



Natural Resources of Bangladesh

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Introduction

Natural resources is most important for a country. There are many countries which are directly depends on natural resources. Bangladesh is a developing country. Area of Bangladesh is small. We have also some natural resources. Some are renewable and some are non-renewable.

Classification of natural resources of bangladesh

In the context of Bangladesh the natural resources are classified into two types. Followings are the categories of natural resources of Bangladesh. Renewable Natural Resources are Water, Fish, Forest etc and Nonrenewable Mineral Natural Resources are Gas & Oil, Coal, Rock, Sand etc.

Water Resources

Water is the available renewable natural resources of Bangladesh. Bangladesh is endowed with plenty of surface and groundwater resources. The surface water resources comprise water available from flowing rivers and static water bodies as ponds, beels and haors. Surface water inflows of the country vary from a maximum of about 140,000 m³/s in August to a minimum of about 7,000 m³/s in February. Two main rivers, the brahmaputra and the ganges account for more than 80% of streamflows. The highest flood discharge of the Ganges observed at hardinge bridge in1987 was 76,000 m³/s and that of the Brahmaputra observed at Bahadurabad in 1988 was 98,600 m³/s. the minimum discharges of the rivers are 261 m³/s and 2800 m³/s, respectively. The average daily flow of the Ganges is about 10,874 m³/s, which reduces to 1366 m³/s during season and increases to 32,00 m³/s. The highest flow is about 44,000 m³/s which is usually received in August. The annual average discharge of the Meghna at Bhairab Bazar is approximately 4,800 m³/s and the maximum flow occurs generally around mid August. (Banglapedia, CD version 2.0)

River

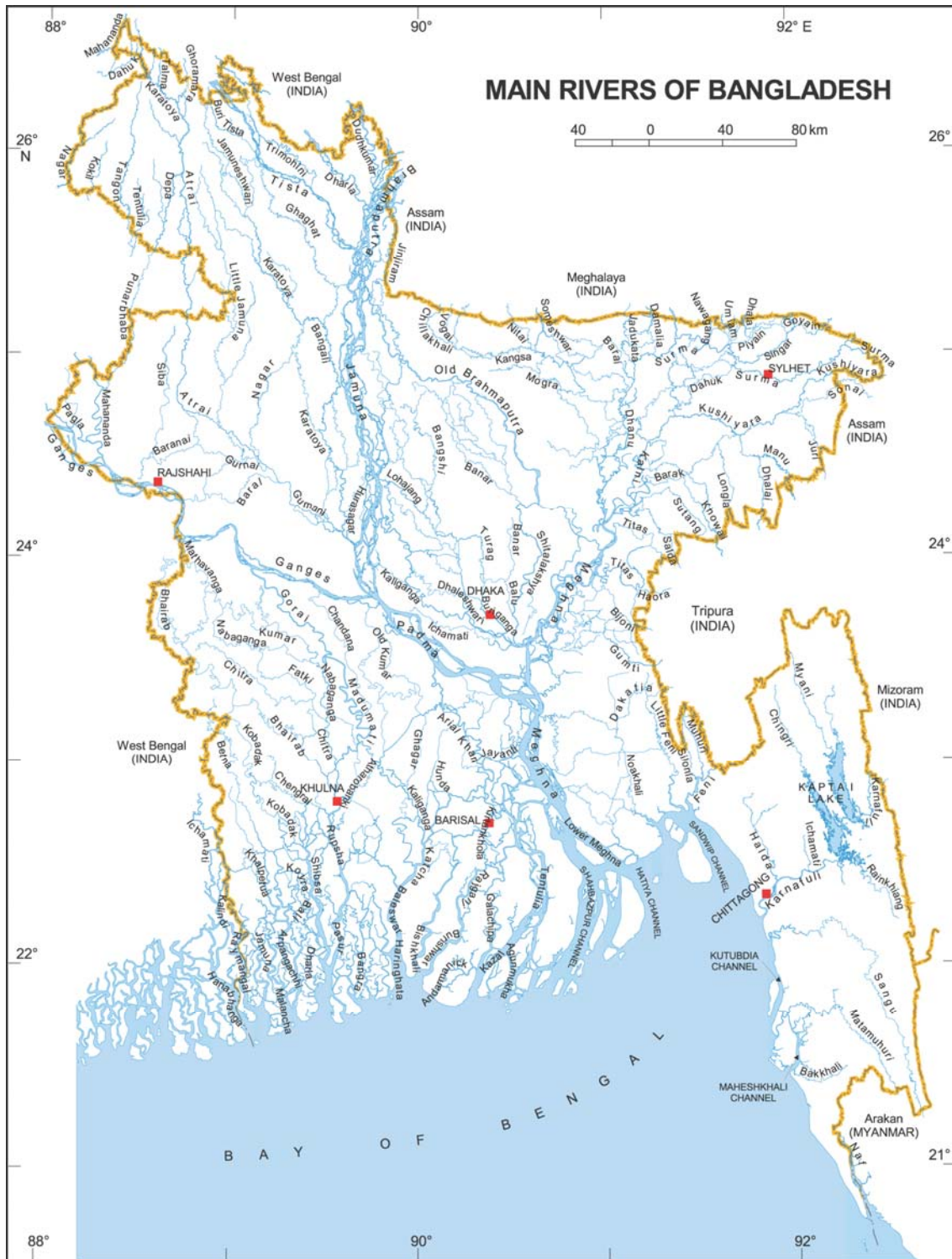
long water course that flows down a slope along a bed between banks. It originates from a 'source' and culminates to a SEA or lake at its 'mouth'. Along its length it may be joined by smaller rivers called 'tributaries'. A river and its tributaries form a 'river system'. Land surfaces are never perfectly flat, and as a result the RUNOFF WATER after precipitation tends to flow downward by the shortest and steepest course in DEPRESSIONS formed by the intersection of slopes. Runoff water of sufficient volume and velocity join to form a stream that, by the EROSION of underlying earth and rock, becomes deep enough to be fed ground water or when it has as its source an ultimate water RESERVOIR, for example, the GANGES flowing from the Gangotri Glacier and the BRAHMAPUTRA from the Manas Sarovar. (Banglapedia, CD version 2.0)

