Methodology of rebasing GDP, 2005-06

Production and Expenditure Approach

Bangladesh Country Report

Presented at

Regional Course on SNA 2008 (Special Topics):
Improving Exhaustiveness of GDP Coverage

31 August – 4 September 2015
Daejeon, Republic of Korea

Presented by

Abdul Alim Bhuiyan
Deputy Director
Bangladesh Bureau of Statistics

Methodology of rebasing GDP, 2005-06

Overview

- Bangladesh Bureau of Statistics (BBS) is compiling National Accounts Statistics since the independence of Bangladesh.

- "Bangladesh National Accounts Statistics: Sources and Methods", published in August 2014, is the third publication exclusively devoted to the process of rebasing of national accounts data from 1995-96 to 2005-06 .

- 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.

- At present, BBS is estimating GDP by production and expenditure approach.

GDP by Production Approach

Industrial origin sector

- ➤ **1. Agriculture and Forestry**
- ➤ **2. Fishing**
- ➤ **3. Mining and Quarrying**
- ➤ **4. Manufacturing**
- ➤ **5. Electricity, Gas and Water Supply**
- ➤ **6. Construction**
- ➤ **7. Wholesale and Retail Trade**
- ➤ **8. Hotel and Restaurant Services**
- ➤ **9. Transport, Storage and Communication**
- ➤ **10. Financial Intermediation**
- ➤ **11. Real Estate, Renting and Business Activities**
- ➤ **12. Public Administration and Defence**
- ➤ **13. Education**
- ➤ **14. Health and Social Work**
- ➤ **15. Community, Social and Personal Service**

3

Methodology and Data Sources

1. Agriculture and forestry Sector

Crops and Horticulture:

- Data on production volume of about 124 crops **(including 24 new crops)** are taken from Agriculture Wing of BBS. Rubber production data are collected from BFIDC.
- Prices used for valuation of these products are collected from DAM.
- The value-added estimates for crops are based on gross production less intermediate consumption or production inputs.
- New input coefficients from **Input Cost Survey, 2008-09 of BBS** are used.
- **Output/GVA of irrigation services** is newly included.

4

Methodology and Data Sources

1. Agriculture and forestry Sector

Animal Farming:

- Agriculture censuses 1996 and 2008 are used as benchmark. Survey of livestock and poultry 2007-08 at farm level and 2008-09 at HH level are also used. Consultation with Department of Livestock (DLS).
- Annual estimates are made by the intercensal growth rate.
- Animal farming include
  - (i) Meat
  - (ii) Milk
  - (iii) Hides and skin
  - (iv) Cow dung
  - (v) Animal fats and others
  - (vi) Poultry birds and eggs
- Prices used for valuation of these products are collected from DAM.
- New **input coefficients** and **slaughter rate** are used.
- Both **farm** and HH level livestock and poultry covered.

5

Methodology and Data Sources

1. Agriculture and forestry Sector

Forest and related services:

- Both **public** and private forestry are covered
- Data are collected from Bangladesh Forest Department, BFIDC, DAM, HIES of BBS for different forest products and prices.
- The output is estimated by establishing a bench mark year (2005-06) data with the help of consultation with the Chief Conservator of forest, and trade sources.
- Annual estimates are estimated using wood product index, small scale quantum index, intercensal rural HH growth rate.
- Technical co-efficient derived from Input-Output table for 1993-94 are used to estimate Gross Value added.
- **Services of BFIDC** is newly included.

