

MARKETING AND EXPORT OF MARINE-BASED FOOD PRODUCTS¹

By

Hajjah Norasma Dacho, Rayner Datuk Stuel Galid and Alvin Wong Tsun Vui,²
(Department of Fisheries, Sabah)

1.0. INTRODUCTION

1.1. The seafood industry is a booming business worldwide where the value of international fish trade continues to increase. World seafood demand has been growing steadily over the past years for a variety of reasons including, a rise in living standards, the greater variety of seafood available compared to other meats, more affordable pricing and growing appreciation for alternative forms of healthy foodstuff. In recent times, the food safety concerns arising from scares such as the cancer-causing *dioxin* presence and mad cow disease in livestock products in the European Union and the viral encephalitis epidemic in the local pig industry have caused consumers to seek other alternatives.

1.2. Seen in the global context Malaysia can be categorised as a bit player in world trade of seafood and fish-based products as compared to global producers. Be it in the export of fresh and processed fish products Malaysia contributes to a small portion of the total seafood trade. The rank and expansion of fisheries sector in Malaysia is characterised by an ever-increasing value and volume of production and export of marine-based product. There has been rapid growth in the manufacturing and service sectors while contribution of the agriculture and fisheries sector has been crucial to the nation's development. The development of fisheries sector is a joint effort by prioritisation and participation of government agencies, farmers, corporate sectors and institutions of higher learning working toward the planned objective of raising food production for the country and enhancement of fisheries commodities for export. On the micro level, the state of Sabah can claim to only a small percentage to national fisheries industry's output. This situation however should not detract one from the fact that the local fisheries industry does have a significant import in terms of socio-economic contribution,

-
- 1 Paper presented at the *Seminar on Enhancing Indigenous Capabilities in the Marine-Based Food Industry* by Institute Development Studies, Marco Polo Hotel, Tawau, 29-30 June, 1999.
 - 2 The statements and opinions expressed herein in this paper are those of the authors in their personal capacities and do not necessarily mean or reflect the official policies of the Department of Fisheries, Sabah.

employment opportunities, food protein source and particularly the great potential that this sector can realised in the future.

1.3. Various development and initiatives that impinge upon fisheries trade at the global level will have important significance to local seafood industry development. The various agreements concluded at the establishment of the World Trade Organization (WTO) has and will further stimulate globalisation and liberalisation of the international trade including that of fish and fishery products. Environmental and social concerns will continue to influence fisheries exports major consumer nation. The introduction of eco-labeling schemes will further increase this trend. Further, with growing concern about food safety, increasing efforts have been undertaken to improve the quality of fisheries products. This will have strong impact on trade in fisheries products in the near future In addition being confronted these issues and challenges, Sabah's seafood industry, being relatively under developed as it is, still have to contend with local issues such as under production, product technology and development, market access, and investments.

1.4. At the national level, Malaysia is currently involved in the regionalizing and localisation of the Code of Conduct for Responsible Fisheries (CCRF).³ Among other things it will see the implementation of codes of conduct for aquaculture practices and fishing. The new Third National Agriculture Policy (NAP3), which was launched recently, also mandated several new policy thrusts in agriculture (including fisheries and aquaculture) production and processing, and market development. Elements of NAP3 have been included in working draft of the Second Sabah's State Agriculture Policy. This will become official policy very soon.

1.5. The main treatise of this paper is on the issues and challenges confronting the state of Sabah's seafood industry particularly focusing on the processing, marketing and export of fish and fish products and the future directions that this important sector should head into. The first part of this paper will outline the status of the fisheries trade at the global, national and state level.

³ This Code, which was unanimously adopted on 31 October 1995 by the UN-Food and Agriculture Organization Conference, provides a necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment.

The important issues that are faced by this sector are also discussed. The main part of this paper will focus on the local fisheries industry in the aspects of production, processing and trade with a special emphasis on future developments such as on market development, product processing and industry support.

2.0. PRESENT STATUS OF THE NATIONAL FISHERIES INDUSTRY AND TRADE

2.1. Contribution of the fisheries sector in the Malaysian economy can be regarded as an essential element towards the nation's development. This is reflected in the amount of foreign exchange earnings, employment opportunities and provision of high quality protein supply for consumption. The last few decades has seen a tremendous increased in the marine-based products in Sabah. These are illustrated in **Table 1**. Sabah's export value of fishery commodities showed increasing trends from RM200,629 million in 1995 to RM 237,037 million in 1997. Production of the fisheries sector has been concentrated on the continued exploitation of marine resources, while in the aquaculture sector, efforts have been on the development of shrimp farming and the processing industry. In 1996, total production from the fisheries sector in Malaysia amounted to 1,239,434 tonnes valued at RM3.84 billion. In Sabah alone a total of 192,773.21 tonnes with estimated wholesale value of RM650,661.76 million was recorded.

2.2. In 1996, Malaysia exported a total of 201,670 tonnes of fish and fish products valued at RM726 million and imported a total of 238,760 tonne valued at RM759 million. For Sabah, a total of 36,049 tonnes was exported with estimated value of RM237,036,673 in 1997 (**Chart 1 a & b**). These were seafood products exported to Japan, Hong Kong, Singapore, Australia, Peninsular Malaysia and Sarawak. In the international commerce context, fisheries sector in Sabah is contributing in the balance of trade through foreign exchange earnings and international market of seafood products. The sector recorded a total of RM202.4 million contributions in the Gross Domestic Product in 1996 and RM197 million in 1997. The value of fisheries export for 1996 was RM216,582 million while in 1997 it amounted to RM237,037 million; these has

recorded a total RM179.5 million balance of trade for 1996 and about RM198 million balance of trade for 1997.

2.3. The demands of an ever increasing Malaysian population and the need for continued favorable balance of trade in the export and import of fisheries commodities are complimented with efforts to encourage aquaculture and deep-sea fishing to supplement the shortage and meet demands of high value fisheries products. The average annual consumption in Malaysia is 45 kg and

Table 1
Import & Export of Fishery Commodities (1987 - 1997)
SABAH

Unit of Quantity : Metric tons; Value in Ringgit Malaysia.

Year	Import		Export	
	Quantity	Value('000)	Quantity	Value('000)
1987	6,157	19,531	9,252	92,797
1988	8,640	19,044	8,528	90,467
1989	5,174	22,269	13,270	101,697
1990	5,731	23,941	19,310	122,071
1991	7,011	25,499	23,092	139,931
1992	5,945	28,506	26,934	146,075
1993	5,614	27,075	31,217	154,429
1994	7,413	32,369	32,657	170,012
1995	6,303	36,401	36,353	200,629
1996	6,703	37,043	35,962	216,582
1997	6,144	38,707	36,049	237,037

Source: Annual Fisheries Statistics 1997, Department of Fisheries Sabah.

Chart 2 a.

(Source: Annual Fisheries Statistics 1997, Department of Fisheries Sabah.)