Table: Major rivers of Bangladesh

| River | Length (km) | Area covered (old districts) in km |
|--|-------------|---|
| Arial Khan | 160 | Faridpur (102) Barisal (58) |
| Bangshi | 238 | Mymensingh (198) Dhaka (40) |
| Betna-Kholpotua | 191 | Jessore (103) Khulna (88) |
| Bhadra | 193 | Jessore (58) Khulna (135) |
| Bhairab | 250 | Jessore, Khulna |
| Bhogai-Kangsa | 225 | Mymensingh (225) |
| Brahmaputra-Jamuna (Jamuna 207) | 276 | Rangpur (140) Pabna (136) |
| Buriganga | 27 | Dhaka (27) |
| Chitra | 170 | Kushtia (19) Jessore (151) |
| Dakatia | 207 | Comilla (180) Noakhali (27) |
| Dhaleshwari | 160 | Mymensingh, Dhaka |
| Dhanu-Bulai-Ghorautra | 235 | Mymensingh (126) Sylhet (109) |
| Donai-Charalkata-Jamuneshwari-Karatoya | 450 | Rangpur (193), Bogra (157), Pabna (100) |
| Ganges-Padma (Ganges 258, Padma 120) | 378 | Rajshahi (145), Pabna (98), Dhaka and Faridpur (135) |
| Gorai-Madhumati-Baleshwar | 371 | Kushtia (37), Faridpur (71), Jessore (92), Khulna (104), Barisal (67) |
| Ghaghat | 236 | Rangpur (236) |
| Karatoya-Atrai-Gur-Gumani-Hurasagar | 597 | Dinajpur (259), Rajshahi (258), Pabna (80) |
| Karnafuli | 180 | Chittagong HT, Chittagong |
| Kobadak | 260 | Jessore (80) Khulna (180) |
| Kumar | 162 | Jessore, Faridpur |
| Kushiyara | 228 | Sylhet (228) |
| Little Feni-Dakatia | 195 | Noakhali (95) Comilla (100) |
| Lower Meghna | 160 | from Chandpur to the Bay of Bengal |
| Matamuhuri | 287 | Chittagong HT and Chittagong |
| Mathabhanga | 156 | Rajshahi (16), Kushtia (140) |
| Nabaganga | 230 | Kushtia (26) Jessore (204) |
| Old Brahmaputra | 276 | Mymensingh (276) |
| Punarbhaba | 160 | Dinajpur (80) Rajshahi (80) |
| Rupsa-Pasur | 141 | Khulna (141) |
| Sangu | 173 | Chittagong (80), Chittagong Hill Tracts (93) |
| Surma-Meghna | 670 | Sylhet (290), Comilla (235), Barisal (145) |
| Tista | 115 | Rangpur (115) |

