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EnviStats-India
Frequently Asked Questions

Social Statistics Division
National Statistical Office
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Government of India

FREQUENTLY ASKED QUESTIONS

1. What is Natural Capital?

The term natural capital is attributed to economist E.F. Schumacher, who presented the concept in his 1973 book *Small is Beautiful*.

Natural Capital¹ is natural asset in its role of providing natural resource inputs and environmental services for economic production. Natural Capital is generally considered to comprise three principal categories: natural resource stocks, land and ecosystems. All of these are considered essential to the long-term sustainability of development for their provision of “functions” to the economy, as well as to mankind outside the economy and other living beings.

Natural Capital² is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.

The concept of natural capital extends beyond nature as a source of raw materials for production (e.g. timber) to include the role of the environment and ecosystems in supporting human well-being through the supply of such important goods and services as clean water, fertile soils and valuable genetic resources.

Natural capital³ includes all the resources that we easily recognize and measure, like minerals, energy, timber, agricultural land, fisheries and water. It also includes the ecosystem services that are often “invisible” to most people, such as air and water filtration, flood protection, carbon storage, pollination of crops, and habitats for wildlife. These values are not readily captured in markets, so we don’t really know how much they contribute to the economy. We often take these services for granted and don’t know what it would cost if we lose them.

Since the early 1970s, interest in the practical applications of a natural capital perspective has grown considerably within government, business, civil society and academic communities.

2. What is Natural Capital Accounting?

Natural Capital Accounting (NCA)⁴ is an umbrella term covering efforts to make use of an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital. Its underlying premise is that since

¹ <https://stats.oecd.org/glossary/detail.asp?ID=1730>

² <https://seea.un.org/content/natural-capital-and-ecosystem-services-faq#What%20is%20natural%20capital?>

³ <https://www.wavespartnership.org/en/frequently-asked-questions-natural-capital-accounting-nca>

⁴ <https://seea.un.org/content/frequently-asked-questions#What%20is%20natural%20capital%20accounting?>

the environment is important to society and the economy, it should be recognized as an asset that must be maintained and managed, and its contributions (services) be better integrated into commonly used frameworks like the System of National Account (SNA).

Natural Capital Accounts⁵ are sets of unbiased data for material natural resources, such as forests, energy and water.

NCA covers accounting for individual environmental assets or resources, both biotic and abiotic (such as water, minerals, energy, timber, fish), as well as accounting for ecosystem assets (e.g. forests; wetlands), biodiversity and ecosystem services.

3. What is the history of Environmental Accounts in India?

India has a long history of research on environmental aspects including ecosystem services, ranging from theoretical concepts to practical applications and internalization of study outcomes into policies. These studies had been carried out in the areas of forest, wetland, coastal, marine & mangrove and others.

These studies covered a wide range of issues – from the application of economic principles and tools to environmental management in India for policies related to pollution control, resources management and biodiversity conservation and from quantifying the resourcefulness of India to highlighting the economic consequences of the loss of biological diversity and the associated decline in ecosystem services. But despite having the vast richness of findings of these research studies, a full-fledged account could not be compiled due to the lack of comparability in the methods and definitions used in these studies which limited their aggregation

In order to help the official system to come up with the environmental economic accounts, a high-level Expert Group under the Chairmanship of Prof. Sir Partha Dasgupta, Frank Ramsey Professor Emeritus of Economics, University of Cambridge, U.K. was constituted by MOSPI in 2011 with the mandate of developing a framework for green national accounts of India and preparing a roadmap to implement the framework. The Expert Group submitted its report titled “Green National Accounts in India-A Framework” in 2013 which included a roadmap for implementing the Green Accounting Framework.

The Expert Group in its report recommended the compilation of the accounts as envisaged in SEEA Central Framework in a phased manner (such as the Asset accounts and the Supply and Use tables).

⁵ <https://www.wavespartnership.org/en/frequently-asked-questions-natural-capital-accounting-nca>

4. How are Natural Capital Accounts different from the National Accounts that countries have now?

Natural Capital Accounts are sets of unbiased data for material natural resources, such as forests, energy and water. NCAs follow an international standard approved by the United Nations Statistical Commission called the System of Environmental Economic Accounting (SEEA), while National Accounts follow the framework of the System of National Account (SNA).

The datasets in the National Accounts describe a country's economic performance and forms a basis for calculating GDP and other well-known economic indicators, such as the balance of trade and household consumption. While national accounts are limited to the production boundary of the economy, natural capital accounts go beyond that, to account for natural goods and services that aren't subject to market transactions and do not necessarily have a well-established market price.

5. Why do we need to account for Natural Capital?

Natural Capital Accounting is an umbrella term covering efforts to make use of an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital. NCA covers accounting for individual environmental assets or resources, both biotic and abiotic (such as water, minerals, energy, timber, fish), as well as accounting for ecosystem assets (e.g. forests; wetlands), biodiversity and ecosystem services, in both physical and monetary terms.

While National Accounts are limited to the production boundary of the economy, natural capital accounts go beyond that, to account for natural goods and services that aren't subject to market transactions and do not necessarily have a well-established market price.

It is therefore important to move beyond traditional GDP. Incorporating natural capital into national accounts will reveal the interactions of economic activity with the environment, and support better economic decisions.

6. Why do we need to measure the Environment?

There is a need for consistent and long-term collection of environmental data. Environmental information is critical for decision-making in both public and private spheres. Without measurement of environmental conditions, little would be known about the dynamism of our natural world.

Data producers have a role to play in helping decision-makers understand the many systems which they manage. Without a clear understanding of

environmental measurements, and related environmental indicators, the depiction of the state of the environment is unclear.

7. What are Environmental Economic Accounts?

Environmental-Economic Accounts⁶ are integrated statistics that illuminate the relationship between the environment and the economy, both the impacts of the economy on the environment and the contribution of the environment to the economy. Environmental Economic Accounts can provide information about the extraction of natural resources, their use within the economy, natural resource stock levels, the changes in those stocks during a specific period and economic activity related to the environment. Environmental Economic Accounts present this information in physical and monetary terms, as appropriate.

8. What is the System of Environmental Economic Accounting (SEEA)?

The System Environmental Economic Accounting (SEEA)⁷ is the accepted international standard for environmental-economic accounting, providing a framework for organizing and presenting statistics on the environment and its relationship with the economy. It brings together economic and environmental information in an internationally agreed set of standard concepts, definitions, classifications, accounting rules and tables to produce internationally comparable statistics.

SEEA is produced and released under the auspices of the United Nations, the European Commission, the Food and Agriculture Organization of the United Nations, the Organisation for Economic Co-operation and Development, the International Monetary Fund and the World Bank Group.

It consists of two parts:

(i) The *SEEA-Central Framework (SEEA CF)* was adopted by the UN Statistical Commission as the first international standard for environmental-economic accounting in 2012. The Central Framework looks at “environmental assets”, such as water resources, energy resources, forests, fisheries, etc., their use in the economy and the residuals that returns back to the environment in the form of waste, air and water emissions. The CF covers measurement in three main areas: (a) Environmental flows (b) Stock of Environmental Assets (c) Economic activity related to the environment. In addition, there are also several methodological

⁶ <https://seea.un.org/content/frequently-asked-questions#What%20is%20natural%20capital%20accounting?>

documents that have a sectoral approach such as SEEA-Energy; SEEA-Water and the SEEA Agriculture, Forests and Fisheries (AFF).

(ii) The *SEEA-Ecosystem Accounting (SEEA EA)* complements the Central Framework and represents international efforts toward coherent ecosystem accounting. It takes the perspective of ecosystems and considers how individual environmental assets interact as part of natural processes within a given spatial area. It constitutes an integrated and comprehensive statistical⁸ framework for organizing data about habitats and landscapes, measuring the ecosystem services, tracking changes in the ecosystem assets and linking this information to economic and other human activity. Ecosystem accounts enable the presentation of indicators of the level and value of “ecosystem services” in a given spatial area. The UN Statistical Commission adopted the SEEA Ecosystem Accounting at its 52nd session in March, 2021.

