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**COUNTRY STATUS REPORT
MALAYSIA**

(2) SABAH

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MARINE FISHERIES RESOURCES STATUS: SABAH REPORT

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I. INTRODUCTION

A developing country's economic status is wholly dependent on the optimization and production of its agricultural sector, which includes fisheries. Biusing (1997) reported that the fisheries sector has importance in providing cheap protein (national per capita of 37 kg/year or 60-70% of animal protein consumed) besides offering social economic opportunities to fishermen, downstream processors and traders. In 1998, the total marine fisheries landing (94% of the total fisheries landing) was 196.2 metric tons with a value of RM 660,079 million. This figure shows an increase of 12.5% with a value of RM90,916 million compared to the marine fisheries landing reported in 1997. From 1993 to 1998, the marine fisheries shows a steady and consistent trend of high contribution (93-94%) to the state's total fisheries production and followed by the aquaculture sector (5-6%) which includes contribution from the freshwater sub-sector. The lowest contribution came from the open water fisheries with yearly production of less than 1%. This report covers the latest status of the marine fisheries sector in Sabah including various issues and recommendations pertaining to the industry.

II. PROFILE OF THE MARINE FISHERIES ZONES IN SABAH

2.1 Fishing Zones

The marine fishing grounds are divided into two major zones which are the West Coast Zone (South China Sea and Sulu Sea) and East Coast Zone (Sulu Sea and Sulawesi Sea). Sabah's coastal line of some 1,600 km has vast biodiversity ranging from various types of coral reefs, sea grass, mangrove swamps and river mouths. The main characteristics of both zones respectively are as follows:

West Coast Zone

All areas in this zone are in the *continental shelf* (water areas between the coastal line and isobath of 200 meters in depth) which elongates between 30 to 200 nautical miles (nm) towards the open sea. The zone's off-shore EEZ (Economic Exclusive Zone) is estimated at 90,000 km² with estimated trawlable grounds of 14,000 km². The Palawan Trench (more than 2,500 meters in depth) is located along the Sarawak's waters up north towards the Philippines' waters. The main marine fisheries species available along this trench are the oceanic tuna and small pelagic species. At present, various types of fishing activities are being carried out in the coastal waters by using both modern gears (trawlers, purse seines and drift nets) and traditional gears ("selambau", hooks & lines and traps). Crustacean fisheries (prawn fishery) is also another important activity carried out in the Brunei Bay, areas between Tuaran and Kota Belud and in Kota Marudu.

East Coast Zone

This zone represents a smaller area due to the EEZ borders of Philippines and Indonesia. There are unique diversified aquatic profiles ranging from 50 meter to more than 1,000 meter in depth along a few kilometers from the coastal line of Semporna. The main fisheries resource in this area are the coral reef fishes, oceanic tuna and small pelagic species. Mangrove forests are mostly found in Sandakan and Tawau coastline. Both areas are well-known as the most important fishing site for crustacean fishing activities in Sabah in which more than 60% of the marine prawns landing are contributed from these two sites.

Both modern and traditional gears are used in most fishing activities carried out in the coastal line water (less than 30 nm from the coastline). At present, the deep sea fishing zone is not fully exploited (more than 30 nm from the coastal-line) due to technological constrains and unsuitability of the local fishing gears in venturing into deep sea fishing.

III. STATUS OF THE MARINE FISHERIES INDUSTRY IN SABAH

3.1 Potential yield

To date, the actual potential yield of the Sabah's marine fisheries is still unknown. Until a more comprehensive research is carried out in future, all potential yields are estimated based on a previous preliminary research as a rough guideline. **Table 1** shows that there is an estimate of 265,000 metric tons and 85,000 metric tons (total: 350,000 metric tons) potential yield of coastal fisheries and deep-sea fisheries respectively.

Table 1 - Marine Resource Fish Production Potential (Sabah)

Fishing region	Resource category	Potential yield (mt)
COASTAL WATERS (within 12nm zone)	small pelagics	80000
	tuna	20000
	demersal fish	130000
	coral fish ¹	n/a
	crustaceans	20000
	other invertebrates	15000
	Sub-Total	265000
DEEP SEA (beyond 12nm zone)	Pelagic ²	54000
	Tuna ³	20000
	Demersal ³	11000
	Sub-Total	85000
	Grand Total	350000

Source: Biusing, 1996

¹ roughly estimation more than 50,000 mt

² acoustic survey result (SEAFDEC 1995)

³ Survey result RV Rastrelliger 1985

other estimation based on Biusing 1995

3.2 Fishing vessels

The commercial fishing sector involves large-scale operations by using various types of modern devices (trawlers, purse seines and drift nets) operated by large vessels whereas vice-versa for the traditional fishing operations.

