ENVIRONMENTAL ACCOUNTING IN INDIA

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Need For GNA

- Environmental-Economic Accounting describes the interaction between the economy and the environment, and the stocks and changes in stocks of environmental assets.
- While System of National Accounts (SNA) provides a comprehensive accounting framework for analyzing and evaluating the performance of an economy, a growing recognition that contemporary national accounts has limitations in the sense that these accounts do not take into consideration all aspects of economic evaluation e.g.: human capital, environment.

Need For GNA

- Often, economic policies designed to promote growth have been implemented without considering their full environmental consequences, presumably on the assumption that these consequences would either take care of themselves or could be dealt with separately
- There is evidence to suggest that such policies may actually result in a net decrease in human well-being.
- Globally, environmental degradation is manifesting itself through the loss of fertile soils, desertification, decreasing forest cover, reduction of fresh water availability, and an extreme loss of bio-diversity. These are serious consequences, and it has become clear today that economic development must be environmentally sustainable.

Need For GNA

- Contemporary national accounts systems do not adequately account for the costs arising out of the use of environmental and natural resources .
- The pursuit of growth can be at the cost of degradation of environment.
- As a possible solution to the limitations of national income accounting, integrated environmental and economic accounting has emerged as a new concept.
- The main objectives of this concept are segregation and elaboration of all environmental and economic accounts with assessment of environmental costs and benefits, and accounting for the maintenance of tangible wealth.

Development of Environment Statistics

- In India developing of an appropriate environmental statistical system in the country was discussed in annual conferences of central and state statistical organizations .
- In 1990s a framework for Environment Statistics was adopted on the lines of UN Framework for development of env Accounts(FDES).
- The first issue of Compendium of Environment Statistics published in 1997. Thereafter, the Compendium became an annual feature. The 13th issue covering data up to 2011-12 was released in January, 2013.
- Some states have also started bringing out the state specific Compendium of Environment Statistics.
- In 2013 UNSD has adopted a revised framework for Environment Statistics.

System of Integrated Environmental and Economic Accounting (SEEA)

- As a first global initiative to account the Environmental costs, UNSD published the Handbook of National Accounting-Integrated Environmental and Economic Accounting in 1993as an Interim version.

- In 2012 UN Statistical Commission has accepted System of Environmental Economic Accounts(SEEA) Central Framework as an International statistical standard.

- Other related frameworks like Ecosystem Accounting are under development by UNSD.

Environmental/Natural Resource Accounting in India

- **Environmental and Natural Resource Accounting in India is in developing stage.**

- **The entire process of Environmental and Natural Resource Accounting involves 3 steps:**
  - **Physical Accounting**
  - **Monetary Valuation and**
  - **Integration with Economic Accounting.**

Environmental/Natural Resource Accounting in India

- As per the recommendations of the Technical Working group on Natural Resource Accounting Constituted by CSO, a pilot project on Natural Resource Accounting in the State of Goa was initiated in 1999-2000.This was followed by other studies in other sectors including forest sector.
- Subsequently, an Expert Group under the Chairmanship of Professor Sir Partha Dasgupta, was set up in 2011 to develop a framework of green national accounts and prepare a roadmap for India to implement the framework.

Environmental/Natural Resource Accounting in India

- The Expert Group submitted its Report in March, 2013. An International Workshop was held during 5-6 April, 2013 in New Delhi to discuss the Report. The Workshop was inaugurated and the Report unveiled by Hon'ble Prime Minister of India.
- The report is available in the MOSPI website: mospi.gov.in.

Salient features of the Report

- Wealth means social value of an economy's stock of value assets comprising (i) reproducible capital (commonly known as manufactured capital), (ii) human capital (population size and composition, education, and health), and (iii) natural capital (ecosystem, land, sub-soil resources, etc.).
- NDP is GDP minus depreciation, which includes not only wear and tear of buildings, and equipment but also loss of human capital and physical depletion and quality degradation of natural capital.
- Aggregate investment per capita does not simply mean aggregate per investment divided by population but the social value of the change in per capita stocks of assets.

Salient features of the Report

- The Report shows that aggregate net investment (as defined above) would be positive iff aggregate consumption is not to exceed NDP.
- There are three important propositions in the Report:

  (i) An economy's development is sustainable over any brief interval of time iff wealth increases.

  (ii) Intergenerational well-being averaged over the generations increases over a period of time iff per capita net aggregate investment over the period is positive.

  (iii) Intergenerational well-being averaged over the generations increases over a brief interval of time iff aggregate consumption per capita is less than NDP per capita.