The SEEA Applications and Extensions illustrates to compilers and users of SEEA Central Framework based accounts how the information can be used in analysis and to derive indicators. It is a companion document⁹ to the SEEA-CF. This was formulated to help the compilers and users of SEEA accounts understand how the accounts can be used in decision making, policy review and formulation, analysis and research. In particular, SEEA Applications and Extensions is on describing measurement and analysis at a broad national level on topics such as resource use, environmental intensity, environmental protection activity, production of environmental goods and services and environmental assets.

9. What is SEEA-Energy Framework?

The SEEA-Energy is a multi-purpose conceptual framework for organizing energy-related statistics. It supports analysis of the role of energy within the economy, the state of energy inputs and various energy-related transactions of environmental interest. It is fully consistent with the SEEA Central Framework. Energy information is typically presented in physical terms, but the SEEA-Energy also applies monetary valuations to various stocks and flows, based on the SEEA accounting approach. Two main types of accounts capture relevant energy information in a systematic way:

- (i) **Flow Accounts:** In physical terms, these accounts record physical flows of energy between the environment and the economy. Physical flows are recorded in joules to provide a common unit to aggregate across energy sources. Parallel monetary accounts then record the monetary flows associated with energy-related transactions for energy products.
- (ii) **Asset Accounts:** These accounts measure the quantity of mineral and energy resources and changes in these resources over an accounting

⁸ <https://seea.un.org/ecosystem-accounting>

⁹ <https://seea.un.org/applications-extensions>

period. These accounts can be compiled in physical terms, which provide valuable information about energy resource availability. They can also be compiled in monetary terms to show the contribution and depletion of the natural capital of energy resources.

10. What is SEEA-Water Framework?

The System of Environmental Economic Accounts for Water (SEEA-Water) is an integrated approach to water monitoring, bringing together a wide range of water-related statistics across sectors into one coherent information system. The SEEA-Water is the conceptual framework and set of accounts that present hydrological information alongside economic information in a consistent way.

SEEA-Water has three main types of accounts to record the hydrological system and its linkages to the economy:

- (i) **Physical Flow Accounts:** These accounts record the physical flows of water between the environment and the economy. They record the abstraction of water by the economy, how water flows within the economy and the return flows of water back to the environment. Water emission accounts can also be compiled in relation to these flows.
- (ii) **Physical Asset Accounts:** These accounts describe the hydrological cycle over an accounting period. Water stocks and their depletion over the accounting period are presented, including links to the abstraction and consumption of water by the economy.
- (iii) **Economic Accounts:** This set of accounts presents, among others, flows related to water products, information on the costs associated with water use and supply, and information on water-related financing.

11. What is SEEA-Agriculture, Forest and Forestry Framework?

The System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries integrates information on the environment and economic activities of agriculture, forestry and fisheries using the structures and principles laid out in the SEEA-CF. These activities depend directly on, as well as have an impact upon, the environment and its resources. Integrating information about agriculture, forestry and fisheries facilitate understanding of the trade-offs and dependencies between these activities and their related environmental factors. Understanding this complex relationship is critical for the analysis of sustainable food and agriculture.

The accounts in SEEA Agriculture, Forestry and Fisheries are most commonly compiled at the level of the individual product and use two main types of accounts to capture relevant agriculture, forestry and fisheries information.

- (i) **Flow Accounts:** In physical terms, these accounts record physical flows of agriculture, forestry and fishery products between the environment and the economy. Parallel monetary accounts then record the monetary flows associated with agriculture, forestry and fishery transactions for products.
- (ii) **Asset Accounts:** These accounts measure the quantity of agriculture, forestry and fishery resources and changes in these resources over an accounting period. These accounts can be compiled in physical terms, which provide important information on the stock of environmental assets. Also, parallel monetary accounts then record the monetary flows associated with transactions for the agriculture, fishery or forestry products.

12. What are some of the applications of the SEEA?

Examples of the kinds of questions that the SEEA can help answer include:

- (i) Who benefits and who is negatively impacted by natural resource use? What are the impacts on the state of the environment and on specific sectors of the economy?
- (ii) How does depletion of natural resources affect measures of the real income of a nation? What extracting industries and owners of natural resources are responsible for depletion?
- (iii) To what extent is decoupling between resource use and economic growth taking place? Which sectors have the highest water productivity or are most energy-intensive?
- (iv) How is the wealth of nations, specifically its natural capital, developing over time?
- (v) Are the expenditures on environmental protection effective?
- (vi) To what extent is the tax system greening? What economic instruments are in place? What is the impact of new instruments?
- (vii) What is the size of environmental investment in the economy? How many green jobs is the economy generating?
- (viii) What is the carbon footprint or water footprint of the nation?
- (ix) Which ecosystem services are being generated, who is benefiting from them, and where are they located?
- (x) Are current trends in production and consumption of resources sustainable? Is the amount of waste generated increasing or not? How much of this is being recycled in different economic sectors?

The SEEA Applications and Extensions illustrate to compilers and users of SEEA CF based on the accounts how the information can be used in analysis and the derivation of indicators.

13. How is the Environment Economic Accounting related to policy framing?

The SEEA responds to the need for information in four high-level policy areas:

- (i) Economy and the environment: Information for policies in support of the management of natural resource supply and demand while reducing environmental impacts.
- (ii) People and the environment: Information for policies in support of basic access to environmental services and natural resources.
- (iii) Ecosystem Health: Information for policies in support of improving the state of the earth's ecosystems.
- (iv) Mitigating Risks: Information for policies in support of mitigation and adaptation to extreme natural events.

14. What are the limitations of Environmental Measurements?

Some of the limitations of the Environmental Measurements are:

- (i) Environmental measurements may sometimes be costly in terms of technological and human resources, especially for countries that wish to undertake complex monitoring programs.
- (ii) Environmental measurement provides essential statistics to inform decision-making. But, sometimes working in silos hinders the usage of data of one agency by the other.
- (iii) Some environmental measurement programs require considerable investments of time before results are available.

15. What is Ecosystem and Ecosystem Accounting?

An ecosystem¹⁰ is a system in which the interaction between different organisms and their environment generates a cyclic interchange of materials and energy.

The Convention on Biological Diversity (CBD) defines an Ecosystem as “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”¹¹. Examples of ecosystems are agroecosystem, aquatic ecosystem, forest, marine ecosystem, urban ecosystem and others.

Ecosystem accounting is a coherent framework for integrating measures of ecosystems and the flows of services from them with measures of economic and other human activity. Ecosystem accounting complements, and builds on, the

¹⁰ <https://stats.oecd.org/glossary/detail.asp?ID=735>

¹¹ CBD, article 2, entitled “Use of terms” <https://www.cbd.int/convention/articles/?a=cbd-02>

accounting for environmental assets as described in the System of Environmental Economic Accounting (SEEA) Central Framework (e.g. water resources, soil resources). In ecosystem accounting as described in the SEEA Ecosystem Accounting (SEEA EA), the accounting approach recognizes that these individual resources function in combination within a broader system and within a given spatial area.

It is an approach that can help answer questions such as:

- (i) What is the contribution of ecosystems and their services to the economy, social wellbeing, jobs and livelihoods?
- (ii) How is the condition, health and integrity of ecosystems and biodiversity changing over time and where are the main areas of degradation and enhancement?
- (iii) How can natural resources and ecosystems be best managed to ensure continued services and benefits such as energy, food supply, water supply, flood control, carbon storage and recreational opportunities?
- (iv) What are the trade-offs among different land uses (e.g. for agriculture, mining, housing development, habitat conservation, recreation) to achieve long-term sustainability and equity?