Quantity of Import & Export Fisheries Commodities, Sabah 1997

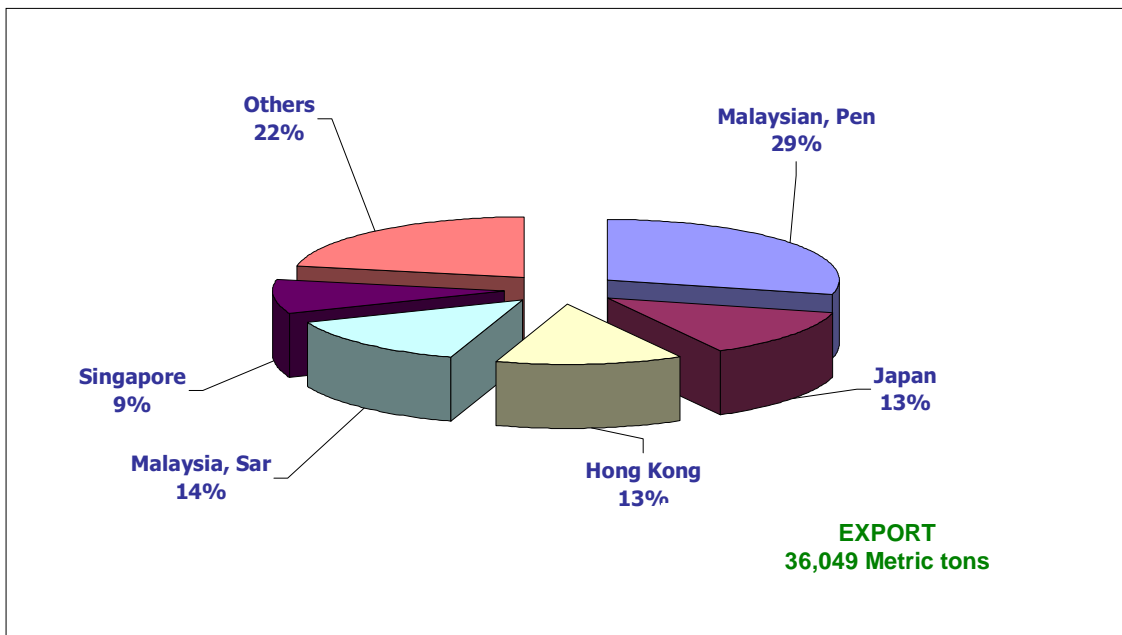
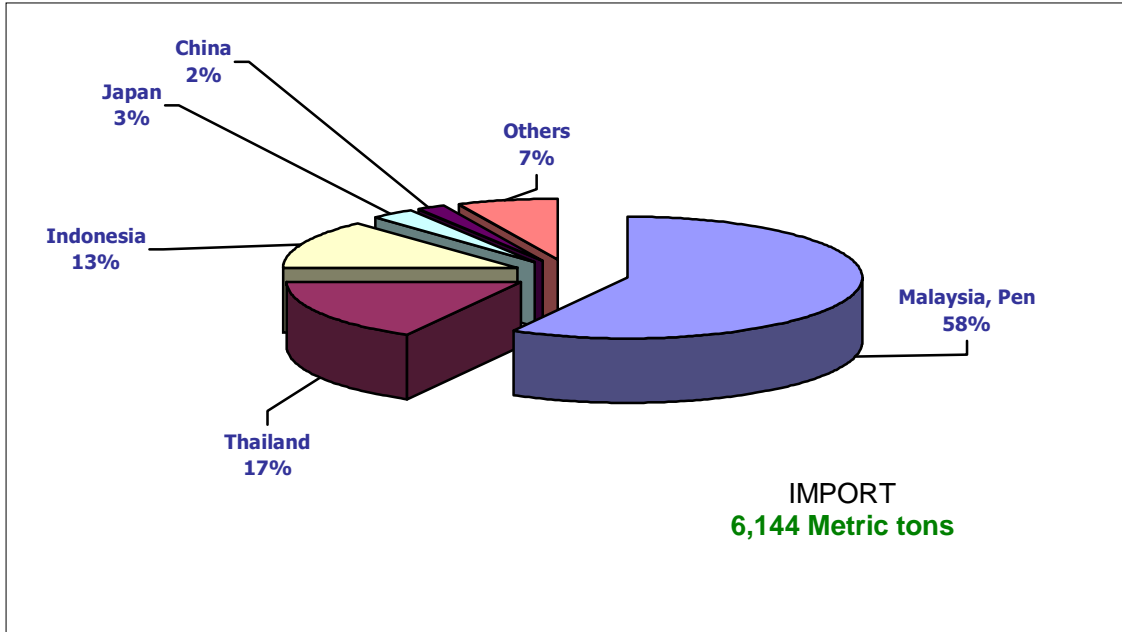
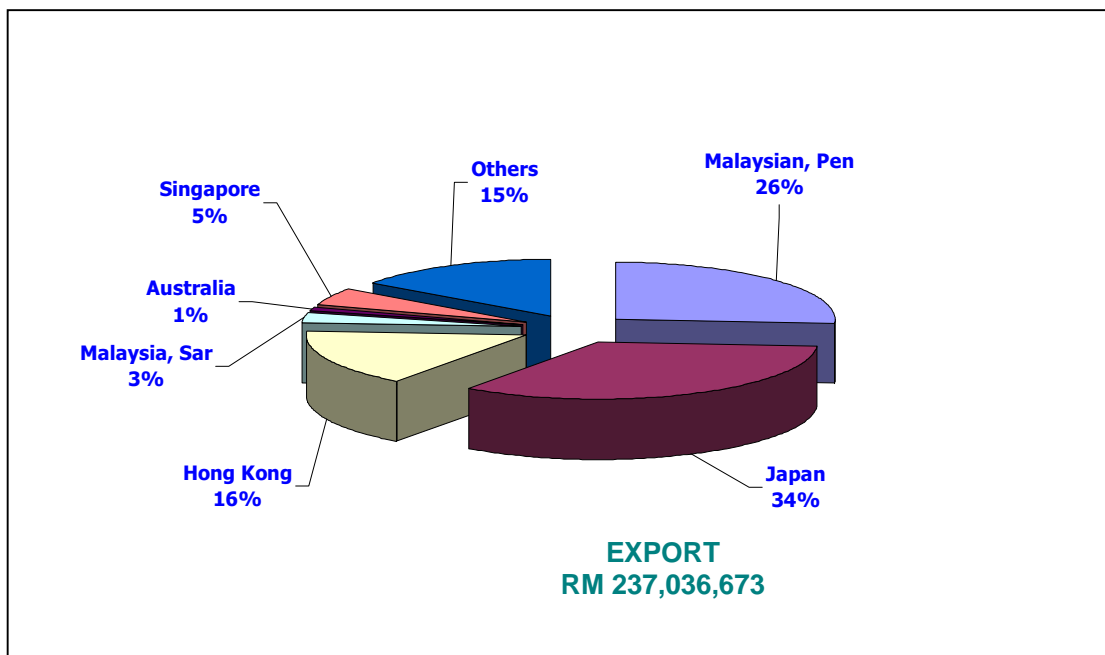
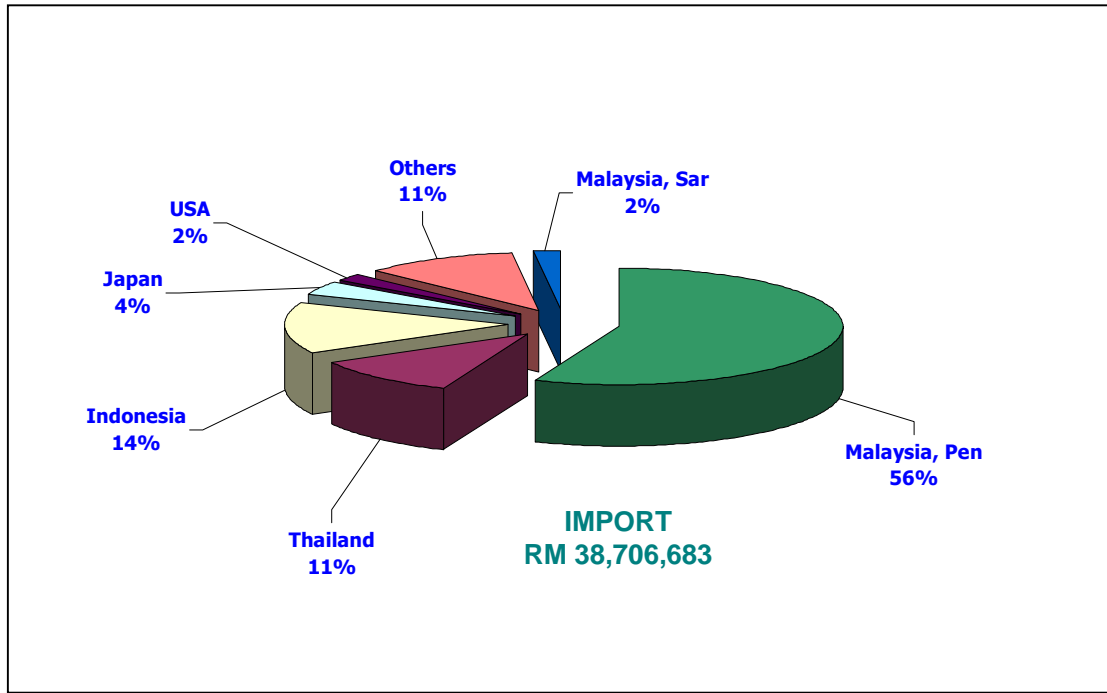


