| FISHERY COUNTRY PROFILE | Food and Agriculture Organization of the United Nations | FID/CP/BGD |
|---|---|---|
| PROFIL DE LA PÊCHE PAR PAYS | Organisation des Nations Unies pour l'alimentation et l'agriculture | November 2007 |
| RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES | Organización de las Naciones Unidas para la Agricultura y la Alimentación | |

# THE PEOPLE'S REPUBLIC OF BANGLADESH

## I. GENERAL GEOGRAPHICAL AND ECONOMIC DATA

| | |
|---|---|
| Area: | 147 570 km$^2$ |
| Water area: | 52 753.5 km$^2$ |
| Shelf area (down to 200 m): | 67 000 km$^2$ |
| Length of continental coastline: | 480 km |
| Population (2006 projected): | 138.8 million |
| GDP at purchaser's value (2005-2006): | US$ 6 025.04 million |
| GDP per head (2005-2006): | US$ 447 |
| Agricultural GDP (2005-2006): | US$ 901.78 million |
| Fisheries GDP (2005- 2006): | US$ 236.48 million |

## II. FISHERIES DATA

| Data for 2003 | Production | Imports | Exports | Total supply | Per capita supply |
|---|---|---|---|---|---|
| | | tonne liveweight | | | kg/year |
| Fish for direct human consumption | 1 998 197 | 3 390 | 44 353 | 1 956 984 | 13.3 |
| Fish for animal feed and other purposes | 251 | Imported, but no data available | No data available | No data available | |

Estimated Employment (2005-2006):

| | |
|---|---|
| (i) Primary sector (including aquaculture) | 22.9 million |
| (ii) Secondary sector | 21.4 million |
| Gross value of fisheries output (2005-2006): | US$ 2 435.37 million |

Trade:

| | |
|---|---|
| Value of fisheries imports (2006): | US$ 5 118 000 |
| Value of fisheries exports (2006): | US$ 458 358 000 |

# III. FISHERY SECTOR STRUCTURE

## *3.1 Overall fishery sector*

Fish plays a major role in meeting the animal protein demand, foreign exchange earning and socioeconomic development of the rural poor by alleviating poverty through employment generation in an agrobased country like Bangladesh. Bangladesh fisheries have three sectors: inland capture, inland culture and marine capture. The inland capture fisheries exploit open water areas of rivers and their tributaries, estuaries, the Sundarban mangrove forest area, permanent wetlands called *beel* and seasonal flood plains. The inland culture fisheries includes production from closed water bodies such as ponds and ditches, ox-bow lakes, *baor*, and coastal and inland shrimp and fish farms. The marine fisheries comprise industrial and trawl fisheries and small-scale artisanal fisheries by coastal fisher communities. The total area under inland waterbodies is about 500 000 ha, of which 91 percent is open water and 9 percent closed waterbodies.

There are 265 species of freshwater finfish and 475 marine fish species reported from the country, together with 68 shrimps and prawns, 26 marine and freshwater turtles and tortoises, 24 amphibians, more than 300 molluscs, 2 crocodiles, 1 gavial, about 20 water snakes, about 182 aquatic or wetland birds, and 12 aquatic mammal species. There are 93 species of exotic fishes introduced in the country, of which 18 were introduced for culture fisheries and the rest for aquaria. Two accidental releases of alien species have been recorded so far.

Inland fisheries are the major source of fish to meet national demand. Major carps, exotic carps, catfishes, snakeheads, live fishes, *hilsha* fishes and small indigenous fishes are the most important fisheries in commerce, and 2005-2006 statistics show that the large and small indigenous species formed 45.43 percent of inland fish produced in the country, followed by major carps (27.59 percent), exotic carps (13.94 percent), large and small shrimps (8.81 percent) and *hilsha* fishes (4.23 percent). In 2005-2006, the fisheries growth rate of GDP at constant prices was 3.91 percent (based on the year 1995-1996). For 2006-2007, the expected growth rate of GDP was 3.99 percent.

## *3.2 Marine subsector*

Bangladesh is bounded on the south by the Bay of Bengal. The coastline of Bangladesh is about 480 km long, and the continental shelf extends over an area of about 66 400 $km^2$, of which about 37 000 $km^2$ is within the 50-m-depth zone and has good fisheries resources. This sector can further divided into industrial and artisanal fishing subsectors.

