FISHERY AND AQUACULTURE COUNTRY PROFILES	Food and Agriculture Organization of the United Nations	FID/CP/MYS
PROFILS DE LA PÊCHE ET DE L'AQUACULTURE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
RESÚMENES INFORMATIVOS SOBRE LA PESCA Y LA ACUICULTURA POR PAíSES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	February 2009

MALAYSIA

1. GENERAL ECONOMIC DATA

Area:	329 758 km^2
Shelf area (200 m depth):	about 450 000 km^2
Exclusive Economic Zone area (to 200 n.m.):	about 418 000 km^2
Length of coastline:	4 810 km
Population (2007):	26.5 million
GDP (2007):	USD 180.7 billion
GDP per head (2005) :	USD 4 960
Agricultural GDP (2005):	USD 12.3 billion

2. FISHERIES DATA

Commodity balance:

2005	**Production**	**Imports**	**Exports**	**Total supply**	**Per *caput* supply**
	tons live weight				**kg/head/yr**
Fish for direct human consumption	1 147 978	487 129	321 656	1 335 387	52.1
Fish for animal feed and other purposes	242 039	27 600	125 500	-	-

Estimated employment (2006):	
Primary sector (including aquaculture- 20 100):	111 000
Secondary sector:	not available
Gross value of fisheries output (2005)	USD 1 416 million

Trade (2007):	
Value of imports:	USD 633 667 000
Value of exports:	USD 752 393 000

3. FISHERY SECTOR STRUCTURE

1.

3.1 Overall fishery sector

The fishery sector has for decades been playing an important role as a major supplier of animal protein to the Malaysian population. In 2007 the total fishery production of the country amounted to 1 563 942 tonnes. The fisheries is generally considered to consist of two major components, namely marine capture fisheries and aquaculture. The greatest bulk of the fish landings has always come from the capture fisheries, constituting 88.3 percent of the total production for the year 2007, with the rest coming from aquaculture. Production from the inland fisheries is small, standing at around 0.3 percent. The production pattern has not changed much over the last couple of years.

3.2 Marine sub-sector

The marine capture fisheries are further sub-divided into coastal fisheries and the offshore sub-sector. Production from the marine capture fisheries was estimated to be 1 381 423 tonnes in 2007. The contribution from the coastal fisheries has remained fairly static lately at around 1.0 million tonnes. It is generally well accepted that the coastal fishery resources have been fully exploited. There is possibly some extent of overfishing. Over the years the Department of Fisheries (DOF) has tried various measures in an attempt to reduce the coastal fishing effort.

Further expansion of capture fisheries would need to come from the offshore sub-sector, namely the South China Sea. It has been estimated that the potential yield from the offshore areas is slightly over 400 000 tonnes. Given the present level of landings, the scope for an increase in landings is quite limited.

3.3 Landing sites

For the purpose of collection of landing statistics, the Department of Fisheries divides the coastal belts into fisheries districts. There are 41 fisheries districts on the West Coast of Peninsular Malaysia, 18 on the East Coast, 15 in Sarawak and 12 in Sabah, giving a total of 68 fisheries districts. Landings data are gathered from all these districts, but the details are left out in the compilation of the Annual Fisheries Statistic published annually by the Department of Fisheries.

Within each fisheries district there can be several landing sites, so there are hundreds of landing sites throughout the country. Information on the quantity of fish landed at each of these landing sites is not available.

3.4 Fishing production means

In the year 2004, there was a total of 36 136 licensed fishing vessels in the country, 15 651 of which consisted of small vessels powered by outboard engines or non-motorised (2 697). The remaining vessels are powered by inboard engines.

Nevertheless, small vessels below 10 GRT constitute nearly half of these vessels. The remaining vessels have GRT ranging form 10 to over 70, with decreasing number towards the high GRT end. Nevertheless, there are 833 vessels with 70 GRT or above.

Among these vessels over half, or 18 439, were licensed to fish with drift/gill nets. Most of these were small coastal vessels below 10 GRT. The trawlers constitute the next dominant group of vessels (6 055). Most of the larger vessels are either trawlers or purse seiners. The purse seiners were also a major group with 1 025 vessels. Vessels licensed to fish with hooks and lines numbered 4 731, most of them being small coastal vessels. Other minor fishing gears used include lift nets, stationary traps, portable traps, bag nets, barrier nets, push nets and scoops for shellfish collection. There is also a significant number of small unlicensed fishing vessels operating in the inshore waters with some of the so-called traditional gears (gears other than trawling or purse seining).