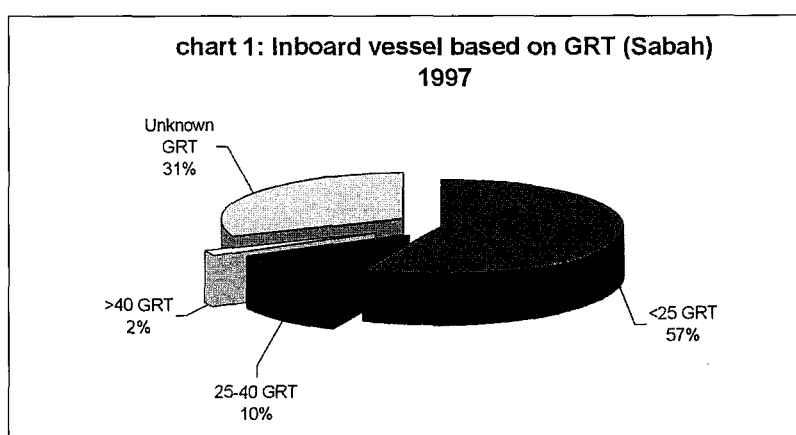
Sabah has the largest traditional fleet in Malaysia in which 85% are for vessels with non-motors and 31% for vessels with motors (**Table 2**). Most of these vessels are traditionally operated at the shoreline areas.

Table 2: Total Fishing Boat (Malaysia) 1997

Area	Inboard engine	Out Board engine	Non-powered	sub total
Sabah	3214	4065	2557	9836
FT Labuan	11	87	3	101
Sarawak	1675	727	3	2405
Pen. Malaysia	12701	8112	437	21250
Total	17601	12991	3000	33592

Source: Annual Fisheries Statistic Malaysia

Chart 1 shows that 57% of the inboard powered vessels are small in size (less than 25 GRT), 10% moderate (25-40 GRT) and 2% large (more than 40 GRT). However, the sizes of 31% of the vessels are still unknown but it is believed that it consists of small vessels.



Characteristics of Inboard & Outboard, powered vessels by zone, non-powered vessels by zone and categories of fishing vessels by district are described in detail in **Table 3-5**.

Table 3: Inboard powered fishing vessel (Sabah) 1997

Fishing area	Inboard powered by GRT (Gross Tonnage)									Total	
	GRT	>5	5-10	10-15	15-20	20-25	25-40	40-70	>70		Unknown GRT
East Zone		326	428	277	159	135	222	9	5	293	1840
West Zone		20	246	139	60	43	115	43	1	693	1360
Total		346	674	416	219	178	337	52	6	986	3214

Source: Annual Fisheries Statistic Sabah

Table 4: Out-board and non-powered fishing vessel (Sabah)

Vessel category	Non-powered vessel	Out-board engine
East Zone	1,499	1,667
West Zone	1058	2,398
Total	2,557	4065

Source: Annual Fisheries Statistic Sabah

Table 5: Fishing vessel by district (Sabah) 1998

District	Non-powered	Out Board engine	Inboard engine	sub total
Tawau	295	670	150	1115
Semporna	283	165	452	900
Kunak	90	94	12	196
Lahad datu	112	108	146	366
Sandakan	485	360	854	1699
Beluran	178	634	164	976
Kudat	75	255	936	1266
Kota marudu	129	390	37	556
Pitas	131	220	67	418
Kota Belud	343	340	93	776
Tuaran	61	162	35	258
Kota Kinabalu	15	254	246	515
Papar	20	145	1	166
Beaufort	65	383	38	486
Kuala Penyu	239	323	7	569
Sipitang	3	150	41	194
Total	2524	4653	3279	10456

Source: Annual Fisheries Statistic Sabah

3.3 Fishermen population

Although it was estimated that Sabah has about 40,000 number of fishermen involved in the fishing industry, it has been reported that there are only 20,845 people who are full-time fishermen. The fishermen consist of 74% locals, 25% others and 0.90% Chinese with a total population of 15,176 person, 5,056 person and 183 person respectively. Almost 19% of these fishermen are from Sandakan followed by Kudat (13%) and Tawau (9.8%). **Table 6-8** shows the characteristic of the fishermen population.