Ecosystem accounting does this by integrating biophysical and economic data using standard accounting principles and accounts to produce detailed measurements of the linkages between ecosystems and economic and other human activity. Because an ecosystem's contribution to human well-being is dependent on its location (for example, its proximity to human settlements), ecosystem accounts are inherently spatial.

16. What kind of information is contained in Ecosystem Accounts?

Ecosystem accounting can produce information on the extent of ecosystems, their condition based on selected indicators, and the flow of ecosystem services. Because of the spatial nature of ecosystem accounting, maps are a common method of presenting the information. The links between an ecosystem and the economy can be presented in both physical and monetary terms, often via combined presentations that show both kinds of data together, noting that monetary valuation is not a necessary feature of the accounts.

SEEA Ecosystem Accounting (SEEA EA) is an integrated statistical framework for organizing biophysical data, measuring ecosystem services, tracking changes in ecosystem assets and linking this information to economic and other human activity. It comprises a set of accounts that collectively present a coherent and comprehensive view of ecosystems.

- (i) *Ecosystem Extent Accounts*: This account serves as a common starting point for ecosystem accounting. It organizes information on the extent of

different ecosystem types (e.g. forests, wetlands, agricultural areas, marine areas) within a country in terms of area.

- (ii) *Ecosystem Condition Account*: This account organizes biophysical information on the condition of different ecosystem types. The ecosystem condition account organizes data on selected ecosystem characteristics and the distance to a reference condition to provide insight into the ecological integrity of ecosystems.
- (iii) *Ecosystem services flow account* (physical and monetary terms): This set of ecosystem accounts measures the supply of ecosystem services and the use of those services by economic units, including households, enterprises and government.
- (iv) *Monetary Ecosystem Asset Account*: This account records information on stocks and changes in stocks (additions and reductions) of assets. The ecosystem monetary asset account records this information in monetary terms for ecosystem assets based on the monetary valuation of ecosystem services and applies the net present value approach to obtain opening and closing values in monetary terms for ecosystem assets at the beginning and end of each accounting period.
- (v) *Thematic Accounts*: These accounts organize data on themes of specific policy relevance. Examples of relevant themes include biodiversity, climate change, oceans and urban areas.

17. What are Ecosystem Services?

In SEEA Ecosystem Accounting, ecosystem services are defined as “the contributions of ecosystems to the benefits that are used in economic and other human activity.” SEEA EA uses the following three broadly agreed on categories of ecosystem services:

- (i) *Provisioning Services*: those ecosystem services representing the contributions to benefits that are extracted or harvested from ecosystems. E.g. Crop provisioning services, Aquaculture provisioning services, Wood provisioning services, etc.
- (ii) *Regulating and maintenance services*: those ecosystem services resulting from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions beneficial to individuals and society. E.g. Climate regulation services, Air filtration services, Water filtration services, Soil and sediment retention services, Flood control services, etc.
- (iii) *Cultural Services* are the experiential and intangible services related to the perceived or actual qualities of ecosystems whose existence and functioning contributes to a range of cultural benefits. E.g. Recreation related services, Visual amenity services, Education, scientific and research services, etc.

18. What is the valuation of Ecosystem Services?

Ecosystems contribute to economic activities by providing services that have economic value. The core valuation concept applied in the SNA and is also used in ecosystem accounting is that of exchange value, that is, the value at which goods, services, labour or assets are in fact exchanged or else could be exchanged for cash. The value is not generally visible in standard national accounts because, in most circumstances, they are not priced and not transacted in markets.

One of the purposes of SEEA ecosystem accounting (EA) is to provide sound statistical information on the economic value of ecosystem services and assets and present them in an accounting framework. Ecosystem services are defined as the contributions of ecosystems to benefits used in economic and other human activity. Valuation of ecosystem services involves assigning a monetary value to these contributions to benefits rather than to the benefits themselves.

A range of techniques has been developed for the valuation of non-market transactions that can be applied for the purpose of providing estimates of the value of the supply and use of ecosystem services in monetary terms. The valuation of ecosystem services is meant to provide an estimate of the value of the contribution of ecosystems to economic production and consumption.

However, it should be noted that there exists a range of challenges with respect to the implementation of these techniques and the interpretation of the values that they yield.

19. What is Crop Provisioning Service?

Crop Provisioning Services are the services provided by the croplands for generation of the food and non-food crops. The ecosystem service, “crop provisioning service” is the total and combined result of processes taking place in croplands, that support crop production such as infiltration of water, water holding capacity of the soil, the absorption of plant nutrients by soil particles and the resupply of these particles to plants.

In other words, Crop provisioning¹² services are the ecosystem contributions to the growth of cultivated plants that are harvested by economic units for various uses including food and fiber production, fodder and energy. This is a final ecosystem service.

In SEEA, the ‘Resource Rent Method’ or ‘Rental Price Method’ have been prescribed for the valuation of the crop provisioning services.

¹² https://seea.un.org/sites/seea.un.org/files/5._adoption_of_seea_ea_as_an_international_standard.pdf

20. What is Timber and Non-Timber Forest Products (NTFP) Provisioning Service?

Forests provide direct and indirect goods and services to human well-being. Provisioning services provided by forests are the forest goods and services obtained from forest ecosystems. Timber provisioning services are the contribution of the Forest Ecosystem to the supply and use of forestry products (excluding the Non-Wood Forest Products).

As the term Non-Timber Forest Product (NTFP) specifies, these products are not timber and come from forests. NTFP provisioning services are defined as the provisioning service for products other than timber that are produced in forests. NTFPs comprise a large number of wild-growing forest materials such as bamboo, fodder, lac, sandalwood, honey, resin, gum, tendu leaves, cork, balsams, eelgrass, acorns, horse chestnuts, mosses, lichens, etc. NTFPs include plants used for food, beverages, forage, fuel, medicine, fibers and biochemicals; animals, birds and fish for food, fur and feathers; as well as their products such as honey, lac and silk. Another term, Non-wood Forest Products differs from the NTFP in that it excludes all wood (including fuelwood) while NTFP includes wood for uses other than for timber. Non-biotic products that may come from the forest, such as rocks and minerals, are not classified as NTFPs.

21. What is Soil Erosion Prevention Service provided by the Croplands?

Soil erosion control/prevention services are ecosystem contributions, particularly the stabilizing effects of vegetation, that reduce the loss of soil (and sediment) and support the use of the environment (e.g., agricultural activity, water supply). This has been estimated by computing the difference between the current estimates of loss of soil and the probable loss of soil due to erosion in case the cropland did not exist.

22. What is Carbon Retention Service?

Carbon dioxide is the most commonly produced greenhouse gas. Carbon retention is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. Carbon retention services provided by the ecosystems services are the ecosystem contributions to reducing concentrations of GHG in the atmosphere through the removal (sequestration) of carbon from the atmosphere and the retention (storage) of carbon in ecosystems. In other words, it is defined as the estimates of annual service flow derived from the carbon stocks using a suitable rate of return.

23. What is a Nature-Based Tourism Service?

Nature-based tourism is a general term for recreational travel that depends on the natural landscape or natural resources either as the setting for activities or where the land or resources are themselves the central component of the tourist activity. Such disparate activities as mountaineering, snorkeling, wildlife viewing and photography, fishing, downhill skiing, hunting, biking, paddling or rafting, and ecotourism—by no means an exhaustive list—all fit under the umbrella of this term. The ecosystem service of “nature-based tourism” can be defined as providing opportunities for or enabling nature-related tourism and recreation activities.

24. What are Ecosystem Assets?

Ecosystem assets are contiguous spaces of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions. The definition of ecosystem assets is a statistical representation of the general definition of ecosystems from the Convention on Biological Diversity. Examples of ecosystem assets include forests, wetlands, agricultural areas, rivers and coral reefs.