Source Bangladesh Bureau of Statistics 1999

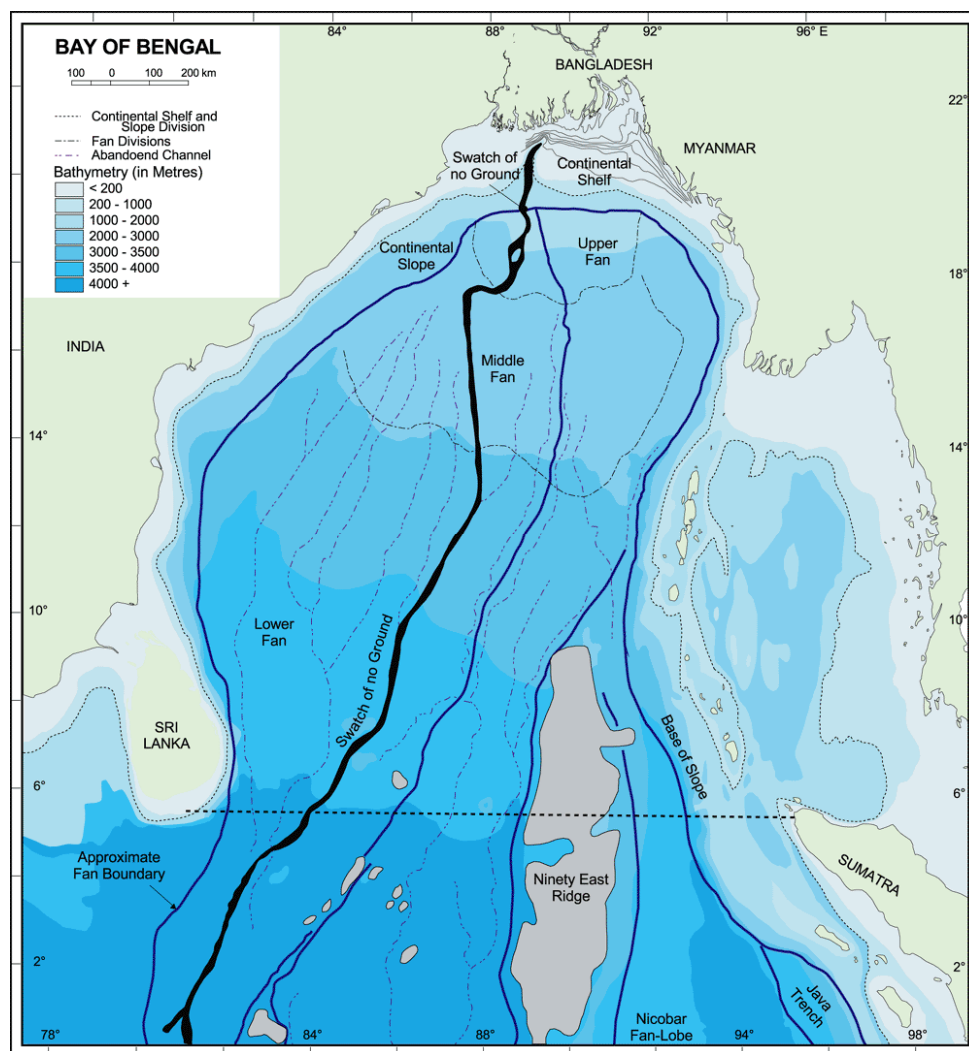
Map : Main Rivers of Bangladesh



Sources: Banglapedia, CD version 2.0

Another surface water sources of Bangladesh is Bay of Bengal, a northern extended arm of the INDIAN OCEAN, is located between latitudes 5°N and 22°N and longitudes 80°E and 100°E. It is bounded in the west by the east coasts of Sri Lanka and India, on the north by the deltaic region of the Ganges-Brahmaputra-Meghna river system, and on the east by the Myanmar peninsula extended up to the Andaman-Nicobar ridges. The southern boundary of the Bay is approximately along the line drawn from Dondra Head in the south of Sri Lanka to the north tip of Sumatra. The Bay occupies an area of about 2.2 million sq km and the average depth is 2,600m with a maximum depth of 5,258m. Bangladesh is situated at the head of the Bay of Bengal. (Banglapedia, CD version 2.0)

Bottom topography characterised by a broad U-shaped basin with its south opening to the Indian Ocean. A thick uniform abyssal plain occupies almost the entire Bay of Bengal gently sloping southward at an angle of 8°-10°. In many places underwater valleys dissect this plain mass.



Sources: Banglapedia, CD version 2.0

Fisheries resource

Bangladesh possesses a wide range of fishes, prawns, lobsters and other crustaceans, molluscs, turtles and other fishery resources inhabiting its extensive marine and inland open waters. The total fish production of Bangladesh was estimated at 11,72,800 m tons (DOF 1995) in 1995. Inland openwater fisheries contributed 73 percent of the total fish production. In 1987, Bangladesh became third in world inland fish and shrimp production after China and India and produced 5,81,827 m tons of fish and shrimp (FAO 1987). Fisheries play an important role in the national economy and account for 4.7 percent of GDP, 9.1 percent of the export earnings (1995-96), 6 percent of the supply of protein and about 80 percent of the animal protein intake of its population. But the human population growth has resulted in a decline in per capita fish consumption from 36g per day in 1965-66 to the level of 20.5g per day in 1996 in place of the required 38g per capita consumption per day. (*Banglapedia, CD version 2.0*)

