, which is about 20 - 27% in the total effort (Fig. 1 and 2).

Yearly distributions of longline effort from 1999 to 2003 were shown in Fig. 3 and quarterly distributions of that in 2002 and 2003 were shown in Fig. 4. Although the geographical distribution of the effort showed basically similar in the recent years, the effort off Tanzania seems relatively large in latest two years, especially in 2003.

1-1-3. Catch

Catch statistics in weight from 1999 to 2003 caught by Japanese longliners in the Indian Ocean was shown in Table 2 (Data of 2002 and 2003 are preliminary), and geographical distributions of catch in 2002 and 2003 for major species were shown in Fig. 5. Total catch includes the catch for southern bluefin tuna, albacore, bigeye, yellowfin, swordfish, striped marlin, blue marlin, black marlin, sailfish, shortbill spearfish, and skipjack. Catch for each species in 2003 (2002) was 2,578 (3,039MT) for southern bluefin, 2,416MT (3,233MT) for albacore, 11,067MT (13,562MT) for bigeye and 18,778MT (14,022MT) for yellowfin. In Fig. 6, historical change in species composition in the eastern and western Indian Ocean was shown. In the Eastern Indian Ocean, the percentage of bigeye has been higher and that of yellowfin has become lower since around 1991. The opposite trend was observed in the western Indian where the ratio of yellowfin has increased steadily since early 1990s. As a result, the total catch in weight of yellowfin in the Indian Ocean has exceeded that of bigeye since 1999.

1-2. Purse Seine Fishery

The latest available data for Japanese purse seine fishery is those for 2003. The catch and effort data in 2003 is preliminary.

1-2-1. Fishing vessels

Japanese purse seine vessels in the Indian Ocean are 350-700 GRT class (700-1000 carrying capacity). Change in the number of purse seine vessel in the latest five years was shown in Table 1. More than 10 Japanese purse seiners operated in 1991-1993. It decreased year by year and the last commercial purse seiner retreated from the Indian Ocean in 2001. Now, only Nippon-Maru, the research vessel of Fisheries Research Agency, is operating in this Ocean.

1-2-2. Fishing Effort

Total fishing effort (operation days + searching days) was 134 days in 2002 and 159 days in 2003 (Table 3). Geographical distribution of Japanese purse seine effort in 2003 was shown in Fig. 7.

1-2-3. Catch

Catch in weight of skipjack, yellowfin and bigeye in 2003 (2002) was 1,488MT (1,161MT), 416MT (182MT) and 537MT (328MT), respectively.

2. Progress on the implementation of recommendations of the Scientific Committee

Progress on the implementation of recommendations of the past Scientific Committees relating to Japan is as below:

(1) Collection of more size data

Tuna longline fisheries industries in Japan have been collecting size data based on the recommendation made by the Fisheries Agency of Japan. As it is not mandatory, the longliners have been collecting size data voluntary basis in the past. Collecting the size data is extra work loads for tuna longliners because of their busy fishing operations by limited man powers.

For the Indian Ocean, the size data have been mainly collected by the high school training vessels off Java Island, Indonesia. For example, the coverage of size data of bigeye tuna was 10-20% of the total catch in the Indian Ocean before 1992, but afterwards it sharply decreased to only a few percents. This is mainly because these training vessels shifted to the Pacific Ocean due to the pirate problems. Under such situation, as size data sampled are limited to the particular waters and not from the whole area, they are not useful for the stock assessments.

Thus, it will be not anticipated to be able to collect more size data under the current situation. The situations are likely similar to Japan in the other longline fishing nations such as in Taiwan and Korea.

(2) Search for the historical weight data

To solve the problem mentioned in the previous Section, it was suggested by the past IOTC SC to search historical weight data recorded by the skippers of the longline vessels. The situation is explained as follows:

Scientists in the NRIFSF's Yaizu tuna fishing port branch been collecting fishers' notes regarding their longline fishing operations from the middle of 1980's, which included individual fish weight without gills and guts. Such weights data had been entered to our database. However these notes are confidential information of these fishers, hence scientists need to have reliable relations with fishers and need strong personal will and effort to get the data. Hence, the amounts of these weight data depend on the personal efforts of the scientists. In recent years, the amounts of the data have been decreasing because of less fishing effort. Under such circumstances, we can not expect to obtain such weight data from the fishers' confidential notes without extra voluntary basis efforts made by scientists.

However, according to the Japanese tuna industry, they can contact to skippers and can get such historical confidential weight data on a voluntary basis and some efforts have been made to now. This may solve the problem in some extent.

Likewise, it seems that such fishers' notes are available in the Taiwanese and Korean longliners. If scientists not only of Japan but also of such countries try to collect, we might be able to get considerable amounts of past weight data. Although, as mentioned, these notes are the confidential information, thus scientists collecting such data need to have reliable relationships with the fishers and they also need great personal efforts. For these reasons, collecting such data is not easily achieved.

Besides the fishers' notes, it was informed that other sources of the historical fish weight data could be found the sales slips at tuna fishing ports or the tuna fishing companies. But we realized that these data are not useful because of two reasons, i.e., (a) the weight data in the sale slips do not describe precise areas of the fish caught, but they indicate rather larger scale waters such as the eastern or the western Indian Ocean and (b) precise time such as month or season of the weight (catch) collected is not indicated. As a result, these weight data are not at a satisfactory level to be used for tuna resources analyses.

As a conclusion, the industry effort to get the historical confidential weight data from the skippers of the longliners seems to be only possible solution at this stage. In order to solve these problems, Japan has been developing robot-observer system.