### 3.2.1 Catch profile of marine fishes

The main catches from the Bay form two broad groups: finfish and shrimps. According to DoF 2005-2006 data, marine fishes were further grouped into 9 categories. Marine *hilsha* contributed the most (41.44 percent of total catch of 198 850 t), followed by shrimp (48 119 t; 10.03 percent), Bombay duck (Herpodonidae) (37 331 t; 8.20 percent); Jew fishes (32 538 t; 6.78 percent); catfishes (18 151 t; 3.78 percent); pomfret (12 023 t; 2.51 percent); sharks and rays (4 448 t; 0.93 percent); and miscellaneous marine fishes (125 332 t; 26.12 percent). Industrial (trawl) fishing contributed only 7.10 percent of the total catch from the Bay. Moreover, trawl fishing catches during 2005-2006 fiscal year were poor (34 084 t in total). The trawl catch comprised marine catfishes (3 544 t), shrimp (3 444 t), Jew fishes (3 247 t), pomfrets (388 t), Bombay duck (371 t) and other, miscellaneous, marine fishes (23 090 t). The artisanal fisheries contributed 92.9 percent fishing in the same fiscal year, which was in total 439 600 t, caught by powered and unpowered traditional boats, using gill nets (57.7 percent of catch), set bag nets (29.0 percent), trammel net (2.5 percent), long lines (6.0 percent) and other fishing gear (4.8 percent).

### 3.2.2 Landing sites for marine fishes

Landing sites are not fixed as catch is unloaded in various places in the coastal belt of the country. There are 5 government fish landing centres in the coastal areas (black squares on

map in Figure 1) established and administered by Bangladesh Fisheries Development Corporation (BFDC), and more fish landing sites in the private sector (red squares on map). The map indicates the more important landing sites in the coastal area of Bangladesh.

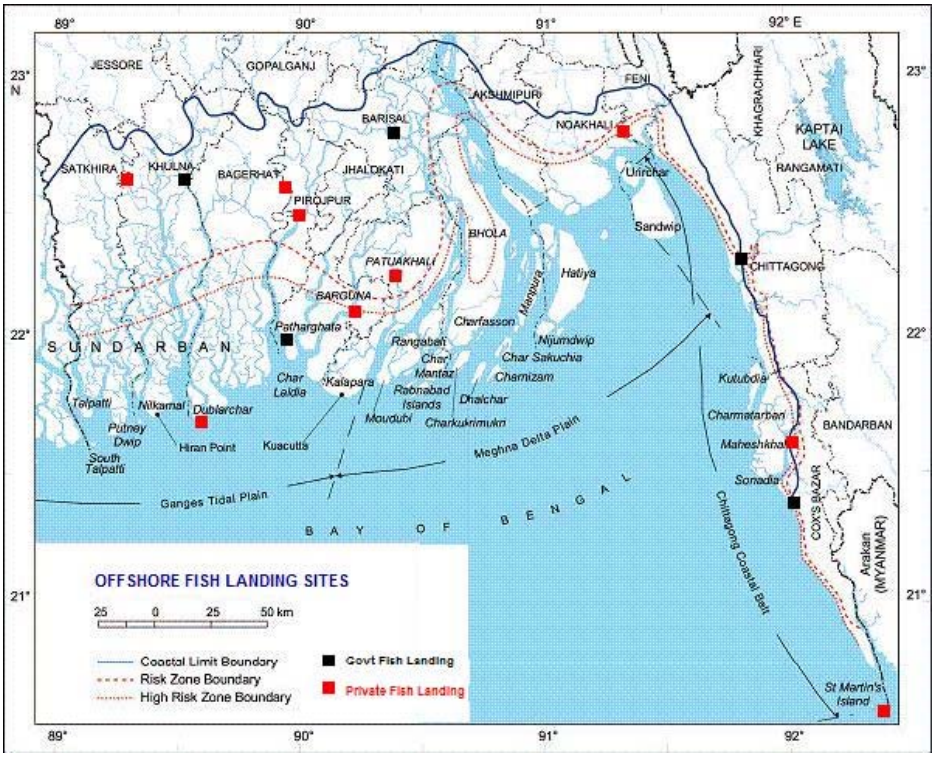


**Figure 1**. Main landing sites in the coastal area of Bangladesh. Black squares indicate State operated sites; red squares indicate privately operated sites.