Some freshwater fishes

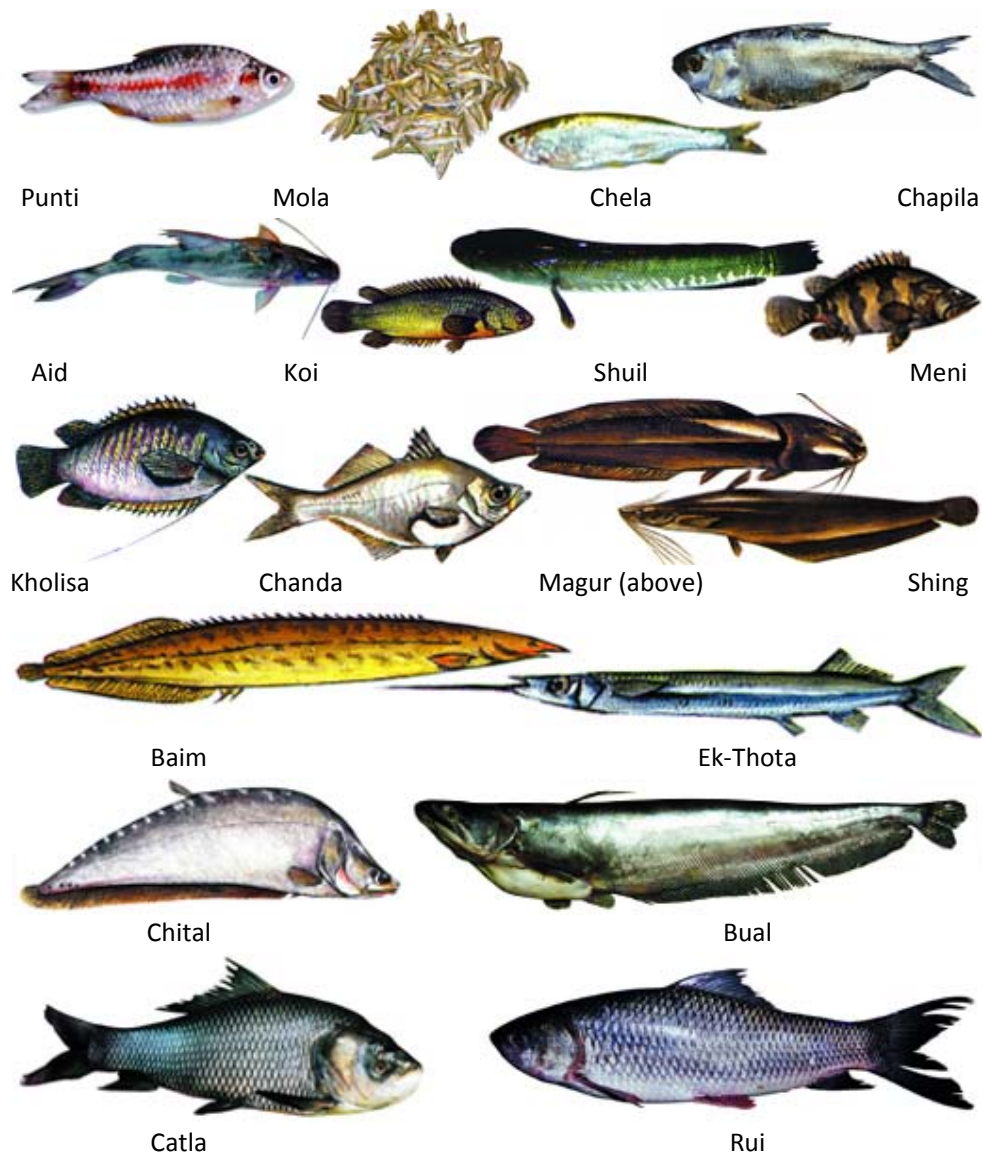


Figure: Some freshwater fishes of Bangladesh (Sources: *Banglapedia, CD version 2.0*)

Table : Area under different types of waterbodies

| Sector | Water area (ha) of inland fisheries |
|--|--|
| Capture fisheries (1992-93) | |
| Rivers and estuaries (Except the Sundarbans) | 10,31,563 |
| Floodplains | 28,32,792 |
| Beels | 114,161 |
| Kaptai Lake | 68,800 |
| Total | 40,47,316 |
| Culture fisheries (1992-93) | |
| Ponds | 146,890 |
| Baors | 5,488 |
| Shrimp farms | 108,280 |
| Total | 260,658 |
| Inland Total | 43,07,974 |

Source: Banglapedia, 2006

Table : Production (m tons) of different species of fish, shrimp and prawn in various types of inland waters, 1987-88