The trawlers are the most efficient vessels, taking up 56 percent of the catches, followed by the purse seiners, with a share of 22 percent. Despite their greater number, only 10 percent of the landings are taken by vessels operating drift/gill nets. The remaining catches are taken by vessels operating hook-and-line, bag nets and other miscellaneous fishing gears.

The above description is based on data for the year 2004.

3.5 Main resources

A great variety of fish species is caught from the warm tropical waters off the country. For the purpose of statistical collection, DFO categorises species caught into over 100 “groups”. A “group” may include over 10 species. Hence, over a thousand fish species could occur in the catches.

Several “groups” of pelagic fish consistently dominate the catches, with just one or two demersal fish “groups” appearing in the list of dominant groups. Shrimp catches have always been significant.

The pelagic Indian mackerel (*Rastrelliger* spp.) has always been the most dominant group, with landings of 156 687 tonnes in 2007. The landings come mostly from the purse seiners and drift/gill netters, trawlers apparently taking the most of remaining landings.

The round scad (*Decapterus* spp.), also pelagic, is the next dominant group with landings of 89 958 tonnes in 2007. It is mostly caught by the purse seiners, with less than 10 percent contributed by the trawlers. Lift nets come as a distant third.

The squids (*Loligo* spp.) generally come in third on the list of dominant groups, with catches of 59 730 tonnes in 2007. Trawlers generally contribute nearly 90 percent of these catches, with the balance coming from a wide range of other fishing gears.

Tunas and tuna-like species (*Thunnus* spp., *Euthynnus affinis, Auxis thazard, Katsuwonus pelamis*) are usually quite prominent, with landings of 52 909 tonnes in 2007. Most of the catches come from purse seiners, followed by drift/gill netters. Hooks and lines come in a distant third.

Threadfin bream (*Nemipterus* spp./*Pentapodus* spp.) is one of the few demersal fish groups landed in substantial amounts. The landings were 36 201 tonnes in 2007. The greater portion of the landings has always come from trawlers, followed by portable traps, drift/gill nets, and hooks and lines.

The anchovies (*Stolephorus* spp.), ox-eye scad (*Selar boop*s), hardtail scad (*Megalaspis cordyla*), lizard fish (*Saurida* spp./*Trachinocephalus* spp.) and jewfish (*Pennahia* spp./*Johnius* spp.) are other important fish groups with landings over 20 000 tonnes.

The landings of marine shrimp as a group have always been significant, with landings of 71 729 tonnes in 2007. However, there has been a slow decline in shrimp landings lately. The annual landings used to be over 90 000 tonnes in the 1990s, with a record catches of 126 405 tonnes achieved in 1992. Most of the landings come from trawlers, while drift/gill netters come in a distant second.

3.6 Management applied to main fisheries

For the purpose of regulating the fishing activities the marine waters are divided into four fishing zones, namely:

Zone A (from the shoreline to 5 n. miles):
Zone A is generally reserved for small vessels operating traditional fishing gears. Commercial fishing operations (trawling and purse seining) are not allowed.

Zone B (5 –12 n. miles):
Commercial fishing activities (trawling & purse seining), with vessels below 40 GRT, are allowed to operate in the area.

Zone C1 (12 –30 n. miles):
Zone C1 is for the operation of vessels below 70 GRT. The majority of such vessels are trawlers with some purse seiners.

Zone C2 (beyond 30 n. miles):
Zone C2 is for the operation of the fleet of offshore vessels of 70 GRT and above.

For each Zone the optimum number of fishing vessels has been determined based on estimation of maximum sustainable yield. The issuance of new fishing licences for the inshore waters has been suspended. A limited number of licences is still being issued annually to offshore vessels.

A series of marine parks has been established in the coastal waters. Fishing within two n. miles from the marine parks boundaries is prohibited. Surplus fishermen are diverted to the tourism sector, ferrying tourists to the parks, acting as tour or dive guides.