Chart 2 b.

Value of Import & Export Fisheries Commodities, Sabah 1997



projection for per capita consumption in the year 2010 will be at 55kg. With the population increase, awareness of eating more healthy products coupled with the encouraging positive economic situation, Sabah can expect more demands for fisheries products from trading nations such as the European Union, United States of America, China, Singapore and Japan.

3.0 ROLE OF GOVERNMENT SECTOR IN THE SABAH FISHERIES INDUSTRY

3.1. The responsibility to develop the fisheries industry in Sabah falls under the purview of the Ministry of Agriculture Development and Food Industry, Sabah. The objectives entrusted to this ministry, in summary, are:

- To raise the productivity of Agriculture and Fisheries by efficient utilisation of resources.
- To stimulate food production for national exports needs.
- To diversify Agriculture, Fisheries and Livestock production and processing.

3.2. As a developing nation, Malaysia endeavors to achieve economic growth via five-year development programmes, which began in 1958 and currently the programme is in its 7th Malaysia Plan (1996 – 2000). The future and prospect of fisheries sector is mapped out clearly in every Malaysia Plan proposed to the government by respective departments. Specific approaches and strategies have been injected to enhance the sectors' potentials through several government programmes.

3.3. Government agencies under the Ministry of Agriculture Development and Food Industry are responsible for managing, developing and regulating all fisheries-related activities. Each agency has their own functions, ranging from development to marketing and service support. The traditional tasks of the Department of Fisheries Sabah includes to encourage production, regulating enforcement laws and to maintain and sustain fisheries resources through research and development and resource management programmes.

3.4. Table 3 summarises the functions and roles of government agencies under this Ministry. The government is encouraging further development especially in the aquaculture sector as this contributes and will continue to contribute to the social and economic welfare of the population and will become an important foreign exchange earner.

Table 3

Summary of Fisheries Development Support System, Ministry of Agriculture Development and Food Industry, Sabah.

Function / role	Department of Fisheries	Ko-Nelayan (Sabah Fisheries and Fishermen's Development Corporation)	SAFMA (Sabah Fish Marketing Sdn. Bhd.)
Enforcement and regulation	✓		
Research and development	✓		
Extension and Training	✓	✓	
Subsidy Programmes	✓	✓	
Marketing			✓

3.5. With respect to exports in the marine-based product industry, the Department of Fisheries Sabah is extending support and services as summarised below:

- Issuance of import and export permit.
- Issuance of fishing license.
- Issuance of laboratory reports for quality assessment of fishery products.
- Quarantine of imported fish.
- Inspection of fish and fish products (sanitary quality).

4.0. EMERGING ISSUES IN GLOBAL AND NATIONAL FISHERIES TRADE

4.1. According to a Food and Agriculture Organisation (FAO) report, by the year 2010 global demands for seafood product will top 110-120 million metric tonnes but supplies will have a shortfall of 10-40 million metric tonnes. In 1996, total world production of finfish and shellfish from capture fisheries and aquaculture reached 120.3 million tonnes. International seafood exports reached US\$52 thousand million in 1995, up from US\$35.8 thousand million in 1990. About half the world exports of fishery products originate from developing countries. The share of exports from developing countries grew from 44% in 1990 to 51% in 1995 and net receipts of foreign exchange rose from US\$10.4 thousand million to US\$18 thousand million in the same period. Shrimp is the leading fishery commodity in world market. It brings in over \$10 billion or 20 per cent share in global seafood trade. In Asia alone, the industry is worth about \$20 billion with investment in shrimp farming infrastructure over \$11 billion. Some 60 percent of the world's population looks to seafood to provide 40 percent of their animal protein. In Asian countries alone, approximately one billion people depend upon seafood for 100 percent of their animal protein.

4.2. The International trade in fishery products will be subjected to further globalisation and liberalisation as the various agreements of the World Trade Organization (WTO) are implemented. Fishery products, especially for value added products, are at the moment subject to high tariffs. Under the Marrakesh Protocol of General Agreement on Tariffs and Trade (GATT) 1994, the main importing countries, have reduced tariffs. However, tariff measures by the EU were only reduced very marginally and were kept on the same level for those processed products of strategic interest to the EU industry. Despite some reductions in tariffs on fish and aquaculture products in recent years, tariffs as well as import licenses continue to represent barriers to trade in many countries. This is especially the case in many fast-growing economies in Asia, but important markets such as Japan, the European Union and the USA all give competitive advantages to domestic producers of many species, especially in the case of processed products. According to an FAO report in 1995, average tariffs on imports from developing countries was estimated at 4.8%, a cut of

27% from the previous level of 6.6%. However, the long-term trend, with growing membership in the WTO, will be for further reductions in tariffs.

4.3. The GATT Agreement on Technical Barriers to Trade requires countries to inform signatory countries about new regulations which are deemed non-tariff barriers such as technical regulations and certification requirements of imported seafood. These are constantly evolving specifications and regulations that current and would-be exporters are well advised to keep abreast of. For example, Japan has recently submitted a proposal for establishment of quality labeling standards for dried fishes and powdered dried fishes and the establishment of quality labeling standards for powdered *kezuribushi* (shaved dried fish).

4.4. With growing concern about food safety, increasing efforts have been undertaken to improve the quality of seafood products. The 1995 FAO Conference adopted the Code of Conduct for Responsible Fisheries which calls for, *inter alia*, food safety and quality of fisheries products. The rules that govern international trade in food were agreed upon during the Uruguay-Round on Multilateral Trade Negotiations and apply to all members of the World Trade Organization (WTO). With regard to food safety, these rules are set out in the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement). According to the SPS Agreement, WTO members have the right to take legitimate measures to protect the life and health of their people from hazards in food, but these measures may not be unjustifiably trade restrictive. Thus, current international codex standards that covers fisheries products, and the introduction of mandatory HACCP (Hazard Analysis Critical Control Points) requirements for exports to the USA and the European Union in 1997 will have strong impact on trade in fisheries products in the near future.⁴ In fact, there is a burgeoning global acceptance to the HACCP approach towards food and in particular, seafood safety and quality.