Ecosystem assets are the building blocks for the accounting framework and provide the structure for the organization of data about ecosystems. Ecosystem assets supply ecosystem services, either from a single ecosystem asset or by multiple ecosystem assets operating collectively. In this framing, ecosystem assets may be characterized as producing units. Ecosystem assets are measured by their extent and condition as well the basket of ecosystem services flows that they generate. Ecosystem assets are nested within the broader concept of environmental assets as defined within the SEEA Central Framework.

Ecosystem assets are classified into ecosystem types, where the IUCN Global Ecosystem Typology is used as reference classification.

25. What are the different categories of mineral and energy resources?

The known deposits of mineral and energy resources are categorized into three classes, based on the criteria from the United Nations Framework Classification (UNFC)-2009 as follows:

- (i) Class A: Commercially Recoverable Resources which includes production projects, projects approved for development and projects justified for development.

- (ii) Class B: Potentially Commercially Recoverable Resources which includes economic and marginal development projects pending and development projects on hold.
- (iii) Class C: Non-commercial and Other Known Deposits which includes unclarified development projects, non-viable development projects and additional quantities in place.

Known deposits exclude potential deposits where there is no expectation of the deposits becoming economically viable and there is a lack of information to determine the feasibility of extraction or to have confidence in the geological knowledge.

As per the Indian Standard Procedure¹³(ISP) the coal resources are classified into 3 categories:

- (i) Proved: The Coal Resources of an Area falling within a 200 m radius from a borehole point (observation point)
- (ii) Indicated: Those resources occurring in the area falling between radii of 200m and 1 km from a borehole point.
- (iii) Inferred: Those resources occurring in the area falling between radii of 1 km and 2 km from a borehole point.

It may be noted here that only the economically mineable occurrences were termed as Reserves while the rest were considered as Resources.

26. What are reappraisals and reclassification?

Reappraisals, which may be upward or downward, should apply only to known deposits. In general, reappraisals will entail either additions or reductions in the estimated available stock of a specific deposit, or changes in the categorization of specific deposits within classes A, B or C, based on changes in geologic information, technology, resource price, or a combination of these factors.

Reclassifications may occur if certain deposits are opened or closed to mining operations owing to a government decision concerning the access rights to a deposit. All other changes in the quantity of known deposits should be considered as reappraisals.

27. What is Net Present Value (NPV)?

Once the yearly unit resource rents have been calculated, they must be discounted back to the reference year, because a given amount of income received in the following year is considered to be worth less than the same amount received in the

¹³ https://www.cmpdi.co.in/Publication/UNFC_combined.pdf

current year, and the difference is reflected by the discount rate. A discount rate of, for example, 6 % indicates that \$106 next year corresponds to \$100 this year.

The sum of the discounted future resource rents represents a total net present value of future extraction, which is then assumed to correspond to the value of the total quantity of the mineral and energy resource in situ.

28. How does SEEA relate to other Official Statistics?

The System of National Accounts (SNA) is a measurement framework that has been evolving since the 1950s to embody the pre-eminent approach to the measurement of economic activity, economic wealth and the general structure of the economy. The SEEA Central Framework applies the accounting concepts, structures, rules and principles of the SNA to environmental information. Consequently, the SEEA Central Framework allows for the integration of environmental information (often measured in physical terms) with economic information (often measured in monetary terms) in a single framework. Because it uses the same accounting conventions, the SEEA Central Framework is aligned, in general, with the SNA. For example, SEEA accounts use the “residence principle” in determining boundaries, so that data is based on the residence of producer units rather than the territory in which activity occurs, the same approach used for Gross Domestic Product.

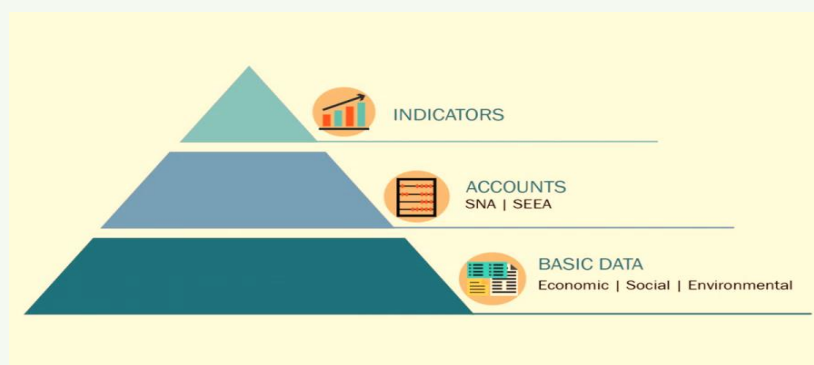
29. How are Environmental Economic Accounts different from Environmental Statistics?

To place accounting frameworks in context it is relevant to consider the information pyramid. This pyramid has as its base a full range of basic statistics and data from various sources including surveys, censuses, scientific measurement and administrative sources. Generally, these data will be collected for various purposes with the use of different measurement scopes, frequencies, definitions and classifications. Each of these data sources will be relevant to the analysis or monitoring of specific themes.

The role of accounting frameworks (at the middle levels of the pyramid) is to integrate these data to provide a single best picture of a broader concept or set of concepts– for example, economic growth or ecosystem condition. The compiler of accounts must therefore reconcile and merge data from various sources considering differences in scope, frequency, definition and classification as appropriate.

Finally, having integrated the data within a single framework, indicators can be derived that provide insights into the changes in composition, changes in relationships between stocks and flows, and other features taking advantage of the underlying relationships in the accounts between stocks and flows, between

capital and labour, between production and consumption, etc. Indicators such as GDP, national saving, national wealth, terms of trade and multi-factor productivity all emerge from the one national accounts framework.



30. What is Biodiversity and why do we need to account for it?

The term biodiversity derived from “biological diversity” refers to the variety of life on Earth at all its levels, from genes to ecosystems. This includes diversity within species, between species and of ecosystems. Biodiversity includes all ecosystems— managed (plantations, farms, croplands, aquaculture sites, urban parks) and unmanaged (forest, nature preserves, or national parks) and represents the wealth of biological resources available to humankind. The biodiversity of any given region is not evenly distributed. It varies globally and within regions. The various factors that influence the biodiversity of a region include temperature, altitude, precipitation, soils and pressures from human activities.

According to CBD, “Biological diversity¹⁴” means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

The accounting for biodiversity is needed with the aim of mainstreaming¹⁵ the use of data on biodiversity in planning and decision making. The purpose of accounting for biodiversity includes informing conservation actions and the enhancement of biodiversity as an environmental management objective in its own right, as well as discussion about securing ecosystem services supply, and about various policy responses that may be relevant, such as biodiversity finance. Accounting for Biodiversity¹⁶ recognizes the CBD definition of biodiversity, the different components of biodiversity, and the links between economic activity and changes in biodiversity.

¹⁴ <https://www.cbd.int/convention/articles/?a=cbd-02>

¹⁵ https://seea.un.org/sites/seea.un.org/files/documents/EA/seea_ea_white_cover_final.pdf

¹⁶ [https://ec.europa.eu/environment/nature/biodiversity/economics/#:~:text=The%20Economics%20of%20Ecosystems%20and%20Biodiversity%20\(TEEB\)%20is%20a%20global,of%20ecosystem%20services%20and%20biodiversity](https://ec.europa.eu/environment/nature/biodiversity/economics/#:~:text=The%20Economics%20of%20Ecosystems%20and%20Biodiversity%20(TEEB)%20is%20a%20global,of%20ecosystem%20services%20and%20biodiversity)

31. What is the Shannon-Weiner Index of Biodiversity?

Species diversity is defined as the number of species and abundance of each species that live in a particular location. Species richness (number of different species) is a common way of measuring biodiversity. The Shannon-Weiner Index of biodiversity is a commonly used indicator for comparing diversity between various habitats. It quantifies the diversity of the species by measuring both species abundance and species richness. The Shannon-Wiener index is calculated by the following formula:

$$H' = -\sum p_i \ln p_i$$

where p_i is the proportion of individuals found in species 'i'.

