



Regional Course on SNA 2008 (Special Topics): Improving Exhaustiveness of GDP Coverage
31 August – 4 September 2015
Daejeon, Republic of Korea

Country Report

Bangladesh

Methods of Estimation of GDP and Data Sources

Abdul Alim Bhuiyan
Deputy Director
Bangladesh Bureau of Statistics
Ministry of Planning
Government of the People's
Republic of Bangladesh



Methods of Estimation of GDP and Data Sources

Bangladesh Bureau of Statistics (BBS) is compiling National Accounts Statistics since the independence of Bangladesh. It started compiling Gross Domestic Product (GDP) and other basic aggregates of national accounts in collaboration with the Planning Commission from 1972. However, in 1974, BBS itself was restructured, centralized and revitalized. Thereafter, BBS started producing national accounts aggregates independently.

“Bangladesh National Accounts Statistics: Sources and Methods” is the third publication exclusively devoted to the process of rebasing of national accounts data from 1995-96 to 2005-06 and it incorporates extensive methodological part and factors of data improvements. The first publication titled "Twenty Years of National Accounting of Bangladesh" published in July 1993, covered data for the period 1972-73 through 1991-92 and used 1984-85 as base year for constant price estimates. The second one is “Sources and Methods of National Accounts” published in FY 2000 for documenting the revision and rebasing of national accounts from 1984-85 to 1995-96.

A. GDP by production approach

In the revised estimates, for estimation of GDP by production method the total economy has been divided into 15 mutually exclusive industry/activity sectors under which all economic activities are covered. Value added estimates of these 15 industry sectors are derived as follows:

I. Agriculture and Forestry Sector

Agriculture is one of the largest sector of gross domestic product (GDP) in Bangladesh. This sector comprises (i) crops and horticulture (ii) animal farming and (iii) forest and related services. The contribution of this sector to GDP is estimated in terms of gross value added (GVA). The estimation of GVA involves evaluation of the products and by-products at prices received by producers and deducting there from the value of inputs and services at purchasers' prices consumed in the production process.

Crops and Horticulture

For this subsector, production of 124 crops that grouped into 10 categories is taken into account for GVA estimation. The crops can again be divided into three groups on the basis of data generation system namely - (i) Forecast crops, (ii) Non-forecast crops and (iii) Plantation crops.

The forecast crops cover paddy (aus, aman and boro), wheat, jute, sugarcane, potato and major pulses. The non-forecast crops for which no production forecasts are prepared, include tobacco, rape-seed, mustard, linseed, onion, ginger, black pepper, vegetables and fruits. For these crops estimation, Agriculture Wing of BBS prepares annual estimates based on field reports. The plantation crops include tea and rubber, the estimates of which are prepared on the basis of returns received from the concerned regulatory boards (Tea Board, Forest Industries Development Corporation, Rubber Development Board).

The value-added estimates for crops are based on gross production less intermediate consumption or production inputs. Gross production figures are obtained primarily from Agriculture Wing of BBS and Bangladesh Tea Board (BTB) and crop-wise harvest prices are obtained from the Department of Agricultural Marketing (DAM). After deducting wastage during the harvesting period, the net available production is estimated. The proportion of wastage by types of crops is deducted to arrive at the net available output.

The by-products of the main crops like paddy, wheat, jute, sugarcane oilseeds etc. are also included in the estimation of net production. Harvest prices collected by DAM are adjusted for transport charges from farmyards to primary markets to arrive at homestead prices for valuation.

Input-output coefficient prepared by the Planning Commission in 1981-82 and 1993-94; the proportion of input costs obtained from the “Survey of the use of inputs in major agricultural crops” in 1993-94 by BBS; and “Cost of production survey” in 2008-09 by BBS have been applied to the net available production of crops to allow for input use. The inputs considered are as seeds, fertilizers, pesticides, irrigation charges and other material input costs that are deducted from net available production values to obtain gross value added of crop subsector.

Horticulture is a growing activity in the country. There is, however, no systematic survey to estimate horticultural outputs. Production of horticultural specialties including seeds for flowers, fruits or vegetables, fruits saplings, growing of living plants for planting or ornamental purposes belongs to horticultural activities. Information of gross output and input costs etc. have been collected by the Upazila (Sub-district) Statistical Offices of BBS through field survey (Survey on selected economic activities).

In the revised estimates

- **about 124 crops are included**
- **output of irrigation service is newly included**

In the previous estimates about 100 crops were included.

Animal Farming

Animal farming sub-sector comprises livestock and poultry birds. These livestock and poultry birds are reared at household and farm level. Agriculture Census of BBS is the basic source of animal farming data. Periodic surveys on livestock and poultry birds, administrative records of the Livestock Department are also used for current estimation.

Estimates of animal farming populations are made on the basis of intercensal growth rates (1996 and 2008 Agriculture Census) of livestock and poultry population and then adjusted in the light of the current livestock and poultry surveys. The following products of livestock and poultry population are included in the output and value added estimation:

- (i) Meat
- (ii) Milk
- (iii) Hides and skins
- (iv) Cow dung
- (v) Animal fats and others
- (vi) Egg

Annual flows of these products are obtained by applying specific yield coefficients established through special studies/surveys, field investigations and consultations with the experts of the Department of Livestock Service (DLS). Prices used for valuation of these products are collected from DAM. Value of output is deducted by intermediate consumption or input cost to obtain the value added in the animal farming sub-sector.

Revised estimates include

- **livestock and poultry population at household level**
- **livestock and poultry population at farm level**

Previous estimates include

- **livestock and poultry population at household level**
- **poultry population only at farm level**

Forest and Related Services

Forest and related service activities are divided into public and private forestry. In the revised estimates, outputs of both public and private forestry are taken into account for estimation of GVA of this sub-sector whereas only private sector forestry was included in the previous estimates. The public sector forestry output (lease or sale receipts) was included in the overall output of the public administration and defence sector in the previous estimates. Major activity of reserve forest (public) is generally conservation and development.

The output data of private forestry by types of forest products comprising (i) timber, (ii) bamboo, (iii) firewood, (iv) honey and (v) others are indirectly measured. Public forestry output data are from Bangladesh Forest Department. For annual estimates, the bench mark (2005-06) figure is adjusted for annual changes measured first in constant prices and converted to current prices with timber price index (of construction material prices). Data from the periodic surveys like Farm Forest Survey and Household Income and Expenditure Survey (HIES) are also used in final adjustments of the annual estimates.

For valuation of output wholesale prices are used. To arrive at producer prices, wholesale prices are marked down by 25% to remove trade and transport margins. Finally, the gross value of output is reduced by 11% to account for the input costs to arrive at the value added in producer prices of this sub-sector.

In the revised estimates

- **both public and private sector forestry are included**
- **services of Bangladesh Forest Industries Development Corporation (BFIDC) is newly included**

In the previous estimates

- **only private sector forestry was included**

II. Fishing Sector

The activities in the fishing sector include (i) commercial fishing in deep sea, coastal and offshore water and catching and gathering fish from inland rivers, canals, lakes, and water bodies (haors, bills, ponds) etc. and (ii) subsistence fishing in inland water.

The gross value added of this sector involves estimation of the total value of output in producer prices and deducting there from inputs (in purchasers' prices) which are used in the process of production. Estimates of the aggregate fish production, both inland (including subsistence catch) and marine are obtained from the Department of Fisheries (DOF). The fish production obtained from the DOF is further validated with HIES data (per capita fish consumption) and availability estimated by total production minus exports plus presumed imports. Estimated fish production (inland and marine) are disaggregated by major fish species obtained from the DOF.

For estimating value added of fisheries activity total production have been divided into capture and culture. In the revised estimate seed fish (pauna) is included as output of fishing but it is excluded from value added as an input cost. Sundry fish (dry fish) is also included, and value added of Fisheries Development Corporation (FDC) is included in the revised estimates.