(2) Tagging in the eastern Indian Ocean

As a result of the feasibility tagging research by Japan which will be explained in Section 3-2 in the report, a total of 606 fishes (572 skipjack, 11 yellowfin and 23 bigeye) were tagged and released in 2004. If the FADs with enough fish school are constantly available, it would be possible to release 100-200 individuals of bigeye and yellowfin in 1 month cruise using jigging and hand line with live bait, with 500-1000 skipjacks by pole and line.

The result of the feasibility study suggests that enough number of tagging for bigeye and/or yellowfin can not be expected by the tagging research at high sea area in the eastern Indian Ocean where there are not enough floating objects. It might be better to attempt to tag and release tunas using fixed Payao at coastal waters..

Due to the above mentioned results of this Japanese feasibility survey, the Japanese fund for the IOTC tagging in the eastern Indian Ocean (about US $250,000 per year for three years from 2004-2006 will not be allocated to the tagging in the high seas, but to be allocated to two surveys in the coastal and offshore waters off Sumatra (Indonesia) and around Andaman and Nikorba Islands (India). MOU (Memorandum of Understanding) for these two feasibility surveys will be signed by relevant countries and IOTC, i.e., Japan, Australia, Indonesia and IOTC for the Sumatra survey and Japan, India and IOTC for the Andaman and Nikorba Islands survey. If feasibility surveys are resulted to be successful, full-scale tagging experiments will be conducted till 2006 (last year of the tagging project).

(4) Investigation of the status of the live bait for the tagging experiments

In the feasibility tagging research by No.2 Taikei-Maru, Milkfish was used as live bait for mainly pole and line fishing. Through the investigation and the research, Milkfish was confirmed to be available in Indonesia and useful species as the live bait because of its stable supply, its extreme euryhalin (0–158 ‰), toughness for low to high temperature (favorable temperature is from 20 to 33 °C) and toughness also for low dissolved oxygen. However, change in the water quality after loaded should be carefully checked.

The artificial baits recently produced commercially by a Japanese company were introduced (IOTC/WPT/2004/INF03, *"Introduction to the artificial baits: Effective for the IOTC tagging project?"*). From the information presented, it is uncertain if the baits are useful at this stage. Hence, IOTC tagging projects plan to get some samples and will check effectiveness in the near future. If artificial baits were resulted to be useful, they will be very beneficial for the IOTC tagging project especially for the waters where live baits are rare or not available.

(5) Improvement of the CPUE Standardization

In the standardization of Japanese longline CPUE for bigeye (IOTC/WPTT/2004/18), classification of NHF (the number of hooks between float) to be applied in the model was modified considering recent remarkable change in NHF derived maybe from the gear material.

Applying the same method of standardization for Japanese longline CPUE for bigeye, Taiwanese longlile CPUE was standardized (IOTC/WPTT/2004/20) as the collaborating study by Japanese and Taiwanese scientists.

The Taiwanese tuna longline data did not include information on the number of hook per basket (NHB) before 1995 and even after 1995 they have been collecting only about 40% in averages. Thus it has been a major problem in standardizing their CPUE as NHB is one of the key information for accurate CPUE standardization. Under such conditions, Japanese and Taiwanese scientists reviewed the past methods to mitigate this problem and also explore possible effective methods in the joint paper (IOTC/WPTT/2004/10, *"Reviews and prospects on approaches reflecting actual dynamics of Taiwanese longline fisheries in CPUE standardizations when number of hook per basket information not available"*). Based on this paper, a small group meeting on this topic was held at the IOTC HQs during the WPTT meeting and two approaches were suggested i.e., (a) trip based approach and (b) species composition approach (for details, refer to APPENDIX V of 2004 WPTT report). Scientists will examine these approaches and will report the results to the next WPTT.

(6) Progress of the predation survey

The five years survey on the predation for the longline caught tuna and tuna like species have been conducted since September 2000 using some 500 Japanese tuna longliners in three Oceans. This survey will end August, 2005. The survey summary up to December, 2002 was reported during 2004 WPTT meeting (IOTC/WPTT/2004/22). Table 4 shows the schedule of this survey and relevant activities.

3. Progress on national research programs currently in place

3-1 Tag and release research for tunas and skipjack in the eastern Indian Ocean.

Tag and release research using No.2 Taikei-Maru was conducted in the eastern Indian Ocean from February to March 2004 by the scientists of NRIFSF (National Research Institute of Far Seas Fisheries) of FRA (Fisheries Research Agency) as the contribution of Japan to the IOTTP (Indian Ocean Tuna Tagging Program). Fishing gears used to catch the fishes to be tagged were pole and line, hand line and trolling. A total of 606 fishes (572 skipjack, 11 yellowfin and 23 bigeye) were tagged and released. Detail results were reported at WPT in July, 2004 (IOTC/WPT-04-02).

3-2 Tag and release research for tuna and skipjack

Nippon-Maru (JAMARC, Fisheries Search Agency) started to cooperate the IOTC tagging project for three years from this year to 2006 (end of the project). Nippon-Maru is now surveying in the Indian Ocean using the spaghetti tags provided by the IOTC.

4. Other relevant information.

None

Table 1. Number of Japanese boats operated in the Indian Ocean. Data of 2002 and 2003 for longliner are preliminary.

Fleet/Year	1999	2000	2001	2002	2003
Longliner	223	193	198	213	141
Purse seiner	3	2	2	1	1

Table 2. Fishing effort and catch in weight (MT) by the Japanese longline fishery in the Indian Ocean (IOTC statistical area), 1999-2003. Data of 2002 and 2003 are preliminary. Sets and hooks are in thousand. "Total" includes skipjack catch.