Recommendations of The Report- summary

- **The recommendations of the Expert Group can be broadly summarised into 4 categories.**
  - **Initial focus will be on preparation of physical supply use tables(PSUTs) in respect of land, forest and timber and minerals which will be possible in a short time period.**
  - **To have a 5 year medium-term plan for preparation of (a) monetary supply use tables for land, forest and timber and minerals, and (b) physical supply use tables for soil, water, carbon and energy.**
  - **To initiate exploratory research on valuation and development of a more complete set of national accounts.**
  - **To have a 10 year long-term plan for (a) environmental accounts in respect of aquatic resources, air and biodiversity and (b) institutionalising mechanism for period collection of data/periodic studies and surveys.**

ENVIRONMENTAL ECONOMIC ACCOUNTING

- The following are the types of accounts
- 1. Asset Accounts: This provide the Stocks and changes in stocks of an Environment asset for a period of time.
- 2. Physical Supply and Use Tables (PSUT) are accounts in physical units in the form of matrices that record the flows of natural resources, residuals, products and eco-systems inputs according to origins (supply) and destinations (uses). It record all flows of products in an economy between different economic units in physical units of measurement. PSUT are used to assess how an economy supplies and uses energy, water and materials, and are also used to examine changes in production and consumption patterns over time.

ENVIRONMENTAL ECONOMIC ACCOUNTING

- **3.** Monetary supply and use tables record all flows of products in an economy between different economic units in monetary terms. Many of the flows of products recorded in monetary terms relate to the use of natural inputs from the environment, for example the manufacture of wood products, or to activities and expenditures associated with the environment, for example environmental protection expenditure.
- The MSUT and PSUT are divided into two parts – the supply table and the use table.

Basic form of an asset account

Opening stock of environmental assets	
Additions to stock	
	Growth in stock
	Discoveries of new stock
	Upwards reappraisals
	Reclassifications
	Total additions to stock
Reductions in stock	
	Extractions
	Normal loss of stock
	Catastrophic losses
	Downwards reappraisals
	Reclassifications
	Total reductions in stock
Reclassification of the stock*	
Closing stock of environmental assets	

*** Only applicable for asset accounts in monetary terms**

Basic form of a Physical Supply and Use Table

SUPPLY TABLE						
	Industries	Households	Accumulation	Rest of the World	Environment	Totals
Natural Inputs					Flows from the environment	Total supply of natural inputs
Products	Output			Imports		Total supply of products
Residuals	Residuals generated by industry	Residuals generated by household final consumption	Residuals from scrapping and demolition of produced assets			Total supply of residuals
USE TABLE						
	Industries	Households	Accumulation	Rest of the World	Environment	Totals
Natural Inputs	Extraction of natural inputs					Total use of natural inputs
Products	Intermediate consumption	Household final consumption	Gross Capital Formation	Exports		Total use of products
Residuals	Collection & treatment of waste and other residuals		Accumulation of waste in controlled landfill sites		Residual flows direct to environment	Total use of residuals

Challenges

- Data availability- The present statistical system in India has limitation in meeting the huge data requirement for preparation of PSUTs in many sectors.
- Valuation methods need be developed for non-marketed environmental goods and services.
- Ecosystem accounting is a challenge.

Forest- Data requirements

Forest Area	
Total	By forest type, as appropriate National Sub-national
Natural	
Planted	
Protected forest area	
Area deforested	
Area reforested	
Area afforested	
Forest area affected by fire	
Natural growth	
Forest Biomass Total	
Carbon storage in living forest biomass	

FOREST- DATA REQUIREMENTS

1. Number of known species by status category **2. Species population** **3. Number endemic species** **4. Number of invasive species**	**By class(eg. Mammals, fishes, birds, reptiles, etc.)** **By ecosystem(Marine, coastal, Inland water, coastal, Inland water, Forest, Dryland, Island. Mountain, Polar, Cultivated, Urban)** **By biome** **By habitat** **By status category(e.g. threatened)** **National** **Sub-national**
1. Protected terrestrial(including inland water) and marine area	By management category By ecosystem By biome By habitat National Sub-national

1. Stocks of timber resources	By type(e.g. natural or planted) National Sub-national
2. Natural Growth	
3. Felling's	
4. Removals	
5. Felling residues	
6. Natural losses	
7. Catastrophic losses	
8. Reclassifications	

Challenges

Forest production	By type of product(e.g. timber, industrial roundwood, fuelwood, pulp, chips) National Sub-National
Fuelwood consumption	National
Imports of forest products	By type of product
Exports of forest products	
Number of permits issued per year	By type of animal National Sub-national
Imports of endangered species	
Exports of endangered species	
Reported wild animals killed or trapped for food or sale	
Non-wood forest products and other plants	By type of product National Sub-national

CHALLENGES

a. General ecosystem characteristics, extent and pattern	By ecosystem(e.g. Marine, Coastal, Inland water, Forest, Dryland, Island, Mountain, Polar, Cultivated , Urban) By biome By habitat By bio geographical region By river basin National Sub-National
Area of ecosystems	
Location of within country	
Proximity of relevant ecosystem to urban areas and cropland	
Nutrients	
Carbon	
Pollutants	
Biota(flora and fauna)	
Endemic species	
Biodiversity(aggregate measure of diversity of flora and fauna)	
Threatened species	

THANK YOU