### 3.2.3 Fishing production means for marine fish

In general, about 93 per cent of the marine fish catch is harvested by artisanal fisheries. The share of the industrial trawl fishery has been static over the last two decades. At present, approximately one-third of the Exclusive Economic Zone (EEZ) is fished, while the remaining area of the deeper part of the EEZ needs to be explored and developed.

According to the 2005-2006 fish catch profile, industrial fishing was carried out by 122 trawlers catching 34 084 t of finfish and shrimps. Of them, 42 were shrimp trawlers (3 544 t of shrimp and 6 921 t of fish; total 27 163 t). The other 49 trawlers were fish trawlers, catching 16 t of shrimp and 23 207 t of fish (total 23 223 t). In the artisanal fishery, 21 433 powered boats and 22 527 unpowered boats equipped with 106 316 gill nets, 50 083 set bag nets, 6 925 trammel gear, 24 614 long lines and 30 643 other gear types were involved.

### 3.2.4 Main resources in marine fishes

The marine fisheries resources comprise primarily finfish and shrimp. The catch in 2005-2006 consisted of marine *hilsha* (Clupeidae; 41.44 percent); shrimp (penaeid and other families; 10.3 percent); Bombay duck (Herpodonidae; 8.20 percent); Jew fishes (Sciaenidae; 6.78 percent); catfish (Plotosidae; 3.78 percent); pomfret (Carangidae; 2.51 percent); sharks and rays (various families; 0.93 percent); Indian salmon (Polynemidae; 0.21 percent); and miscellaneous marine fishes (26.12 percent). The major fishing grounds and their fishery are given in Table 1.

**Table 1**. Fishing grounds in the Bay of Bengal, with location and major fisheries.

| Fishing Ground | Location | Major Commercial Fishes |
|---|---|---|
| A. South Patches (6 200 km$^2$) 60–80 m depth | 91°10'E – 91°50'E; 21°10'N – 21°40'N Squares 302–305, 402–405, 502–505 and adjacent waters | Indian salmon, *hilsha*, pomfret, ribbonfish, Bombay duck, Carangids, eel, Jew fish, catfish, sharks and rays |

| | | |
|---|---|---|
| B. Middle Ground (4,600 km$^2$) 80-100 m depth | Can be sub-divided into two fishing areas | |
| 1. Southwest of South patches | 90°30'E – 91°40'E; 20°45'N – 21°10'N Squares 603–609, 703–709, and adjacent waters | Pomfret, red snappers, Ribbonfish, silver Jew, Carangids, shrimp |
| 2. East of Swatch of No-ground | 90°00'E – 90°40'E; 21°00'N – 21°25'N Squares 509–512, 609–612. | Indian mackerel, snappers, groupers, Jew fish. In shallower upper area: Koral, Pangas, and Triple tail (Perch) |
| C. Swatch of No-ground (3 800 km$^2$) submarine canyon type, depth more than 800–1000 m | 89°00'E - 90°00'E; 21°00N - 21°40'N | Shrimps, *hilsha*, pomfret, ribbonfish, Bombay duck, Jew fish |

### 3.2.5 Management applied to main fisheries

The management of marine fisheries are basically met by closed season and input control, i.e. licensing of fishing vessels. DoF lacks any research vessel and for MSC purposes relies on the Bangladesh Navy and Coast Guard. In the 2004-2005 fiscal year, 122 trawlers were licensed to fish; there is no control over the artisanal sector. Government has also banned the use of set bag nets and a complete ban on shrimp fry catchers along the coastal belt to preserve the biodiversity. All these management activities are executed under the Marine Fisheries Ordinance 1983, as well as Marine Fisheries Rules 1983.

### 3.2.4 Fishermen communities

Over 167 000 fishermen and support staff are employed in the marine sector. In addition, about 185 000 people are engaged in part-time shrimp fry collection activities.

## *3.3 Inland subsector*

The inland fishery consists of open water capture fisheries, which contributed about 41.1 percent of total national fish production in 2005-2006. The capture fisheries includes the fish catch from the vast uncultivated water bodies including the rivers and estuaries, the mangrove forest (Sundarban), wetlands like *Beel*, vast seasonal flood lands and the country's largest and only hydroelectricity generation artificial lake, Kaptai.

