
A STUDY ON NATURAL CAPITAL ACCOUNTING AND VALUATION OF ECOSYSTEM SERVICES (NCAVES) OF INDIA**Dr. Shruti Sandeep Chavarkar**

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ABSTRACT

In the day to day life of human beings, the contribution of a healthy ecosystem is very important to get clean water, productive soils etc. Large number of the population depend on the ecosystem. Gross Domestic Product (GDP) gives economic performance of a country but it has a limited representation of natural capital that underlines this revenue. Natural capital means all environmental assets and ecosystem services like water purification, air filtration etc. As this capital is required for the economic development, employment, and increase in the Gross Domestic Product of any country. Depletion or degradation of these natural capital may occur as a reduction in the country's wealth and resources. Therefore it is required to do the valuation and proper measurement of an environment by all the countries through Natural Capital Accounting, which is measuring the full extent of a country's natural assets. This study has been undertaken to examine and study the Natural Capital Accounting and Valuation of Ecosystem Services of India. The goal of the research paper is to focus on the importance of valuation of natural resources used by human beings for his economic development. It is observed that in the world nowadays many countries have started working on it, and many countries have started following the System of Environmental Economic Accounting (SEEA). The study is based on secondary data collected from reports of SEEA and NCAVES India.

Keywords: Ecosystem Services, Natural Capital Accounting and Valuation of Ecosystem Services, System of Environmental - Economic Accounting, Environmental Policy,

INTRODUCTION:

The well-being of humans depends upon a healthy ecosystem. In the day to day life of human beings, the contribution of a healthy ecosystem is very important to get clean water, productive soils etc. Large number of the population depend on the ecosystem. Ecosystem provides oxygen to breathe, clean water, food, raw material for industries, natural medicines, and many other services. They always help in improving the quality of life.

Gross Domestic Product (GDP) gives economic performance of a country but it has a limited representation of natural capital that underlines this revenue. Natural resources or natural capital consist of all types of environmental assets existing in the environment and also includes a set of services like water purification, air filtration etc provided by ecosystem assets. Natural resources are important as they are required for the economic development, employment, prosperity and increase in the Gross Domestic Product of any country. But loss of biodiversity, degradation of ecosystems are becoming more evident. Offsetting this loss is not only expensive but also difficult for society. Depletion or degradation of these natural capital may occur as a reduction in the country's wealth and resources. Though India is blessed with rich natural resources, but continuous and wrongly managed usage of resources depleting are this wealth every day. Due to urbanization, overconsumption, overpopulation, natural resources like forest, land, water are depleting. Wildlife is being lost due to hunting, industrialization.

Rapid depletion in renewable and non renewable natural resources of the country indicates that it is high time to maintain proper accounting and effective management of natural resources. It is required to do the valuation and proper measurement of an environment by all the countries through Natural Capital Accounting, which is measuring the full extent of a country's natural assets. NCA helps in providing links between economy, ecology and environment which will be helpful to control and manage natural resources for further growth and development of the country. Within the accounting framework by adopting systematic measurement it will be easy to understand the stock and flows of natural capital.

REVIEW OF LITERATURE:

Peter B. (2013), in his study explained that The 1992 Earth Summit drove the launching of System Environmental and Economic Accounting (SEEA). Since then SEEA has given way to green growth and green economy indicators in the 2012 Summit. And now it produced SEEA Central Framework (SEEA-CF). The new framework which will focus on expenditure for environmental protection and resource management, and stocks and flows of "economic" resources, both covered under Conventional national account whereas, Environmental degradation is under "experimental" ecosystem accounts.

Anthony D.(2018), in his study focused that recent international efforts have focused on the development of metrics to supplement or adjust Gross Domestic Product (GDP) to better account for the broader environmental and social impact on economic development. In his paper he had taken a case study of South Shore Long Island Bays to develop a pilot process for applying the EEA within a coastal area. Results indicate significant data gaps for marine and coastal areas that may limit the immediate ability to compile these ecosystem accounts.

Sitki E (2020), explained in his study that water resources are nowadays under pressure and the Water accounting approach of the SEEA has been developed to inform decision - makers on water supply, its use and quality. In his study he focused on the critical issue in water accounting is finding data and models to populate SEEA water accounts. According to him it is needed to see how the SEEA water accounts can be connected to policy uses. The objective of this study is to develop water accounts with the use of a hydrological model. He studied the SWAT hydrological model in the Buyuk Menderes Basin in Turkey to estimate the key hydrological parameters required for water accounting. His article provides new insights into the added value of using a hydrological model in constructing water accounts for better water resources management.