To convert the output figures into value terms, wholesale prices by species types, obtained from the Department of Agricultural Marketing (DAM) are converted into producer prices by deducting trade and transport margins. The gross value of production thus arrived at is then reduced by the following input proportion or intermediate consumption rates of inland fish (culture) to obtain the gross value added.

In the revised estimate,

- **Total production has been divided into capture and culture separately**
- **Fry fish have been incorporated as an output**
- **Sundry fish (dry fish) have been included**
- **Value added of Fisheries Development Corporation (FDC) is included**
- **The input coefficients of inland have been updated based on fisheries study, DOF. In the previous estimate an average input coefficient (13.68%) was used to obtain value added estimates.**

III. Mining and Quarrying Sector

Mining and quarrying sector consists of the activities related to extraction of natural gas and crude petroleum, production of coal, production of sand, crude salt production, collection of stones and boulders, production of white clay and production of limestone. Data are collected from the following sources:

- i) Oil, Gas and Mineral Development Corporation (PETROBANGLA)
- ii) Barapukuria Coal Mining Project
- iii) Maddyapara Hard Rock Project
- iv) Bureau of Mineral Development (BMD)
- v) Bangladesh Chemical Industries Corporation (BCIC)
- vi) Geological Survey of Bangladesh.
- vii) Field Offices of BBS
- viii) BBS publications

Gas sub-sector covers activities related to extraction of natural gas and crude petroleum by the gas and oil production companies of Bangladesh. Refining activities of natural gas by PETROBANGLA is also included in the estimation of output. The weighted average of sales price to distribution companies is considered for valuing output of natural gas. The production cost or intermediate consumption of gas and crude petroleum is estimated using the MIS report. Finally the estimates of gross value added at current price are obtained by subtracting intermediate consumption from gross output.

In order to derive the constant price estimates of gas sub-sector, current price estimates are deflated by the average gas price index. Estimates of value added at current prices for coal, hard rock, stone and boulder limestone and white clay are based on production, prices and input data obtained from Bangladesh Oil, Gas and Mineral Development Corporation, Bureau of Mineral Development, Bangladesh Chemical Industries Corporation and field offices of BBS.

Salt production by solar evaporation of sea water in coastal areas prior to the refinement is regarded by the ISIC as a mining activity. Data of crude salt production is available from the Survey of Selected Economic Activities conducted by BBS. An indirect approach is used to estimate value added for sand production and is based on cement and sand ratio (1:6). Estimates of stone and boulder production along with their prices and input structure are collected by regional offices of BBS. To obtain the gross value added at constant prices of coal and other mining and quarrying products, respective price indices of various items/components are used.

- **Refining activity of natural gas by PETROBANGLA is included in the output in revised estimates.**
- **The weighted average of sales price to distribution companies is considered for valuing output of natural gas.**
- **Cement and sand ratios are used (1:6) to estimate output of sand.**
- **10% of value of sand output is deducted as input cost.**

IV. Manufacturing Sector

A manufacturing enterprise is defined as a unit engaged in the physical or chemical transformation of materials, substances or components into new products.

As regards manufacturing sector, the activities of this sector are divided into two broad sub-sectors by employment size of manufacturing establishments namely, (i) Large and Medium scale and (ii) Small scale manufacturing establishments (including Cottage and Handloom). Large and Medium scale manufacturing establishments comprises of 50 or more persons and 10-49 persons engaged respectively. The Small-scale sub-sector covers all manufacturing establishments employing less than 10 persons.

Large and Medium Scale Industries

The estimates of GVA for the large and medium scale manufacturing sub-sector are worked out by the method requires estimates of value of output at ex-factory prices and the corresponding value of intermediate consumption at purchasers' prices. It also requires information on various non-industrial costs. Gross Output includes sales value, work-in-progress and change-in-stock. Intermediate consumption includes all industrial and non-industrial costs such as raw materials, fuel, advertising, stationary, water charge, telephone charge, legal fees and costs of all ancillary activities related to production. The relevant data are collected by BBS through the Survey of Manufacturing Industries (SMI) 2005-06.

The survey data have been used for the estimation of GVA in large and medium scale industries for the base year 2005-06 after few adjustments. Computations of GVA for all manufacturing industries have been covered at 3-digit level using industrial classification ISIC Rev.-3. Quantum Index of Industrial Production (QIIP) for Large & Medium is used for extrapolation. Output-value added ratios are also used to estimate the GVA. The constant price estimates are converted into current price estimates in the following years using the Producers Price Index (PPI) of this sub-sector.

Small Scale Industries

This sub-sector suffers from under-coverage and lack of detailed information. BBS has conducted the 'Annual Establishment and Institutional Survey (AEIS 2002-03)' and the survey data have been used for estimating and conciliating of GVA. To mitigate the under coverage problem of AEIS 2002-03 data, Labour Force Survey (LFS) 2005-06 data have been used for necessary adjustments.

QIIP for small scale used for extrapolation. Output-value added ratios are used to estimate the GVA. The constant price estimates are converted into current price estimates in the following years using the Producers Price Index (PPI).

Large and medium scale manufacturing

- Data from Survey of Manufacturing Industries (SMI) 2005-06 have been taken as benchmark. The survey data have been used for estimating Gross Value Added (GVA) after few adjustments.
- Quantum Index of Industrial Production (QIIP) for Large & Medium is used for extrapolation.
- Output-Value Added ratios are used to estimate the Gross Value Added (GVA).

Small scale manufacturing

- Annual Establishment and Institutional Survey (AEIS 2002-03) data have been used for estimating and conciliating GVA. To avoid the under coverage problem of AEIS 2002-03 data, Labour Force Survey 2005-06 data have been used for necessary adjustments.
- Quantum Index of Industrial Production (QIIP) for Small scale is used for extrapolation of Output.

- Output value added ratios are used to estimate the Gross Value Added (GVA).

V. Electricity, Gas and Water Supply Sector

This sector is classified into 3 sub-sectors (i) electricity (ii) gas and (iii) water supply. Economic activities relating to generation, transmission and distribution of electricity are included in the electricity sub-sector. Distribution activities of natural gas are included in the gas sub-sector and the activities associated with collection, purification, distribution of water and sewerage activities are covered under water supply sub-sector.

Electricity

Production method is used for estimating electricity sub sector. System loss is included in the estimation i.e. total generation of electricity is taken into account for estimation of value added. Unit price index of electricity is used as deflator.

Data sources of this sub-sector are Power Development Board (PDB), Dhaka Electric Supply Company (DESCO), Rural Electrification Board (REB), Budget estimates of autonomous bodies of the Ministry of Finance and Annual Report of Private Power Generation Companies (Summit Power, Khulna Power etc.). The power generation by private establishments included in the revised estimate separately from their annual report. Transmission of power (PGCB) is also included in the new estimate.

Gas

Data of output and intermediate consumption are obtained from the following sources.

- i) Titas Gas Transmission and Distribution Co. Ltd.
- ii) Jalalabad Gas T and D System Ltd.
- iii) Bakhrabad Gas Distribution Co. Ltd.
- iv) Karnaphuli Gas Distribution Co. Limited
- v) West Region Gas Company Limited

Total output of gas distribution and transmission and their intermediate consumption are taken into account. From the value of output (sale minus purchase), inputs (administrative cost, repair & maintenance etc.) are deducted to obtain gross value added of gas distribution. Unit price indices of gas (base: 2005-06) is used to obtain value added at constant price.

Water Supply

Production and distribution of water are included in the estimation. The estimates of gross value added are obtained by the differences of sales (or receipts from sale of water and sewerage services) and intermediate consumption used in the generation of these services. The data are obtained from the annual budgets of the organizations, such as Dhaka WASA, Chittagong WASA and Khulna WASA, providing these utilities. The output of water supply from only at district headquarters municipalities derived from their annual budgets. Unit price index of water (base: 2005-06) are used to obtain the respective sub-sector value added at constant price.