⁴ For example, the European commission banned seafood from India, Bangladesh and Madagascar in 1997 on the account of food quality concerns. In Malaysia so far there has been no industry-wide ban but there were instances of seafood companies being banned from exporting to the EU. The EU has deemed that the Malaysian Ministry of Health is capable of verifying the applications of laws on sanitary health that is equivalent to the EEC Directive. This equivalence has led to more than 40 Malaysian companies being approved to export to the EU.

4.5. Emergent issues such as the ISO 9000 certification are gaining much concern among exporting countries. ISO 9000 is a standard system, which provides series of standards to ensure consistency, and established quality systems of the product to comply with buyers need. Concern on compliance from producers and processors on volume of chemicals used in shrimp ponds and additives composition in seafood processing plants are giving notable impact in the international market.

4.6. The Uruguay Round Agreements on Non-tariff Measures will apply to all WTO members, and thus will have a multilateral status, ensuring a global coverage of the rules. A WTO Member applying non-tariff measures is required to follow precise guidelines to make the system transparent and predictable, as well as to provide a procedural guarantee for exporters. This applies inter alia to fish and fishery products.

4.7. Technical barriers to trade in the international seafood export industry remains pervasive in many countries. These technical regulations and standards are extensively used for fish trade and sometimes constitute distortion or obstacles to trade. The linking of environmental and social concerns to access to seafood export markets has increased significantly in recent years. The most recent, however, are measures aimed at limiting trade to fish coming from a sustainably managed resource. International environmentalist groups and non-governmental organisations (NGOs) have voiced concern on the production of cultured shrimp which originates from mangrove land and adjacent to rice field in countries like India, Indonesia and Bangladesh. Such aquaculture ventures have displaced people and seepage of saline water from prawn farms has caused economic problem to agriculture farmers.

4.8. These are trade impediments the results of which could increase trade distortions and difficulties which might counteract some of the benefits resulting from the Uruguay Round negotiations. The introduction of eco-labeling schemes will further increase this trend. Certification of fishery products is just starting, with the establishment of the Marine Stewardship Council (MSC). The certification will be awarded subject to an assessment to ensure that the MSC's Principles and Criteria for sustainable fishing are applied in a given fishery. These Principles and Criteria and the MSC certification methodology which

certification bodies will apply in certification process are ready to be used. Responding to concerns of members with regard to currently evolving schemes of certification of sustainable marine fisheries and eco-labeling of products originating from them, FAO has convened a Technical Consultation in November 1998 to initiate a process for the investigation of the feasibility and practicability of developing non-discriminatory, global Technical Guidelines for the eco-labeling of marine Fishery products.

4.9. In Malaysia, business and the corporate sectors have enjoyed benefits from marine-based food industry as it has provided strong economic and social security for the entrepreneurs and employment for the locals. As we approach the new millennium, the expected growth of the food industry is not going to be easily attained as problems of aquaculture-related diseases, market access and health concerns surfaces. The recent economic reverses in Southeast Asian region have also created notable uncertainties. The seafood industry in Sabah does not operate in an economic vacuum - the development of trading marine-based products are linked to regional and global market sensitivities. The conducive local business environment has also been a ferment in the continued expansion of seafood industry. While relevant government agencies will continue to pave ways to facilitate further development, on the part of fisheries entrepreneurs, they need to assess global market situation by streamlining their business strategies towards the betterment of production quality, improving processing standards, up grading and refinement of infrastructure facilities and compliance with existing quality control systems.

5.0. PRODUCTION AND MARKETING OF FISH AND FISH PRODUCTS

5.1. Recognising the importance of good marketing as the solid basis to the successful fisheries industry, it is therefore essential to look at this from the customer's and the producer's point of view. Both consumers' and producers' decisions on seafood products and the premium they place on desired produce and products are dependent on a variety of interlinked factors and variables such as availability of resources, current demand and supply, characteristics of the product, prevailing economic and social situations of producer and importing countries. For example, there is currently less demand for luxury fish products in

Hong Kong and Japan such as live fish, sahsimi, cephalopods, etc, as the economic recession prevails in these countries.

5.2. Sabah fisheries commodities of export and imports consist of live fish, live crab, fresh/ chilled and frozen fish, crabs and shrimp, fishmeal, fish fillets, and dried, salted or in brine fish products. Sabah trading partners are summarised in **Table 4**. In the 1997 export market, frozen crustaceans leads the export value with a total of RM145,763,435 million worth of frozen shrimps, lobsters and crabs. This is followed second by export of fresh/chilled/ frozen/dried molluscs (squid, cuttlefish and octopus) worth RM21,161,784 million and third in place was the export of frozen fish worth RM21,154,522. The primary source of export for marine-based products mainly comes from marine fisheries and a significant volume produced by aquaculture activities mainly from cage culture (for live fish export) and prawn farms. The prawn fishery in particular is considered as one of the most valuable commercial fisheries. These are exported as chilled or frozen commodity. Four types of processed prawn that are usually produced are PTO (peeled tail on), PUD (peeled undeveined), Head on and Headless. Other emerging new products for export are surimi, 'nobashi ebi' and dried seaweed.

5.3. The processing of surimi products - *Itoyori (Thread Fin Bream)*, *Kimedai (Big Eye Snapper)*, *Eso (Lizard Fish)* - is supported by the local supply of white meat fish from marine fishery and currently one company is producing surimi for the Korean market. Although the production of seaweed is traditionally focused for food, animal feed and fertiliser, there are increasing demands for extract agar from seaweed for cosmetic and pharmaceutical products. Currently, Sabah is the only Malaysian states farming and producing dried seaweed. 'Nobashi ebi' is new value-added prawn product, it involves secondary processing of peeled tail on prawn, deveined and elongated before vacuum packed of high value uniformed size prawn for the Japanese market. A private local company is currently testing the overseas market for this type of product.