Table 6: Breakdown Fishermen based on Race (Sabah) 1995

Races	Sub-total	percents %
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Chinese	183	0.90
<i>Bumiputera</i>	15176	74.34
Miscellaneous	5056	24.77
Total	20,415	100%

Table 7: Full-time Fishermen (Sabah) 1998

District	Sub-total	percents %
Tawau	2036	9.77
Semporna	1781	8.54
Kunak	669	3.21
Lahad datu	801	3.84
Sandakan	3987	19.13
Beluran	1568	7.52
Kudat	2915	13.98
Kota marudu	713	3.42
Pitas	650	3.12
Kota Belud	1203	5.77
Tuaran	490	2.35
Kota Kinabalu	1719	8.25
Papar	356	1.71
Beaufort	718	3.44
Kuala Penyu	851	4.08
Sipitang	388	1.86
Total	20,845	100%

Table 8: Fisherman Based on Gears (Sabah) 1998

Gears type	Sub-total	percents %
Trawl net	5129	24.61
Seine net	1497	7.18
Drift net	6134	29.43
Lift net	1394	6.69
Hooks & Lines	4806	23.06
Traps	589	2.83
Miscellaneous	1296	6.22
Grand total	20,845	100%

3.4 Fish landing monitoring system

Previously, fish landings are estimated by observations in fish markets only. From 1991 onwards, the system was upgraded in which SMPP (Sistem Maklumat Pengurusan Perikanan/Fisheries Management Information System) is applied as a fish landing monitoring tool in 16 districts all over the state.

3.5 Marine fish landings by zones

In 1998, there is a high increase of 81% in marine fisheries production (196.2 metric tons) compared to 1991 (108.4 metric tons) as shown in **Table 9**. During the period, Tawau and Kudat show significant high contributions (> 150%) and followed by Kota Kinabalu (113%) compared to a drastic decline of production in Beaufort and Kota Belud's (> -60%). There are 6 districts (Lahad Datu, Tawau, Kota Kinabalu, Semporna, Kudat and Pitas) with relatively high increase in production (>150%), 3 districts (Kunak, Sandakan and Sipitang) with moderate increase (38-71%) and 1 district (Kota Marudu) which has not shown any

significant change in terms of production. Other districts (Tuaran, Papar, Beluran, Kuala Penyu, Kota Belud and Beaufort) show a decline between -10% until -85%. However, factors pertaining to the declining of fisheries production have not been identified although there are possibilities of unrecorded landings or over-fishing occurrence in other districts.

Table 9: Marine Fish Production based on Zone (Sabah) 1991-1998

ZONE/DISTRICT	91	92	93	94	95	96	97	98	Average	% 91
Tawau	22.63	30.05	39.84	45.87	60.12	74.27	59.01	59.93	48.97	+164.8
• Tawau	4.71	4.25	3.96	6.91	10.01	16.70	15.91	16.54	9.87	+251.2
• Semporna	4.16	4.70	6.85	9.00	18.01	17.41	14.78	12.34	10.91	+196.6
• Kunak	10.90	18.29	25.08	24.57	26.77	35.20	20.33	18.63	22.47	+70.9
• Lahad Datu	2.86	2.81	3.95	5.39	5.33	4.96	7.99	12.42	5.71	+334.3
SANDAKAN	26.56	31.64	34.31	36.38	32.1	35.17	30.01	36.12	32.79	+36.0
• Sandakan	20.29	25.14	28.93	27.16	27.57	28.05	24.98	31.87	26.75	+57.1
• Beluran	6.27	6.50	5.37	9.23	4.54	7.12	5.03	4.25	6.04	-32.2
KUDAT	11.76	23.26	32.86	31.42	27.78	25.58	25.13	31.14	26.12	+164.8
• Kudat	11.11	18.79	20.34	27.66	25.33	24.32	23.37	30.14	22.63	+171.3
• Kota Marudu	0.44	3.68	10.22	2.85	1.34	0.68	1.11	0.46	2.6	+4.5
• Pitas	0.21	0.79	2.29	0.91	1.11	0.59	0.65	0.54	0.89	+157.1
KOTA BELUD	13.50	18.44	14.12	8.54	7.69	8.57	6.69	5.27	10.35	-61.0
• Kota Belud	4.68	8.53	8.06	3.99	2.44	3.92	5.12	3.95	5.09	-15.6
• Tuaran	8.82	9.91	6.06	4.55	5.25	4.65	1.58	1.32	5.27	-85.0
KOTA KINABALU	26.81	25.77	26.50	25.87	27.88	29.39	48.15	57.22	33.45	+113.4
• Kota Kinabalu	20.24	16.21	16.63	20.79	24.96	27.51	46.47	56.12	28.62	+177.3
• Papar	6.57	9.56	9.87	5.08	2.92	1.88	1.68	1.10	4.83	-83.3
BEAUFORT	7.17	7.16	7.49	12.25	10.90	7.15	5.27	6.54	7.99	-8.8
• Beaufort	2.60	3.28	3.09	5.02	6.18	3.93	1.96	2.35	3.55	-9.6
• Kuala Penyu	3.42	2.52	2.82	5.88	4.03	2.51	2.62	2.60	3.3	-24.0
• Sipitang	1.15	1.35	1.58	1.35	0.70	0.71	0.69	1.59	1.14	+38.3
JUMLAH	108.44	136.31	155.12	160.33	166.46	180.14	174.27	196.23	159.66	+81.0