6

Methodology and Data Sources

2. Fishing Sector

- **The activities in the fishing sector include**
    - **commercial fishing in high sea, coastal and offshore waters**
    - **catching and gathering fish from inland rivers, canals, lakes, haors, bills, ponds etc. and**
    - **subsistence fishing in inland waters.**
- **The GVA of this sector is estimated by applying the production approach.**
- **The following new activities are included in the new estimate**
    - **Sundry fishing activity**
    - **Fry fish (pona mach) activity**
- **Department of Fisheries (DOF), ad-hoc Fish Species Survey of 1993-94, Fisheries studies, DAM, Fisheries Development Corporation (FDC) are the sources of data.**
- **Value added of the services of FDC are newly included.**

7

Methodology and Data Sources

3. Mining and Quarrying Sector

- **The activities of this sector include**
    - **extraction of natural gas and**
    - **production of limestone, white clay, stones and boulders, sands and crude salt production.**
- **Production approach is followed to obtain GDP of this sub-sector.**
- **Basic data (production, intermediate input and prices) for mining and quarrying of natural gas, limestone and white clay are taken from state corporation engaged in the activity.**
- **Output of sand is indirectly estimated as a fixed ratio (1:6) of cement.**
- **Refining activity of gas by PETRO-BANGLA is included in revised estimates.**

8

Methodology and Data Sources

4. Manufacturing Sector

Large & Medium Scale

- **Survey of Manufacturing Industries (SMI) 2005-06 have been taken as bench mark data.**
- **After few adjustments the survey data have been used for estimating Gross Value Added (GVA).**
- **Quantum Index of Industrial Production (QIIP) for Large & Medium is used for extrapolation.**
- **Output Value added ratios are also used to estimate the Gross Value Added (GVA)**

9

Methodology and Data Sources

4. Manufacturing Sector

Small Scale

- **Annual Establishment and Institutional Survey (AEIS: 2002-03) data have been used for estimating and reconciliation of 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 as well as Gross Value Added (GVA).**
- **Output Value added ratios are also used to estimate the Gross Value Added (GVA).**
- **BSCIC Census 1991 data are extrapolated by value added growth rate.**
- **Handloom Census 1990 data are extrapolated by value added growth rate.**
- **Value Added growth rate have been used for extrapolation of Handloom and Cottage Industries.**

10

Methodology and Data Sources

5. Electricity, Gas, and Water Sector

- Basic data for direct estimates of GVA of these sectors are taken from government enterprises and local governments budget documents.

- Electricity, gas, and water price indices are used to obtain value added at constant prices.

- PDB, REB, DESA, WASA, Petrobangla, City corporation, Municipalities etc. have been used as data sources.

- **District headquarter municipalities water supply** are newly included in the 2005-06 base.

11

Methodology and Data Sources

6. Construction Sector

- Gross value of construction is derived from the 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 and used some ratios and weights from I-O 2000 (SHD, Planning commission)

- Input output coefficients of basis of five major components are taken from the report on Case Study on Major Inputs used in Building Construction and input output coefficients, 2011 to get total volume of building construction.

- 31.88% of the gross value of construction output is taken as gross value added for pucca house construction.

12

Methodology and Data Sources

6. Construction Sector

- The katcha house construction bench-mark year 1980-81 on the basis of some objective data used by Dr. Wahiuddin Mahmud's study.

- Extrapolated that bench-mark year's data to current years by the intercensal growth rate. 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.

13

Methodology and Data Sources

7. Wholesale and retail trade Sector

- Commodity flow of domestically produced goods and imports is used for trade sector.
- For benchmark estimate, AEIS 1996-97 and 2002-03 have been used.
- Public (TCB) and private are desegregate in the new estimate.
- New coverage
  - Repair of motor vehicle
  - Repair of HH goods

14

Methodology and Data Sources

8. Hotel and restaurant services sector

- The output of hotels and restaurants is measured by the service which is the value of the sale receipts plus receipts from other services rendered, rentals, etc.
- Benchmark estimate derived from AEIS 1992-93 and AEIS 2002-03.
- For constant price estimate use
  - Residential Hotel - CPI non-food
  - Hotel and restaurant- CPI food