5.4. The marketing of seafood products in Malaysia goes through a number of stages before they are sold to consumers or exported to other countries. Production from prawn and fish processing companies in Sabah are destined for overseas market. A small percentage is marketed by SAFMA outlets, frozen

Table 4

Export of Fisheries Commodities, Sabah (1997)
By Type, Quantity and Value

<i>Fisheries Commodity</i>	<i>Volume</i>	<i>Value</i>
	Metric	RM million
	Tonne	
<i>Live fish</i>	468.10	13,140,905
<i>Fish (fresh, or chilled)</i>	1,049.37	7,748,128
<i>Fish (frozen)</i>	8,260.70	21,154,522
<i>Fish Fillets (frozen)</i>	46.36	294,254
<i>Fish Fillets (fresh or chilled) and other Fish Meat (fresh, chilled or frozen)</i>	181.91	674,061
<i>Fish, (dried, salted or in brine but not smoked)</i>	462.76	1,202,036
<i>Fish (salted but not dried or smoked & fish in brine)</i>	1.88	104,210
<i>Fish Livers & Roes (dried, smoked, salted or in brine)</i>	14.28	49,980
<i>Crustaceans (frozen)</i>	5,837.67	145,763,435
<i>Crustaceans (other than frozen)</i>	3,308.76	11,239,425
<i>Molluscs, Aquatic Invertebrates (fresh, chilled, frozen, dried, salted or in brine)</i>	6,222.64	21,161,784
<i>Fish prepared or preserved, Caviar & caviar substitutes prepared from fish eggs</i>	113.85	599,355
<i>Crustaceans, Mollusc & Other Aquatic Invertebrates, (prepared or preserved)</i>	1.76	11,537
<i>Flours, meals and pellets of fish, or of crustaceans, molluscs or other aquatic invertebrates (unfit for human consumption)</i>	8,766.04	12,213,566
<i>Miscellaneous</i>	1,313.02	1,679,475
Grand Total	36,049.10	237,036,673

seafood shops and supermarkets. Popular markets for prawn have been United States of America and Japan, but recently new markets have developed in the Asian 'tiger economies'. Singapore, Hong Kong, West Malaysia and Taiwan have assumed bigger roles in providing markets for prawn and fish exported from Sabah.

5.5. The list of countries, which are trading partners for Sabah imports and exports of fisheries commodities are listed in **Table 5**. Major export trading partners are Japan, Hong Kong, Peninsular Malaysia, Singapore and USA. In 1997, Japan topped the list by importing a total of 4,878.16 metric tonnes of fisheries commodities amounting to RM87,145,017 million followed by Peninsular Malaysia, Hong Kong and Italy. In Sabah, consumers prefer fresh seafood as compared to processed or frozen seafood. Comparative local

Table 5.

**Imports and Exports of Fishery Commodities
By Countries of Origin & Destination, 1997
SABAH MALAYSIA**

Countries of Origin/Destination	Imports		Exports	
	Quantity	Value	Quantity	Value
<i>Argentina</i>	0.30	2,157	-	-
<i>Australia</i>	1.36	85,325	1,583.58	1,434,408
<i>Brunei</i>	80.02	10,000	1,088.38	2,706,965
<i>Canada</i>	1.35	19,353	179.55	152,619
<i>Chile</i>	7.29	30,484	-	-
<i>China</i>	93.09	251,037	1,188.38	5,192,948
<i>Denmark</i>	1.78	42,194	548.60	742,912
<i>France</i>	-	-	60.57	1,276,553
<i>Germany</i>	-	-	88.20	2,542,481
<i>Hong Kong</i>	12.58	156,960	4,757.80	37,138,233
<i>Indonesia</i>	822.95	5,898,983	10.00	67,541
<i>Italy</i>	-	-	689.01	10,631,541
<i>Japan</i>	172.05	1,645,020	4,878.16	87,145,017
<i>Korea</i>	17.96	155,750	192.59	1,687,775
<i>Malaysia, Peninsular</i>	3,576.08	23,269,213	10,308.37	54,281,712
<i>Malaysia, Sarawak</i>	77.15	559,194	4,958.62	8,605,159
<i>Mauritania</i>	0.52	5,533	-	-
<i>Mexico</i>	0.40	138,993	-	-
<i>Netherlands</i>	0.10	4,086	41.85	1,486,544
<i>Netherlands</i>	89.92	470,843	-	-
<i>New Zealand</i>	1.64	57,196	-	-
<i>Norway</i>	0.02	2,251	-	-
<i>Peru</i>	5.92	33,903	518.63	794,731
<i>Philippines</i>	18.28	437,523	3,168.84	6,367,645
<i>Singapore</i>	-	-	419.94	3,081,506
<i>Spain</i>	-	-	9.60	286,500
<i>Switzerland</i>	18.72	158,214	505.07	2,415,842
<i>Taiwan</i>	1,072.56	4,581,157	407.81	1,936,789
<i>Thailand</i>	-	-	84.89	1,797,879
<i>United Kingdom</i>	72.34	691,314	360.66	5,263,373
<i>USA</i>				
Total	6,144.38	38,706,683	36,049.10	237,036,673

Quantity in **Metric Tons** & Value in **Ringgit Malaysia**

Source: Annual Fisheries Statistics, Department of Fisheries, Sabah.

advantages have stimulated increasing trends in availability and quality of marine-based products for internal and external markets. The state is rich with high value seafood products such as cultured and wild prawn, various molluscs, crustaceans and marine fish. There is a sizeable number of local processing plants in Sabah. Sandakan has 11 processing plants producing frozen shrimp, fresh and frozen fish, crab meat, fishmeal and squids. Tawau has 6 frozen

shrimp processing plants and there are buyers in Sandakan and Kota Kinabalu involved in the live fish trade for local and export market.

6.0. FUTURE DIRECTIONS, ISSUES AND CHALLENGES

6.1. As compared to other food related industrial business, fisheries business can be categorised as having high economic risk as it involves enormous investment and deals in highly perishable products. Although opportunities for further development are encouraging, analysing current situations, drawbacks, future challenges and understanding threats that could impede Sabah seafood industry would prepare us for the future. The future scenario of Sabah seafood industry would depend a lot on the capability of producers to output high quality products that meets international standards. Much has been brought forward by government agencies on the need for establishment of processing plants that comply with health and safety standard measures which ensure safety and maintain the nutritive values of seafood products. Thus, the industry needs to maintain production and management standards which ensure quality marine-based products. Such an attainment will enable exporting processors to meet global perception and demands of importing countries. In the process of preparing this paper, several interviews with seafood processors and exporters were conducted to gather information on issues and constraints surrounding the seafood industry in Sabah. These are summarised in **Table 6**.

6.2. There is a general feeling among the processors that forecasting the future market trends needs strong assistance and institutional back up. As a growing industry, the government has put strong emphasis on maintaining competitiveness and continued expansion of the seafood industry in Sabah. This is mirrored in some of the government development projects, through combined activities such as business forums, extension services and research and development. There are no specific guidelines to guarantee success in dealing with the future outlook and emerging issues, but awareness and preparing for the future will ensure progress continuity. Evidently, it is not the sole responsibility of any government agency. To take this discussion further, the following section summarises issues, constraints, strengths, weaknesses, and opportunities faced by the seafood industry in Sabah. There are listed in **Table 7** as follows.

Table 6**Issues /Challenges and Solutions in Sabah Seafood Industry**

	Issues/constraints	Suggested solutions
Live crab exporter (1)	<ul style="list-style-type: none"> - low quantity and quality of local crabs (taste and size) - high competition from other buyers/middlemen. 	<ul style="list-style-type: none"> Government and Institute of higher learning to do research in crab culture. - request the government to safeguard local entrepreneurs.
Live fish exporter (1)	uncertainty in the Asian market since 1997 has caused dropped in prices.	diversification in seafood product.
Frozen crab processor/exporter	low quantity and quality of local crabs (taste and size)	<ul style="list-style-type: none"> - request the government to encourage crab culture to enhance production in better quantity and quality.
Surimi processor (1)	<ul style="list-style-type: none"> -dependency on foreign labour -labour intensive 	<ul style="list-style-type: none"> - request the government to lower the levy cost of foreign labour.
Prawn Processor/exporter (5)	<ul style="list-style-type: none"> - -production of prawn from captured and cultured ponds are inadequate; prawn factories are operating below their present capacity. - recent outbreak of white spot disease has caused losses to prawn producers and processors in Tawau and Lahad Datu. -low quality of captured prawn; prawn shell quality differs between Sandakan and Kota Kinabalu captured prawn. Captured prawns landed are not properly handled, very poor post harvest technology. - uncertainty in international market ; price fluctuation. - higher price in foreign labours levy; labour turn over for locals are very high. 	<ul style="list-style-type: none"> - request government to facilitate more prawn farms development - request the government to approve import of shrimp from neighboring countries to be processed in Sabah for export. - request the government to accelerate the establishment of prawn quality laboratory and facilities in Tawau. Diversification in seafood product. - to look at European and USA market. Request the government to lower the levy cost of foreign labour.
Fishmeal plant	<p>Insufficient amount of raw materials. Unavailable lab facility for Salmonella test on fishmeal; Veterinary / Fisheries Department could not provide such test. Limited permissible area for expansion ; competition of space with other industry.</p>	<ul style="list-style-type: none"> - request the government to consider the survival of fisheries industry related activities as important as other industry and acknowledge the plight of fisheries business.