3.7 Fishermen communities

Out of the total fishing population of about 90 000 fishers in 2006, more than 55 200 were in Peninsular Malaysia, 13 200 in Sarawak, 29 850 in Sabah and 232 in Labuan. Malays make up nearly half of them. The next prominent group is the immigrant workers (31 percent), followed by the Chinese (17 percent). There are

very few Indians in the fishing industry, constituting less than 1 percent of the fishing population.

The greatest number (29 500) of these fishermen operate drift/gill nets. This is followed by those working on trawlers (25 018), and purse seiners (16 426). There are 8 258 of them utilising hook-and-line, with the remaining fishermen working on other traditional fishing gears.

3.8 Inland sub-sector

Malaysia does not have large river systems, or natural lakes, and with increasing industrialisation, many of the river systems are being polluted, leading to a decline in river fisheries. There are, however, a number of sizeable man-made reservoirs in Peninsular Malaysia (e.g. the Perak and Terengganu dams) that are being developed for inland fisheries, including for recreational fisheries. However, there is already evidence of decline in some of the reservoirs, e.g. the Kenyir dam in Terengganu. Several species of native river fish are considered endangered.

The inland fisheries contributed an insignificant production of 4 208 tonnes in 2007. There is probably not much scope for further expansion.

3.9 Recreational sub-sector

Recreational fishing has been practised for decades or possibly a century in the country, both in the inland water bodies and out in the open sea. Lately a significant number of aquaculture ponds, both brackish and freshwater, have also been converted into angling ponds. However, only recently the Department of Fisheries (DOF) has taken a greater interest in recreational fishing. But, as yet there are no regulations controlling recreational fishing activities, nor are there any reliable records on the number of people involved in such activities.

For a long time recreational fishing has been under the realm of tourism as a result of the substantial amount of revenue it generates. The European Tackle Traders Association estimated the value of angling and related expenditure in Malaysia at around USD 54 million in 2000. Arguably, as many foreigners and locals are prepared to spend substantial amounts of money on recreational fishing, this figure must have increased significantly during the last few years, in line with the growth in the number of local anglers and the rise in the number of foreign anglers visiting Malaysia.

The official homepage of Tourism Malaysia lists both fresh and salt water ponds open to anglers. It also has a listing of angling associations and organisers who assist in arranging fishing trips. Tourism Terengganu also has a website offering advice on when (April to August, for sea going) and where to go for freshwater (Kenyir) and marine (Pulau Perhentian, Pulau Redang and Pulau Kapas) recreation fishing.

However, many freshwater and marine fish species targeted by recreational anglers are considered threatened or endangered. Therefore, the Malaysian Angling Association has been advocating the practice of Catch and Release and with much success. It is claimed that Catch and Release now has become the norm for most anglers.

3.10 Aquaculture sub-sector

In 2007 aquaculture production reached 178 239 tonnes (208 239 tonnes including aquatic plants). The sector has long been identified as having the most potential for further development.

Among the various culture systems, the traditional culture of cockle on coastal mudflats on the west coast of Peninsular Malaysia has dominated, with cockle landings amounting to more than half the total aquaculture production (excluding seaweeds) until 1999. But, its share in total aquaculture production declined from 42 percent in 2000 to 28 percent in 2007. This was caused by a decrease in production in conjunction with a growth in production of most other species. In 2007, cockle production was 49,620 tonnes, followed by aquatic plants (30,000 tonnes), tilapia (26,409 tonnes), banana prawn (23,738 tonnes), *Clarias catfish* (21,892 tonnes) and giant tiger prawn (11,435 tonnes).

Mud flat culture (of cockles) is the most common production method, followed by freshwater pond culture, brackishwater pond culture, long-line culture of seaweed, and several other minor culture systems including marine cage culture of fish, raft culture of mussel and oyster, mining pool culture of freshwater fishes, freshwater cage culture, and tank culture of freshwater fishes - in that order. Shrimp culture in brackishwater pond contributes most in terms of value. The average unit price for marine shrimps is high, *inter alia,* because a significant portion is exported. Lately, the longline culture of seaweed, practised only in Sabah and negligible during several decades, has been gaining rapidly in importance.

http://www.fao.org/fishery/countrysector/naso_malaysia/en

4. POST HARVEST USE

4.1 Fish utilization

The bulk of fish, especially that from the marine capture sector, is sold in fresh and chilled form. Mud crab, molluscs, and freshwater fishes from the inland areas, however, are more likely to be sold in live form. A small amount of shucked cockle and mussel meat is available in the market.