| Fish types | Types of inland fisheries | | | | | | | |
|------------------------------|---------------------------|------------|--------|-------------|--------|---------|-------------|--------------|
| | Rivers | Sundarbans | Beel | Floodplains | Boars | Ponds | Kaptai Lake | Shrimp farms |
| Major carps | 1,187 | | 1,355 | 7,664 | 475 | 77,461 | 231 | -- |
| Exotic carps | -- | -- | -- | -- | 429 | 7,815 | -- | -- |
| Other carps | 1,024 | -- | 15,87 | -- | 1 | 2,047 | 288 | -- |
| Catfish | 3,352 | -- | 4,397 | 2,947 | 1 | 3,078 | 415 | -- |
| Snakehead | -- | -- | 433 | 16,511 | 54 | 9,698 | 35 | -- |
| Live fish (=Jeole fishes) | 38 | -- | 346 | 16,092 | 16 | 6,665 | -- | -- |
| Miscellaneous inland fish | 81,836 | 6,297 | 35,116 | 125,096 | 263 | 41,987 | 3,117 | 7,359 |
| Hilsa | 77,577 | 974 | -- | -- | -- | -- | -- | -- |
| Shrimp and Prawn (large) | 1,141 | 540 | -- | -- | -- | -- | -- | 12,400 |
| Shrimp and Prawn (small) | 17,662 | 255 | 2,376 | 13,725 | 15 | 672 | -- | 5,489 |
| Total production | 183,817 | 8,066 | 45,610 | 182,037 | 1,254 | 149,423 | 4,068 | 25,248 |
| (% share) | (30.66) | (1.35) | (7.61) | (30.36) | (0.21) | (24.92) | (0.68) | (4.21) |

Source: Banglapedia, 2006

Marine resource Of the three fishing grounds (South Patches, Middle Ground and Swatch of no Ground) occupying about 70,000 km of the Bay of Bengal, the South Patches are known to be the most productive. The fish stock and maximum harvestable stock in the Bay of Bengal are estimated to be as follows:

| Varieties | Standing stock (m tons) | Annual harvestable stock (m tons) |
|------------------|-------------------------|-----------------------------------|
| 1979-82 | | |
| a. Demersal fish | 200,000-250,000 | 100,000-125,000 |
| b. Pelagic fish | 160,000-200,000 | 30,000-60,000 |
| c. Shrimp | 4,000-6,000 | 2,000-3,000 |
| 1996-97 | | |
| a. Demersal fish | 150,000-160,000 | 50,000-85,000 |
| b. Pelagic fish | 90,000-120,000 | not estimated |
| c. Shrimp | 14,000 | 6,500-7,000 |

Source: Banglapedia, 2006

Table : Annual total catch, area and productivity of beel fishery sector

| Year | Water area (ha) | Total catch (m tons) | Catch/area (kg/ha) |
|-----------|-----------------|----------------------|--------------------|
| 1992-1993 | 114,161 | 53,019 | 464 |
| 1993-1994 | 114,161 | 55,592 | 487 |
| 1994-1995 | 114,161 | 58,298 | 511 |
| 1995-1996 | 114,161 | 60,768 | 532 |
| 1996-1997 | 114,161 | 62,798 | 560 |

Source: Banglapedia, 2006

Forest Resources

The Forest is another renewable natural resources of Bangladesh. There are 16% of total land are forest area of Bangladesh. **Forest type** Based on their ecological characters, the forests of Bangladesh can be divided into

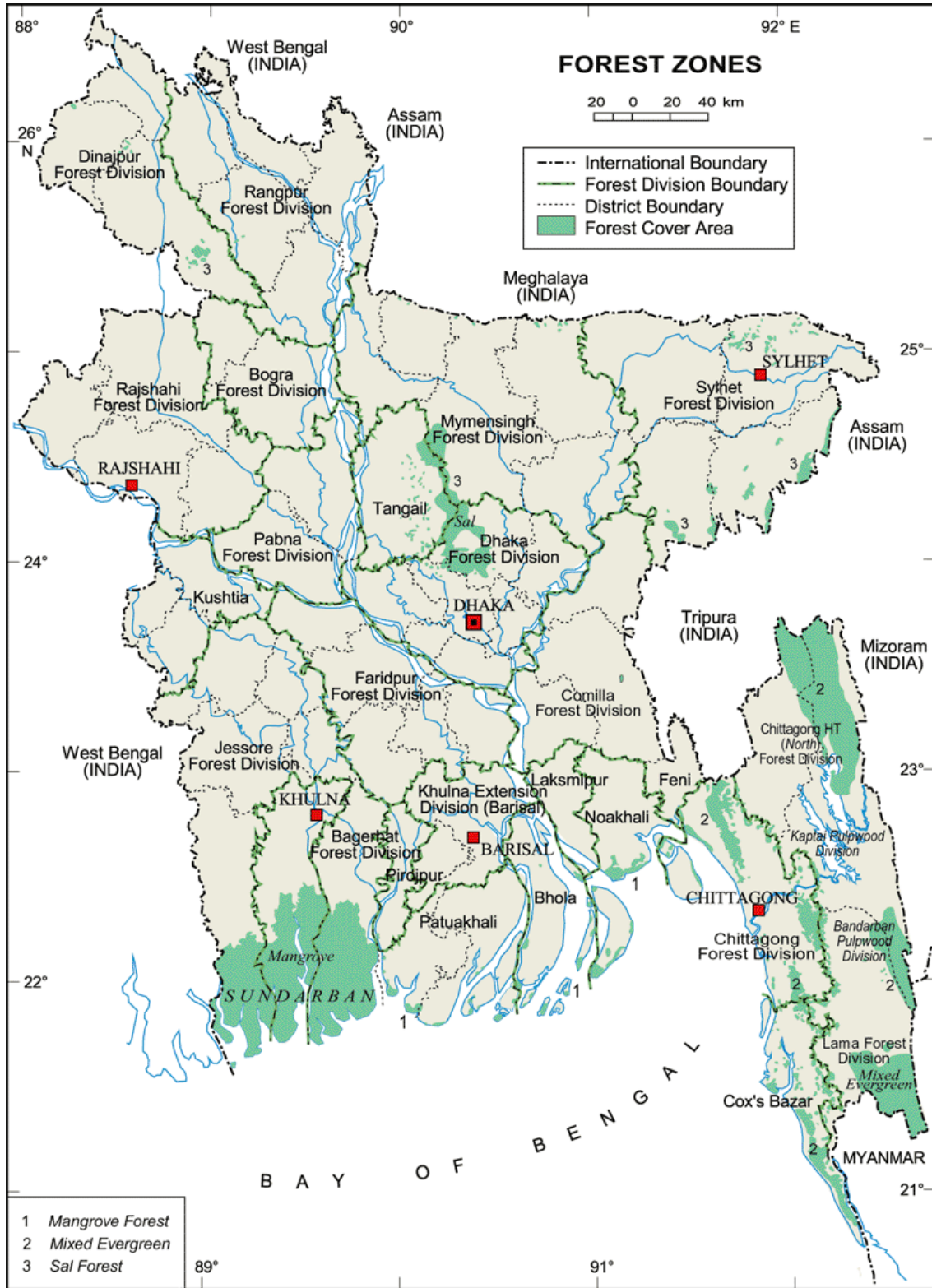
1. tropical wet evergreen,
2. tropical semi-evergreen,
3. tropical moist deciduous,
4. tidal, and
5. planted forests.

