

The Need for Natural Resource Accounting in the System of National Accounting

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Presentation Overview

- **General Idea about NRA: What it is and what it does;**
- **Why does country (Bangladesh, Canada) need Natural Resource Accounting?**
- **A comparative picture of wealth accounts;**
- **Discussion on NRA Framework;**
- **Applications and Policy Uses of NRA;**
- **Case Study: Institutional Failure in Bangladesh;**
- **Recommendations to Adopt NRA**

What is NRA?

NRA

- Measure quantities and values of natural resources stocks at the start of an accounting period, records changes in the stocks due to natural and human processes to give the stock level at the end of the period
- Follows the structure of the asset accounts of the SNA, with data for opening stocks, closing stocks, and changes during the year
- Uses both physical and monetary units
- Provides an informational framework best suitable for analyzing policy issues
- The basic accounting identity :

Opening Stocks

Changes due to economic activities

Other changes

Closing stocks

Types of NRA

- **Physical accounts:** record detailed physical changes in the asset's positions over the year and give a clear picture of resource consumption, extraction, increases and decrease;
- **Monetary accounts:** estimate monetary values of asset stock and provide a figure of total natural capital

Physical Accounting Format of Forest Land

Opening stock
+ Changes in forest land
 Man-made changes
 +Afforestation
 - Deforestation
 Natural events
 + Natural expansion (growth, regeneration)
 -Degradation (Catastrophic events)
 Change in classifications
 Economic decisions
 - Net transfer of forest land to non- forest uses
 - Loss of forest land due to shifting cultivation
+ Net reclassification and other changes
= Closing stocks

Source: Adapted from SEEA-2003 and Sanyal et al. 2007

Why does Country Need Natural Resource Accounting?

Need to Understand current System of National Accounting (SNA)

SNA is an accounting framework that provides:

- economic information suitable for analyzing the performance of the economic system; and
- macro-economic indicators: GDP, GNP, Total Wealth are the principle measures of economic progress and transformation

Shortcomings of SNA

- Takes no account for non-economic asset
- Takes no account for depletion of natural resources
- Takes no account of environmental degradation
- Takes no account of ecosystem services as an intermediate input
- Takes no account of non market goods and services of nature

Let's see some examples of Such Accounts

Example – 1 : Agricultural Production Account in Bangladesh

Value Added = Value of Output – intermediate Consumption (IC)

IC: Seed, fertilizer, pesticide, irrigation services, labor

Subsidized

Unaccounted Inputs

Use fixed Input coefficient table(1996) to measure intermediate inputs

Quality Soil

Water for Spraying Pesticide

Pollination Services by Bee

Nature's contribution considered to be zero

Overstating Estimate

In FY 1996-1997 to FY 2005-2006

- SNA of Bangladesh shows increase in agricultural production;
- Economic Review of Finance Division shows fertilizer use increase;
- Soils Division of BARC reports a decline in soil fertility and cereal productions, and indicates additional inputs are needed per year due to decline in soil fertility

Example – 2 : Timber Account in Canada

Value added = the value of extracted timber- extraction costs



Extraction Costs

fuel, electricity, materials, supplies and wages

Produced Capital

Machinery used for planting, thinning and transporting logs, construction of logging roads

Here man-made assets are written off against the value of production as they depreciate.

Sustainable Income

Net Value Added = Value added - Consumption of produced capital

Pricing Strategy:

Resource Rent = Revenue from the sale of timber - All current and capital cost - Management costs

No depreciation account for running down forest resource base due to construction of logging roads and harvesting process.

Does the province's Resource Rent truly reflect the cost of timber production?