Most aquaculturists prefer to market their products in live form, especially directly to restaurants, hoping to obtain higher unit prices than in other markets. However, the market for live fish is small, and most farmed fish is now marketed in chilled form.

The anchovies are always sold in dried form. The fish is usually cooked in brine on board the vessels, and dried on land before being marketed. A significant portion of small marine shrimp, especially that caught by coastal drift-nets and bag-nets, is also processed into the dried form for marketing.

Fish processing such as the making of shrimp paste (belacan), pickled shrimp (chincaluk), salted fish, dried cuttlefish, jelly fish, fish sauce, fermented fish (budu), fish crackers, fish balls and fish cake, has traditionally been family operations in fishing villages. However, there has been an increasing trend towards commercial operations lately, with industrial scale set-ups. The trend is likely to continue with

the small family businesses being slowly phased out in the coming years. The making of fish balls and surimi is for example mostly industrial in nature now.

Fish satay (flavoured dried fish) is a speciality of the Pankgor/Lumut area from the state of Perak. The quantity, however, is small. A small quantity of boiled mackerel is also available in the fresh fish market occasionally.

The greater amount of exported shrimp and tuna is frozen in processing plants. Shrimps are usually de-headed, peeled and de-veined before being frozen.

There is some canning of fish, cockle meat, and – but to a much lesser extent - mussels and cuttlefish.

Most of the trashfish is generally converted into fishmeal to be incorporated into animal feed, including fish and shrimp feed. The marine cage culture industry has also been dependent on the supply of trash fish for its feeding regime. With an estimated fish production of slightly over 10 000 tonnes annually, and assuming a feed conversion ratio of 8 to 1, up to 100 000 tonnes of trash fish could be needed. However, the actual amount utilized is likely to be less. Some fish farmers prefer formulated feed, while others are likely to use a mixture of trash fish and formulated feed.

4.2 Fish markets

Fish caught in the sea are landed at major landing points in chilled form. Commercial vessels are fitted with refrigerated seawater systems, while most traditional fishermen use ice. At landing points fish are generally auctioned to wholesalers. Some fishermen, however, are committed to sell their catches to specific wholesalers as a result of credits acquired earlier, or for the convenience of getting credit later when required. The Fisheries Development Authority of Malaysia (FDAM) has fish landing complexes in major landing points throughout the country. It also serves as fish auctioneer to ensure fair prices to the fishermen on those premises.

From the landing complexes, chilled fish are sent to major urban centres for retailing in the wet market. However, with greater urbanization, an increasing amount is being channelled to the supermarket chains in major cities/towns to cater for the needs of a more sophisticated urban population.

However, in times of excess/glut some fish is frozen and put into cold storage. Quality fish and shrimp also tend to be put into cold storage a month or two before the festive seasons, such as the Chinese New Year, when demand for such commodities is considerably higher, and so the prices.

A significant amount of cultured fish and shrimp is sent to Singapore both in live and chilled form. Some of the marine fish raised in coastal cage culture units are sold live to Hong Kong. Subsequently, a portion of this fish is re-routed to China in live form. Vessels from Hong Kong, equipped to transport fish live, ply the areas regularly for collection of fish. Small quantities of live coral fishes are regularly air freighted from Sabah to Hong Kong.

There is generally quite a high movement of fish among the various states of the country, depending on the supply and demand situation. During the monsoons, for

example, when the fishing effort is considerably reduced in the East Coast of Peninsular Malaysia, and in the State of Sabah and Sarawak, there can be substantial movement of frozen fish from the West Coast of Peninsular Malaysia to these areas.

5. FISHERY SECTOR PERFORMANCE

5.1 Economic role of fisheries in the national economy

In 2004 the contribution of the fishery sector to GDP amounted to 1.73 percent. The fishery sector has always been a source of foreign exchange. Though the economic value of a wide range of diversified supporting industries cannot be quantified, it could possibly be in the same order of magnitude.

The fishery sector also provided direct employment to 111 000 people in 2006. As indicated below under the sub-title of "Employment", the figure is an under-estimate. Additional employment opportunities are also created in the supporting industry.

Fisheries have always had a role in eradicating poverty and as a source of cheap animal protein to the rural communities.