### 3.3.1 Catch profile

The inland fisheries is the major commercial fishery of Bangladesh. The catch profile is given in Table

2. In 2005-2006, the river and estuary together produced 0.14 million metric tons of fish with a contribution of 134 Kg catch/Ha area. Beels produced 0.07 million metric tonnes of fishes, which contributed 669 Kg catch/ Ha area. The vast flood land is source of the major catch of the open water fisheries. In the same fiscal year, the flood lands produced about 0.7 million metric tons of fishes. In average, it was about 254 kg catch/ Ha area. The largest man made lake Kaptai produced 0.008 million metric tonnes of fish, in average about 110 kg/ha area production.

**Table 2**. Area and production of fishes from different inland open water bodies of Bangladesh in 2005- 2006.

| Category | Water area (ha) | Total catch (tonne) | Catch/Area (kg/ha) |
|---|---|---|---|
| River and estuaries | 1 031 563 | 137 859 | 134 |
| Sundarbans* | - | 16 423 | - |
| Beel | 114 161 | 74 365 | 669 |
| Kaptai Lake | 68 800 | 7 548 | 110 |
| Flood lands | 2 832 792 | 718 491 | 254 |
| TOTAL | 4 047 316 | 956 686 | |

Notes: Sundarban area included in rivers and estuaries.

### 3.3.2 Landing sites for inland open water fisheries

There are no definite landing sites for inland fisheries except one government landing site at Rajshahi, established and administered by BFDC. However, numerous private fish landing sites are evident depending on the location, market, town and facilities. The rule of thumb is that each city or major river port or water body has at least one major private landing site, which have an ice factory, auction house and with good communications.

### 3.3.3 Fishing production means for inland open water fisheries

The inland fisheries use various gear according to season and district. They include gill nets, seine nets, drag nets, fine purse nets, stake nets, dip nets and cast nets, together with 26 types of traps, 8 spears and harpoons and some 5 types of longlines. The variations in fishing production means are due to the water or geographical variation and traditional or fishing differences.

### 3.3.4 Main resources in inland open water fisheries

The aquatic resources of the inland open water fisheries was considered earlier (Table 2). The major fisheries are divided into two broad groups: large fishes (mainly major carps, large catfish, eels and others) and small fishes (minor carps, barbs, minnows, snakeheads, etc.). The large fish fisheries are in the rivers while the small fishes are from the beels and canals. *Hilsha* is also available in rivers and their tributaries during its migration from the sea in the rainy season.

### 3.3.5 Management applied to inland open water fisheries

The major fisheries and livelihoods of the poor fishermen mainly depends upon the open water fishing. Overexploitation is a major problem, in many cases resulting in loss of species diversity from many water bodies of the country, However, to maintain the stock and production from open water fisheries, the following management attempts have been made:

- Enhancement of stock by releasing fish fingerling in open water.
- Community-based Fisheries Management has shown most success in maintaining open waterbodies.
- Leasing and licensing for fishing of ‘Jolmohal’ areas of waterbodies belongs to the government.
- Fish culture in food plain areas. A Daudkandi model has been proposed by the DoF.
- *Hilsha* conservation effort by restricting fishing of the migratory juvenile *hilsha* in the river in rainy season.
- Restricting gear and fishing of fecund fishes in the breeding season.
- Conserving the only major carp breeding sites at Halda river.
- Habitat restoration programmes, including excavation of the *beel.*
- Establishment of fish sanctuaries.

### 3.3.6 Fishermen communities involved in inland open water fisheries

The inland open water fishery provides employment for 770 000 fishers through access to the waterbodies.

## *3.4 Recreational subsector*

Geomorphologically, Bangladesh has some interesting large inland water bodies that are leased for recreational fishing, almost all line fishing. Most often the lakes are managed by a club or by the city development authority. Access is available by ticket or licensing, depending upon the agreement with the administrative authority.

### 3.4.1 Catch profile of sports fishing

The sport fishery is dominated by major carps. Occasionally, exotic fishes have been introduced. The club releases the fish in the lake and maintains the rearing facilities. No catch profile is available, and the production is included in the pond production of the country.

### 3.4.2 Major sites for sport fishing

There are major sports fishing sites in the country, but no statistics are available in the DoF. The major sport fishing sites are Dhanmondi lake, Dhaka; Gulshan Lake Dhaka; Banani lake, Dhaka; Ramsagar, Dinagpur; Jamindar Pukur, and Jessore.

### 3.4.3 Fishing production means in sport fishing

Rod and line is used, with live or prepared bait.