Table 7

Analysis of Strength, Opportunities and Challenges of the Seafood Industry in Sabah

Strength / Opportunities	Challenges / Issues
<ul style="list-style-type: none">• Availability of marine fisheries resources.• Established regional and international markets for prawn and fish product.• Established tenure with major trading partners in the export market links.• Competitive Quality of Marine-based product.• Technology availability in the capture, culture and processing of prawn.• Readily resources of marine fish for export (live and processed product)• Technology availability in the capture, culture and processing of prawn.• Existing government support in providing R & D for new product development, investment opportunities and infrastructure facilities.• Growing demands for seafood product.• Potential for increased in business cooperation and joint-venture in fisheries project through BIMP-EAGA.• Economic improvement of the nation and regional economic and political stability in the Asian region is encouraging business growth.	<ul style="list-style-type: none">• Unreliable supply of suitable prawn from captured fisheries.• Processing plants depends largely on farmed shrimp.• High competition from other processing factory.• Poor post harvest handling for marine captured prawn; degrading product quality.• Poor road condition and long journey aggravating the quality of prawn before consignment reach processing factory.• Lack of skilled and semi-skilled workers; some factories have high dependency on foreign workers; lack of interest from locals; could hamper technology transfer.• Processing factories are operating below maximum capacities.• Constrains in developing downstream processing industry.• Lack of variety in value added and ready to cook / ready to eat marine-based products• Government needs to encourage private sectors to up-grade and invest in plant automation and venture in downstream industry.• Government needs to encourage private sectors to up-grade and invest in plant automation and venture in downstream industry.

6.3. The one constraint that many sea food processors face is the lack of raw material supply. Many processing plants are not operating at their maximum capacities due to inadequate or rather inconsistent supply of fish. Prawn processors are often faced with difficulty of limited supplies of captured prawns for their operation. They encounter stiff competition among themselves and with other consumers. The production of cultured prawns in Sabah has increased over the years following the mushrooming of shrimp farms, in particular Tawau district. Cultured prawns represent an alternative resource for prawn processors but the supply is still below what processors can absorb. Mangrove crabs have been claimed to be dwindling in numbers as well as in size compared to what was a decade ago. The decrease of this species could be linked to the degradation and destruction of their habitat – mangrove swamps. Relevant agencies must take firm measures to maintain and conserve mangroves. It should also be enforced that all gravid crabs are prohibited from being exported.

This condition however is difficult to implement; such crabs are in demand for these fetch relatively higher price in the market.

6.4. Consumers are now increasingly aware and particular about good quality and hygienic products. As stated earlier, there is a move worldwide towards adoption of the HACCP approach in quality assurance programs in seafood safety management. Starting early will give competitive edge to local companies as compliance with HACCP requirements will allow local products to be accepted in importing practicing countries. It is also likely that with such compliance it will be easier to access additional markets. On the converse, non-compliant exporters will see their overseas markets shrink as more and more importing countries impose these standards in quality assurance regulations.

6.5. Sabah seafood companies are aware of the US FDA HACCP regulation since 1997. The Department of Fisheries, Sabah has initiated a series of seminars on this subject targeted at the local fisheries processing industry. However, until present there are no local companies which have achieved HACCP certification by the Health Ministry although some have initiated efforts to this end. One of the reason is the high cost of investment in building new facilities or up-grading of existing factories as well as their manpower and processor to the requisite standards. While it is true that HACCP requirements does not necessarily mean the establishment of a super sophisticated facility, it does translate to a substantial investment on the part of the processor even if it is just up-grading the present factories. Another reason has been the inability of local companies to work with consultants on the basis of differing understanding of the requirements of an HACCP facility. On this matter, it is recommended that the relevant government agencies play a more direct and hands-on role in helping local companies achieve HACCP status. The Department of Fisheries Sabah and Health Ministry should work closely with HACCP consultants in helping and clarifying necessary steps to be taken by processing companies. In addition, perhaps some fund facilities that can be obtained by means of specialised loans can be made available to would-be companies to compliment their investments in up-grading their capabilities.

6.6. Packaging is a vital issue in maintaining freshness and quality of seafood product. Live fishery products need to be properly packed to avoid

high mortality rate. The advancement of science had seen the introduction of various packing methods that reduces mortality and minimise freight charges. The recent introduction by MARDI to pack live prawns without using water is an example. This method uses low temperature to send prawns into an inactive state before delivering them in boxes layered with wet saw dust. Transport of crabs is also important and need to be kept alive after removing them from their aquatic habitat. Exporters need to know what are the best packing methods that can reduce mortality. Crabs from certain places are reported to survive longer after separation from water and these crabs are favoured over to those that can only last for a short while. Research and development should provide solutions to these issues and to other species with spines like lobsters that often create problems to exporters while packing. Results from these programmes can bring benefit to the trade.

6.7. Most processing plants in Sabah does minimal processing. Their activities are predominantly the more basic form of preparation such as sorting, grading, cleaning and packing. Most of the equipment features basic functions and relatively no or low technology are required. Workers are only needed to acquire certain basic skills and could very well start off novices. The processing of seafood into secondary, value-added products are minimal. The constraint from inadequate supplies should spur the processors into producing secondary products. Development of products that are acceptable in foreign markets should be intensified.

6.8 Some processing plants reported the problem of hiring workers. Locals are either not interested or lack the right working attitude. This forced employers to turn to foreign labour. Foreign workers are cheap and in abundant but the rate of levy charged, are according to plant owners, exorbitant. The turnover rate is also considered high. There is a request to the relevant government department to review levy charge on processing plant workers. In the event of a reduction, the employers would be more willing to increase the work force. Local workers are difficult to maintain and often leave after a short stint.

6.9 Like any other commodities, price fluctuates according to demand. During the off-season, exporters are faced with difficult time trying to dispose their products without incurring lost. This problem is more apparent to live seafood exporters, they need to avoid keeping the products too long and risk

mortality. Exporters should not be overly dependent on one market and should have alternatives during off-season. The market trend and requirement of certain species should also be fully understood to avoid unnecessary loss.