Table: Status of the state-owned forest land (in ha)

| Forest type | Reserve forest | Protected forest | Vested forest | Acquired forest | BWDB and khas | Unclassed state forest | Total |
|-------------|----------------|------------------|---------------|-----------------|---------------|------------------------|-----------|
| Hill | 594,383 | 32,303 | 2,636 | 11,004 | -- | 721,344 | 1361,670 |
| Inland | 68,140 | 2,689 | 19,985 | 31,198 | -- | -- | 122,012 |
| Littoral | 656,579 | -- | -- | 6 | 101,526 | -- | 758,111 |
| Total | 13,19,102 | 34,992 | 22,621 | 42,208 | 101,526 | 721,344 | 22,41,793 |

Source: Banglapedia, 2006

Map : Forest Zone of Bangladesh



Source: Bangladesh Forest Department, 1999
 (Sources: Banglapedia, CD version 2.0)

Nonrenewable mineral natural resources

Mineral Resources mineral reserves plus all other deposits that may eventually become available - either known deposits that are not economically or technologically recoverable at present, or unknown deposits, rich or lean, that may be inferred to exist but have not yet been discovered. Geologically, Bangladesh occupies a greater part of the BENGAL BASIN and the country is covered by Tertiary folded sedimentary rocks (12%) in the north, north eastern and eastern parts; uplifted Pleistocene residuum (8%) in the north western, mid northern and eastern parts; and Holocene deposits (80%) consisting of unconsolidated SAND, SILT and CLAY. The oldest exposed rock is the Tura Sandstone of Palaeocene age but older rocks like Mesozoic, Palaeozoic and Precambrian basement have been encountered in the drill holes in the north western part of the country. (*Banglapedia, CD version 2.0*)

Because of a different geological environment, important mineral deposits of Bangladesh are NATURAL GAS, COAL, LIMESTONE, HARDROCK, GRAVEL, BOULDER, GLASS SAND, construction sand, WHITE CLAY, BRICK CLAY, PEAT, and BEACH SAND HEAVY MINERALS. Tertiary Barail shales occurring within the oil and gas windows have generated natural gas and oil found in Bangladesh. After generation, gas and oil have migrated upward through multi-kilometre rock layers above, to reach and accumulate in suitable SANDSTONE reservoirs in the Neogene Bhuban and Bokabil rock units. Gravel, glass sand, construction sand, peat, and beach sand are found in the Holocene sediments, and white clay (kaolin) is found in the late Pleistocene sediments in the small hills mainly in the northern part of the country. White clay and glass sand deposits have also been discovered in the north-western part below the surface. Exploitation of the deposits of limestone, construction sand, gravel, glass sand, white clay and beach sand are done through small scale quarrying. The subsurface white clay and glass sand deposits have not been mined yet. Developments of subsurface coal and hardrock mines are going on. (*Banglapedia, CD version 2.0*)

Oil and gas

There are 22 discovered gas fields in Bangladesh of various sizes. The total reserve of 20 gas fields is about 26 Tcf (trillion cubic feet). Gas in most of the fields is dry, in a few fields it is wet, with considerable amounts of CONDENSATE, eg at Beanibazar (16 bbl/mmcf), Jalalabad (15 bbl/mmcf), and Kailashtila (13 bbl/mmcf). Currently, natural gas accounts for more than 70% of the total commercial energy consumption and the major part of the future energy demand would be met from it. (*Banglapedia, CD version 2.0*)