## *3.5 Aquaculture subsector*

The aquaculture subsector includes fishery husbandry activities in closed water bodies, some 529 000 ha of water area. The distribution is given in Table 3. The husbandry activities include pond and ditch, *baor* or oxbow lake, and shrimp farm production. The pond fisheries are countrywide. The closed water oxbow lakes (*baor*) fish culture is situated in the southwest of the country. The brackish water shrimp (*Penaeus monodon*) culture is in the southern, eastern and western coastal regions, while giant freshwater prawn (*Macrobrachium rosenbergii*) culture is expanding across all the country.

**Table 3.** Area and production of fish from various aquaculture sectors in 2005–2006.

| Sector | Water area (ha) | Total production (tonne) | Production per unit area (kg/ha) |
|---|---|---|---|
| Pond and ditch | 305 025 | 759 628 | 2 490 |
| Baor or oxbow lake | 5 488 | 4 498 | 820 |
| Shrimp farm | 217 877 | 127 923 | 587 |
| TOTAL | 528 390 | 892 049 | |
| Percent contribution to the national total | 11.5 percent | 38.3 percent | |

### 3.5.1 Production profile of culture fisheries

The production profile is given in Table 3. Finfish production from ponds and ditches was 759 628 t in 2005-2006. In the same period, *baor* production was 4 498 t and shrimp production was 127 923 t. Considering unit area production, pond production was highest at 2 490 kg/ha, followed by 820 kg/ha in *baor* and 587 kg/ha in shrimp ponds. The ponds are also classified as cultured (64.97 percent by area), culturable (22.58 percent by area) or derelict (12.44 percent by area), which contributed 84.43 percent, 10.79 percent and 4.78 percent of pond production, respectively. The shrimp farms produced 85 510 t of shrimp as well as 42 413 t of fish as by-catch.

### 3.5.2 Landing sites

All major cities have landing places. For shrimp, the depot serves as a landing site from farms. For small-scale production, the local market is the final destination of the product.

### 3.5.3 Fishing production means

In most cases, fertilizer is used to enhance natural productivity. Supplementary feeds are used in semi-intensive or intensive fish culture ponds. For marine or brackishwater shrimp culture, only fertilizer is used. For freshwater prawn and Thai pangus, supplementary feed is used. The fishing is done by Jhaki Jal or cast net, Chai or traps, Tana jal or drag or seine nets, and others. Sometime Barshi or longlines are used to catch a small number of fish from a pond. For commercial harvesting, seine nets are used by professional fishers.

### 3.5.4 Main resources

The main resources of the sector are the fish species itself. A good number of fish species have commercial value. The indigenous species are major carps, minor carps and indigenous catfish. The exotic fishes include carps, tilapia, Thai barbs, Thai pangasids, etc. The country has made tremendous progress in hatchery development through private entrepreneurs for fish seed production. Several world class large shrimp and prawn hatcheries have been established.

The aquarium fish sector has good long-term prospects and is currently expanding fast.

### 3.5.5 Management applied to main fisheries

The management of fisheries and its extension is clear from the efforts of the people and government. Activities include:

- Carp hatchling production
- Carp nursing
- Shrimp hatchery establishment and production
- Fish feed industry
- Fish culture in paddy fields
- Fish culture in cages and pens
- Culture-based lake management
- Culture-based management of minor flood plains, popularly known as the Daudkandi model

## *3.6 Post-harvest use*

### 3.6.1 Fish utilization

Fish is directly consumed by the people of the country. However, post-harvest processing of fish is seen countrywide. Most processing is traditional, and in some cases with regional differences. Fish drying is common everywhere. Frozen fish and shark fins are mainly for foreign markets. Local fish meal is produced from low quality or dry fish waste. Smoked fish and fermented fish paste are produced locally with specific recipes. For example, fish paste 'Shidol' is produced in North Bengal with small fishes, whereas in other parts barbs (*Barbus* spp.) are used and known as Tepa shutki. In the coastal region, 'Napte' is made from small shrimps from the Bay.

### 3.6.2 Fish markets

Bangladeshis are known as fish eaters. However, fish is now being exported globally. The products may be broadly categorized as frozen shrimp, frozen frog legs, live fishes, frozen fish, dry fish, salted and dried fish, turtles, tortoises and crabs, shark fin, fish jaws, etc. The present status is summarized in Table 4. It can be seen that frozen shrimp is the major export item of the country. Recently this sector has been improved to meet HACCP and other export requirements. Fish and shrimp and the processed products are exported to USA, Canada, EU, Japan, Middle East and India.