- **In the revised estimate, public and private GVA estimated separately. System loss is included. Services of Power Grid Company of Bangladesh (PGCB) included in the new series.**
- **Only distribution activity of Gas is considered in the revised estimate. Total gas distribution is taken into account. Gas production output is excluded, as it is included in mining and quarrying sector.**
- **The output of water supply from Dhaka, Chittagong and Khulna WASA and district**

headquarters Municipalities are included in the revised estimate.
--

VI. Construction

The value of construction activities undertaken across the economy are accounted for:

- (i) Residential and non-residential building
- (ii) Katcha house construction
- (iii) Private agriculture construction
- (iv) Installation cost of irrigation
- (v) Public sector other construction

Output of residential and non-residential building construction activities and Gross Value Added (GVA) are estimated indirectly through commodity flow method. Residential and non-residential building construction is worked out on the basis of five major components viz. (i) Cement, (ii) Iron and Steel, (iii) Bricks, (iv) Timber and Round Wood and (v) Fixtures & Fittings. Ratios and weights are estimated from the report of *Case Study on Major Inputs used in Building Construction and I-O coefficients, 2011* are used to get total volume of building construction.

The five basic material groups account for **60.51%** of the total construction materials. **31.88%** of the gross value of construction output is taken as gross value added for building construction. Building material price index is used as a deflator to obtain constant price estimates of GVA.

Base year data of domestically produced items are obtained from the reports of Survey of Manufacturing Industries (SMI), 2005-06 and Annual Establishment and Institution Survey (AEIS)-2002-03, BBS. Quantum Index of Industrial Production and Price Indices of major construction items are used for non-SMI years. Expenditure on net imports of major construction items are taken from National Board of Revenue (NBR) and Foreign Trade Statistics, BBS. The cif values of imports of capital goods are adjusted by markups to arrive at purchasers' value of assets. Trade and transport margin of different items are taken from Input-Output table 2000 for Bangladesh, SHD Unit, Planning Commission.

The katcha house construction benchmark year 1980-81 on the basis of some objective data used by Dr. Wahiduddin Mahmud. Extrapolated that benchmark year's data to current years by the growth rate of SVRS Katcha dwelling structure. The benchmark years (1980-81) price was extrapolated to current years with the help of specially prepared index. 55% of the gross value of construction output is taken as gross value added for katcha house construction. Indices of katcha house construction are used as deflator.

Public sector constructions that cover central and local government and quasi corporation through annual budget book. 31.88% of the gross value of construction output is taken as gross value added for construction other than building. Indices of building material prices are used as deflator. The value of private sector construction is estimated residually by deducting the volume of public sector construction from the estimated value of construction arrived from commodity flow method.

VII. Wholesale and Retail Trade, Repair of motor vehicles, motorcycles and personal and household goods sector

The activities considered in the sector are wholesale and retail trade in all imported and domestically produced products and repair of vehicles as well as repair of household goods. Wholesale trade covers units engaged in resale without transformation of new and used goods generally to the retailer and the industries and other establishments. Retail trade covers units, which mainly resale without transformation of new and used goods for personal or household consumption. Wholesale and retail trade thus deals with distribution activities of goods produced in other sectors of the economy or imports.

Repair of vehicles as well as repair of personal and household goods has been covered in the revised estimate. For maintenance and repair of motor vehicles and motor cycles and repair of personal and household goods, the output and the intermediate consumption are directly taken from the Wholesale and Retail Trade Survey 2009-10 and AEIS 2002-03 and 1996-97.

The gross output in the distribution of commodities is measured as gross trade margins of the trading establishments. Gross output is the gross margins realized on the sale of goods in the same condition as they have been purchased and reduced by the delivery cost of the goods to the unit. From the gross trade margins the intermediate cost (packing, overhead cost, etc.) incurred is deducted to arrive at the gross value added.

Commodity flow method is used to estimate the gross value added of this sector. Co-efficient of trade margin is derived from AEIS 2002-03 and I-O table 2005-06, 1993-94 are utilized to estimate gross value added for wholesale and retail trades. Detailed information on input costs are not available and gross trade margins are reduced by 15.63% for intermediate consumption or input costs so as to obtain the estimate of the value added of this sector.

In the revised estimates commodity flow method with updated information on market margins based on HIES 2005-06 and BIDS agriculture study data are used to estimate gross value added. The AEIS of Non-farm Economic Activities and I-O table 2005-06 are the sources for updating the co-efficient for wholesale and retail trade sector.

In the revised estimates,

- **repair of motor vehicle and household goods are newly included.**
- **trade margins are updated.**
- **input costs are also updated on the basis of the BBS surveys of Non-farm Economic Activities in 1996-97, 2002-03 and trade survey 2009-10.**

VIII. Hotel and Restaurant Sector

Hotel and restaurant sector cover the following

- Hotel, Camps and Other Lodging Places
- Restaurant and Non-residential Hotels
- Tea Stall
- Eating and Drinking Places and others

Gross value added is computed by deducting the value of intermediate consumption from the value of output. The annual benchmark estimates for hotels and restaurants activities are prepared on the basis of the results of the Survey on Hotels and Restaurants, 2009-10 and Annual Establishment & Institution Survey (AEIS) 1992-93, 2002-03.

The output of hotels and restaurants is measured by the service charge which is the value of sales receipts. Receipts from other services rendered, rental income etc. are included to obtain the total value of gross output of hotels and restaurants. The intermediate consumption or input of this sector comprises materials and supplies consumed in business operation, rental services, fuel, electricity, water and other services such as advertising, insurance, management etc. The Consumer Price Index of food group and non-food group are used as deflators for non-residential and residential hotel constant price estimate respectively.

- **The coverage of output has been expanded in the revised estimate on the basis of Hotel and Restaurant Survey 2009-10.**
- **Extrapolation has been made for the non subsequent non-AEIS years using employment and value added growth rates.**

IX. Transport, Storage and Communication Sector

The sector includes passengers and freight transport, whether scheduled or unscheduled by rail, road, water or air including all auxiliary activities such as terminal and parking facilities, cargo handling, storage, besides postal and telecommunication activities. Economic activities covered in this sector broadly comprise

- (i) Land transport
- (ii) Water transport
- (iii) Air transports
- (iv) Support services incidental to transport and storage and
- (v) Communication services rendered by post and telecommunication departments.

The output of transport, storage and communication services cover the value of services, delivered to domestic producers, households and others. To enhance the coverage and update the estimates, surveys were conducted such as survey on Private mechanized road and water transport, Mobile phone operator, Courier services, Cable operators & internet service providers. The methodology and sources of data for the sub-sectors are described below:

Transport Sub-Sector

This sub-sector is divided into public and private transport from data availability point of view. Privately owned transports are further divided into organized and un-organized transport.

Organized Transport, Public

Public sector transport is considered as an organized one. The following types of transport (cargo and passenger services) are included for estimation of gross value added.

Sl. No	Mode of transport	Type of transport
1.	Land transport	Bangladesh Railway, Bangladesh Road Transport Corporation
2.	Water transport	Bangladesh Inland Water Transport Corporation (BIWTC), Bangladesh Shipping Corporation (BSC)
3.	Air transport	Biman Bangladesh Airlines

Estimates of the organized public transports (Railways, water and air transports) are worked out from annual budget documents of the respective agencies. Sales and other receipts for services are taken as gross output. GVA is estimated by deducting intermediate consumption used up in the process of providing services. To allow for substantial system losses particularly in railways and BRTC, the outputs of these organizations are adjusted upwards.

Air Transport

Air transport includes the following service providers

1. Biman Bangladesh Airlines
2. United Airlines
3. GMG airlines
4. Regent Airlines

The Biman Bangladesh Airlines is the only public organization whereas the other three airlines are private in this sub-sector. The value added is compiled in the same way as in other public sector transport agencies. The main source of data is the annual budget documents and published reports of these organizations. The current price value added figures are deflated by the fare and freight index of air transport to obtain the value added at constant price.