Example – 3 : Macro Economic Accounting

Supply = Demand; Investment = Income

Output + Import =

- + Intermediate Consumption**
- + Final Consumption**
- + Gross Capital Formation**
- + Exports**

In this equation, there is no entry for natural resources as capital

Gross capital formation include:

- Capital Stock= Plants, Machinery, Vehicles & Equipment, and Buildings**
- Costs of Land Improvement = Developing and Extending Timber Producing Areas, Infrastructure for the Fishing Industry, Mineral Exploration, Clearing old growth forest for plantation**

Not included:

- Natural Capital: Land itself is not included in fixed capital even though it is a fixed asset, because it is not a product.**
- Non-reproducible physical assets: Soil or the natural growth of trees are not included in the gross formation of capital**

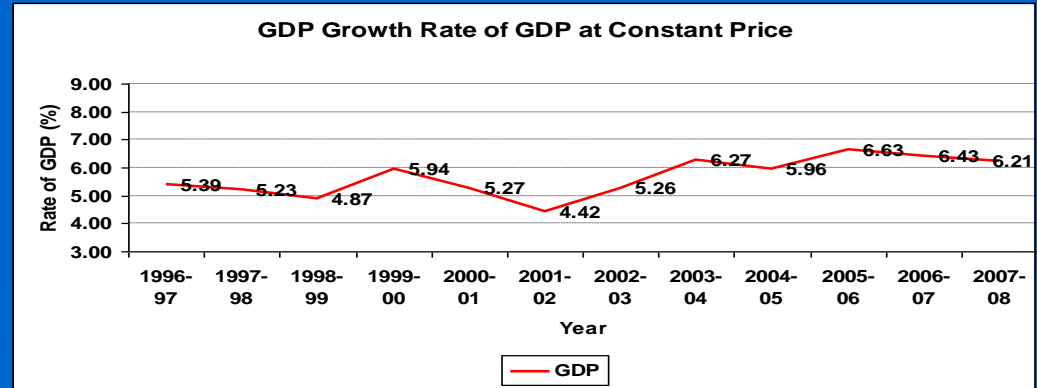
Final Consumption:

- Allowance of a Depreciation Account for Man-made Capital**
- Natural Resources: that are depleted or degraded due to economic activities are not recorded as consuming capital**

A comparative picture of wealth accounts

Bangladesh Bureau of Statistics (BBS)'s GDP Measure

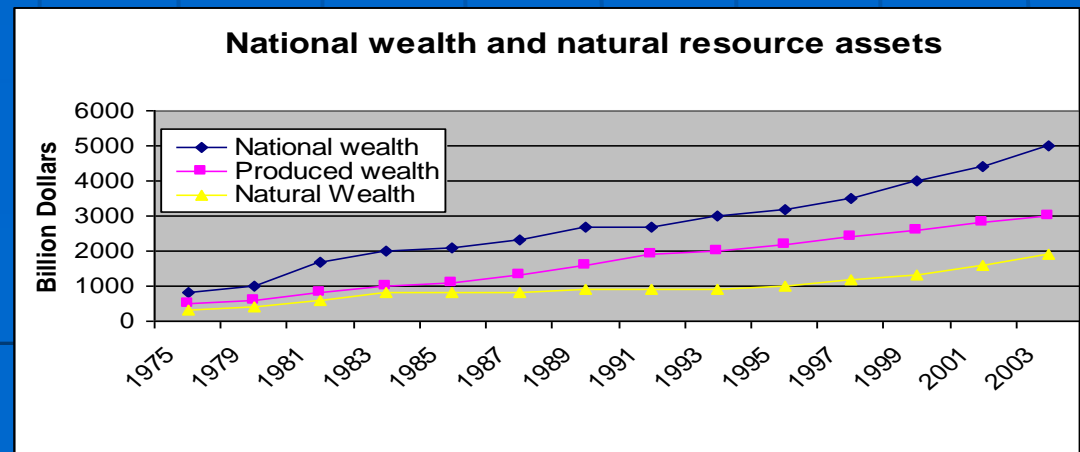
No comparative picture of GDP growth and natural resource growth



Source: Bangladesh Bureau of Statistics and Bangladesh Economic Review, 2006

Statistics Canada's NRA In Monetary Value

- Energy
- Land
- Timber
- Mineral



Source: Robert Smith Presentation Slide No- 18

Question:

Is Canada getting better off under such conditions, or worse off?