Power sector ranks the highest (44%); fertiliser sector ranks the second (28%); and industry, domestic, commercial and other sectors together rank third (22%) in gas consumption. Currently 12 gas fields under public and private sectors are in production with gas supply between 900 and 930 mmcf per day. (*Banglapedia, CD version 2.0*)

Map : Non renewable natural resources of Bangladesh



(Sources: Banglapedia, CD version 2.0)

Coal

Coal first discovered in the country by Geological Survey of Pakistan (GSP) in 1959 was at great depth. GEOLOGICAL SURVEY OF BANGLADESH (GSB) continued its efforts for exploration that resulted in the discovery of 4 coalfields. BHP Minerals, a US-Australian company, discovered a field in 1997 totalling 5 coalfields. All the discovered fields lie in the north-western part of the country. Details of the coalfields and quality of the coal are shown below. (*Banglapedia, CD version 2.0*)

Table Coalfields and coal quality

| Coal field | Depth (m) | Thick-ness (m) | Area (sq km) | Reserve (m ton) | Fixed carbon (%) | Volatile matter (%) | Ash content (%) | Sulphur content (%) | Calorific value BTU/lb |
|-------------|-----------|----------------|--------------|-----------------|------------------|---------------------|-----------------|---------------------|------------------------|
| Jamalganj | 640-1158 | 64 | 11.06 | 1053 | 47 (av) | 38 (av) | 22 (av) | 0.62 (av) | 11000 (av) |
| Barapukuria | 129-506 | 51 | 5.25 | 300 | 45.5-54.7 | 2.28-3.60 | 11.79-23.71 | 0.43-1.33 | 10547-12529 |
| Khalaspir | 257-483 | 50 | 12.56 | 143 | 32.0-80.8 | 2.93-30.47 | 7.6-50.51 | 0.24-3.15 | 7388-13880 |
| Dighipara | 328-407 | 61 | N.D | N.D | 51.3-65.6 | 25.29-38.23 | 2.64-20.05 | 0.51-1.02 | 10200-14775 |
| Phulbari | 151 | --- | --- | 386 | --- | --- | --- | --- | --- |

N.D = Not Determined

Source Asian Mining Year Book (Seventh Edition), 2001

The development of underground Barapukuria Coal Mine, one of the five fields, started in June 1996, which was scheduled to be completed in May 2001, but due to some changes in mine design it will take some more time. Exploitable coal reserve of Barapukuria is 64 million ton and annual production has been estimated to be 1 million ton. A power station will be set up with a capacity of 300 MW using this coal. (*Banglapedia, CD version 2.0*)



Barajpukuria coal, Dinajpur

BHP Minerals have discovered the Phulbari coalfield in January 1997. The right has later been transferred to an Australian company, Asia Energy Corporation (AEC), to develop the mine. AEC is now working for a detailed feasibility study for open-pit mine development whose initial annual production will be 2.9 million ton that will later be 9 million ton. (*Banglapedia, CD version 2.0*)

Coal imported from India, China, and Indonesia is mainly consumed in brickfields both in public and private sectors, and in small industries. (*Banglapedia, CD version 2.0*)

Limestone

In the early 1960s, a quarry of limestone of Eocene age with a small reserve at Takerghat in the north eastern part of the country started supplying raw materials to a cement factory.

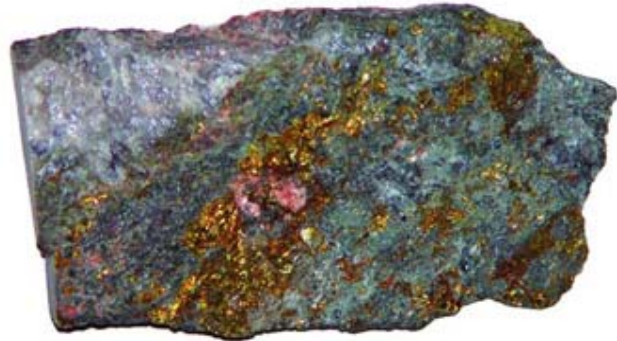
This was the first mine in the country which was actually a quarry. In the 1960s GSB discovered another limestone deposit in Joypurhat at a depth of about 515-541m below the surface with a total reserve of 100 million ton. GSB continued its effort to find out limestone deposits at shallow depth. In the mid 1990s GSB discovered limestone deposit at a depth of 493-508 and 531-548m below the surface at Jahanpur and Paranagar of Naogaon respectively. Thickness of these deposits is 16.76m and 14.32m respectively. (*Banglapedia, CD version 2.0*)



Fossiliferous limestone, Sylhet

Hard Rock

Bangladesh has dearth of construction materials. A large deposit of granodiorite, quartz diorite, gneiss of Precambrian age has been discovered by GSB at depths ranging from 132 to 160m below surface at Maddhyapara, Dinajpur. The Rock Quality Designation (RQD) of fresh rock varies from 60% to 100%. Development of this underground hard rock mine is going on by Nam Nam Co, a North Korean company. Its production was scheduled to start in 2002 and the annual production has been estimated to be 1.65 million ton. (*Banglapedia, CD version 2.0*)