Organized Transport, Private

Private organized transport covers services provided by the following types of privately owned transports.

Sl. No	Mode of transport	Type of transport
1.	Road transport	Bus, truck, taxi, minibus, microbus, station wagon, auto-rickshaw and other mechanized road transports.
2.	Water transport	Ships (coastal and ocean), trawlers, launches, steamers, barges, engine boats and others

The value added originating from these transport fleets/vehicles are derived by using the net earning (gross earnings minus intermediate consumption) per vehicle and the number of vehicles in operation. Estimates of net annual earning per vehicle obtained from *Private commercial mechanized transport survey 2009* and the *1993-94 Survey on Mechanized and Non-mechanized private transport in urban and rural areas in Bangladesh* are used as benchmark estimates. The benchmark estimates are converted into current estimates by the fare and freight (FFI) indices.

Unorganized Transport

The unorganized transport belongs to private sector only and the following types of road and water transports are included.

Sl. No	Mode of transport	Type of transport
1.	Road transport	Rickshaws, push carts, carts, carrier by-cycles.
2.	Water transport	Country boats

The value added of the unorganized non-mechanized transports is computed by net income (gross earnings minus intermediate consumption) per vehicle obtained from *Private Mechanized and Non-mechanized Transport Survey* in urban and rural areas in Bangladesh that are used as benchmark figure. The benchmark GVA is converted into current estimates with the help of rural consumer price index (transport group). Data on number of registered non-mechanized transports are collected from city corporations and local bodies and those for unregistered vehicles are estimated by field surveys.

Only non-mechanized commercial country boats are included in the unorganized water transport. Commercially operated boats are divided into two categories (i) cargo carriers and (ii) passenger carriers. Country boats carrying less than 20 quintals of cargo are treated as passenger boats and those carrying more than 20 quintals of cargo are treated as cargo boats. Gross value added of the country boats is computed by using freight per day per ton and passenger fare and the estimated number of boats by capacity. Estimates of freight and fare are obtained through occasional probing type surveys. The benchmark estimates are extrapolated and converted into current estimates with the help of Fare and Freight indices (FFI).

Support Transport Services

This group includes activities supporting the transport of passengers or freight, such as operation of parts of the transport infrastructure or activities related to handling freight immediately before or after transport or between transport segments. The operation and maintenance of all transport facilities is included.

This class includes:

- activities related to transport of passengers, animals or freight.
- operation and handling of goods, harbours and piers, airway terminals etc.

- operation of roads, bridges, tunnels, car parks or garages.
- operation of waterway, navigation, pilotage and berthing activities.
- airport and air-traffic-control activities
- activities of travel agencies, customs agents, activities of sea-freight forwarders and air-cargo agents, goods-handling operations.

The basic sources of data are the budget documents of the concerned organizations, e.g. Civil Aviation Authority of Bangladesh (CAAB), Bangladesh Inland Water Transport Authority (BIWTA), Bangladesh Parjatan Corporation (BPC), Chittagong Port Authority, Mongla Port Authority etc. Gross output is estimated from annual budget documents of the respective agencies. Sales and other receipts for services are taken as gross output. GVA is estimated by deducting intermediate consumption used up in the process of providing services.

Travel agents and Clearing and Forwarding (C&F) agent are newly included in the revised estimate. To measure the output of travel agents estimates per capita expenditure of outgoing passenger have been used. Number of total outgoing passengers obtained from civil aviation authority. On an average 20% of the output of travel agents are considered as its input on the basis of field study.

Value added of C&F agents is estimated on the basis of export-import information available. Average of the commission (0.55%) that C&F agents receive from export and import is considered as output of this sub-sector. On an average 15% of the output of C&F agents are considered as its intermediate consumption on the basis of special study.

Storage Sub-Sector

The storage sub-sector is divided into urban and rural storage based on the availability of data. The data source of storage sub-sector in urban areas is the Cold Storage Association. Value added for storage sub-sector is computed by multiplying the storage charge per ton of the commodity stored and the estimated capacity owned or operated by the agencies or their member bodies as in the case of Cold Storage Association.

Storage capacity in rural areas is estimated with the help of the benchmark data obtained from the Agricultural Census of 1983-84. This benchmark estimate is updated and reconciled with the data of storage survey in urban areas, 1997. Value added for rural storage is computed in the same way as the urban areas. In absence of an appropriate sector specific rental index the value added at current prices are deflated by House Rent Index (HRI) to obtain the value added at constant prices.

Communication Sub-Sector

The postal sub-sector includes the activities of postal services, pickup and delivery of the mail, i.e. letters, postcards, printed papers, small packets, goods or documents. The communication sub-sector includes the activities of providing telecommunications and related service activities, i.e. transmitting voice, data, text, sound and video.

This sub-sector includes activities of

- Bangladesh Post Office (BPO)
- Bangladesh Telephone Company Limited (BTCL)
- Mobile Phone Operator (Grameen, Bangla Link, Robi, Teletalk, Citycell, Warid)
- Internet Service Provider (ISP)
- Courier Service
- Cable Operator

The method of estimating value added of the communication sub-sector is based on total receipts for the services rendered (i.e. sales and receipts) minus the intermediate consumption from the respective

budget document. The GVA of ISP, cable operator, courier service are obtained on the survey of communication 2011. Privately owned communication such as commercial telephone, fax and courier services are included in the estimates based on Report on Survey of Selected Economic Activities 1995-96, BBS.

- **In the revised estimates, the benchmark figures of various modes of transports are updated based on recent transport surveys.**
- **Coverage of transport sector has been expanded.**
- **New indices have been constructed and used as deflators in sub-sectors of the transport, storage and communication sector.**
- **Outputs of Travel agent, C&F agent, Cable Operator, Internet Service Provider (ISP) have been included in the revised estimate.**

X. Financial Intermediation Sector

This sector presently covers (i) Monetary intermediation, (ii) Insurance and (iii) Other financial auxiliary. Monetary intermediation includes i) Bangladesh Bank ii) All scheduled & specialized Banks iii) Micro financing Institutions including Grameen Bank, iv) Leasing & Finance companies, v) Cooperative societies including Cooperative Bank, vi) Asset Management Companies, vii) Bangladesh House Building Finance Corporation (BHBFC), viii) Investment Corporation of Bangladesh (ICB) and ix) Money Changers.

Insurance sub-sector comprises of 62 insurance companies among those 44 non-life (General) including state owned Shadharan Bima corporation and 18 life including state owned Jibon Bima Corporation.

Other financial auxiliary sub-sector includes i) Capital market affiliates including Central Depository Bangladesh Limited (CDBL), Security Exchange Commission (SEC), Dhaka Stock Exchange (DSE), Chittagong Stock Exchange (CSE) and ii) others including Insurance agents, Banks Association of Bangladesh (BAB), Bangladesh Insurance Association (BIA), Bangladesh Leasing & Finance Companies Association (BLFCA).

Monetary Intermediation

Gross Output (GO) is measured as net interest income plus Fees & Commissions plus other income. Finally, GVA is measured as GO less Intermediate consumption (IC). CPI general is used for deflating to constant price. Bangladesh Bank is the source of data for major industries such as Bangladesh Bank, Scheduled & specialized bank and Leasing & finance companies. For the rest, annual reports of respective agencies are used as the data source.

Insurance

Gross Output (GO) is measured as premium received less claim paid plus other income received. Finally, GVA is measured as GO less Intermediate consumption (IC). CPI general is used for deflating to constant price. Insurance Yearbook published by Bangladesh Insurance Association (BIA) and newly formed Insurance Development and Regulatory Authority (IDRA) is the major source of data.