5.2 Demand

With the growing population, increasing affluence, and the recognition that fish is actually the healthier source of animal protein, the demand for fish has been on the increase. *Per capita* consumption of fish was estimated to be 52,1 kg (live weight equivalent) in 2005.

5.3 Supply

Malaysia has always been a net importer of fish in the sense that the total fishery production, both from capture fisheries and aquaculture, has not been able to cater for the demand of fish in the country. The situation is worsened by the fact that a significant amount of high-value fish species, such as shrimp and tuna is exported. The shortfall in supply over demand is usually made good by the import of cheaper fish from the neighbouring countries. Nevertheless a small quantity of high-value exotic fish species is also imported.

Nevertheless, over the years the self-sufficiency level has been quite high, in the region of 94-95 percent.

5.4 Trade

Malaysia has always been a net importer of fish in term of volume and an exporter in monetary terms.

Based on statistics from 2007, in value terms, the greatest portion of the imported fish came from China, with a share of 21.0 percent, followed by Thailand (19.8 percent), Indonesia (15.1 percent), Viet Nam (8.6 percent), Myanmar (5.1 percent) and India (4.8 percent). The rest of the imported fish came from the United States, Taiwan Province of China, Pakistan, Japan, Norway and a long list of other countries.

In the same year, in value terms, the United States was the main market for Malaysian exports of fish and fishery products with a share of 24.5 percent, followed by Singapore (13.2 percent), Italy (9.3 percent), Japan (7.2 percent), China (6.2 percent), Australia (5.0 percent) and others.

5.5 Food security

As noted above, although Malaysia is a net importer of fish, the self-sufficiency level is always on the high side (over 90 percent). Furthermore, with the export of high-value fish and shrimp species, the foreign exchange earnings acquired from such exports are generally more than sufficient to offset the expenditure for fish imports.

The trend is likely to continue in the coming years. Production of high-value fish/shrimp species in the aquaculture sector is a major thrust of the Third National Agriculture Policy (NAP3). The policy is to continue the production and export of such quality commodity for export earning, and utilising the foreign exchange acquired for the import of relatively cheap fishery products to cater for the protein requirement of the general public. However, there is nothing to prevent those with the means to spend on luxurious seafood should they so desire.

Also in the rural areas many villagers probably get some of their protein requirement from catches from the river systems, irrigation canals, water impoundments and rice fields. Such catches generally are not reported and are therefore not included in the national production figures.

5.6 Employment

The fishing industry provided direct employment to 90 700 fishers in the year 2006. There were 51 480 of them working on coastal waters and 39 200 operating in deep-sea. About 41 000 fishers work on trawlers and purse seiners, with the rest working on traditional fishing vessels. In addition, there was a significant number of fishermen working on small unlicensed inshore fishing vessels.

The operation of the offshore vessels was largely dependent on the employment of foreign workforce, and possibly will continue to be so in the near future. To a lesser extent this is also true for the bigger trawlers and purse seiners. There were 28 150 registered foreign fishermen in 2004. It is likely that there was an additional number of them unregistered.

The aquaculture sector provided direct employment to 20 100 fish culturists in 2006. However, the word ”culturists” is synonymous with “farm owners” for the purpose of statistics collection by the Department of Fisheries. While many farms are small and do not employ extra workers, most shrimp farms may have several paid employees helping out with the farming operation. An integrated shrimp farm may have up to a hundred employees. These employees are not included in the count of “culturists” by DOF. Hence, the size of the workforce in the aquaculture sector is actually bigger than the official count of “culturists”. Again, some of these employees are foreign workers.

The younger generation of Malaysians, even those from fishing villages, are not interested in fishing or aquaculture, unless as boat/farm owners. Fishermen are not held in high esteem.

There is no reliable count on the number of workforce in the secondary or supporting industry. However, it has to be fairly high and possibly in the region of tens of thousands.

5.7 Rural development

As noted earlier, the younger generation of Malaysians no longer find working as employees in the fishery sector attractive. With better educational background, many prefer to move to urban centres to get better paying and more comfortable jobs. However, the existing fishery industry is still big enough to attract services from a wide range of supporting services. It is these supporting services that have been contributing to the growth of fishing villages.