6.10. Live fish and certain shellfish is a potential high earner for the local seafood industry because of the demand in Asian markets. Although relatively small in terms of total quantity, the live fish trade is a billion dollar business serving mainly the demand from Chinese Cantonese communities throughout the region. Asia is rapidly increasing its consumption of live seafood as a result of cultural preferences and growing affluence. The most important markets are in China and Hong Kong, but there is also a significant demand from Japan, Taiwan, and Singapore; expansion is also expected in South Korea, Singapore and Taiwan, and even in Malaysia itself. The live seafood market is largely restricted to the restaurant trade and to consumers with a relatively high disposable income. Locally this sector is already supplying roughly 350 metric tonnes yearly of shellfish and coral reef fishes for export markets and to West Malaysia.

6.11. At the present time highest prices are paid for Napoleon wrasse (*Cheilinus undulatus*), stonefish (*Synanceinae*), and groupers (including *Epinephelus*, *Cromileptes* and *Plectropomus* spp.) For example, wholesale prices for top quality *Cheilinus undulatus* may vary from around US\$90 in Hong Kong to around \$30 in Indonesia. On the other hand, wholesale prices for *E. malabaricus*, *E. tauvina*, *E. coioides*, and *E. fuscoguttatus* may vary from US\$25/kg in Hong Kong to \$5-20/kg in Thailand, depending on quality, size, and whether the fish is wild or farmed. These prices are expected to increase as when the Asian economies recover from the economic downturn.

6.12. Developments in two areas will determine the performance of the live fish trade in Sabah in future. First, the amount of air freight space for cargo exiting Kota Kinabalu need to be increased for live fishes need to be transported by air to external markets. In the early 90's when the export of live fish was at its apex, air cargo space at Kota Kinabalu reserved for transportation of live animals were just not enough. There was severe competition among live fish exporters to the extent that the Department of Fisheries was called to arbitrate who gets how much space. (The Department did not take it up as it was felt that this was MAS prerogative.) Second, the local aquaculture sub-sector must ramp

up its production of the desired species of fish for the live fish trade. The dwindling supply of wild stocks and the ground swell of opinion against fish caught by destructive methods (especially using cyanide) will see supplies of wild fishes get lesser.

6.13. Seaweed mariculture in Sabah portends a good future. This type of aquaculture is comparatively low technology and easily taken up by local farmers, very environment friendly (as compared to consumptive aquaculture such as shrimp pond culture and pollutive activity like fish cage culture), and the crop is exclusively for export. *Euchuema* seaweed is the only type grown and the derivative product is *carrageenan*. At the moment, production stands around 2100 mt from a total farm area of 500 acres in Semporna, Kunak and Lahad Datu.⁵ The production is valued at around RM5 million. **Table 8** shows the world production of *Euchuema*. Seaweed production in Sabah will see a major jump in production in the next few years. Production-oriented government programs such as poverty eradication and rural development projects on seaweed culture (200 new farmers are expected in the next 3 years) as well as the Sabah Fisheries Department emphasis on industrial farming of seaweed will boost production. While at the moment the price of 70% dried seaweed fetches about RM1.80-RM2.00 per kilogram, this will surely increase as the two planned local *carrageenan* extraction plants comes into operation. *Carrageenan* powder is the value-added product of seaweed and commands prices ranging from RM18.00 per kg of semi-refined product to as high as RM750 for pharmaceutical grade powder.

Table 8 : World Production of *Euchuema* Seaweed

<i>Euchuema</i>	<i>Carrageenan</i>	<i>Mt</i>	<i>USD</i>
<i>China</i>	300	1,500	\$72,000
<i>Philippines</i>	60,000	300,000	\$14,400,000
<i>Malaysia</i>	800	4,000	\$192,000
<i>Kiribati</i>	396	1,979	\$94,973
<i>Indonesia</i>	13,447	67,235	\$3,227,280

⁵ According to the biggest exporter of seaweed in Sabah, seaweed from Sabah has a very high rating among foreign importers because of its good quality.

6.14. Targeting niche or specialty markets for local produce (including seafood) is outlined in both the new National Policy on Agriculture and the Second Sabah Agriculture Policy. These policies also emphasize production in agriculture, livestock and fisheries for substitution of food imports. Local seafood processors are well advised to explore opportunities in local markets in addition to developing markets in other countries. For example, the hospitality sector (oysters and lobsters) and the airline catering business (fish fillets) together rack up a significant import bill on seafood. Another example is the animal feed industry where feedmillers are sourcing a large percentage of their fishmeal and fish oils requirements from foreign suppliers. Of course, concerns about acceptable qualities of local produce and products need to be addressed before these local millers can be persuaded to use local substitutes. Malaysia also aims to be an international hub for *halal* food. On these, seafoods quite logically rank as one of the top categories of food amenable for processing as *halal* foods because as a raw product, wild caught fish and cultured produce rarely give rise to concerns about *haram* products.

6.15. It is generally known that the deep sea waters off Sabah's coasts has great potential for tuna fishing. There are confirmed reports of sizeable landings of bigeye and yellowfin tunas in waters off Semporna and the west coast of Sabah using hooked gears. This high-priced fish⁶ are used for *sushi* and *sahshimi* of which the biggest market beckons from Japan. For example, the 1997 demand in Japan for sahshimi tuna was in the region of 470,000 mt. There is local potential to exploit the specialty sashimi tuna market in Japan. However, as stated earlier, just like the constraint encountered in live fish export, local air cargo facility need to be improved in terms of space availability. In addition, there is a need to explore a faster airline route alternative to Singapore-Japan (Narita airport) since sashimi tuna prices are very much dependent on the freshness of the fish.

6.16. The international market for prawns is very sizeable and where better-than-domestic prices can be realised. While the local and national markets for prawn are many, for local processors to realise their maximum earning potential they should target their production for exports to the main consuming markets of

⁶ A single good quality tuna fish routinely fetched auction prices in the range of US\$10,000 at the Tsukiji market, Japan. A recent record is US\$90,000 for a single, spectacular bluefin tuna !

United States, Japan and Europe. These three markets consume annually approximately 50% of the worldwide production of prawns and account for approximately 85% of imports of shrimp worldwide. The natural market is the United States, the largest consumer worldwide, which imports more than 70% of the annual consumption in 1997. The competition for this market is international in scope with the main competition being a group of Asian countries, the most prominent of which are Thailand and China, and a group of Latin American countries, the most prominent of which are Ecuador and Mexico. In marketing their products, Sabah companies will be competing with companies having much greater resources than themselves and much more experience in producing and marketing their products. To assist them in this marketplace, local producers may consider engaging experienced marketing consultants who are able to introduce their products to the international buyers they deal with regularly. Also, the key factor in competing in the international markets is to ensure products maintain a high quality. Seafood exporters should on a regular basis invite these marketing consultants and buyer's agents to inspect their production facilities and implement recommended changes to ensure they continue to produce both the form of product and the quality desired in the marketplace. On this matter, there are local expertise, such as MARDITECH and Universiti Putra Malaysia, to whom local companies can turn.

6.17. Penetrating and developing new opportunities in mature markets populated by well-established and entrenched players is never an easy thing. This is especially so where would-be exporters deals in volumes well below expected industry-standard transactions; large importing firms generally have an aversion to perceived bit players because of the risk of inconsistent supplies and the attendant questions of product quality. A market analysis may involve such questions as product acceptability and advantages, compliance with export market rules/regulations/labels, ability to provide satisfactory servicing, availability and adequate warehousing, transport facilities, etc. Basic to these of course would be the need for accurate information on intended markets. Therein lies requirement of reliable contacts in the targeted country. Information technology developments and the improvements and expansion of electronic information systems particularly the Internet has opened up a new channel for would-be exporters to access and divulge information. Local seafood companies should leverage this useful medium to initiate and expand their market intelligence, networking and development capabilities. For example,

there are internet websites, both local and international, which are dedicated to Malaysian commerce and seafood business.⁷ Many websites have industry listing which a company can get it self listed. For what this is worth, it may at least be a means to initiate industry contacts in the prospective country markets. Sabah companies can access these facilities and services for free or at nominal cost. In addition there are regional or global network of fish marketing information services such as GLOBEFISH and INFOFISH which are available in print and on-line (internet).