Other Financial Auxiliary

Income method i.e. cost of production method has been used for the value addition of NPIs such as SEC, BAB, BIA and BLFCA. For others production method has been used. Activities of capital market (Members/ Depository participants-DPs) are measured indirectly. At first, fixed incomes are taken into account then variable income and margin from the total trade are estimated to get the final

value added. General Price Index of DSE is used as deflator for capital market affiliates. On the other hand, CPI general is used as deflator for rest of the industries of the sub-sector. Annual reports of the concerned agencies are used as the source of data.

Microfinance Activities

There are four main types of institutions involved in microfinance activities in the country. These are i) Grameen Bank ii) Commercial and specialized Bank iii) Government sponsored program (through BRDB Cooperative societies and different ministries) and iv) NGO operated microfinance. Under microfinance activities only NGO operated activities are covered since others are covered by its own account.

Gross Output (GO) is measured by multiplying portfolio yield ratio to total outstanding loan. Finally, GVA is measured as GO less Intermediate consumption (IC). CPI general is used for deflating to constant price. Annual publication of Microcredit Regulatory Authority (MRA) is the major source of such data.

Cooperative Banking

Cooperative Bank including intermediary activities of all cooperative societies are covered under this subheading. Gross Output (GO) is measured as net interest income plus other income. Finally, GVA is measured as GO less Intermediate consumption (IC). CPI general is used for deflating to constant price. Annual report published by Department of Cooperatives is the major source of data.

Insurance Agents

Gross Output (GO) is measured as total agency commission of the insurance companies. Twenty percent of the GO assessed by case study is used as Intermediate Consumption (IC). Finally, GVA is measured as GO less IC. CPI general is used for deflating to constant price.

- **In the previous estimates micro finance institutions, Cooperative Banking, BHBFC, PKSF, ICB, CDBL, SEC, Insurance agents and NPIs of this sector including BAB, BIA and BLFCA were not included.**
- **In the revised estimates, outputs of newly included activities mentioned above are included.**
- **Coverage of all sub-sectors has been extended.**

XI. Real Estate, Renting and Business Activities Sector

The economic activities included in this sector are (i) Housing services, dwelling (occupied residential houses) (ii) Housing services (non-dwelling) (iii) Real estate activities (iv) Renting and business services. "Housing services, dwelling" covers the rental services related to dwelling (residential) houses including services of owner occupied residential houses (imputed rent). Housing services rendered by the non-residential buildings and structures occupied by commercial organizations and industrial establishments are covered in non-dwelling sub-sector. Imputed rent of non-residential buildings is excluded from this sub-sector due to the fact that it is included in the output of respective sectors. Services related to buying, selling, renting of real estates provided by the real estate companies within the territory of the country are covered in the real estate activity sub-sector. Renting and business services sub-sector covers renting of transport equipment, machineries etc. (without operator) and personal and household goods. This sub-sector also covers business activities like legal, accounting, book keeping, auditing, advertising activities.

Production method is followed to estimate value added of this sector. For ownership of dwellings the methodology consists of estimating the gross rental of residential buildings (including owner

occupied) and deducting there from the cost of repairs and maintenance to get gross value added. The numbers of dwelling houses by urban and rural areas obtained from the population and housing census are used as benchmark.

Intercensal growth rates are used to obtain estimates of current stock of dwelling houses. The average annual house rents obtained from Household Income and Expenditure Surveys (HIES) by categories of houses in urban and rural areas are applied to the estimated stock of houses to obtain estimates of gross output. Annual repairs and maintenance costs of owner occupied houses as obtained from HIES are deducted from gross output to get gross value added at constant price. To obtain value added at current prices the relevant house rent index (HRI) is used.

Information of non-residential buildings and structures occupied by the commercial organizations and industrial establishments are obtained from the report of the Economic Census, 2001-2003 (number of permanent structures excluding owner occupied buildings). Annual average rent and repair and maintenance cost from the report of the survey of Housing Services is applied to the estimated number of non-residential buildings to obtain estimates of gross output and intermediate consumption respectively. To obtain current price estimates house rent index (HRI) is used.

For real estate services the GVA is estimated by deducting intermediate consumption from the receipts from sale of services related to real estate activities by the underlying establishments. Incomes are estimated using information available from the report of Annual Establishment and Institution Survey (AEIS). The number of real estate companies is obtained from National Board of Revenue (NBR), Real Estate and Housing Association of Bangladesh (REHAB) and website of Joint Stock Companies.

For renting and business services, data of Annual Establishment and Institution Survey (2002-03, 1995-96) are used. Production method is applied for estimating gross value added. The output and intermediate consumption data are available in the survey reports. CPI is used for constant price estimate.

- **The output of non-residential buildings has been updated using information of Economic Census 2001/2003 report.**
- **Imputed rent of non-residential buildings has been excluded from non-dwelling sub-sector.**
- **Output of Real Estate activities and Business Services has been estimated separately using AEIS reports.**

XII. Public administration and defence sector

- The public administration and defence sector covers services rendered by the administrative departments of the general government, i.e central government and local governments (zila parishad, union parishad, city corporations and municipalities)
- Annual Development Programme (ADP) expenditure are followed according to Economic and Functional code. Data have been collected from Office of the controller general accounts of Bangladesh (CGA)
- Government Non-profit Institutions are included.
- Salary Index is used as deflator.

Gross value added of this sector is estimated by adding estimated consumption of fixed capital (CFC) to compensation of employees (wage and salaries) paid by the government. The sources of data are the revenue budget, controller general accounts of Bangladesh (CGA) office and local government's budgets, different NPI budget document.

The CFC is measured by the perpetual inventory method (PIM) in the following way:

- i) $GFCF(Y) = (GFCF(Y_{curnt}) * 100) / Index(Y)$
 Where $GFCF(Y_{curnt}) = GFCF$ at current prices for year Y, and
 $GFCF(Y)$ is $GFCF$ at constant prices for year Y
- ii) $GFCS(Y) = GFCF(Y) + GFCS(Y-1) - GFCF(Y-L)$, if $Y > L$ (life in years)
- iii) $GFCS(Y) = GFCF(Y) + GFCS(Y-1)$, if $Y \leq L$,
- iv) $CFC(Y) = GFCS(Y) / L$
- v) $CCFC(Y) = CCFC(Y-1) + CFC(Y) - GFCF(Y-L)$, if $Y > L$
- vi) $CCFC(Y) = CCFC(Y-1) + CFC(Y)$, if $Y \leq L$, where $CCFC$ is cumulative CFC
- vii) $NFCS(Y) = GFCS(Y) - CCFC(Y)$ or
- viii) $NFCS(Y) = NFCS(Y-1) + GFCF(Y) - CFC(Y)$

XIII. Education Sector

The estimates are prepared separately for government educational institutions, privately managed educational institutions and education related activities. This sector covers a wide range of educational services provided to the individuals as well as to the households. For public institutions sub-sector, gross value added is measured as the total wages and salaries of teachers and other non-academic staff employed in educational institutions and the secondary income arising from education services, consumption of fixed capital and tax on production of the institutions. Data for public portion are obtained from the government budget/expenditure on wages and salaries of educational personnel and tax paid by the institutions. CFC is calculated indirectly using capital output ratio.

The output of private educational services is estimated from the Report on Survey of Private Education Services in Bangladesh, 2007. Private education services have been divided by two parts; Private Education Service: running with Government grants and running without Government grants. Survey of Private Education Services provides information of educational institutions such as number of persons engaged in educational institutions, wages and salaries, intermediate consumption, consumption of fixed capital, operating surplus etc. Current estimates are obtained by using consumer price index (CPI, National).

- Both public and private education services activities are incorporated in the revised estimates.
- The coverage particularly for private education services of this sector have been increased significantly.
- CFC is incorporated as value added component.
- New data base of education sector has been developed based on recent survey on private education services, 2007, BBS.