For a well-sampled community, this proportion can be estimated as $p_i = n_i/N$, where n_i is the number of individuals or the population of species 'i' and N is the total number of individuals or total population across species in the community. By definition, p_i will all be between zero and one, the natural log makes all the terms of the summation negative, which is why the inverse of the sum is taken.

The Shannon-Wiener Index assumes that all species are represented in a sample and that they are randomly sampled. A high value of H' would be a representative of a diverse and equally distributed community and lower values represent a less diverse community. A community with only one species would have an H' value of 0 because p_i would equal 1 and be multiplied by $\ln p_i$ which would equal zero. Values are generally between 1.5 and 3.5 in most ecological studies, and the index is rarely greater than 4. The Shannon index increases as both the richness and the evenness of the community increase.

32. What is Soil Nutrient Index?

In order to compare the levels of soil fertility of one area with those of another it was necessary to obtain a single value for each nutrient. The nutrient index (N.I) value is a measure of the nutrient supplying capacity of soil to plants¹⁷. This index is used to evaluate the fertility status of soils based on the samples in each of the three classes, i.e., low, medium and high. The classes are constructed based on some threshold values for each nutrient. ICAR, Ministry of Agriculture and Farmer's Welfare have developed a formula for evaluating the soil nutrient index which is given below:

$$\text{Nutrient Index (N.I.)} = \frac{(N_L \times 1 + N_M \times 2 + N_H \times 3)}{N_T}$$

where N_L : Indicates the number of samples falling in the low class of nutrient status

N_M : Indicates the number of samples falling in the medium class of nutrient status

N_H : Indicates the number of samples falling in the high class of nutrient status

¹⁷ Singh, G., Sharma, M., Manan, J., & Singh, G. (2016). Assessment of soil fertility status under different cropping sequences in District Kapurthala. J Krishi vigyan, 5(1), 1-9.

N_T : Indicates the total number of samples analyzed for a given area.

If the value of N.I. comes out to be less than 1.67, it indicates that the fertility status of the soil is low in the area, if N.I. is between 1.67 to 2.33, then it is indicative of the fact that the fertility status is medium and if the value of N.I. is greater than 2.33, it denotes high soil fertility of the area for a particular nutrient.

33. What is IUCN?

The International Union for Conservation of Nature and Natural Resources is an international organization to provide conservation to nature and natural resources in a sustainable way¹⁸. IUCN was established in 1948. The working principle of IUCN depends on data gathering and analysis, research, field projects, advocacy as well as education. The objectives of IUCN include "influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable". IUCN harnesses the knowledge, resources and reach of over 1500 Member organisations. These include States and government agencies, NGOs large and small, Indigenous Peoples' organisations, scientific and academic institutions and business associations. Members from more than 160 countries are involved for the data documentation of IUCN.

34. What is IUCN Red List of Threatened Species™?

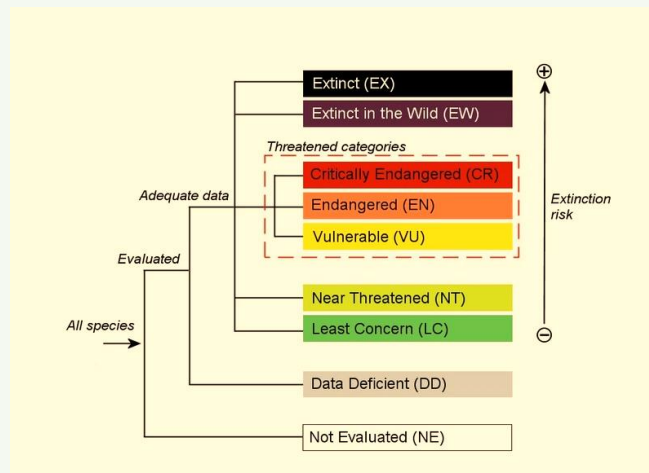
The IUCN Red List of Threatened Species™ is the world's most comprehensive information source on the extinction risk of animals, fungi and plants. Assessors place species into one of the IUCN Red List Categories, based on a series of assessment criteria¹⁹. For each species, The IUCN Red List provides information about its range, population size, habitat and ecology, use and/or trade, threats and conservation actions.

35. What are the IUCN Red List Categories and Criteria?

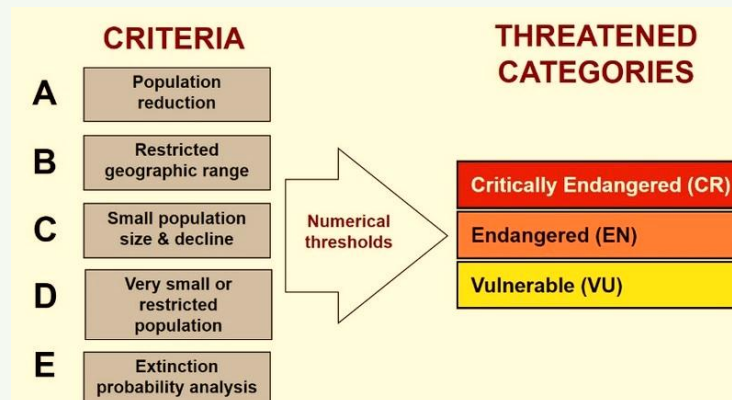
The IUCN Red List Categories indicate how close a species is to becoming extinct. The nine Red List Categories are shown below:

¹⁸ <https://www.iucn.org/about>

¹⁹ <https://www.iucnredlist.org/about/background-history>



Species are assessed against five criteria (see below) based on geographic range, population size and population decline/increase, in addition to extinction probability analyses. These criteria determine which category is most appropriate for the species.



Species in the 'Vulnerable', 'Endangered' and 'Critically Endangered' categories are collectively described as 'threatened'. The IUCN Red List does not include 'Not Evaluated' species. 'Critically Endangered' species may also be tagged as Possibly Extinct or Possibly Extinct in the Wild. For regional assessments, two additional categories are also available: 'Not Applicable' and 'Regionally Extinct'.

36. What is the Framework for Development of Environment Statistics (FDES)?

The Environment statistics²⁰ cover a wide range of information and are multi- and interdisciplinary in nature. They originate from a variety of institutions that collect data and, similarly, numerous methods are used to compile them. The field of environment statistics requires an appropriate framework to guide its development, coordination and organization.

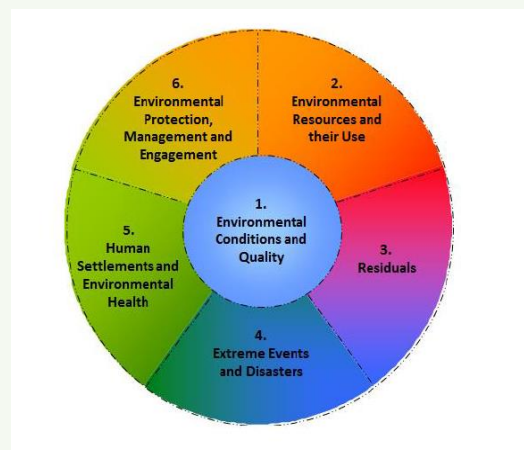
²⁰ <https://unstats.un.org/unsd/environment/FDES/FDES-2015-supporting-tools/FDES.pdf>

The Framework for the Development of Environment Statistics (FDES) is a flexible, multi-purpose conceptual and statistical framework that is comprehensive and integrative in nature. It marks out the scope of environment statistics and provides an organizing structure to guide the collection and compilation of environment statistics at the national level. It brings together data from the various relevant subject areas and sources. It is broad and holistic in nature, covering the issues and aspects of the environment that are relevant for policy analysis and decision making by applying it to cross-cutting issues such as climate change.