Rationale for NRA

- Legal binding : Countries who signed and ratified the Rio convention Agenda 21 sets the basis of Sustainable Development
E.g., MNR's OSF contains SD Principle
- Countries whose industrial structure is dominated by primary sector activities. E.g.,
Canada's economic structure: Agriculture, Fisheries, Forestry, Mining
Bangladesh's economic structure: Agriculture, Fisheries, Forestry, Natural Gas Extraction, Livestock
- Country's exports are mainly or appreciably made up of primary commodities, e.g., 19.19% of Bangladesh's total exports consist of primary commodities
- Countries where environmental depletion or degradation constrains economic activity and is counted misleadingly in the national accounts
- Countries whose strategic direction focuses on ecological sustainability, valuation of natural resources, full-cost pricing for ecosystem services, State of the Resources Assessment and Reporting (MNR's OSF)

Discussion on NRA Framework

Types of Accounting Framework

1- SNA linked "Satellite Accounts" System:

A separate physical accounting system for natural resources where adjustments can be made

E.g., Norway, Canada

Conventional GDP

- = Value added in manufacturing
- + Value added in agriculture
- + Value added in logging
- + Value added in forestry

Adjusted GDP

- = Conventional GDP
- + Final consumption of non-market forest production
- + Final consumption of forest amenities & other Services

Necessary adjustments at the Micro-level

Adjusted value added in agriculture = Conventional value added in agriculture
- Value of ecosystem services provided by soil, water, bee

Source : FAO Forest Accounts Handbook, 1998

Types of Accounting Framework

2- Extensions of SNA-type Systems:

- A comprehensive accounting system with everything measured and aggregated in monetary terms to present in detail the values of natural resource asset stocks and the annual changes in the volume of these stocks
- Requires the Full National Accounting Matrix with Environmental Accounts:
 - The major changes in the SNA structure
 - The adoption of standard classification of environmental statistics
 - The adoption of comprehensive and consistent data sets
 - The adoption of Stocks and flow accounts in physical and monetary term
 - The adoption of Supply and Use table and Input-Output table adjusted with all environmental and economic data

E.g., UN-SEEA, Philippines-ENRAP , Netherlands-NAMEA

Comment

This approach is the most ambitious one requires sufficient modifications to account for all environmental-economic interactions, requires all the information, analytical capability, staffing, funding, and time

Recommended Reading: SEEA-2003, Chapter 2

Why use a SNA approach ?

- The national accounting framework is more complete with respect to natural resource accounting because it provides for balance sheets that record opening and closing stocks, and sources of increases and decreases.
- The national accounting framework is internationally comparable and a very influential source of economic information system.
- The indicators derived from SNA are regularly used in economic analysis, forecasting of economic trends, development plans, estimating economic effects of government policies, and formulating and evaluating various aspects of public policies.
- Natural Resources can be quickly and easily integrated into existing economic and environmental decision making processes.
- Natural Resources Accounting can be easily grasped by national statisticians and would take fewer resources in terms of staff, budgets, and raw data

Considerations on NRA framework

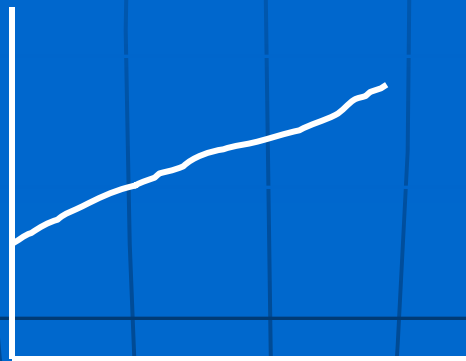
To Adopt NRA, Several Considerations Should be Made :