6. FISHERY SECTOR DEVELOPMENT

Under Malaysia's National Agricultural Policy (NAP) 3 formulated in 1996, and valid for the period 1998 – 2010, fish production targets for the country were set at 1 930 000 tonnes for the year 2010, with 900 000 tonnes coming from the coastal fisheries, 430 000 tonnes from the offshore sector and 600 000 tonnes from the aquaculture industry. It is interesting to note that the then estimated optimal yield of 900 000 tonnes from the coastal waters has been exceeded.

6.1 Constraints

It is generally well accepted that the coastal fishery resources have been fully exploited, or possibly over-exploited. There has been consistent effort on the part of the Department of Fisheries to reduce the fishing effort in the coastal zone through various measures, though such attempts have not always been successful. The DOF is committed to the rational exploitation and management of the resources to ensure the present optimal yield can be sustained. There is no potential for further increasing the yield from the sector.

It is recognised that any development of the capture fisheries would need to come from the offshore sector, namely the South China Sea, where a potential yield of over 400 000 tonnes has been estimated. However, offshore fishing requires considerable capital investment. Many coastal fishermen who are keen to venture offshore but do not have the required financial capital, find it difficult to get credit from financial institutions. Lack of trained and willing local fishing hands for such fishing activities is another major challenge.

With long coastlines, vast expanses of coastal belt, inland areas, and water bodies suitable for aquaculture development, aquaculture provides the best avenue for greater fishery production in the coming years. The NAP3 targeted an aquaculture production of 600 000 tonnes for the year 2010 for the country. Based on the 1996 aquaculture production of 109 062 tonnes, the annual compounded growth would need to be in the region of 13 percent continuously over the period for the target to be met. However, the recorded production increases during the late 1990s and early 2000s have not been of the size needed to attain the stated targets.

As already stated, production of cockle, the dominant aquaculture activity in the country, has declined and most of the mudflat suitable for its culture has been fully

utilized. Hence, there is little room for further expansion. Productivity has remained static or even on the decline lately.

To some extent shrimp farming, over the years, has acquired the reputation of being destructive (being linked to mangrove clearing) and unsustainable. With greater public awareness of the ecological importance of the mangrove, high-lighted by an increasingly vocal environmental movement in the country, many state governments are being much more cautious in the allocation of large parcels of coastal land for such venture and the long process of land application is more of a constraint towards further development of this industry than the existence of suitable lands.

Expansion of the traditional coastal marine cage culture system is made difficult by lack of suitable sheltered waters. Therefore, and starting in the early 1990s, the Department of Fisheries has attempted to create an offshore cage culture industry. However, after over a decade of research and development effort, the industry has yet to take off in a big way, plagued by lack of quality seeds and disease infestation. There is no indication of a likely major breakthrough in either of the areas in the coming years.

Low consumer acceptance and hence market value for some of the cultured freshwater fish species, such as the various Chinese carps, catfish and tilapia, are also to a certain extent a constraint towards large scale expansion of the culture system, although the technology for such culture is well established.

6.2 Development prospects/strategies

There is no scope for further development of the inshore capture fisheries. The focus is really on the attempt to reduce the fishing effort so that the maximum sustainable yield can be maintained.

For the development of the offshore fisheries, the involvement and participation of the corporate sector, with the necessary financial resources and management skills, is encouraged. However, as a precautionary measure, only a limited number of new licences are issued annually, with constant monitoring of the resource situation to ensure that there is no overexploitation.

For aquaculture development the Department of Fisheries has identified land areas and water bodies deemed suitable for aquaculture development. Dialogues have been initiated with the various state governments for the allocation of such lands for aquaculture development.

As in the case of offshore fisheries, the involvement of the corporate sector in integrated aquaculture ventures has been actively encouraged by DOF. This is in a way tied up with the intention of the Department to establish large-scale aquaculture zones, with the DOF providing the needed infrastructure. Suitable parcels of land of various sizes would then be allotted to potential farmers/investors.

Provision of training in offshore fishing and aquaculture is a continuous effort of the Department to ensure that there will be adequate trained personnel for the development of both the offshore fisheries and the aquaculture sectors in the coming years.

6.3 Research

The fisheries research incumbent on the Department of Fisheries, is undertaken by Fisheries Research Institute Malaysia (FRIM) headquartered in Penang. Its major objectives are:

- To provide scientific advice for the sustainable exploitation and management of fishery resources;
- To conserve, rehabilitate and enhance aquatic resources;
- To enhance fish production through the development of appropriate technologies and utilization of new species for aquaculture;
- To develop new uses for living aquatic resources, upgrade quality and reduce post-harvest losses.