XIV. Health and Social Work Sector

Health

This sub-sector includes public and private health care services including NGOs. Furthermore, Public health is distinguished as Revenue, Annual Development Programme (ADP) and Local Government. For public, gross value added is taken as equivalent to the sum of expenditure on wages and salaries of doctors and other medical and non-medical staff, consumption of fixed capital.

Sl. No	Type	Value added components	Source of data
1.	Public health services	CE and CFC	Public Expenditure statement from CGA
2.	Private health services	CE, CFC and OS	Health Survey and other surveys

Survey on Private Health Esatblishments-2007 provides information on private health establishments i.e. information on CE, IC, CFC and OS. Again the estimates on private health related personnel are

obtained by multiplying estimated number of employed persons with the corresponding net income per person. The number of workers in the private health services is estimated by deducting the number engaged in public sector from the corresponding total.

Adjusted growth rate from the said survey and medical professional growth rate from Labour Force Survey 2005-06 has been used to come up constant price value added of private health services and then inflated to current price. For the compilation of public health, cost of production method has been used to come up current price value added and then deflated to constant price. CPI general has been used as Inflater/Deflator. For public part, public expenditure statement from CGA and annual report of different local government is used as major data sources.

Social Works

Adjusted growth rate used in the estimation of private health services has been used as proxy to come up constant price value added of private social work services and then inflated to current price. For the compilation of public part, cost of production method has been used to come up current price value added and then deflated to constant price. For public part, public expenditure statement from CGA and annual report of different local government is used as major data sources.

- **In the revised estimates, the services of private health establishments i.e. private hospitals, clinics, diagnostic centers and their outputs have been taken into account for estimation of GVA.**
- **CFC is incorporated as a value added component.**
- **Production method is used in the revised estimate.**

XV. Community, Social, and Personal Services Sector

Estimates of this sector consist of community, personal, social and recreational services provided to individuals and households. Services provided by welfare institutions, religious activities, trade unions, professional organizations, membership organizations etc. are also included in this sector. This sector also includes the activities of private household's employing domestic personnel such as maids, cooks, domestic helper (ayas) etc.

Value added for each group is worked out separately. The value added within a particular group is obtained by multiplying per person income by the number of personnel in the respective profession. Value added of this sector is obtained by adding the value added of all groups in this sector. Gross income per capita from the two surveys; 'Professional and Miscellaneous Services Personnel' and 'Non-profit Institutions Serving Households' has been taken into account. Labor force has been taken from the Labor Force Survey. Thus constant price value added of this sector has been come up. Wage Rate Index has been used as inflator to estimate current price GVA.

The major sources of data for this sector are different surveys and studies such as Report of the Survey on Professional and Miscellaneous Services Personnel 1993-94, Report on Labor force survey 2005-06, Survey on Non-profit Institutions Serving Households 2007, Cultural and Recreation Survey-2010 etc.

B. GDP by expenditure approach

Expenditures on GDP comprise six components: (i) Private Final Consumption Expenditure (PCE), (ii) Government Final Consumption Expenditure (GCE), (iii) Gross Fixed Capital Formation (GFCF), (iv) Changes in Stock (CS), (v) Exports of goods and services and (vi) Imports of goods and services. It is computed as the sum of total consumption expenditure of final goods and services, changes in stock, gross fixed capital formation and export minus imports of goods and services.

Expenditure on gross domestic product or GDE at market prices is defined as the sum of $C + G + K + \Delta S + V + O + X - M$

Where,

C= Private final consumption expenditure (PCE)

G= General government final consumption (GCE)

K= Gross fixed capital formation (GFCF)

ΔS = Changes in stock or inventories

V= Net acquisition of valuables

O= Weapons system, Research & development (R&D) and intellectual property

X= Export of goods and non-factor services

M= Import of goods and non-factor services

The details of methodology and data sources for compilation of expenditure GDP in current and constant market prices are explained below:

I. Private Final Consumption Expenditure (PCE)

Private Final Consumption Expenditure consists of value of final consumption expenditures on goods and services of households and final consumption expenditure of the Private Non-Profit Institutions Serving Households. The expenditures relate to outlays on new durable and non-durable goods and services. The consumption expenditure also includes imputed gross rentals of owner occupied dwellings, consumption own account production evaluated at market prices and payments in kind of wages and salaries valued at cost (e.g. food, shelter and clothing to employees). The final consumption expenditure of non profit institutions serving households included is equivalent to the value of goods and services produced for own use on current account i.e. the value of gross output reduced by the sum of value of their commodity and non commodity sales.

The estimates of PCE are obtained through commodity flow approach supplemented by HIES data. The commodity flow implies working out commodity balances relating to various items of consumption, taking into account production, intermediate consumption in agriculture, manufacturing and other industries, net imports, stock variations, consumption on government account and household and non-household final consumption. Private final consumption expenditures estimated from HIES are adjusted by comparing with residual estimates and flow estimates to allow for HIES under estimation.

For preparing estimates, total household expenditures are divided into 13 categories and 110 basic headings. The expenditure categories include 12 basic food groups and 10 basic non- food groups.

Food groups

- Bread and cereals
- Meat
- Fish and Sea food
- Milk cheese and eggs
- Oils and fats
- Fruits
- Vegetables
- Sugar, jam, honey, chocolate and confectionery
- Food products n.e.c.
- Non-alcoholic beverage
- Tobacco
- Narcotics

Non-food groups

- Clothing and footwear

- Housing, water, electricity, gas and other fuels
- Furnishings, household equipment and routine household maintenance
- Health
- Transport
- Communication
- Recreation and culture
- Education
- Restaurants and hotels
- Miscellaneous goods and services

The estimates of consumption expenditure from the HIES data are adjusted with the product account of various commodities and other data sources along with certain conceptual adjustments to arrive at the final private consumption expenditure. The consumption expenditure growth rates of various groups are applied to arrive at the estimates for non-HIES years (i.e. the years for which HIES data are not available). The consumer price index is used as a deflator to arrive at constant price estimates.

Direct use of sources of data

- Household Income and Expenditure Survey
- Agricultural production data
- Foreign Trade Statistics (X&M)
- Retail Price Statistics
- Input-Output Table of Bangladesh Economy 2006-07
- Supply and Use Table-2005

II. General Government Final Consumption Expenditure (GCE)

General Government final consumption expenditure (purchase of goods and services) is derived from central government budgets and the budgets of the local bodies, Central Government final consumption expenditures relate to current expenditures on goods and services by central government departments not engaged in trading activities. Since Government is treated as a non-market producer in SNA, General government Final Consumption Expenditure (GCE) is computed as the sum of compensation of employees and purchase of goods and services and estimated Consumption of Fixed Capital (CFC).

General Government Final Consumption Expenditure (GCE) = Total Government output + goods and services purchased to be provided free to the population – receipts from sale of goods and services. In the GCE all non-market NPIs controlled and financed by the central and local government units are included. This consists of expenditure including imputed expenditure incurred by the general government on both individual goods and services and collective goods and services.

General Government final consumptions expenditures thus divide into:

- Government expenditure on individual goods and services;
- Government expenditure on collective goods and services.

Compensation of Employees (CE): These include wages and salaries and other miscellaneous benefits treated as part of CE in SNA.