Year	Sets	Hooks	Total	SBF	ALB	BET	YFT	SWO	MLS	BLZ	BLM	SPF	SFA
1999	37	107522	38968	5032	2283	13997	14662	1538	282	794	187	124	66
2000	35	103115	38440	3632	2567	13583	15475	1569	337	949	142	155	29
2001	36	109357	36888	4852	3003	13035	13978	1222	135	451	72	110	30
2002	34	104346	35953	3039	3233	13562	14022	1247	132	509	75	102	32
2003	29	87056	36686	2578	2416	11067	18778	1179	79	383	101	86	18

Table 3. Catch and effort statistics for the Japanese purse seine fishery in the Indian Ocean from 1999 to 2003. The unit of catch and effort are metric ton and days (search and operation days), respectively.

Year	Days F.	Total	SKJ	YFT	BET
1999	483	6988	4588	1501	899
2000	321	4032	2332	953	747
2001	262	3025	1830	603	592
2002	134	1671	1161	182	328
2003	159	2441	1488	416	537

Table 4. The schedule of predation survey.

<table>
<tr><td>1998</td><td>Predation survey was recommended in the 2nd Scientific Committee.</td><td></td></tr>
<tr><td>1999</td><td>Resolution 00/02 (Resolution on a survey of predation of longline caught fish) was adopted in the 4th Commissioner's meeting.</td><td></td></tr>
<tr><td>2000</td><td rowspan="4">(Jan : survey started)
↓</td><td rowspan="6">(Sept: survey started)
↓

(Aug : end of the survey)</td></tr>
<tr><td>2001</td></tr>
<tr><td>2002</td></tr>
<tr><td>2003</td></tr>
<tr><td>2004</td><td>(Dec: end of the survey)</td></tr>
<tr><td>2005</td><td></td></tr>
<tr><td rowspan="3">2006</td><td></td><td>By middle of the year:
All survey data will be collected.</td></tr>
<tr><td colspan="2">Collaborative data compilation and processing</td></tr>
<tr><td>Later period : workshop</td><td></td></tr>
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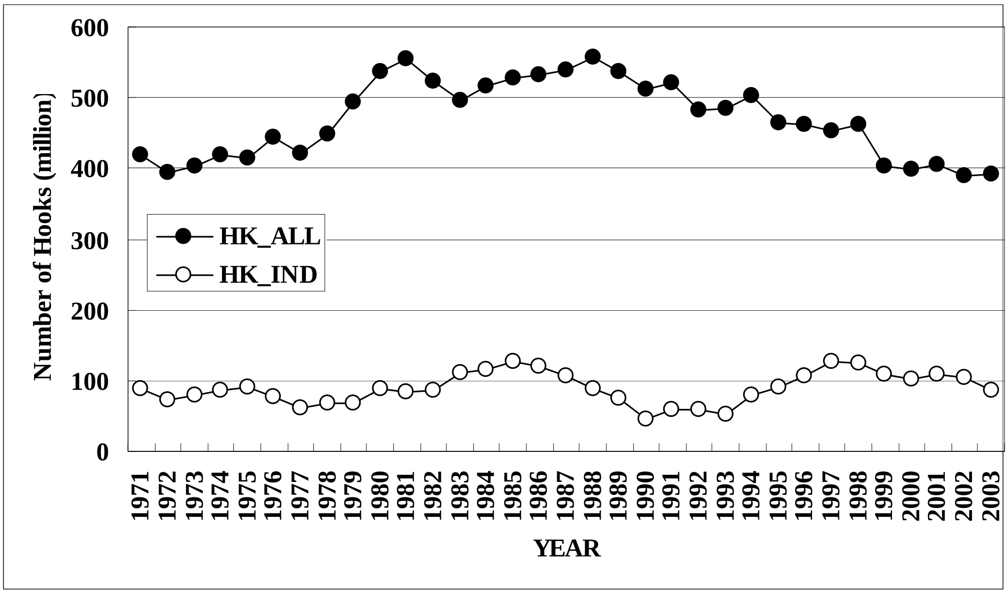


Fig. 1. Historical change in total Japanese longline effort in the all Oceans (solid circle) and the Indian Ocean (open circle)

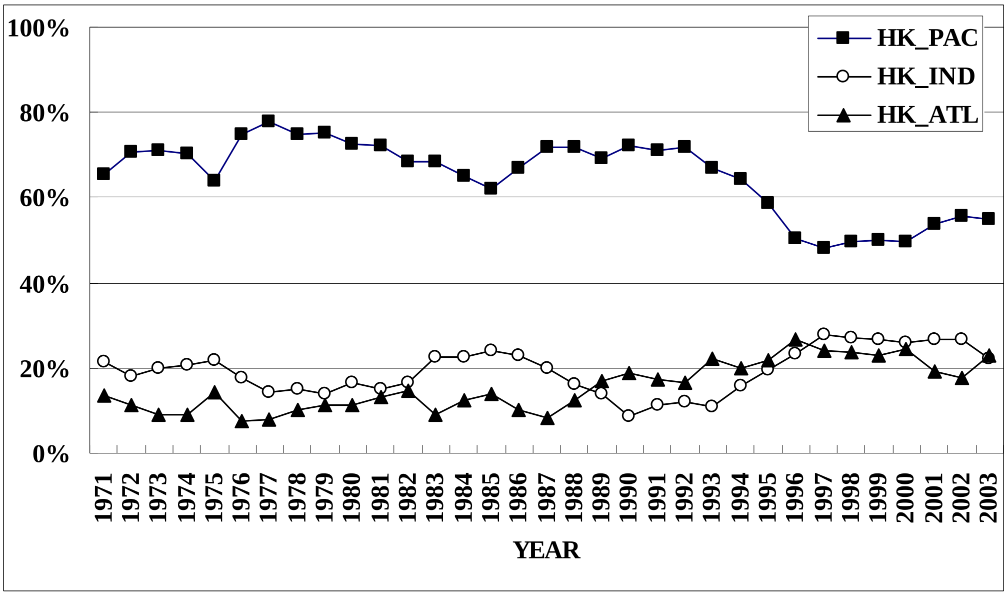


Fig.2. Historical change in the percentage of effort exerted into each Ocean basin.