OBJECTIVES OF THE STUDY:

1. To understand the concept of the System of Environmental Economic Accounting (SEEA).
2. To study the concept of Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES).
3. To study the environmental policy of India.
4. To get the knowledge of the Ministry of Statistics and Programme Implementation (MoSPI) project of India.

RESEARCH METHODOLOGY:

The study is exploratory in nature, based on secondary data collected from different government websites for analysis. The data was collected through the internet, SEEA reports, NCAVES reports of the Government of India. The reports were studied and analyzed for understanding countries' system of environmental economic accounting practices. The analysis was also presented with the help of tables and graphs. Also, relevant annual reports available on official websites were studied. The conclusions were drawn on the basis of data analysis.

System of Environmental Economic Accounting (SEEA):

The UN Statistical Commission adopted the System of Environmental Economic Accounting (SEEA) in 2012. It is described as a satellite system to the United Nations System of National Accounts (SNA). It is an internationally recognised standard use for environmental and economic accounting which provides statistics of the environment and its relationship with the economy and expands thereby the traditional system of System of National Accounts (SNA) which focuses only on economic performances. SEEA is a statistical system which measures the condition of the environment, contribution of the environment on the economy and the impact of the economy on the environment by bringing information of an environment and economy together into a common framework. SEEA includes the assessment of trends in the use and availability of natural resources and discharges of the environment resulting from economic activity, and the amount of economic activity undertaken for environmental purposes. It is divided into three parts as follows:

1. Central Framework - Looks at individual environmental assets which move between environment and economy like land, water, energy etc.
2. Experimental Ecosystem Accounting- how an individual environmental assets interact as a natural process within a given area.
3. Extensions and Applications - how the information can be used in decision making, policy formulation and implementation, research and development.

Thus SEEA is a system which provides statistics with different applications in decision making.

SEEA Ecosystem Accounting (SEEA EA) is a framework for integrating measures of ecosystems and their flows of services with human and economic activities. It provides an integrated information system on 1. Ecosystem assets, encompassing ecosystem extent, ecosystem condition, ecosystem capacity and relevant monetary values and 2. Economic and human activities and associated beneficiaries (households, business, government etc.) . This will be helpful in decision making in the ecosystem.

The Assessment of 2020 shows that,

Year	No. of countries	Percentage of Total	Status
2006	49		Countries implemented SEEA
2014	54		Countries implemented SEEA
2017	69		Countries implemented SEEA
2020	62	(70 %)	Countries publish at least one account on a regular basis (stage III)
	11	(12%)	Countries publish their accounts on an ad-hoc basis (stage II)
	16	(18%)	Countries compile, but do not yet publish their accounts (stage I)
	89 Total		Countries implemented SEEA.
	27		Countries were planning to start compiling the accounts.

(source SEEA 2020)

Five main Accounts of SEEA Environmental Accounting:

1. Ecosystem Extent Account	This is the first account of Ecosystem Accounting. It provides information on the extent of different ecosystem types (e.g. Forests, wetlands, agricultural areas, marine areas,) within a spatial area (administrative region, river basin, etc) in terms of area. This account records the total area of each ecosystem, classified by type within an ecosystem accounting area. This account is measured over time in a specified area, providing an example of the changes in extent from one type to another type over the accounting period.
2.Ecosystem Condition	This account calculates the overall quality of an ecosystem asset and captures. This account records the condition of ecosystem assets in terms of selected features in a set of key indicators, the state or functioning of the ecosystem in relation to both its naturalness and its potential to supply ecosystem services at specific points in time. Over time, they record the changes to their condition.
3.Ecosystem Services	This set of accounts measures and records physical as well as monetary supply of ecosystem services by ecosystem assets and the use of those services by economic units, beneficiaries including households, business etc.
4. Ecosystem Monetary Assets	This account records monetary information of opening and closing stocks of all ecosystem assets and changes in those stocks (additions and deductions). It includes accounting of enhancement and degradation of ecosystems in that period.
5. Thematic Accounts	These are standalone accounts, or sets of accounts, that organize data around specific policy- relevant themes. Three high profile themes are Biodiversity, Ocean and Carbon. Others protected areas are wetlands, forests and urban areas.

The United Nations Statistical Commission endorsed SEEA Experimental Ecosystem Accounting (SEEA EEA) in March 2013. It is the first step in the development of a statistical framework for ecosystem accounting. It was released in 2014 as a joint publication of the United Nations, European Commission, Organisation for Economic Co- Operation and Development , Food and Agriculture Organization of the United Nations and World Bank.