The current FDES 2013 is structured in a way that allows links to economic and social domains. It seeks to be compatible with other frameworks and systems, both statistical and analytical, such as the System of Environmental-Economic Accounting (SEEA), the Driving force, Pressure-State-Impact-Response (DPSIR) framework, and the Millennium Development Goals (MDGs), SDGs and the sustainable development indicator (SDI) frameworks. When applicable, it is based on existing statistical classifications. As such, the FDES facilitates data integration within environment statistics and with economic and social statistics.

FDES comprises of 6 components:

- (i) Environmental conditions and quality
- (ii) Environmental resources and their use
- (iii) Residuals
- (iv) Extreme events and disasters
- (v) Human settlements and environmental health
- (vi) Environmental protection, management and engagement



37. What is Climate Change?

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer. Climate change may be due to:

- Natural internal and external forces such as modulations of the solar cycles, volcanic eruptions
- Persistent anthropogenic changes in the composition of the atmosphere or in land use.

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

38. Who compiles Climate Change Statistics in India? What are the data sources?

Various Ministries/Departments/Institutions/Organization are involved in the compilation of various statistics pertaining to climate change. These are Indian metrological department (IMD), National Remote Sensing Centre (NRSC), Forest Survey of India (FSI), ENVIS Centres of MoEF&CC, etc. NSO, MoSPI collates and compile the information/statistics collected by organization/institutions and release in the form of publication. NSO, MoSPI released two issues of the publication “Climate Change Statistics in India” in 2013 and 2015²¹ based on DPSIR Framework. Later on, with the release of FDES 2013 Framework in 2016, the publications “Compendium of Environment Statistics” and the “Climate Change Statistics in India” were merged in 2018 and a new publication titled “EnviStats-India: Vol. I: Environment Statistics” was conceptualized following the FDES framework. Till date 5 publication has been brought out by the Ministry.

39. What is the Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES) Project?

The project “Natural Capital Accounting and Valuation of Ecosystem Services” (NCAVES) was launched in 2017 with an aim to advance both the knowledge agenda and the development of policy applications of environmental-economic accounting, in particular for ecosystem accounting. The NCAVES project was funded by the European Union via a Partnership Instrument and has been jointly implemented by the United Nations Statistics Division and the United Nations Environment, in collaboration with the Convention on Biological Diversity (CBD).

The project initiated pilot testing SEEA Ecosystem Accounting (SEEA EA) in five participating partner countries, namely Brazil, China, India, Mexico and South Africa, with a view to improving the measurement of ecosystems and their services (both in physical and monetary terms) at the (sub)national level; mainstreaming

²¹<https://mospi.gov.in/documents/213904/301563//climateChangeStat20151619801113578.pdf/63fc6cb2-e690-bbdb-9df9-c6fa2db1d6c1>

biodiversity and ecosystems at (sub)national level policy planning and implementing and contributing to the development of internationally agreed methodology and its use in partner countries.

40. Who implemented the NCAVES project in India?

In India, the NCAVES project was implemented by the National Statistical Office, Ministry of Statistics and Programme Implementations (MoSPI) in close collaboration with the Ministry of Environment, Forest and Climate Change (MoEFCC), National Remote Sensing Centre (NRSC), the Soil and Land Use Survey of India (SLUSI) and the Indian Institute of Science (IISc)-Centre for Ecological Sciences. MoSPI has coordinated with all the stakeholders through a consultative process by setting in place a mechanism for linking the diverse stakeholders concerned-namely producers and the policymakers-using the environmental accounts.

With a view to facilitate this collaboration and highlight the uses to which natural capital accounts can be put, especially in the areas of decision making and policy analysis, the ministry conducted the NCAVES India Forum (in a virtual format), as a series of three sessions in January 2021 held on January 14, 21 and 28, 2021 and released NCAVES India Project Report.

41. Who compiles Environment Accounts/Statistics in India? What are the data sources?

The Ministry of Statistics and Programme Implementations (MoSPI) under the Government of India is mandated to serve as the nodal agency for planning and facilitating an integrated development of the statistical system in the country. As per the Allocation of the Business rules, MoSPI has the mandate for the development of Environment Statistics, the development of the methodology, concepts and preparation of Natural Resource Accounts in India.

MoSPI initiated the compilation of environmental accounts in the SEEA framework in 2018, and these accounts were released in the publication titled "EnviStats-India: Vol. II - Environment Accounts". MoSPI also regularly releases Environment Statistics in the annual publication titled "EnviStats-India: Vol. I - Environment Statistics" following the FDES-2013 framework. The publications are available at <https://mospi.gov.in/web/mospi/reports-publications>.

The data are sourced from different Ministries/Departments of India such as the Ministry of Agriculture and Farmers Welfare, Ministry of Jal Shakti, Nation Remote Sensing Centre, Ministry of Environment, Forest and Climate Change etc.

42. What is Inter-Ministerial Group (IMG)? What is its role?

Since the data for compilation of the Environment Statistics/Accounts are sourced from multiple agencies, MoSPI constituted an Inter-Ministerial Group (IMG) on Environmental-Economic Accounting, under the chairmanship of the Director General, CSO in 2015 primarily to assess the availability of data for compilation of Environmental Economic Accounts and to recommend measures for filling the data gaps.

The Inter-Ministerial Group (IMG) comprises stakeholders from various Ministries/Departments. The role of the IMG is as follows:

- Assessment of availability of data for compilation of Environmental Accounts, identifying data gaps and recommending measures for filling the data gap.
- Assessment of Resource requirements and capacity development for the implementation of Environment-Economic Accounting.
- To suggest a roadmap for implementation of sector-wise accounts

43. What are Sustainable Development Goals (SDGs)?

According to the Brundtland Report, "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Sustainable Development Goals (SDGs)²², also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to take action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

The 17 SDGs are integrated—they recognize that action in one area will affect outcomes in others and that development must balance social, economic and environmental sustainability. The 17 SDG goals to transform our world include:

- GOAL 1: No Poverty
- GOAL 2: Zero Hunger
- GOAL 3: Good Health and Well-being
- GOAL 4: Quality Education
- GOAL 5: Gender Equality
- GOAL 6: Clean Water and Sanitation
- GOAL 7: Affordable and Clean Energy
- GOAL 8: Decent Work and Economic Growth
- GOAL 9: Industry, Innovation and Infrastructure
- GOAL 10: Reduced Inequality
- GOAL 11: Sustainable Cities and Communities
- GOAL 12: Responsible Consumption and Production

²² <https://www.undp.org/sustainable-development-goals>

GOAL 13: Climate Action
GOAL 14: Life Below Water
GOAL 15: Life on Land
GOAL 16: Peace and Justice Strong Institutions
GOAL 17: Partnerships to Achieve the Goal

Countries have committed to prioritize progress for those who are furthest behind. The SDGs are designed to end poverty, hunger, AIDS, and discrimination against women and girls. The creativity, know how, technology and financial resources from all of society is necessary to achieve the SDGs in every context.




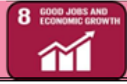





44. How is Environment linked with Sustainability?

The 2030 Agenda for sustainable development highlights the interlinkages and integrated nature of the sustainable development goals implying clearly that this global policy agenda which links goals across many sectors requires integrated statistics for monitoring progress. The implementation of the SEEA is in and of itself an SDG indicator (15.9.1: (a) Number of countries that have established national targets in accordance with or similar to Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020 in their national biodiversity strategy and action plans and the progress reported towards these targets; and (b) integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting). Owing to their integrated nature, ecosystem accounts that are formed under the ambit of the SEEA framework, whether they are extent accounts, condition accounts or ecosystem service accounts provide an underpinning that informs the 2030 Agenda for Sustainable Development. The UNSC recognized SEEA as an important statistical framework for the post-2015 development agenda and the sustainable development goals indicators in 2014. Analysis suggests that 40 of the SDG indicators covering 9 of the 17 goals could be derived from the SEEA.