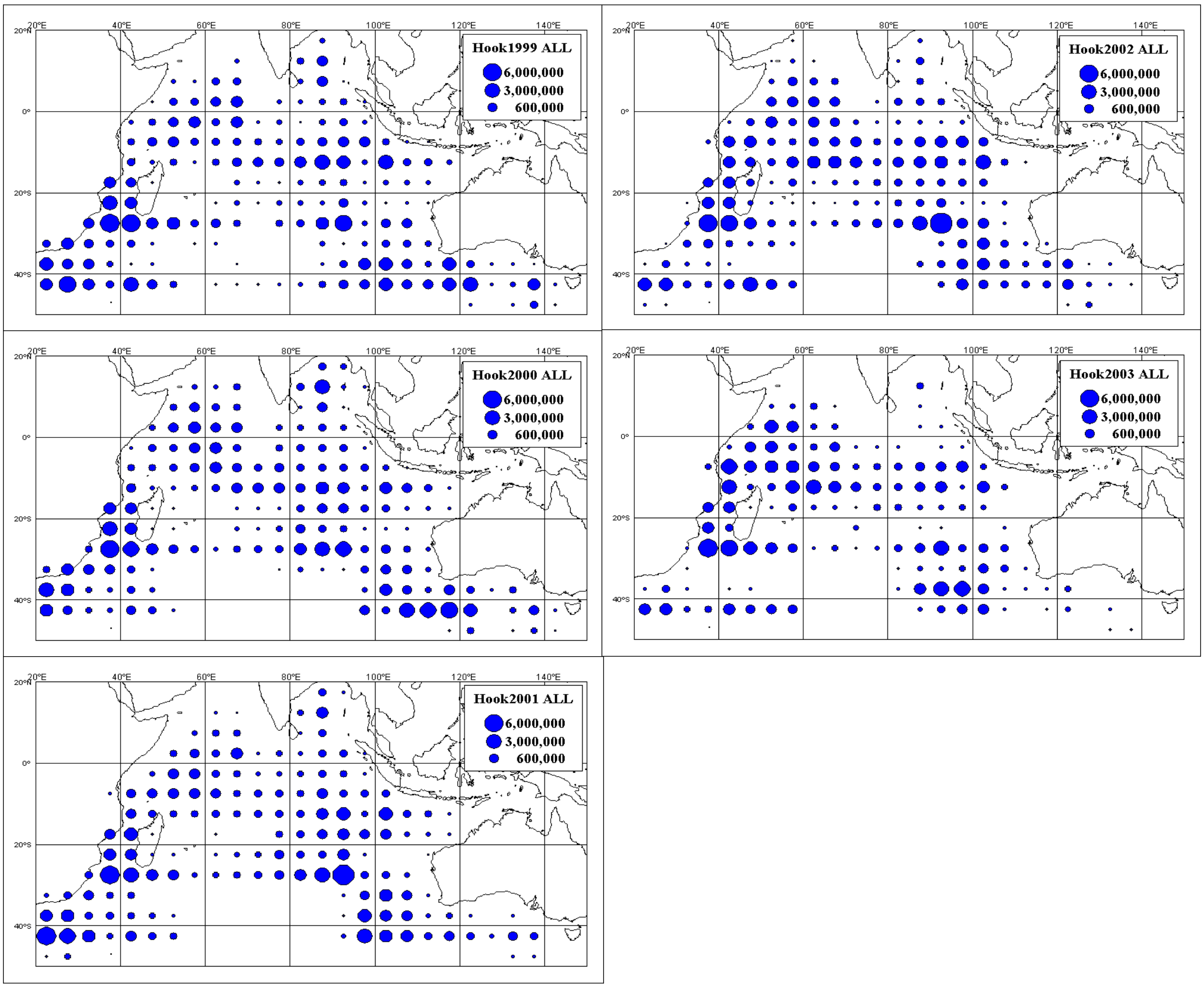


Fig. 3. Distribution of longline effort in the Indian Ocean from 1999 to 2003.