MOSPI (Ministry of Statistics and Programme Implementation)

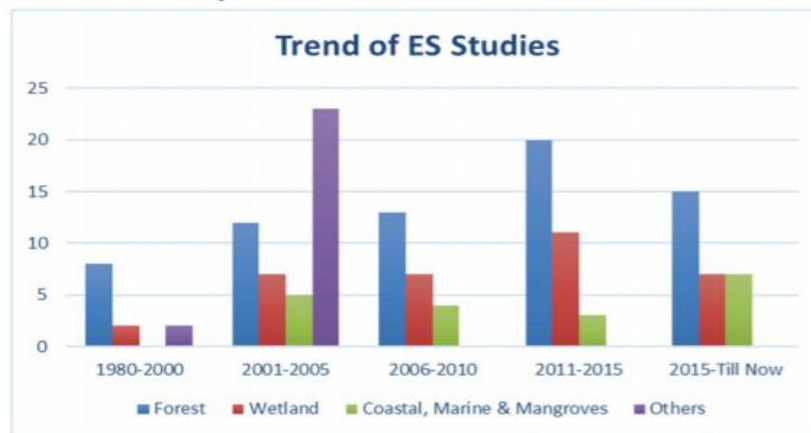
Ministry of Statistics and Programme Implementation (MoSPI) organized Natural Capital Accounting and Valuation of the Ecosystem Services (NCAVES) a three-year partnership funded by European Union. It has been jointly implemented by the United Nations Statistics Division (UNSD), the United Nations Environment Programme (UNEP) and the Secretariat of the Convention of Biological Diversity (CBD).

In this project 5 partner countries India, China, Brazil, Mexico, South Africa are involved. In India NCAVES project is being implemented by MoSPI and the Ministry of Environment, Forest and Climate Change (MoEF &CC) and the National Remote Sensing Centre (NRSC) under the Department of space. This project starts pilot testing of the SEEA EEA in partner countries to build on internationally agreed methodology (System of Environmental Economic Accounting, Experimental Ecosystem Accounting (SEEA EEA) and develop national competences by advancing knowledge on natural capital accounting. The project’s main objective in the partner countries is to mainstream natural capital accounting and valuation ecosystem services in data- driven decisions and policy making. The project will review policy demands, data availability and measurement practices. The main objectives of this report are: To make a review of existing ecosystem accounting initiatives and literature in India, to stock- take available data sources for maintaining ecosystem accounts, to find out and collaborate with the institutions which are active in this field, to understand their policy, interest in the field of ecosystem accounting, and their overall potential contributions to the SEEA EEA India Project.

The review of Existing Initiatives, Literature and Data

Valuation of Ecosystem Services is a rapidly growing field of research in India. There has been a surge in the number of valuation studies since 2000. As follows.

Figure 1: Trend of Ecosystem Services Valuation Studies in India



It shows that total 146 Ecosystem studies (ES) conducted in India in the following areas.

	1980-2000	2001-2005	2006-2010	2011-2015	2015- Till date	Total
Forest	7	12	14	20	15	68
Wetland	2	7	7	11	7	34
Coastal, Marine, Mangroves	-	5	4	3	7	19
Others	2	23	-	-	-	25

From the above Table No. 1 and Diagram No. 1 . It shows that in India Ecosystem studies are conducted in Forest area 68, in terrestrial wetlands 34, Marine , coastal , mangroves 19 and in other ecosystems such as urban , agroecological ecosystem 25.

All Indian States have been scored and selected based on the literature review, authors experience, and expert’s interviews. Based on ranking matrix and literature review the number of case studies are being processed. A.

State level studies in Madhya Pradesh, Uttarakhand, Karnataka, Assam and Rajasthan. B. Primary studies for Individual Ecosystem Services of Pollination, Gene Pool, Biological Control, and Gas Regulation. C. Study of Ecosystem Disservice of Allian Weed Invasion and D. Spatial Dimension Study on Urban Landscapes.

MoSPI starts the compilation of the Environment Accounts as per the UN-SEEA framework and releases environmental accounts in its publication “EnviStats India” on an annual basis from 2018.

Under NCAVES project one more tool is developed that is India - EVL Tool which is giving values of various ecosystem services in the different states of the country.

CONCLUSIONS:

Though in India, there is the development of environmental accounting under the UN, progress made towards implementation of environmental accounting system of national accounts, inter relation between the SNA and the environmental accounting etc. But these prescriptions are at initial stage by making necessary (CF) to fit the needs and requirements in Indian parlance, India is still facing challenges so far to implement theories in Indian context.

Though national capital accounting started in India, it is required to maintain continuity of reporting at pre-defined frequencies, otherwise there would be chances of losing monitoring on natural resources of the country.

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