Purchase of goods and services less sales: This refers to the expenses of the general government on goods and services in providing government services such as education, health, services relating to fire fighting and protection, sanitation and social welfare, law and order enforcement, defence and other general administration. Purchase of goods and services cover expenses on stores and supplies, fuel and lighting, maintenance of buildings and public works and other services. Expenditure on weapon system for military purposes are also excluded (it is treated as investment). Sales include school fees, sale of publications, medical and dental charges, receipts from recreational and cultural

programmes organized by the general government and revenue from other miscellaneous services rendered by the general government. Such receipts of government departments are treated as market output. Expenditures incurred by the government in respect of transfers or the subvention to private organizations are excluded as such expenditures are treated as transfer payment in national accounts. The CFC is measured by the perpetual inventory method (PIM) in the following way:

i) $GFCF(Y) = (GFCF(Y_{curnt}) * 100) / \text{Index}(Y)$

Where $GFCF(Y_{curnt}) = GFCF$ at current prices for year Y, and

$GFCF(Y)$ is $GFCF$ at constant prices for year Y

ii) $GFCF(Y) = GFCF(Y) + GFCF(Y-1) - GFCF(Y-L)$, if $Y > L$ (life in years)

iii) $GFCF(Y) = GFCF(Y) + GFCF(Y-1)$, if $Y \leq L$,

iv) $CFC(Y) = GFCF(Y) / L$

v) $CCFC(Y) = CCFC(Y-1) + CFC(Y) - GFCF(Y-L)$, if $Y > L$

vi) $CCFC(Y) = CCFC(Y-1) + CFC(Y)$, if $Y \leq L$, where $CCFC$ is cumulative CFC

vii) $NFCF(Y) = GFCF(Y) - CCFC(Y)$ or

viii) $NFCF(Y) = NFCF(Y-1) + GFCF(Y) - CFC(Y)$

The Salary Index is used as a deflator to arrive at constant prices estimate. The sources of data are the revenue budget, Annual Development Program (ADP), Controller General Accounts of Bangladesh (CGA) office and Local Government's budgets, different NPI budget documents.

III. Gross Capital Formation

1. Conceptual framework

According to the System of National Accounts 1993 (SNA-93), Gross Capital Formation (GCF) or Investment (I) is the aggregate of gross additions to fixed assets (gross fixed capital formation, GFCF) and change in stocks or inventories during the accounting period (ΔS) and net acquisition of valuables (V).

i.e. GCF or $I = GFCF + \Delta S + V$

The components or boundary of GCF or Investment are slightly different from one edition to another edition of SNA. Components of GCF as per SNA-68, SNA-93 and SNA-2008 are mentioned below.

Sl. No	Period	Components of GCF or I
1.	SNA 1968	GCF or $I = GFCF + \Delta S$
2.	SNA 1993	GCF or $I = GFCF + \Delta S + V$
3.	SNA 2008	GCF or $I = GFCF + \Delta S + V + O$ (Where 'O' includes Weapons system, Research & development and intellectual property)

The details of the major components of GCF are as under:

Component # 1: Gross Fixed Capital formation (GFCF) consists of

- (a) Tangible fixed assets;
- (b) Intangible fixed assets;
- (c) Major improvements to tangible non-produced assets such as land, subsoil assets, non-cultivated biological resources; and
- (d) Costs of ownership transfers of non-produced assets (e.g. fees paid to surveyors, engineer, lawyers, commission paid to agents etc.).

(a) Tangible fixed assets consist of

- (1) Dwelling;
- (2) Other building and structures including irrigations;

- (3) Machinery and equipment;
- (4) Cultivated assets;
 - Changes in livestock used in production year after year (i.e. breeding stock, dairy cattle, draught animals etc.) and
 - Changes in trees that are cultivated year after year (i.e. rubber, fruit trees)

(b) Intangible fixed assets consist of

- (1) Mineral exploration (costs of actual test drilling, aerial or other surveys, transportation costs, etc.);
- (2) Computer software and large data bases to be used in production for more than one year;
- (3) Literary and artistic originals of manuscripts, films, sound recordings, etc.; and
- (4) Other intangible fixed assets (New information, specialized knowledge etc.).

Component # 2: Change in inventories or stocks (ΔS)

According to SNA 1993, inventories consist of:

- (a) Stocks of output that are still held by units/ enterprises that produced them prior to their being further processed, sold, delivered to other units or used in other ways and
- (b) Stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing.

Inventories / stocks are classified into

- (1) Materials and supplies,
- (2) Finished goods,
- (3) Work-in-progress and
- (4) Goods for resale.

Component # 3: Valuables

The 1993 SNA includes a third category of capital formation called “acquisitions less disposal of valuables” covering expenditures on produced assets that are not used primarily for production or consumption, but acquired and held as stores of value:

Examples:

- (1) Precious metals and stores (diamonds, platinum, silver etc.),
- (2) Antiques and other art objects (paintings, sculptures)
- (3) Other valuables (Jewelry, fashioned out of precious stones and metals)

As per SNA 2008 additional elements / components of GCF are the costs value of

- (1) Weapons system/ military hardwires and
- (2) Research and development (R&D)

Details components of GCF / investment as per SNA-2008

- 1. Dwellings
- 2. Other buildings and structures
- 3. Major improvement of non-produced tangible assets (land improvement)
- 4. Machinery and equipment including transport equipment
- 5. Cultivated assets
- 6. Weapons system
- 7. Costs of ownership transfer on non-produced assets
- 8. Mineral exploration
- 9. Computer software and database
- 10. Research and development
- 11. Entertainment, literacy, artistic originals diamonds etc.
- 12. Intellectual property

13. Change in inventories
14. Acquisitions less disposable of valuables

Component wise estimation of GCF/ Investment: Bangladesh Bureau of Statistics (BBS) currently estimates investment or GCF based on SNA-2008. Investment estimates are done for public and private sectors only. Various secondary data sources and extrapolation method are used for estimation of different components of investment.

Dwelling, other building & structures (item # 1&2): Construction is the major component of investment which represents about 75% of the total investment. Construction is also an important sector of the GDP. Construction is divided into 3 categories viz. dwellings, non-dwellings (buildings) and other structures. Dwellings and non-dwellings are further categories into pucca/semi-pucca and katcha construction.

Pucca/semi pucca houses: These houses are built entirely or partly with bricks and cement. Again, houses and structures used for residential and non-residential purposes in urban as well as rural areas are included. The value of output of pucca and semi-pucca dwelling and non-dwellings construction is estimated using commodity flow approach. This approach envisages estimation of production of commodities used in construction after adjusting them for inputs in other industries, changes in stocks, imports and exports so as to obtain the net availability of commodities for construction purposes.

The commodities available for construction are valued at prices paid by the builders at the site of construction. Distributors' margins are added to allow for dealers' profit, transport and other charges. Base year data of domestically produced items are obtained from the annual reports of Survey of Manufacturing Industries (SMI) and Annual Establishment and Institutional Survey (AEIS), BBS. Quantum Index and Price Indices of major construction items are used for non-SMI year. Expenditure on net Imports of major construction items are taken from National Board of Revenue (NBR) and Foreign Trade Statistics.

Construction of katcha houses: Katcha houses are those which do not use bricks and cement; these include houses used as dwellings or otherwise (e.g. shop, educational institutions, mosques, etc.) in both rural and urban areas. The expenditure on katcha house construction is estimated in an indirect way, based on the estimated increase in the stock of such houses and the cost of construction of an average quality house.

Major improvement of non-produced tangible assets – Land (item # 3): This includes private investment in agriculture construction and installation of irrigation equipment. Private investment in agriculture construction includes both monetized and non-monetized investments in land improvements and construction of farm-sheds. The investment for installation of irrigation equipment includes the cost of pump house construction and sinking of tube-wells (including the cost of pipes and other accessories, but not of pump machines and engines which are treated as machinery).

Private investment in agriculture construction: Investment per acre of cultivated land is estimated from survey data is blown up to get the national aggregate.

Installation cost of irrigation equipment: Number of tube-wells/pumps sunk is multiplied by per unit cost.