Source: Annual Fisheries Statistic Sabah

3.7 Pelagic Resources

Pelagic species has the biggest component in the marine fisheries sector of Sabah. In 1991 to 1998, it contributed 47-52% (average 50%) marine fish landing yearly (chart 2 & Table 10). The main dominant species are various neretic tuna (10-21%; average 16%), mackerel (*Rastrelliger* spp) (8-18%; average 12%) and round scads (*Decapterus* spp) (11-17%; average 14%) of the total pelagic species landing yearly (chart 3 & Table 11)

Table 10: Marine fisheries sector production through resource type (Sabah) 1991-1998

Unit: metric tonnes									
Resource	91	92	93	94	95	96	97	98	Average
Pelagics	56877	71560	80264	76405	84136	93693	86365	92388	80211
Demersal	23040	25375	29153	32341	36492	38469	38798	48940	34076
Crustacean	14834	15382	16817	16306	16093	15832	13729	14718	15463.88
Miscellaneous	13713	23988	28433	35276	29741	32149	35373	40181	29856.75
Total	108464	136305	154667	160328	166462	180143	174265	196227	159607.6

Source: Annual Fisheries Statistic Sabah

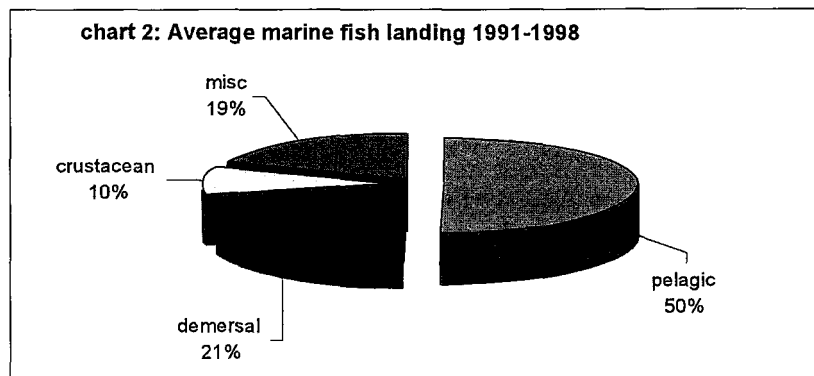


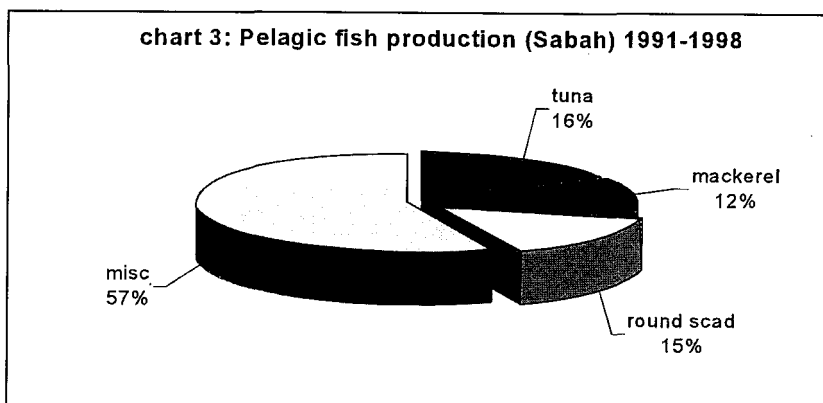
Table 11: Pelagic Fish Production (Sabah) 1991-1997