Hard Rock, Dinajpur

Peat

In Bangladesh peat deposits occur in the marshy areas of the north-eastern, middle and south western parts with a total reserve of more than 170 million ton. Calorific value of peat ranges from 6000 to 7000 BTU/lb. Peat can be used as fuel for domestic purposes, brick manufacturing, boilers etc. However, their exploitation has not yet been started. Details of the peat deposits are given in the following table. (*Banglapedia, CD version 2.0*)



Peat

Table Peat deposits and quality

| Deposits | Depth (m) | Thickness (m) | Area (sq km) | Reserve (m ton) | Carbon content (%) | Ash content (%) | Moisture content (%) | Volatile matter (%) |
|--------------|-----------|---------------|--------------|-----------------|--------------------|-----------------|----------------------|---------------------|
| Bagiachanda | 0-4 | 0.6-3.3 | 500 | 150 | 24 | 16.63 | 17.1 | 42.30 |
| Kolamouza | 0.04-2.5 | 0.2-4 | 25 | 8 | 29.2 | 24.80 | 13.70 | 42.30 |
| Maulvi Bazar | 0-1.3 | 1.6 | 9.6 | 3 | 17.83 | 36.07 | 15.52 | 30.58 |
| Chalan Beel | 0.5-4.75 | 3.35-7.65 | - | 6.2 | 14.80 | 46.13 | 8.53 | 54.13 |
| Charkai | 0-0.8 | 0.13-2.6 | 11 | 3 | 18.32 | 17.6 | 27.77 | |
| Pagla | | | | 13.2 | 16.37 | 25.9 | 37.7 | 43.3 |

Source Asian Mining Year Book (Seventh Edition), 2001

(Sources: Banglapedia, CD version 2.0)

Metallic minerals

GSB has carried out investigation for mineral deposits and succeeded in locating a few potential zones. Relatively high content of metallic minerals like chalcopyrite, bornite, chalcocite, covelline, galena, sphalerite etc have been found in the core samples from the north-western region of the country. *(Banglapedia, CD version 2.0)*

Construction sand

It is very much available in the riverbeds throughout the country. Sand consists mostly of quartz of medium to coarse grains. It is extensively used as construction material for buildings, bridges, roads etc all over the country. *(Banglapedia, CD version 2.0)*

Gravel

Deposits of gravel are found along the piedmont areas of the HIMALAYAS in the northern boundaries of Bangladesh. These river borne gravels come from the upstream during the rainy season. Total reserve of the gravel deposits is about 10 million cu m. Gravel deposits are being exploited and used in the country. *(Banglapedia, CD version 2.0)*

Glass sand

Important deposits of glass sand of the country are at Balijuri (0.64 million ton), Shahjibazar (1.41 million ton) and Chauddagam (0.285 million ton) at or near the surface, Maddhyapara (17.25 million ton) and Barapukuria (90.0 million ton) below the surface. Glass sands consist of fine to medium, yellow to grey quartz. *(Banglapedia, CD version 2.0)*



Glass Sand, Comilla

White Clay

There are surface to near surface deposits of white clay in Bijoypur and Gopalpur area of Netrokona district, Nalitabari of Sherpur district, Haidgaon of Chittagong district and Baitul Izzat of Satkania upazila, Chittagong district. Besides there are subsurface deposits of white clay in Maddhyapara, Barapukuria, Dighipara of Dinajpur district and Patnitala of Naogaon district. The exposed white clay is not good in quality. It is used in the ceramic factories of Bangladesh after mixing with high quality imported clay. (*Banglapedia, CD version 2.0*)



White clay, Netrokona

Beach sand

Deposits of beach sand have been identified in the coastal belt and in the coastal islands of Bangladesh. Different heavy minerals and their reserves (in ton) are: Zircon (158,117), Rutile (70,274), Ilmenite (1,025,558), Leucoxene (96,709), Kyanite (90,745), Garnet (222,761), Magnetite (80,599) and Monazite (17,352). An Australian company has applied for the permission to carry out the feasibility study for exploitation. (*Banglapedia, CD version 2.0*)

Brick Clay

In Bangladesh the mineralogical, chemical and engineering properties of Pleistocene and Holocene brick clays of Dhaka, Narayanganj and Narsingdi districts are well documented. The bulk chemistry and engineering properties of the Holocene and Pleistocene samples have been found satisfactory for manufacturing good quality bricks. These are being exploited and widely used in the country. [AKM Khorshed Alam and Sifatul Quader Chowdhury, *Banglapedia, CD Version 2.0*]

Conclusion

Not only those are natural resources but also some other elements are known as natural resources. But in Bangladesh those are the most common and important natural resources.

Sources:

Banglapedia, CD Version 2.0