Of the three dimensions of sustainable development, the environmental dimension remains the least well measured. Increased global effort to ensure that measurement is done consistently and to high standards across all regions of the planet is needed. Only then one can be sure that the environmental SDGs will be reported with the same quality as those that consider social and economic issues

The SEEA-CF is the basis for measuring a country's natural wealth, or the value of its natural capital. Natural wealth is in turn an essential input in measuring inclusive wealth, which is an important indicator of the sustainability of well-being.

The following image shows the linkages of SEEA with the SDG

	SEEA-Agriculture, Forestry and Fisheries / SEEA-Experimental Ecosystem Accounting
	SEEA-Water / SEEA-physical supply and use tables for water/ SEEA-land accounts / SEEA- ecosystem accounts
	SEEA-Energy
	Material flow accounts / SEEA and tourism satellite accounts
	SEEA-emission accounts
	SEEA-land accounts / SEEA-environmental protection expenditure accounts / SEEA- emission accounts
	SEEA-material flow accounts, water accounts, energy accounts and other resource specific accounts / SEEA-solid waste accounts / SEEA and tourism satellite accounts
	SEEA-Agriculture, Forestry and Fisheries / SEEA-emissions accounts / SEEA-accounts for aquatic resources / SEEA-land accounts / SEEA-environmental taxes and subsidies accounts
	SEEA-land accounts / SEEA-Agriculture, Forestry and Fisheries / ecosystem accounts (ecosystem condition accounts, ecosystem service accounts and biodiversity accounts)

In addition, SDG 3 on Good Health and Wellbeing also shows linkage with SEEA, as all SEEA accounts promote good health and wellbeing. SDG 13 on Climate Change also shows linkage with SEEA and SDG.

45. What is Physical and Monetary Supply and Use Tables?

An economy uses natural resources and other inputs from the environment and lets the environment absorb the by-products. Measuring these flows using physical units can provide instructive information. The physical flow accounting framework provides a set of accounting principles and boundaries within which a consistent recording of all types of physical flows related to economic activity can be made.

The Physical Supply and Use tables are accounts in physical units in the form of matrices that record the flows of natural resources, residuals, products and ecosystems inputs according to origins (supply) and destinations (uses). While the rows of the PSUT show types of natural inputs, products and residuals, the columns reflect both the activity underlying the flow and the economic units involved.

The Physical Supply tables provides information about the flows relating to the production, generation, and supply of natural inputs, products and residuals by different economic units or the environment.

The physical Use tables provides information about the consumption and use of natural inputs, products and residuals by different economic units or the environment.

The Monetary SUTs captures the supply and use of ecosystem services in monetary terms. The intent of Physical flow accounting is to record the physical flows underpinning the monetary supply and use tables and to extend the monetary table to record all physical flows from the environment to the economy and the environment.

46. What are Protected Areas?

A Protected Area²³ is a geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. The establishment of comprehensive, ecologically representative, effectively managed and financially secured protected area networks is a critical strategy not only for biodiversity conservation, but for securing ecosystem goods and services, enabling climate change adaptation and mitigation, and helping countries achieve the Sustainable Development Goals.

Protected areas²⁴ are those in which human occupation or at least the exploitation of resources is limited. The definition that has been widely accepted across regional and global frameworks has been provided by the International Union for Conservation of Nature (IUCN) in its categorization guidelines for protected areas. There are several kinds of protected areas, which vary by level of protection depending on the enabling laws of each country or the regulations of the international organizations involved. The term "protected area" also includes Marine Protected Areas, the boundaries of which will include some area of ocean, and Transboundary Protected Areas that overlap multiple countries which remove the borders inside the area for conservation and economic purposes.

As per IUCN, there are 6 categories of Protected Area; Category Ia & Ib- Strict Nature Reserve and Wilderness Area, Category II- National Park, Category III- Natural Monument or Feature, Category IV- Habitat/Species Managed Area, Category V- Protected Landscape/ Seascape, Category VI-Protected area with sustainable use of natural resources. In India, Protected Areas are declared under Wildlife (Protection) Act 1972 in four categories- National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves.

²³ <https://www.cbd.int/undb/media/factsheets/undb-factsheet-pa-en.pdf>

²⁴ http://www.wiienvi.nic.in/Database/Protected_Area_854.aspx

47. What is Convention on Biological Diversity?

The Convention on Biological Diversity (CBD) is a multilateral agreement of treaty. It was opened for signature on 5th June 1992 during the Earth Summit in Rio de Janeiro, Brazil, and entered into force on 29th December 1993. The prime goals of this convention include sustainability in conservational measures and benefit-sharing along with the development of the strategic plan for the conservational practices.

There are three main objectives of Convention on Biological Diversity (CBD).

- (i) The conservation of biological diversity
- (ii) The sustainable use of the components of biological diversity
- (iii) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources

48. What is CITES and its Appendix?

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a global agreement or multilateral treaty among governments to regulate or ban international trade in species under threat to protect endangered plants and animals. It was adopted by International Union for Conservation of Nature (IUCN) in 1963 and signed in 1973 whereas it was active since 1st July 1975. CITES represents three appendices as Appendices I, II, and III to protect the floral and faunal communities against over-exploitation²⁵.

Appendix I included animals and plants which are threatened with extinction. CITES prohibits international trade in specimens of these species except in exceptional circumstances like when the purpose of trade is not commercial and for scientific research through import and export permit.

Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled. The species whose specimens in trade look like those of species listed for conservation reasons. International trade in specimens of Appendix-II species may be authorized by the granting of an export permit or re-export certificate.

Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade. International trade in specimens of species listed in this Appendix is allowed only on presentation of the appropriate permits or certificates.

²⁵ <https://cites.org/eng/disc/what.php>

49. What are some priority areas identified by NSO, India for Environment Accounting?

NSO, India released “Strategy for Environmental Economic Accounts in India: 2022-2026” in December, 2021. The document has been developed with an aim to implement concerted efforts towards the goal of strengthening the environmental statistics and environmental accounts for India. The strategy document provides a road-map for development of environmental accounting and also helps provide some goals for the short term and also act as a means for measuring India's progress in the domain of the environment accounting. Following priority area has been highlighted in the strategy documents:

- i. Energy Accounts
- ii. Material Flow Accounts
- iii. Ocean Accounts
- iv. Urban Accounts and Biodiversity

50. What are Energy Accounts?

Energy Accounts are a structured compilation of information on flows of energy and its relation with economy and the environment. It is based on SEEA-Energy framework²⁶, which is an accounting approach that records, as completely as possible, the stocks and flows of energy in the territory of reference. It supports analyses of the role of energy within the economy and of the relationship between energy-related activities and the environment. The energy accounts as described in SEEA comprises of primarily three types of accounts:

- (i) Physical supply and use tables: The physical supply and use tables (PSUT) provide a structure for compiling and presenting all energy flows that enter, are used within and leave the national economy of a given country for a period of time.
- (ii) Monetary supply and use tables: Monetary supply and use tables in SEEA fully articulate in monetary terms the flows of energy products in an economy between different economic units.
- (iii) Asset accounts: The purpose of asset accounts is to record the opening and closing stock of known assets and the various types of stock changes over an accounting period.

51. What are Material Flow Accounts?

Economy-wide material flow accounts (EW-MFA) are a statistical accounting framework recording, in thousand tonnes per year, material flows into and out of

²⁶ <https://seea.un.org/seea-energy>

an economy²⁷. They cover solid, gaseous, and liquid materials, except for bulk flows of water and air. The general purpose of EWMFA is to describe the physical interaction of the national economy with the natural environment and the rest of the world economy in terms of flows of materials.