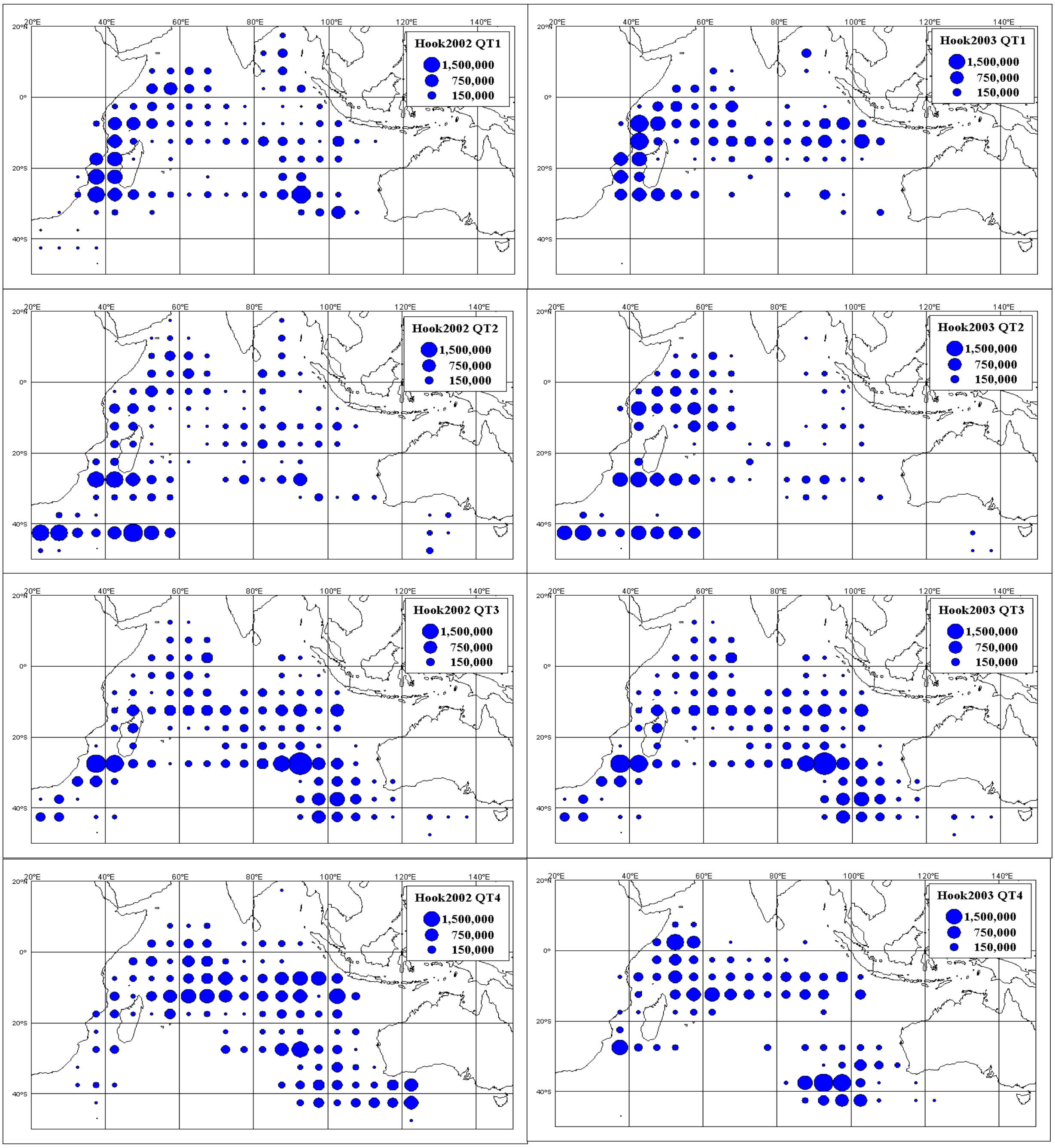
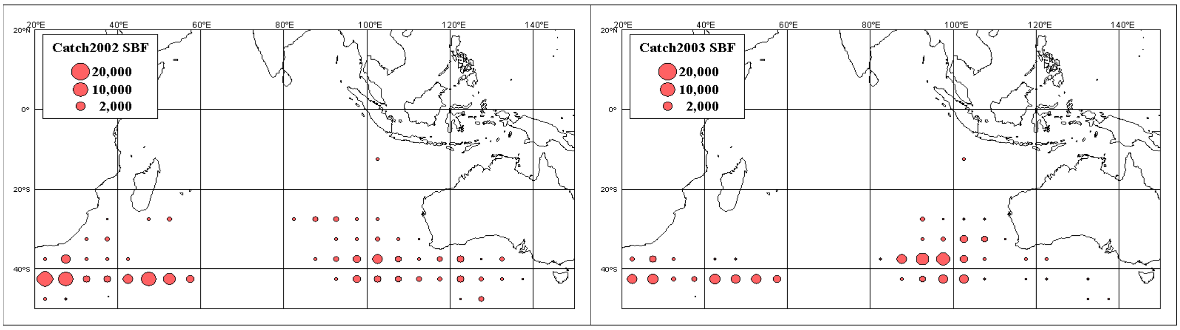
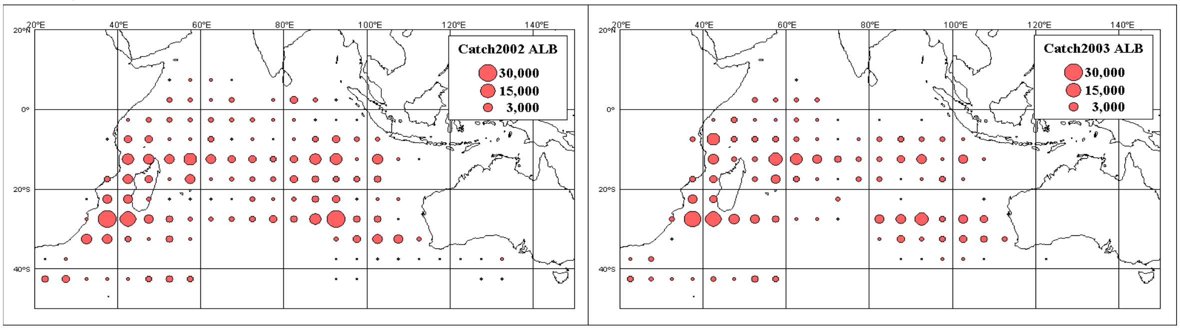


Fig. 4. Quarterly Longline effort distribution in the Indian Ocean in 2002 (left) and 2003 (right).