Unit: metric tonnes

	91	92	93	94	95	96	97	98	Average
Tunas	10821	15102	17136	11564	10704	15840	14007	9628	13100
Mackerel	10349	11132	12631	9300	9830	8163	7202	8834	9680
Round scad	6701	9777	11094	12954	14784	14922	11866	12913	11876
Miscellaneous	29006	35549	39403	42587	48818	54769	53290	61013	45554
Total	56877	71560	80264	76405	84136	93694	86365	92388	80211.13

Source: Annual Fisheries Statistic Sabah

The pelagic species has “migratory” behavior and are exploited together as shared stocks



with other neighboring countries in South East Asia. In this context, stock management of these species is hard to implement because it requires exploitation management with other countries. At present, the migration pattern and actual stocks are still unknown and this requires a collaborative research among countries to study the population dynamic and biological characteristics of the pelagic species.

In the past, there is an indication that the tuna resources are exploited at middle and moderate level both in coastal waters and deep sea. Based on this, it is advisable to use FAD (fish aggregating device) where fishing methods such as hooks and lines, purse seines and trawler are used.

3.8 Demersal resources

In general, the demersal fisheries in the coastal of Sabah status exploitation level ranges from mid to overexploited level. Trawlers are the common fishing device used in the fishing activities. Most of the coastal fishing ground in the west coast are not suitable for exploitation due to the existence of petroleum platforms and oil pipelines. To date, the demersal resources in the off-shore has not been exploited to the maximum unless a better fishing device and methods are introduced.

3.9 Prawn resources

Prawns resources are the most important component in the marine fisheries production sector. Between 1995-1998, the prawn fisheries has contributed a quantity of 6% (average) and value of 18% to the yearly marine fisheries production (Table 12-13 & chart 4).

Table 12: Marine fish landing quantity based on resource (Sabah) 1995-1998

Volume: metric tons						
Resource type	1995	1996	1997	1998	average	percents
Fish	141608	155212	150079	170766	154416.3	86
Prawn	12398	11521	10290	8739	10737	6
Miscellaneous	12456	13410	13896	16722	14121	8
Total	166462	180143	174265	196227	179274.3	100%

Source: Annual Fisheries Statistic Sabah

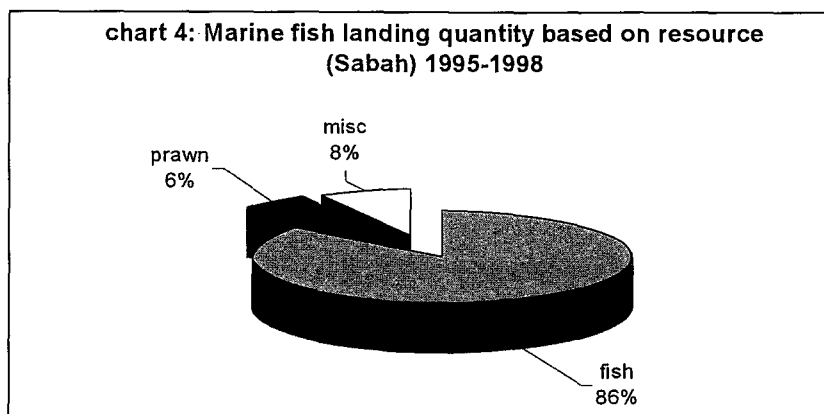


Table 13: Marine fish landing value based on resource (Sabah) 1995-1998

Value: RM ('000)

Resource type	1995	1996	1997	1998	average	percents
Fish	318.152	357.989	416.296	490.687	395.781	72
Prawn	100.355	95.652	97.98	93.252	96.810	18
Miscellaneous	42.484	50.24	54.888	76.14	55.938	10
Total	460.991	503.881	569.164	660.079	548.529	100%

Source: Annual Fisheries Statistic Sabah

3.10 Fisheries Resources Research Program

Most of the previous research carried out in the past are concentrated at the Western Coast of Sabah. Little work has been done in the east coast (prawn resource research in Labuk Bay) due to safety reasons. Below are the information of all previous research works carried out through collaborative efforts: -