EW-MFA is a statistical framework conceptually embedded in environmental-economic accounts and fully compatible with concepts, principles, and classifications of national accounts – thus enabling a wide range of integrated analyses of environmental, energy and economic issues e.g. through environmental-economic modelling. Material flow accounts are one of the many types of accounts covered by the SEEA Central Framework

52. What are Solid Waste Accounts?

Solid wastes are the discarded material that are no longer required by the owner or user²⁸. These include Chemical and Health care wastes, Radioactive wastes, Metallic wastes, Other recyclables, discarded equipment and vehicles, animal and vegetal wastes, mixed residential and commercial wastes, mineral wastes and soil, combustion wastes and other wastes.

Solid waste accounts, part of SEEA- CF, are organized information on the generation of solid waste and the management of flows of solid waste to recycling facilities, to controlled landfills or directly to the environment. Measures of the amount of waste in aggregate or of quantities of specific waste materials is an important indicator of environmental pressure. The construction of solid waste accounts allows these indicators to be placed in a broader context with economic data in both physical and monetary terms.

53. What are Ocean Accounts?

An Ocean Account is a structured compilation of consistent and comparable information – maps, data, statistics and indicators – concerning marine and coastal environments, including related social circumstances and economic activity²⁹.

The general purpose of such accounts is to inform and enable public policy decision-making about oceans, and related analysis and research. The function of these accounts is to provide coherent structures for standardizing often-fragmented data to produce reliable integrated indicators of interest to policy.

²⁷ <https://seea.un.org/content/material-flow-accounts#:~:text=What%20is%20it%3F,in%20the%20SEEA%20Central%20Framework>.

²⁸ SEEA Central Framework - <https://seea.un.org/content/seea-central-framework>

²⁹ https://unstats.un.org/unsd/statcom/51st-session/documents/BG-item-3h-TG_Ocean%20accounting_ESCAP-E.pdf

Ocean Accounting can (a) help in understanding the role of oceans and coasts in the economy, (b) serve as a mechanism to monitor the investment and net returns from ocean activities, (c) serve as a tool to understand how external events such as storms, climate change and environmental changes can impact Blue Economy development, and (d) help in identification of new areas for investment and innovation.

Ocean accounts can answer the following questions:

- What is the status of ocean wealth including produced assets (e.g. ports) and non-produced assets (e.g. coral reefs, mangroves, fish stocks)? What are the implications of external stresses (e.g., climate change) on ocean wealth?
- How are different groups of people benefitting from the ocean, ocean economy? (income or welfare)

54. What are Urban Accounts?

Ecosystem services are the direct³⁰ and indirect contributions of ecosystems to human well-being. Cities depend on ecosystems both within and beyond the urban environment for a wide variety of goods and services that are essential for economic, social, and environmental sustainability. Ecosystems have the potential in cities to regulate climate, protect against hazards, meet energy needs, support agriculture, prevent soil erosion, and offer opportunities for recreation and cultural inspiration. In many urban areas, particularly in brownfields and other non-used urban land, there are ample opportunities to create novel functioning ecosystems that generate services that enhance the well-being of urban inhabitants.

Ecosystems in urban areas also serve as habitats for species and as storehouses for genetic diversity. Nutrient cycling and soil formation processes are often driven by non-iconic species, such as bacteria or invertebrates; the contribution of biodiversity to these vital ecosystem services often goes unacknowledged or unprotected.

Urban ecosystem accounting provides a framework for quantifying the extent and condition of urban ecosystems and the services they provide and associating these services with beneficiaries.

55. What are the different ecosystem accounts that has been attempted by NSO, India?

NSO, India regularly compiles environment accounts since 2018 following the SEEA framework and has carried out several accounts since then. India has

³⁰ <https://www.cbd.int/doc/health/cbo-action-policy-en.pdf>

developed several extent and condition as well as ecosystem services accounts for various selected ecosystems. A brief description is given below:

Type of account	Topics covered
Ecosystem extent	Change matrix of Land Use - Land Cover (LULC) from 2005-06 to 2011-12 and 2011-12 to 2015-16; and the corresponding Asset Accounts. Land Degradation Account, 2005-06 and 2015-16 Wetland Extent Account, 2006-07 Asset accounts for Minerals and Forests
Ecosystem condition	Soil nutrient indices; Water quality accounts Forest condition account; Cropland condition account
Ecosystem services	Crop provisioning services (monetary) Timber and Non-Timber Forest Products (NTFP) provisioning services (monetary) Carbon retention services provided by forests (physical and monetary) Nature-based tourism (monetary) Soil erosion prevention services provided by croplands (physical)
Thematic Accounts	Biodiversity - Extent of protected areas; State-wise floral and faunal species accounts; Species Richness of IUCN Red List species
Individual environmental asset accounts (SEEA CF)	Forests - Growing Stocks of Timber and Carbon Water Mineral

Apart from this, NSO India constantly strives towards improving the scope and coverage of the Environmental Accounts in India.

56. What are the other organisations involved in Environment accounting in India?

Apart from MoSPI, the natural resource accounting is being dealt by Government Accountings Standards Advisory Board (GASAB) under the aegis of Comptroller and Auditor General of India. In line with its mandate in suggesting accounting framework for enhancing the quality of decision making and public accountability in mind, GASAB has initiated the efforts by preparing a roadmap for implementation of NRA in India. GASAB³¹ has initially proposed preparation of the Asset accounts in the States and then gradually expand it to the nation.

57. To what extent India collaborates with the International agencies regarding environment accounting?

³¹ <http://gasab.gov.in/gasab/pdf/NR-Accounting.pdf>

NSO, India joined the EU funded Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES) India project in 2017 which was jointly implemented by the United Nations Statistics Division (UNSD), United Nations Environment Programme (UNEP) and the Secretariat of the Convention of Biological Diversity (CBD) in five piloted countries-the other countries being Brazil, China, South Africa and Mexico. A large amount of the work on the Environment Accounting in India has been done under the NCAVES project. The report of the project can be accessed at <https://mospi.gov.in/web/mospi/ncaves-india-forum-2021>.

The UN Committee of Experts on Environmental-Economic Accounting (UNCEEA), established by the UN Statistical Commission at its 36th session in March 2005, functions as an intergovernmental body to provide overall vision, coordination, prioritization and direction in the field of environmental economic accounting and supporting statistics. The Bureau of the UNCEEA was established in 2007 to assist the Committee to carry out specific activities pertaining to Environment Accounts. India is a member of the Bureau of UN Committee of Experts on Environmental-Economic Accounting (UNCEEA).

The Global Assessment of Environmental-Economic Accounting and Supporting Statistics is a survey administered under the auspices of the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA). The aim of the Global Assessment is to assess the progress of implementation of the SEEA in countries. NSO, India provides regular responses to the Global Assessment of Environmental-Economic Accounting and Supporting Statistics, conducted UNSD.

In addition, India regularly contributes to SEEA newsletter highlighting the achievements in Environment Statistics and Environment Accounts. NSO, India also actively participates in meetings of London Group on Environment Accounting which serves as a forum to advance methodological research and to develop implementation advice for the SEEA. In addition, NSO India provides critical inputs and feedback on various issues relating to Environment Statistics and Accounts in the annual sessions of UNSC.

58. Where can one find the glossary of all the items used in the EnviStats India publication?

NSO, India has recently released EnviStats India Glossary which encompasses all the terms and definitions used in the EnviStats India publication at a single platform. This will help the user to have a better understanding of the various definition and technical terms used in EnviStats India publications. The glossary will be updated in line with the subsequent release of the publications. The publications can be accessed at

<https://mospi.gov.in/web/mospi/reports-publications/-/reports/view/templateFive/27501?q=RPCAT>



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