6.18. Seafood marketing in Sabah is carried out on an individual basis by companies. While this may be adequate in provincial or national trade, it may be to the advantage for local firms to have informal or formal groupings to penetrate, develop and maintain fisheries markets in foreign countries. Such groupings have been shown to accrue many benefits to participating companies in other countries.

6.19. Local seafood companies may want to consider becoming the members of an Export Network (EN). An 'Export Network' is a group of exporters formed to take advantage of a specific, clearly identified offshore market development opportunity. The primary objective of such a group is to increase foreign exchange by aiming at foreign market development opportunities. The second aim is to broaden local export base by encouraging collaboration between companies that are new to exporting and more experienced exporters as well as to lower the risk bar that currently discourages Sabah exporters from proactively targeting offshore market development opportunities. An EN should be under a designated EN Manager who can be one of the EN participants or an independently appointed manager. There is the possibility also of putting the EN management under relevant department or ministry (such as The Ministry of Trade Development). Full or partial funding to cover the cost of specific activities of the EN and the cost of the manager can perhaps be obtained from an *ad hoc* fund initially set up by government.

7 For example see:

www.malaysiaexports.com
www.export.com.my
www.newmalaysia.com
www.fish-international.com
www.sea-world.com

6.20. It is generally known that having ownership of abundant natural resources such as fisheries and timber does not confer automatic success in industrialization. In industrialising this must be leveraged as a strategic advantage with the aim to produce products based on design innovation, specialized niche product segments and marketing efforts. The industries suggested for rapid advancement are those with the high value-added content where sustainable competitive advantage is not based only on basic factor advantages (i.e., natural resources, labour, etc.) but on product design, specialised knowledge, total efficiency in manufacturing, close knowledge and finally product branding. Thus for the fisheries industry in Sabah, it should not only compete on cost and its natural resource linkages but on innovation, high levels of skill, product and process technology innovations and marketing.

6.21 It is recognised that Sabah's seafood industry is comparatively undeveloped with its processing competence falling under the lower end of the value-added spectrum. This can be seen in the product range where much is sold live, fresh, chilled or frozen and where processing is done at only the secondary level such as industrial packing of partially processed products. It is not foreseen that the local fisheries sector will make a quantum leap in production quantity in a short time. The implication of this for investment in the processing side is that there will be no major investments in tertiary processing facilities in the near future particularly by way of direct foreign investments (DFI). DFI-fuelled development would have been a means of acquiring established product and process technologies, funding and easier access to foreign markets. Be the case may be, it would seem local processors should concentrate more on producing secondary products such as industrial packed seafood, battered and breaded fish fillets, shrimp, squid rings, fish patties, fingers and cakes, crab cutlets, etc, as well as on convenience and ready-to-cook products. The process technologies for these products are comparatively not complicated and can be easily acquired by way of non-equity technology transfer including licensing arrangements. Further, local manufacturers should consider entering into strategic alliances such as original equipment manufacturer (OEM) arrangements with foreign companies. The benefits of this are that the local processor will learn and use the foreign technology while the processed products can be assured a stable market demand. Potential products for this type of arrangement are canned pet foods, canned foods, specialty seafoods, etc. It is pertinent to note that this is the strategy adopted by the

Sabah Industrial Masterplan in as far as developing the marine food products industry in the State.

6.22. At present government involvement in fisheries marketing and export by way of direct programmes is quite minimal. Leaving aside the question of applicable laws ambiting matters of fisheries trade and commerce, there are areas in local and export business of the seafood industry that can benefit from purpose-built programs. These should include the following areas:

- Undertaking and promoting projects which develop technologies and processes for adding value to existing products.
- Developing new and expanding markets, market knowledge and marketing strategies.
- Developing and introducing quality management programs, product promotion strategies, and industry promotion opportunities.
- Undertaking trade and development initiatives.
- Development of training and leadership programs.
- Establishment of funds assisting retailers, wholesalers and restaurateurs with seafood promotion as well as to increase promotion of Sabah's quality seafood and aquaculture products to local and overseas markets.

6.23. There are existing support chains at the government agencies level which are extending assistance and institutional support to fisheries companies in Sabah. This has been discussed briefly in Section 3 of this paper. The Department of Fisheries Sabah (DOF) will design future development projects under the Eight Malaysia Plan specifically to enhance fisheries business and to realise the inherent potentials of the local seafood industry. The Ministry of Trade and Industry Sabah is in the process of formulating an action-oriented industrial plan for Sabah based on the completed Sabah Industrial Master Plan (SIMP) report. Under this approach, the fisheries industry development is approached in the global context. Further, the DOF has submitted an action plan proposal to chart down existing issues and suggested solutions to further formulate the Sabah Industrial Plan.

7.0. CONCLUSION

The state of Sabah is endowed with abundant fisheries resources as well as extensive land and sea areas which are suitable for aquaculture. Production of fish will see further increase as commercial interests take advantage of the potential in deep sea fishing and marine, brackish and freshwater aquaculture. This increase in local production as well as the ever increasing demands in local, regional and global seafood markets will stimulate the local processing industry to transform from a primary product-based processing sector to more downstream value-added industry. There are several emerging issues both in the local and global marketplace that Sabah processors should take note and adjust or take advantage of. However, the future of this industry looks very promising. There are several marine-based products which hold excellent promise for export market development as well as for local consumption. Product and process technologies for the processing of secondary fisheries products are by no means inaccessible to would-be processors locally. The development of the seafood industry Sabah will be the joint responsibility of both the private and public sector. The private sector is expected to take the lead in putting investments in both the production and processing side of the fisheries sector while the government should act as an effective facilitator for a conducive environment for business and commerce.

Acknowledgements

In the course of research for this paper, the authors have had help and inputs from the following persons. We acknowledge their contributions and express our sincere thanks -

1. *Mr. Gan Kian Tee*
JutaFish Marketing Sdn. Bhd.
Tawau
2. *Mr. Lau Chieng Tiung*
Unistate Seafood (Sabah) Sdn. Bhd.
Tawau.
3. *Ms Kim Voon*
Tawau Seafood Sdn. Bhd.
4. *Mr. Tiong Kung Kiang*
P.P.E. Sdn. Bhd.
Tawau.

5. *Mr. Arthur Kong
New World Seagull Surimi Production Sdn. Bhd.
Kota Kinabalu.*
6. *Ms H'ng Suan Hoay
Kiang Huat Seagull Sdn. Bhd.
Kota Kinabalu.*
7. *Mr. H'ng Cheow Huat
Kauluan Sdn. Bhd.
Kota Kinabalu.*
8. *Mr. Yam Ken Chee
Sandakan.*
9. *Mr. & Mrs. Tang Yong Siang
Mrs. Lee Lie Yee
Tang Aik Sea Product
Sandakan.*
10. *Mr. Robert Tang Yen Ling
Protects Enterprise
Sandakan.*