Year	Research vessel	Area	Notes
1997-98	KK Manchong	West Coast	2 nd Malaysia ZEE survey
1995-96	KK Manchong	West Coast	SEAFDEC collaborative survey (demersal survey)
1995-96	MV SEAFDEC	West Coast	SEAFDEC collaborative survey (pelagic survey using 'hydro-acoustic' and oceanography)
1993-95	KK Manchong	West Coast	DOF Sabah & IPP Sarawak collaborative survey

Stock assessment and basic biology research was also carried out for 39 fish stocks (pelagic and demersal) at the west coast of Sabah.

SCOMBRIDAE (14 species)	CARANGIDAE (10 species)	Other families (15 species)
<i>Euthynnus affinis</i>	<i>Decapterus macrosoma</i>	<i>Abalistes stellaris</i>
<i>Katsuwonus pelamis</i>	<i>Decapterus maruadsi</i>	<i>Dussumeira acuta</i>
<i>Rastrelliger kanagurta</i>	<i>Decapterus russelli</i>	<i>Herklosichthys quadrimaculatus</i>
<i>Rastrelliger brachysoma</i>	<i>Megalaspis cordyla</i>	<i>Gerres filamentosus</i>
<i>Rastrelliger faughni</i>	<i>Selar boops</i>	<i>Lactarius lactarius</i>
<i>Sarda orientalis</i>	<i>Selar crumenophthalmus</i>	<i>Nibeia semifasciata</i>
<i>Scomber australasicus</i>	<i>Selar mate (Atule mate)</i>	<i>Nemipterus japonicus</i>
<i>Scomberomorus commerson</i>	<i>Selaroides leptolepis</i>	<i>Nemipterus nemurus</i>
<i>Scomberomorus guttatus</i>	<i>Seriolina nigrofasciata</i>	<i>Nemipterus peronii</i>
<i>Scomberomorus lineolatus</i>	<i>Alepes djeddaba</i>	<i>Priacanthus macracanthus</i>
<i>Scomberomorus queenslandicus</i>		<i>Priacanthus tayenus</i>
<i>Auxis thazard</i>		<i>Sphyraena forsteri</i>
<i>Auxis rochei</i>		<i>Sphyraena jello</i>
<i>Thunnus alalunga</i>		<i>Sphyraena obtusata</i>
		<i>Siganus javus</i>

The potential of the fisheries resources in Sabah is still unknown due to non-availability and unreliable basic information, which requires a comprehensive research. The latest report available comes from the fisheries resource research, which was carried out by IPP (Institut Penyelidikan Perikanan) along the west coastline of Sabah. The findings are used as basic guidelines by the Department of Fisheries Sabah in managing the resources.

At present, the potential yield and biomass estimations are as **Table 14**:

Table 14 - Demersal Resource Potential (West Coast Of Sabah)

Fishing Zone	Coastal	Offshore	Combine
Estimated trawlable area	11,400km ²	16,300 km ²	27,700 km ²
Mean trawl catch rate	169kg/hour	265kg/hour	208kg/hour
Commercial fish	79%	90%	85%
trash fish	21%	10%	15%
Mean density	2.55mt/km ²	3.98mt/km ²	3.14mt/km ²
total demersal biomass	29,070 mt	64,870 mt	86,980 mt

Source: Busing, 1996

IV. CONCLUSION AND RECOMMENDATION

Sabah has an important role in developing the fisheries industry in Malaysia in terms of providing protein supply as required in NAP3 (National Agricultural Policy). Based on this report, it is well-understood that the off-shore fisheries are still yet to be exploited to the maximum due to technological constraints. Investment from the corporate sector into this industry is encouraged to strengthen the industry financially. Besides that, it is also suggested that the Department of Fisheries Malaysia assist the Sabah Fisheries in both planning and implementing comprehensive research in near future because the establishment

of a smart-partnership between these organizations will enhance and develop a good networking in developing the fisheries industry.

In conclusion, a master plan for further development of the fisheries sector should be established and carried out in future. The master plan approach should be a holistic and comprehensive planning regime, which includes basic issues such as resource availability, competitive use of the resources, technological advances, sustainability of resources and manpower. Without proper guidelines, there may be negative impacts of the industry towards the environment, social and economics elements in future.

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