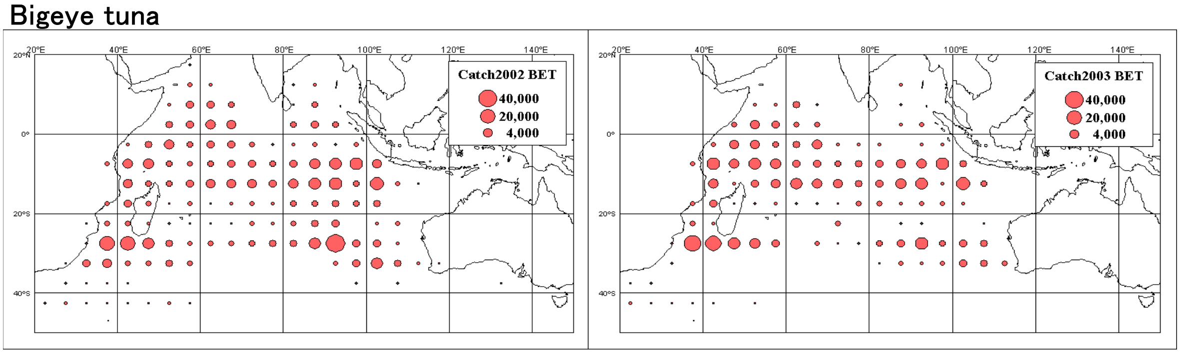
Southern bluefin tuna



Albacore



Bigeye tuna



Yellowfin tuna

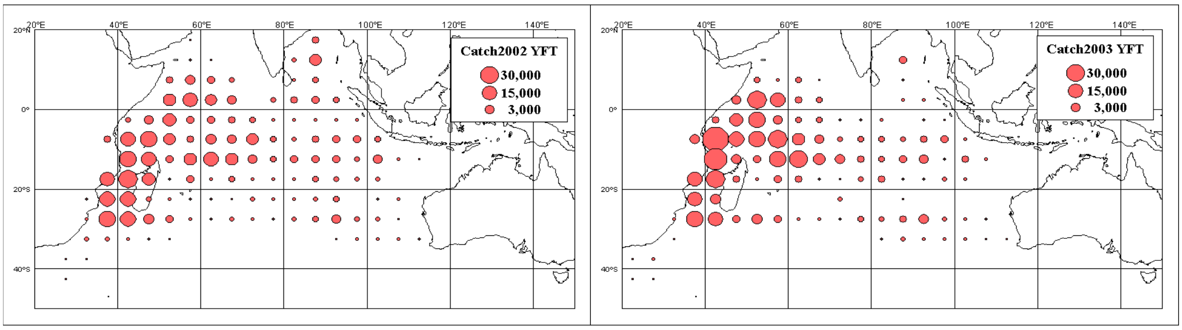


Fig. 5. Geographical distributions of catch in number of major species caught by longline fishery in 2002 (left) and 2003 (right).