The FRIM has various branches located throughout the country, each specializing in specific fields of research.

The National Prawn Fry Production and Research Centre in Kg Pulau Sayak, Kedah, focuses on hatchery technology for marine shrimp and finfishes.

The Freshwater Fisheries Research Centre, Gelami Lami, Negeri Sembilan (formerly located in Batu Berendam, Malacca), specializes in freshwater fisheries and aquaculture.

The Brackishwater Research Centre in Gelang Patah, Johor, carries out research in brackishwater pond culture.

The Marine Fish Production and Research Centre in Tanjung Demong, Terengganu, is mostly involved in broodstock and hatchery development for marine finfishes.

The Fisheries Research Institute Sarawak in Bintawa, Sarawak, is a miniature version of FRIM, but concentrates on fisheries and aquaculture in the state of Sarawak.

The Likas Research Station in Likas, Sabah, is noted for its work related to hatcheries for marine finfishes.

The Marine Fisheries Research Development and Management Department (MFRDMD/SEAFDEC[1]) is a regional body aiming to be the centre of distinction in matters relating to resources and sustainable development of marine fishery resources in South East Asia. MFRDMD is really not a branch of FRIM in Penang, but a partner. It nevertheless collaborates closely with FRIM in matters relating to fishery resources in the region. It is a regional organization, under the jurisdiction of the DOF.

Beside the various research branches of DOF mentioned above, the local universities, in particular KUSTEM (University College of Science and Technology) in Terengganu, the Science University in Penang, the University of Malaya, Kuala Lumpur, the University of Malaysia Sarawak, the Putra University in Selangor, the University of Malaysia Sabah, the National University Malaysia in Selangor, and the University of

[1] Southeast Asian Fisheries Development Centre

Technology Malaysia in Johor also actively conduct research on fisheries, namely in resource assessment, fish biology, aquaculture, mangrove and coral ecology, habitat development and rehabilitation, pollution monitoring and assessment, disease control and prevention, toxicology, design of vessels and other subjects.

The WorldFish Centre, formerly known as ICLARM (International Centre for Living Aquatic Resource Management), is located in Batu Maung, Penang. The major objective of the Centre is "to reduce poverty and hunger by improving fisheries and aquaculture" .

6.4 Education

The Department of Fisheries conducts hands-on courses, both long-term and short-term on various aspects of fishing technologies, aquaculture and fish processing. The courses on fishing technologies and fish processing are conducted in the Institute of Fisheries Malaysia in Chendering, Tengganu. Those on brackishwater aquaculture are conducted in the Marine Fish Training Centre, Pulau Sayak, Kedah, and those on freshwater aquaculture and aquarium fish breeding are conducted in the Aquarium Fish Training Centre, Enggor, Perak.

Academic courses on fisheries and aquaculture are provided by KUSTEM, Tengganu, both at diploma and degree levels. Most of the other public universities mentioned above offer a wide range of related courses, also at diploma, degree and post-graduate level.

6.5 Foreign aid

MFRDMD/SEAFDEC is a regional organisation with funding support from JICA[2]. All the regional programme of the Department is financed by JICA, which also provides expert service to the fishery sector either on a long-term or short-term basis.

JIRCAS (Japanese International Research Centre for Agriculture Research) also has a cooperative study with FRIM in Penang on mangrove ecology.

The Department of Fisheries has always been working closely with SEAFDEC, NACA[3], FAO and WorldFish Centre on promoting fisheries and aquaculture development in the region.

Assistance is also obtained from countries such as Australia, Canada, and Norway in the fields of aquaculture; marine fisheries; monitoring, control and surveillance of marine capture fisheries; and in the use of remote sensing for coral reefs assessment in marine park management.

Malaysia participates in the project "Sustainable Management of the Bay of Bengal large Marine Ecosystem", implemented by FAO (2009-2013). This project addresses issues of overexploitation of resources, habitat degradation and land-based pollution.

[2] Japan International Cooperation Agency
[3] Network of Aquaculture Centres in Asia-Pacific

7. FISHERY SECTOR INSTITUTIONS

The Federal Department of Fisheries (DOF), with its Headquarters in Putra Jaya, Selangor, is responsible for the overall management and administration of the fisheries and related matters.