- Natural Resource Assets to be included in NRA
- Physical versus Monetary Accounts
- Valuation Principles
- Cooperative Approach to data Collection
- Institutional Arrangement

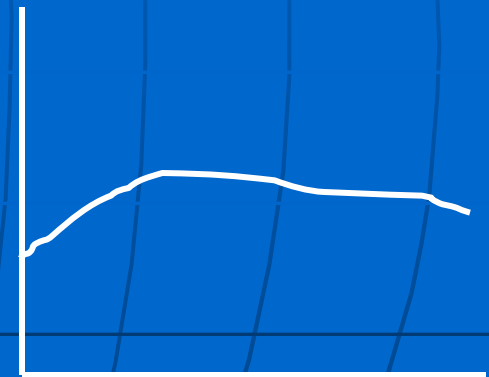
Physical Vs. Monetary Account

Philippines Forest Account

Both physical and monetary accounts need to be consulted Before making any managerial or policy decision



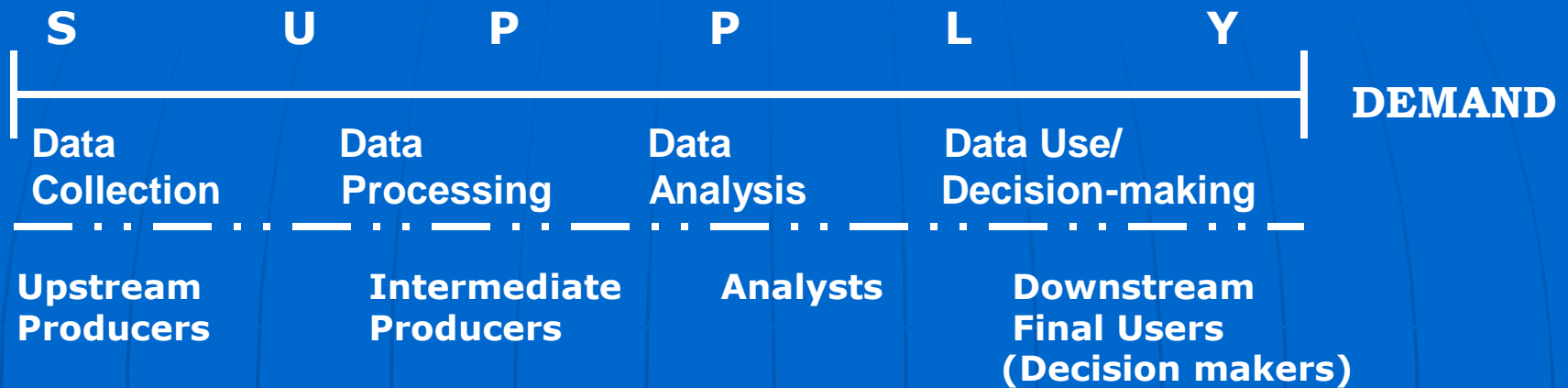
Monetary Account: The Value of Forest Went up



Physical Account : Volume decreased

Cooperative Approach to data Collection and Use

The Information Continuum



Source: Adapted from the World Bank, 1992

- A common resource information policy to develop common statistical concepts, definitions and classification system;
- A cooperative effort among ministries and different agencies to collect and compile raw data, and to conduct new survey to fill the data gaps;
- Coordination among suppliers, and between suppliers and users;
- Centralizing computer equipment

Applications and Policy Uses of NRA

- Development of Economic and Sustainability indicators;
- Policy Analyses (e.g., analyzing structural changes in the economy);
- Strategic Planning (e.g., improving resource management by generating empirical evidence of over exploitation);
- Economic Analysis and modeling (e.g., measuring the sectoral costs associated with government regulation and policy);
- Monitoring the pressures exerted by the economy on the environment;
- Developing pricing techniques for natural resources (e.g., flow accounts of water used in water pricing policy in Australia);
- Answers many questions like how much does depletion and degradation matter?
- Adjusting Macro-economic aggregates;
- Ecological fiscal reform;
- Financial and economic decision- making for resource sector;
- Dealing with aspects of international trade