**Table 4**. A comparative picture of fisheries export items from Bangladesh.

| Export Item | 1985–1986 | | 2005–2006 | |
|---|---|---|---|---|
| | tonne | US$ $\times 10^6$ | tonne | US$ $\times 10^6$ |
| Frozen shrimp | 13 631 | 90.74 | 49 317 | 402.7 |
| Frozen frog leg[(1)] | 2 463 | 10.13 | – | – |
| Live fish | – | – | 57 | 0.07 |
| Frozen fish | 5 017 | 12.29 | 17 429 | 43.9 |
| Dry fish | 786 | 3.39 | 150 | 0.33 |
| Salted and dehydrated fish | 422 | 1.67 | 591 | 2.96 |
| Turtles, tortoises, crabs | 679 | 1.39 | 1 107 | 1.90 |
| Sharks (fins, fish and fish jaws) | 50 | 0.36 | 78 | 0.12 |

| | | | | |
|---|---|---|---|---|
| Other | – | – | 100 | 0.16 |
| Total | 23 048 | 119.97 | 68 829 | 452.2 |

Notes: (1) Now a banned item for export.

# IV. ORGANIZATION AND INSTITUTIONS IN FISHERIES

The Department of Fisheries (DoF) is the principal institution for the management and development of the fish resources of Bangladesh. Its activities are supported by two other organizations, the Bangladesh Fisheries Development Corporation (BFDC) and the Bangladesh Fisheries Research Institute (BFRI). The DoF URL is http://www.fisheries.gov.bd/

BFRI was created by an Ordinance entitled "The Fisheries Research Institute Ordinance, 1984" on 11 July 1984. In pursuance of this Ordinance, the Institute was established in July 1984. In 1997, the Institute was renamed the Bangladesh Fisheries Research Institute (BFRI). The BFRI URL is http://www.fri.gov.bd/

The Bangladesh Fisheries Development Corporation (BFDC) was established in 1964 to help fisheries product conservation and distribution through management of harvesting of fishery resources and by developing marketing facilities. BFDC has established fish harbours, landing and distribution centres, ice plants and processing plants at various sites in the country. E-mail: <bfdc@citechco.net>

The Marine Fisheries Academy (MFA) was established under the Ministry of Fisheries and Livestock for training personnel for fishing vessels. The centre was upgraded in 1983 to meet growing demand and expansion of the fishing fleet. MFA URL is http://www.mofl-mfabd.net/

Fisheries research in Bangladesh is structured through the BFRI. It has several specialized stations and substations for R&D, often in association with universities offering degrees in fisheries. Many of the university graduates now work as extension workers in the country. The Bangladesh Agricultural University, Chittagong University, Dhaka University, Hazi Danesh University, Khulna University, Noakhali Science and Technology and Rajshahi University offer degrees in fisheries. In addition, specialized degrees from zoology departments are offered by Chittagong, Dhaka, Jahangirnagar, Jagannath, National and Rajshahi universities.

# V. GENERAL LEGAL FRAMEWORK

A few laws and rules apply to protection and conservation of fisheries resources. The first fisheries law was in 1938, to protect ponds. Later, in 1950, a detailed conservation law for inland water resources was enacted. The law for protection and conservation of marine resources was implemented from 1983. The legal acts comprise:

- The Tank Improvement Act 1939, for bringing the ponds (Private not used for fish culture) under fish culture by law.
- The Protection and Conservation of Fish Act 1950, for conservation and management of inland fisheries.
- The Marine Fisheries Ordinance 1983, for protection, conservation and management of marine fisheries.
- The Fish and Fish products (Inspection and Quality Control) Ordinance 1983, for post-harvest quality control and safety assurance of fish and fish products for local consumption and export.

The government has revised the fisheries and related laws through amendment and notifications from time to time. Recently some new laws have been formulated. They are:

- The Fish Feed Act: A law is proposed to ensure the quality of fish feed used in fish culture sector.
- The Fish and Shrimp Hatchery Act. A law is proposed to mitigate the inbreeding and cross-

breeding practical problems in many hatcheries. It will also help in the improving the quality of fish seed from hatcheries.

- The Fish Quarantine Act. A law is proposed that will help maintain the quality of fish and fishery products and prevention of diseases for both import and export.
- The Fish Sanctuary Act. A law is proposed to establish fish sanctuaries with a view to improve fish habitats and augment natural fish stock. This will also help in maintaining biodiversity in the open water bodies.