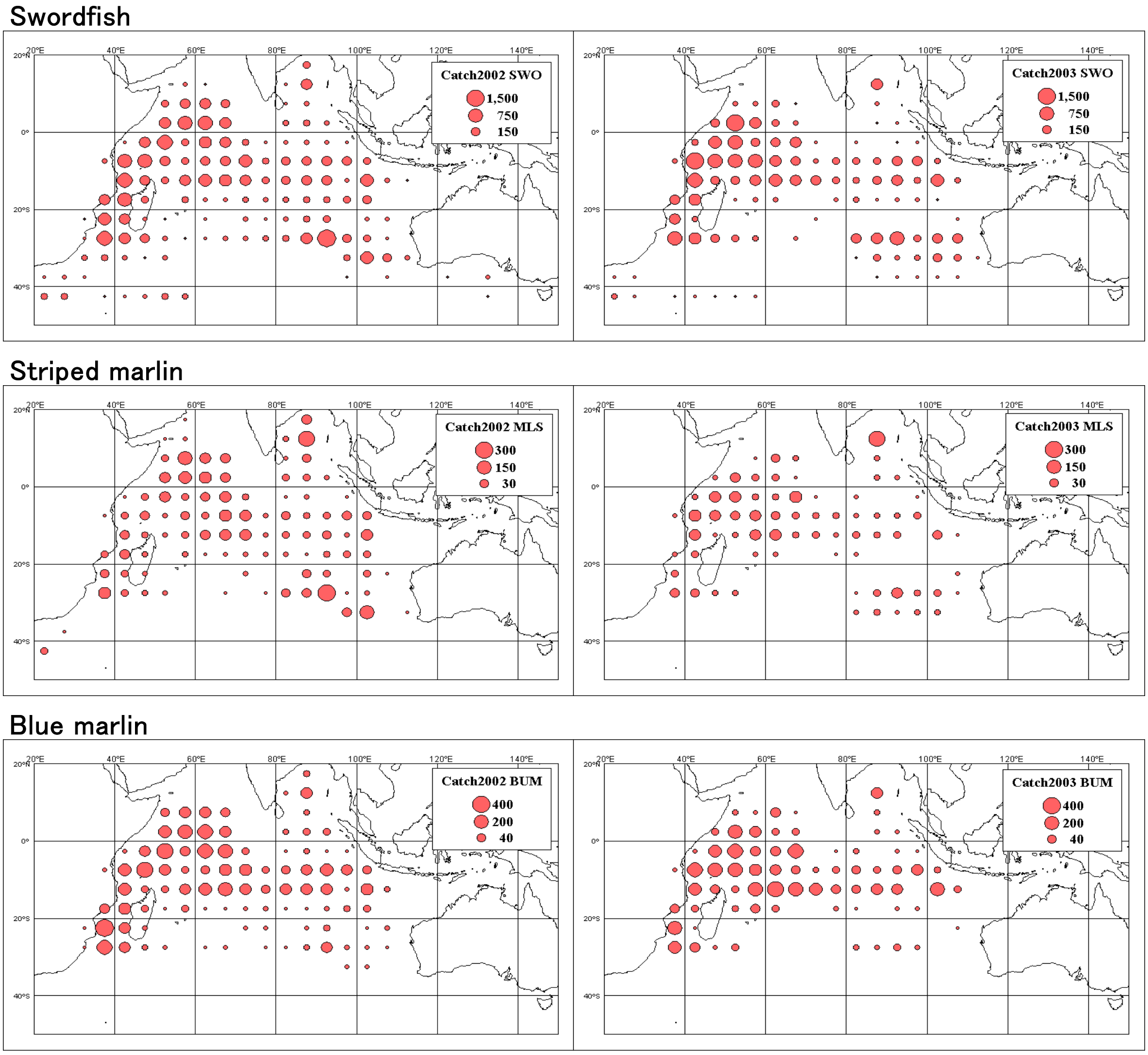


Fig. 5. continued.

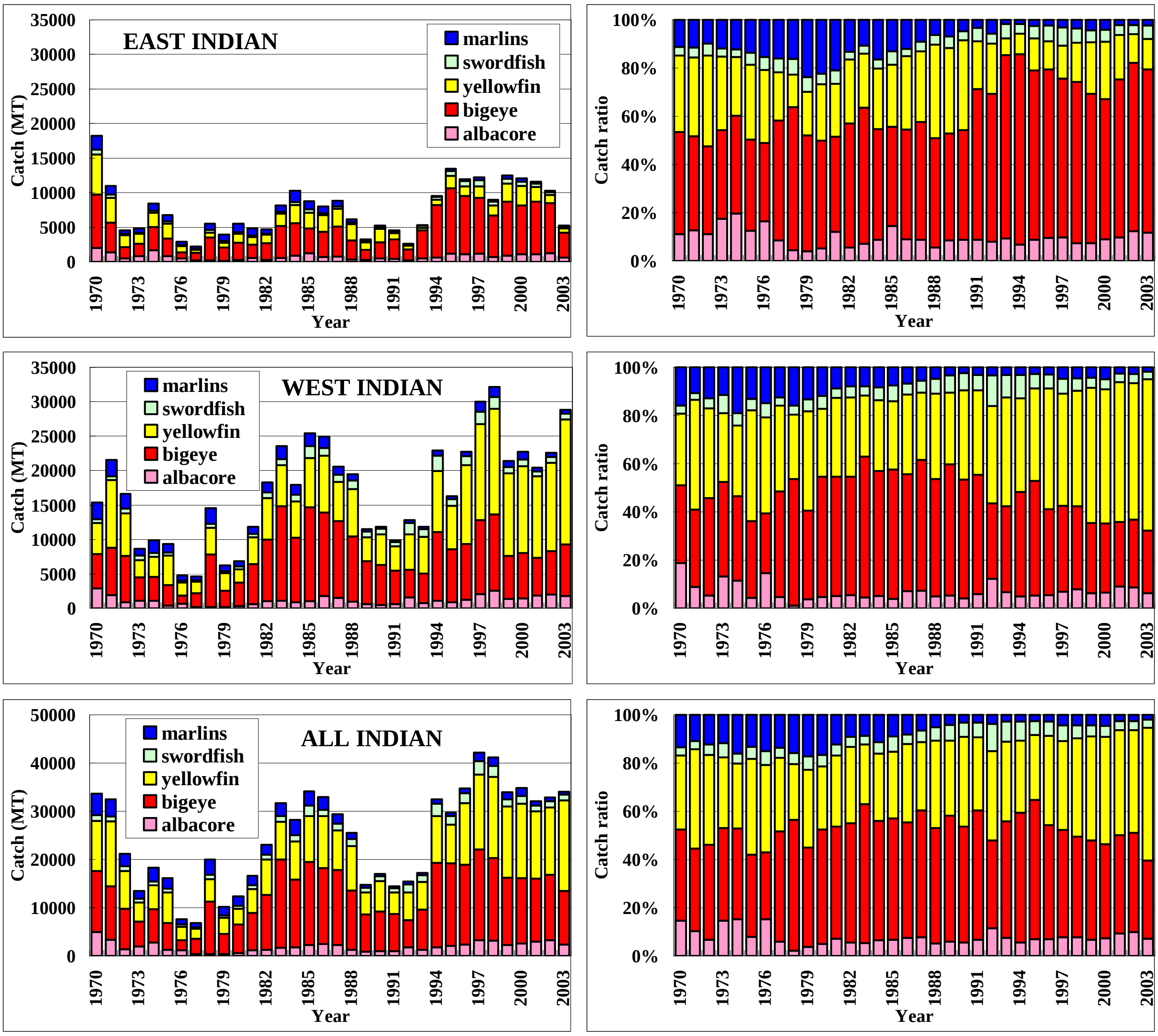


Fig. 6. Historical change of species composition of major tunas, swordfish and marlins in the Indian Ocean.