The DOF is headed by a Director-General (DG), aided by two Deputy Director-Generals (DDG), namely DDG (Development) and DDG (Operation).

The DDG (Development) has seven Department Divisions under his jurisdiction. These Divisions are :

Division of Aquaculture Development
Division of Fisheries Extension;
Division of Recreation Fisheries and Marine Park;
Division of Licensing and Resource Management;
Division of Planning and International Relation;
Division of Development and Legal Service; and
Division of Research.

The DDG (Operation) has six Department Divisions under his jurisdiction. These Divisions are:

Division of Administration and Finance;
Division of Fish Quarantine and Quality Assurance;
Division of Human Resource Development;
Division of Resource Protection;
Division of Fisheries Information Management; and
Division of Engineering.

Beside the two DDGs, also the various State Directors report directly to the Director-General in the Fisheries Headquarters. There is one State Director in each of the 13 States and the Federal Territory of Labuan. The organizational structure of each state office is a miniature version of that in the DOF Headquarters, with some of the lesser divisions missing.

The other government institution with responsibility on fisheries is the Fisheries Development Authority of Malaysia (FDAM). FDAM is a statutory body established in 1971 with the objective of upgrading the social-economic status of the fishing communities, including fishermen, fish farmers and processors. FDAM has the authority to regulate fish marketing in the country. The establishment by FDAM of landing complexes in major landing points, and the provision of auctioning service in such complexes are attempts to reduce the economic dependency of fishermen on the middlemen or wholesalers, hence increasing their income.

Below is a list of some of the most important internet links for the fishery sector:

Ministry of Agriculture and Agro-Based Industry:http://agrolink.moa.my/
or:
http://www.gov.my/MyGov/BI/Directory/Business/BusinessByLifeCycle/GrowBusiness/HumanResourceDevelopment/TrainingSeminarsAndCourses/MinistryOfAgricultureAndAgroBasedIndustry/

Department of Fisheries Malaysia: http://www.dof.gov.my/index.htm
Development Authority of Malaysia: http://www.lkim.gov.my/
Department of Fisheries Sabah : http://www.fishdept.sabah.gov.my/
Fisheries Research Institute Malaysia: http://www.fri.gov.my/
Marine Fisheries Research, Development and Management Department: http://www.mfrdmd.org.my/
Fisheries Research Institute Sarawak: http://www.fri.gov.my/friswak/about.htm
Malaysian Fisheries Society: http://www.vet.upm.edu.my/~mfs/
Malaysian Angling Association: http://www.pemm.org.my/
WorldFish Centre: http://www.worldfishcenter.org/cms/default.aspx

8. GENERAL LEGAL FRAMEWORK

The Fisheries Act 1985, and the regulations made under the Act provide the legal framework for the management of fishery resources and aquaculture.

The major fishery regulations are listed/summarised below:

It is an offence to carry out fishing activities in Malaysian waters without a valid licence.

An application for licence for new fishing vessels or fishing stakes shall be made before the construction of the vessels or fishing stakes is commenced.

The Director-General shall, in issuing a licence to a fishing vessel, impose such conditions to the licence as he thinks fit.

The DG may refuse to issue, renew or suspend any licence issued under the Act.

There could be no modifications to a vessel, already licensed, without the written permission of the DG.

It is an offence for a foreign fishing vessel to fish, load or unload fish in Malaysian waters without proper authorisation. However, the right to enter Malaysian waters for the purpose of passage to a destination outside these waters is recognised.

The use of explosive, poison and electric current for fishing is prohibited. It is illegal to fish for aquatic mammals and turtle in Malaysian waters. Such animals, if caught alive by accident, should be released back into the waters.

The Ministry may establish an area in Malaysian waters as a marine park. Fishing within two nautical miles of the marine park is prohibited.

A permit is required for the import and export of live fish. A licence from DOF is required for the setting up of any marine water-based aquaculture project.

Under the Environment Quality Act 1974, an environmental impact assessment is required for the establishment of an aquaculture project involving the clearance of more than 50 ha of mangrove.

Under the National Land Code 1965, land based aquaculture project can only be established on land gazetted as agricultural land.

http://www.fao.org/fishery/legalframework/nalo_malaysia/en