Case Study: Institutional Failure to Adopt NRA in Bangladesh

Background:

SEMP-1996 (UNEP, UNDP, CIDA, WEF, IUCN)—10 Years Program)

One Component's Objective:

- Environmental Statistics
- NRA

Result:

- Compendium of Environmental Statistics
- Drop NRA from the program objective

Informal Discussion

Formal Interview with:

- DM- Secretary
- ADM-Addt.Secretary
- Director- Joint Secretary
- Statistician

Interview Result

- 80 % Policy makers don't see linkages
- No demand for NR Information
- Institutional Failure
- Ignorance of the subject matter

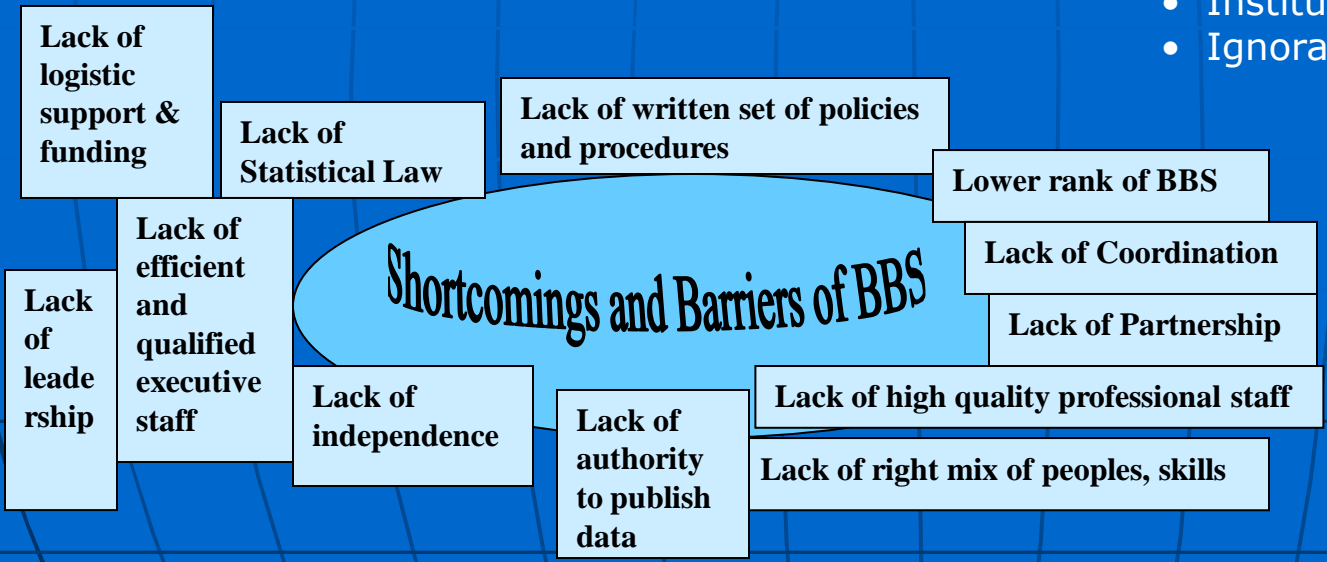


Figure- Shortcomings and Barriers of BBS to adopt NRA

Recommendations to Adopt NRA

- **Need leadership and commitment;**
- **Raise awareness of policy makers to recognize linkages between; economy and the environment**
- **Generate demand for NRA;**
- **Assess the feasibility of constructing NRA;**
- **Ensure strong institutional environment;**
- **Prepare action plans to adopt NRA;**

Concluding Remarks

NRA has wider applications and uses. If governments are interested in sustainable development, they need NRA to measure development activities that capture its sustainability. It will take time to develop NRA into an effective tool, but serious work in this area should now be pursued actively and vigorously.

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Discussion