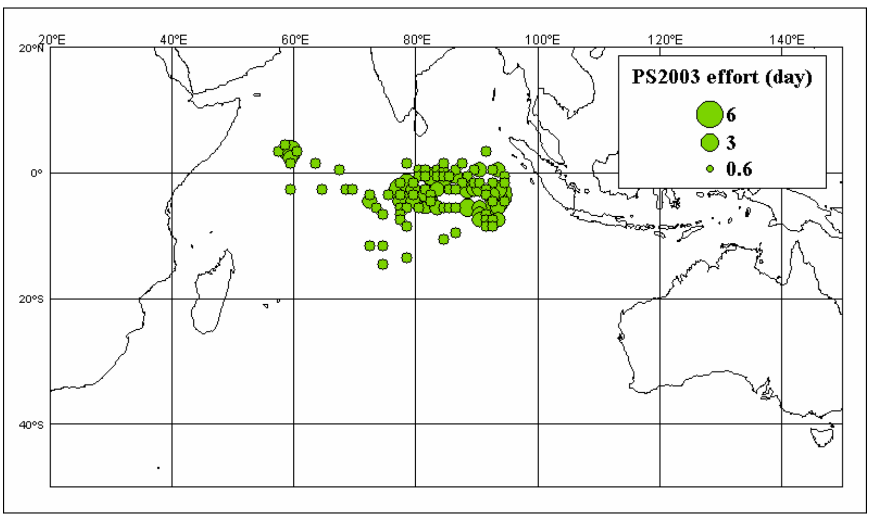


Fig. 7. Distribution of Japanese purse seine effort (days) in the Indian Ocean in 2003.

Addendum: IOTC/SC/2004/Inf07

Country report of Japan : Robot observer system in Japan under development

Remarks *This system is still in the developmental stage thus it is not expected that this system can be replaced by the human observers soon. It will take considerable time till this system becomes the routine system as various tests, feasibility checks and examinations in situ are required.*

Mechanical Observer

MITSUBISHI SPACE SOFTWARE CO., LTD.

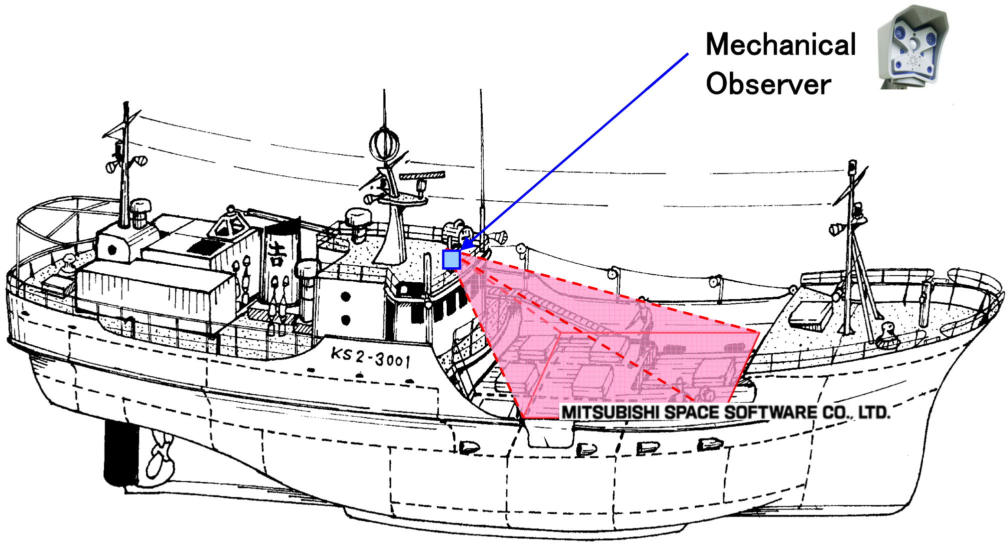


Fig.1 Mechanical Observer Overview

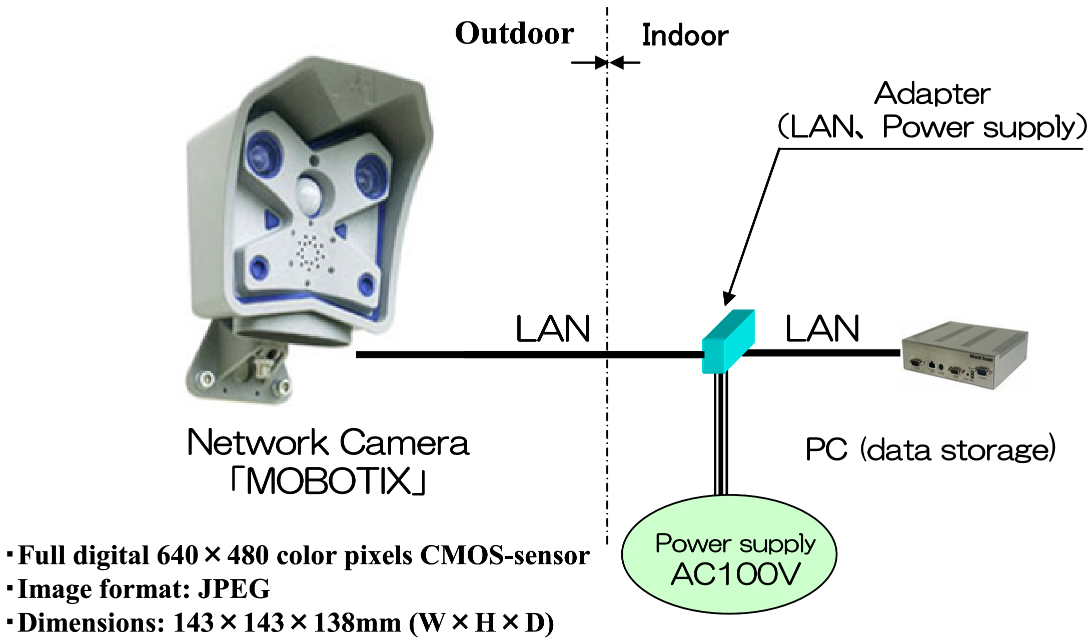


Fig.2 Mechanical Observer System