Methodology and Data Sources

9. Transport, Storage and Communication Sector

- Mode of transport (Land, Water and Air)
- Communication
- Support service, storage etc.
- GVA of public transport (BRTC, Railway, BIWTC, Shipping, Biman, BPO, BTCL) are estimated from respective budget document.
- Private commercial transport survey, 2009 is used for benchmark estimate.
- No. of registered vehicle on are obtained from BRTA, BIWTC.
- Non-Mechanised transport (Rickshaw, Van etc.) data are obtained from city corporation.
- Non-Mechanised transport (Rickshaw, Van etc.) data are obtained from city corporation.
- Non Mechanised water transport (country boat) data are obtained from Agriculture census report Communication.
- Fare and freight index is used for current price estimate.

Methodology and Data Sources

9. Transport, Storage and Communication Sector

•ISP, Cable service, courier service data are obtained from Communication Survey-2011.
• GVA of Storage sector is estimated using Agriculture Census 1984-85 and 1996.
• Storage sub-sector is divided into urban and rural storage. the data source for urban storages is the cold storage association.
• Storage capacity on rural areas is estimated with the help of the benchmark data obtained from the agriculture censuses are validated by the survey on private storage.
• Deflated by House Rent Index (HRI) to obtain the value added at constant prices.
• Newly included activities are
•Internet Service Provider (ISP)
•Cable service operator
•Private airline (GMG, United airlines)

17

Methodology and Data Sources

10. Financial Intermediation Sector

(a) Banking:
•Value added of this sector is measured through production method.
•Net interest receipt plus actual service charges (rental income, commission and other fees) are added up to obtain the value of gross output.
•This sub-sector newly includes Grameen Bank including Micro Financing Institutions, Cooperative societies including Cooperative Bank , Asset Management Companies, Bangladesh House Building Finance Corporation (BHBFC), Investment Corporation Bangladesh (ICB).

18

Methodology and Data Sources

10. Financial Intermediation Sector

(b) Insurance:

•The value of output in Insurance sub-sector comprises net retained premium, investment income, re-insurance income.

•Intermediate consumption is subtracted to get the value added.

•Annual reports of the concerned insurance companies are the sources of the data.

(c) Other Financial :

•Insurance agents, NPIs, BCDL, are newly included in this sub-sector.

Methodology and Data Sources

11. Real Estate, Renting and Business activities

• Production approach is used. Number of own occupied dwelling by urban and rural areas are obtained from the population census which is used as bench mark data.

• Average annual house rent (as per HES) is applied to provide to estimate of gross output.

• Maintenance cost is treated as intermediate consumption. Owner-occupied dwellings' out-put is valued as the estimated rentals that tenants would pay for similar accommodation.

• Non residence HH stock estimated using Economic Census 2001-03 data.

Methodology and Data Sources

12. Public administration and defence

- Gross value added of this sector is estimated by adding estimated CFC to compensation of employees (wage and salaries) paid by the government.
- The CFC is measured by the perpetual inventory method (PIM).
- Sources of data are the revenue budget, controller general accounts of Bangladesh (CGA) office, local government's budgets, different NPI budget documents.
- Government NPIs are included in the revised estimate
- Salary Index is used as deflator.

21

Methodology and Data Sources

13. Education

- The estimate are prepared both for government and privately managed educational institutions and education related activities.
- For public institutions, gross value added is taken to be the same as the total wages and salaries of teachers and other non –academic staff employed in educational institutions.
- Data for public portion are obtained from Government budget/ expenditure on wages and salaries of educational personnel.
- Growth rate from 'Private education survey-2007' has been used to come up constant price value added of private education institutions and then inflated to current price.
- For the compilation of public education, 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 Inflator/Deflator.

22

Methodology and Data Sources

14. Health and Social work

- 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. .
- Growth rate from private health establishment survey-2007 has been used to come up constant price value added of private health services and then inflated to current price.
- Value added by NGOs has been estimated as 15 percent of the NGOs value addition taken from the survey of NIPISH-2007.
- CPI general has been used as Inflator/Deflator..