Machinery and equipment (item #4): Machineries and equipment comprise all types of machineries such as agricultural machinery, power generating machinery, manufacturing plant machinery; transport equipment, furniture and fixtures. The estimates include all relevant items of new capital goods. The estimate of investment is derived entirely on the basis of the commodity flow approach. Expenditures on machinery and transport equipment are estimated from the value of domestic production and retained imports of capital goods. Distributors' margins are added to allow for dealers'

profit, transport and other charges. Estimates of domestically manufactured machineries and transport equipment are obtained from the annual reports of Survey of Manufacturing Industries (SMI) and Annual Establishment and Institutional Survey (AEIS), BBS. Quantum Index and Price Indices of machineries and transport equipment are used for non-SMI year. Expenditure on imports of machineries and transport equipment are taken from National Board of Revenue (NBR). The cif values of imports of capital goods are adjusted by mark-ups to arrive at purchasers' prices.

Cultivated assets (item # 5): This includes livestock for breeding, dairy and draught animals which are repeatedly used for production year after year. They include breeding stock dairy cattle, draught animals, animal used for transportation, Trees (fruits trees, trees for bark and leaf products) etc. Only public sector data is available in Govt. Budget book. Private sector data are not yet included in the estimation.

Weapons System (item # 6): Weapons system includes vehicles and other equipment such as warships, submarines, military aircraft, tanks, missile carriers and launchers. This is a new item of GCF as per SNA-2008. This data is available in Govt. Budget book.

Cost of ownership transfer of non-produced tangible assets (item # 7): Transfer costs of land which include stamp duties, legal fees, fees paid to surveyors, engineer, lawyers, commission paid to agents are included in GFCF. Expenditure on stamp duties, legal fees and others are computed on the basis of the number of transfer cases registered with the sub-registers office and the average transaction value of the property and the average rate of charges. Govt. Budget Book is the source of data.

Mineral Exploration (item # 8): Mineral exploration and evaluation consists of the value of expenditures on exploration for petroleum and natural gas and for non-petroleum deposits and subsequent evaluation of the discoveries made. It is public sector expenditure and necessary data are available in Government development and Revenue Budgets.

Computer Software and databases (item # 9): Computer software consist of computer programs, program descriptions and supporting materials for both system and applications software. Gross fixed capital formation in computer software includes both the initial development and subsequent extensions of software as well as acquisition of copies that are classified as assets. Database consists of files of data organized in such a way as permit resource-effective access and use of the data. Only public sector data is available based on Govt. Budget Book. Private sector is not yet included in estimation.

Research and Development (item # 10): Research and [experimental] development consists of the value of expenditures on creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and use of this stock of knowledge to devise new applications. This does not extend to including human capital as assets within the SNA. It is a new component of GCF as per SNA-2008. Public sector data on R&D is available from the Govt. Budget Book.

Entertainment, Literary and artistic originals (item # 11): Entertainment, Literary and artistic originals consists of the original films, sound recordings, manuscripts, tapes, models, etc. on which drama performances, radio and television programming, musical performances, sporting events, literary and artistic outputs, etc., are recorded or embodied. Only public sector data is available based on Budget Book. Private sector data is not yet included in the estimation.

Other Intellectual property (item # 12): Other intellectual property products include any such products that constitute fixed assets but are not captured in any of the specific items discussed above. It is a new component of GCF according SNA 2008.

Change in Inventories/ Stocks (item # 13) (Major component # 2): Not yet included in the estimation.

Acquisitions less disposable of valuables (item # 14) (Third major component #3): Valuables includes precious metals and stones antiques and other art objects and other valuables. This component is included in the estimation.

IV. Exports and Imports of Goods and Non-Factor Services

Exports and imports of goods and non-factor services consist of transactions of resident institutional units with the rest of the world and include commodities and other goods and services, such as (i) merchandise (ii) freight (iii) insurance and (iv) other transfer payments. These transactions in national accounts need to be recorded when the legal ownership of the goods passes from non-residents to resident and are estimated on the basis of physical movement of goods and services.

The basic data on merchandise trade are obtained from the BBS foreign trade statistics, whereas service data are obtained from the balance of payment statements of the Bangladesh Bank. In addition, imports under baggage rules, and gifts in cash or kind are included in imports while military equipment transferred between governments are excluded. The current estimates of exports and imports of goods and services are deflated by exports and imports unit price indices (UPI) to arrive at constant price estimates.

V. Saving

Saving represents the excess of current income over current expenditure and is the residual item of use of disposable income of producing enterprises, households, General Government and other institutional units. Currently domestic and national savings are estimated indirectly due to lack of primary data. Saving is computed in the following way:

Domestic saving = GDP at current market price - total consumption expenditure

National Saving = Gross National disposable income - total consumption expenditure Where,

Gross National disposable income = GNI at current market price + net international transfers,

GNI = GDP at current market price + net primary income from rest of the world

Total consumption = General Government consumption + Private consumption.

Over all, to measure the balancing items such as gross domestic savings (GDS), National savings (S) and other aggregates of the national accounts the following equations/ relations hold:

i) Gross Domestic Product/Expenditure (GDP/GDE):

$$\text{GDP (GDE)} = C + I + X - M$$

Where, C = Consumption [Private consumption expenditure (PCE) and general government consumption expenditure (GCE)]

I = Investment/gross fixed capital formation (public and private investment)

X = Export of goods and non-factor services

M = Import of goods and non-factor services

ii) National savings (S):

$$S = CAB + I$$

$$S = NDI - C$$

Where, S = National saving

CAB = Current accounts balance of the balance of payment

I = Investment

NDI = National disposable income

C = Consumption

iii) Current account balance (CAB):

$$\text{CAB} = \text{S} - \text{I} = \text{X} - \text{M} + \text{NFI} + \text{NCT}$$

Where, NFI = Net factor income from abroad (factor income receipts minus factor income payment)

NCT = Net current transfers; (NGO transfer, remittance and Govt. grants); Grants includes food, commodity and projects aids

iv) National disposable income (NDI):

$$\begin{aligned}\text{NDI} &= \text{C} + \text{I} + \text{CAB} \\ &= \text{C} + \text{I} + (\text{X} - \text{M} + \text{NFI} + \text{NCT}) \\ &= \text{GDP} + \text{NFI} + \text{NCT}\end{aligned}$$

v) Gross domestic saving (GDS):

$$\begin{aligned}\text{GDS} &= \text{GDP} - \text{C} \\ &= \text{I} + (\text{X} - \text{M}) \\ &= \text{S} - \text{NFI} - \text{NCT}\end{aligned}$$

vi) Investment/gross fixed capital formation (I/GFCF):

$$\begin{aligned}\text{I} &= \text{S} - \text{CAB} \\ &= \text{S} - (\text{X} - \text{M} + \text{NFI} + \text{NCT}) \\ &= \text{S} - (\text{X} - \text{M}) - \text{NFI} - \text{NCT} \\ &= (\text{S} - \text{NFI} - \text{NCT}) - (\text{X} - \text{M})\end{aligned}$$

vii) Net resource (NR):

$$\begin{aligned}\text{NR} &= \text{GDP} + (\text{X} - \text{M}) \\ &= \text{GDP} - (\text{X} - \text{M}) \text{ (Note: Net export is negative)}\end{aligned}$$

viii) Resource gap (RG):

$$\text{RG} = \text{X} - \text{M}$$

ix) Domestic demand (DD) = C + I

MAIN FEATURES OF THE REVISED ESTIMATES

1. The methodology of compilation is as recommended by the UN SNA-1993/SNA-2008
2. Rebased from 1995-96 to 2005-06 for constant price estimates;
3. More comprehensive coverage which increases GDP by about 15% and per capita income by early 13% compared to previous method;
4. Measurement of production retained for producer's own use;
5. Measurement of other non-market outputs of Government, non-profit institutions serving household;
6. Upgrades input coefficients based on recent surveys and out-reach departments;
7. Direct estimation of private final consumption expenditures based on HIES data;
8. Incorporates new data available from all recent studies and surveys in the revised series.

C. Challenges for compilation of national accounts

- (i) Data coverage (Lack of formal data, Lack of time from different data sources)
- (ii) Appropriate deflators (Lack of appropriate indices)
- (iii) Human resources (Inadequate training, Lack of technical supports)