23

Methodology and Data Sources

15. Community, Social and Personal Service

- Production approach has been used for value added compilation.
- 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.
- Gross income per capita has been taken from the two surveys
  - 'Professional and Miscellaneous Services Personnel' and
  - 'Non-profit Institutions serving households'.
- Labor force has been taken from the Labor Force Survey.
- Constant price value added of this sector has been come up.
- Wage Rate Index has been used as inflating to current price.

24

GDP by Expenditure Approach

➢ **(i) Private Final Consumption Expenditure (PCE)**

➢ **(ii) Government Final Consumption Expenditure (GCE)**

➢ **(iii) Gross Fixed Capital Formation (GFCF)**

➢ **(iv) Changes in Stock/Inventories (CS)**

➢ **(v) Exports of goods and services and**

➢ **(vi) Imports of goods and services**

25

Methodology and Data Sources

I. Private Final Consumption Expenditure (PCE)

- **PCE consists of value of final consumption expenditures on goods and services of HHs and PCE of the private NPISHs.**
- **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 estimates of PCE are obtained through commodity flow approach supplemented by HIES data.**
- **The consumption expenditure growth rates of various groups are applied to arrive at the estimates for non-HIES years.**
- **The consumer price index is used as a deflator to arrive at constant price estimates.**
- **Data sources are: HIES, Agricultural production data, Foreign Trade Statistics, Retail price statistics, Input-Output table of Bangladesh economy 2006-07, Supply and Use Table-2005.**

26

Methodology and Data Sources

II. General Government Final Consumption Expenditure (GCE)

- GCE is derived from central government budgets and the budgets of the local bodies.
- GCE is computed as the sum of compensation of employees and purchase of goods and services and estimated CFC.
- All non-market NPIs controlled and financed by the central and local government units are included.
- GCE = Total Government output + goods and services purchased to be provided free to the population – receipts from sale of goods and services.
- GCE consists of Government expenditure on goods and services by both individual and collective.
- Salary Index is used as a deflator to arrive at constant prices estimate.
- Sources of data are the Revenue budget, ADP budget, CGA office and Local government's budgets, different NPI budget documents.

27

Methodology and Data Sources

III. Gross Capital Formation (GCF)

- GCF or I = GFCF + ΔS + V + O ; Where, GFCF = Gross fixed capital formation, ΔS = Change in inventories, V = Net acquisition of valuables, 'O' includes weapons system, research & development and intellectual property.
- 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.).
- Tangible fixed assets consist of (1) Dwelling (2) Other building and structures including irrigations (3) Machinery and equipment (4) Cultivated assets: (a) Changes in livestock used in production year after year (i.e. breeding stock, dairy cattle, draught animals etc.) and (b) Changes in trees that are cultivated year after year (i.e. rubber, fruit trees).
- 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.).

28

Methodology and Data Sources

IV. Exports and Imports of Goods and 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.
- 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.
- 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.

29

Methodology and Data Sources

Main Features of the Revised Estimate

- The methodology of compilation is as recommended by the UN SNA-1993/SNA-2008
- Rebased from 1995-96 to 2005-06 for constant price estimates
- More comprehensive coverage which increases GDP by about 15% and per capita income by early13% compared to previous method
- Measurement of production retained for producer's own use
- Measurement of other non-market outputs of Government, non-profit institutions serving household
- Upgrades input coefficients based on recent surveys and out-reach departments
- Direct estimation of private final consumption expenditures based on HIES data
- Incorporates new data available from all recent studies and surveys in the revised series.

30

Methodology and Data Sources

Challenges for compilation of national accounts

- **Data coverage (Lack of formal data, Data from different sources are not timely available)**
- **Appropriate deflators (Lack of appropriate indices)**
- **Human resources (Inadequate training, Lack of technical supports)**

31

Thank You

32