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**Advancing the System of Environmental-Economic Accounting (SEEA)  
Experimental Ecosystem Accounting Project Update**

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# Advancing the System of Environmental- Economic Accounting (SEEA) Experimental Ecosystem Accounting: Project Update

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## 1 Introduction

The System of Environmental-Economic Accounting 2012 Central Framework (SEEA Central Framework) was adopted by the United Nations Statistical Commission (UNSC) at its 43<sup>rd</sup> session in 2012 as the international statistical standard for environmental-economic accounting. Further, at its 44<sup>th</sup> session in 2013, the UNSC endorsed SEEA 2012 Experimental Ecosystem Accounting (SEEA-EEA). The white-cover publication ‘SEEA Experimental Ecosystem Accounting’ of 2012 offers a synthesis of the current knowledge in ecosystem accounting and serves as a platform for its development at national and subnational levels. It provides a common set of terms, concepts, accounting principles and classifications, and an integrated accounting structure of ecosystem services and ecosystem condition in both physical and monetary terms.

The United Nations Statistical Division (UNSD) in partnership with the Secretariat of the Convention on Biological Diversity and the UNEP TEEB Office has embarked on a project in June 2014 to advance natural capital accounting (ANCA) in seven pilot countries, through SEEA-EEA, supported by funding from the Government of Norway. The project is to deliver the following: A Strategy for testing the SEEA-Experimental Ecosystem Accounting; Technical Guidance and Training material; The organization of a Forum of experts in ecosystem accounting; National assessments and programme of work (one per each pilot country); and Outreach & Communications, including the organization of an international conference/expert group/high-level meeting on linking the SEEA Experimental Ecosystem Accounting with the business account, data revolution and sustainable development. This paper provides an update on the project and its deliverables.

## 2 Pilot country updates

### **Bhutan**

Bhutan has a unique approach to respecting nature, environment and social considerations along economic development. This approach is expressed in the development of the Gross National Happiness Index and a number of very high level commitments to nature and environmental conservation. Examples of such commitments include the constitutional obligation to maintain at least 60% of forest cover in the country at any time, and also to enhance the populations of critically endangered iconic species such as tigers and snow leopards.

The first mission for undertaking a broad based assessment took place from 4 to 10 October 2014 in Thimphu, jointly organized by staff of UNSD and the National Statistical Bureau of Bhutan. The mission included an information workshop on ecosystem accounting, attended by 28 participants from around 10 different government agencies. Meetings with a number of institutions were held in the next 2 days to discuss priorities, potential involvement and benefits from ecosystem accounting as well concrete steps for data exchange. Environmental conservation is a priority for the Royal Government of Bhutan, and environmental sustainability is one of the four pillars of the Gross National Happiness, however the rapid advance of certain economic sectors do pose environmental challenges. Data availability and capacity to work with spatial data are possibly the biggest challenges in Bhutan, although new and high-quality data sources are in the process of development, for example in forest carbon stocks mapping and species monitoring. There is a very high interest in SEEA including ecosystem accounting as expressed by many of the interviewed stakeholders. In particular the monetary part was stressed among others in order to analyse the economic benefits of the large-

scale green policies being carried out in Bhutan (for example benefits and returns from the management of protected areas, that currently occupy 51% of the country).

A second mission to Bhutan is expected to take place in the third quarter of 2015 to present the National Plan for Advancing Environmental-Economic Accounting during bilateral consultations with sectoral ministries and agencies and at a high level seminar to recognise the SEEA as an important statistical framework in support of the information system for sustainable development.

## **Chile**

Chile is an economically developed country in Central and South America, and since last year considered a high-income country by the World Bank. Environmental issues have been gaining priority on the government's agenda over the last decade. This has led to the recognition of the SEEA as the statistical framework to organise the information system for sustainable development. The Ministry of Environment has been tasked to put in place the design of this information system. A National Plan was developed based on a national assessment of policy priorities and data availability.

The first mission in Chile was jointly organized by the UNSD and the Ministry of Environment in Chile and took place in the last week of October to undertake the above mentioned assessment and provide initial training. In addition a working team on ecosystem accounting has been established for the pilot project in Chile (including external consultants) to test and experiment selected aspects of SEEA experimental ecosystem accounts. A national plan prepared and presented during the second mission in Chile, held in April 2012. Meanwhile the national plan has been submitted to the Council of Ministers for their comments and a final agreed Plan is expected to be completed by the end of the project.

## **South Africa**

Statistics South Africa has already been engaged in the implementation process of the SEEA Central Framework and produced a regular set of water, energy, mineral resources and fishery accounts. Moreover, there are currently sufficient data of high quality to produce a pilot land cover account for one province. In advance of the mission, UNSD brought together two years of land cover data and established a preliminary land cover account for one province. Demonstrating this to selected stakeholders raised the possibility of developing a pilot land cover and condition account over the short term.

The national planning process focusses on actions and measurable outcomes. There is a range of opportunities and developments upon which the implementation of the SEEA in South Africa can be built. From a policy perspective these opportunities include the commencement of work on the National Development Plan, National Framework for Sustainable Development and New Growth Path and the requirement from the government at the international level to monitor the Sustainable Development Goals process. To date, two missions have been conducted. The first mission, which was held in the period 25-29 August 2014, consisted of a series of bilateral and multi-lateral discussions with relevant stakeholders to develop a national assessment. General topics of discussion included national plans and priorities, the institutional arrangements, statistical work related to ecosystem accounting and data availability. The second mission, which was conducted on 10-14 November, included 3 days training on the SEEA Central Framework and 2 days training and stakeholder workshop on SEEA Experimental Ecosystem Accounting.

A National Plan drafted on the basis of the assessment report is presently being considered by the Statistics South Africa to broaden the scope of the Plan to include both the implementation of the SEEA Central Framework and Ecosystem Accounting as statistical framework in support of the information statistics for sustainable development.

## **Mauritius**

There is a range of opportunities and developments upon which the implementation of the SEEA Central Framework and Experimental Ecosystem Accounting can be built. From a policy perspective these opportunities include: 1) the commencement on the Green Economy Action Plan and other sustainable development initiatives such as the African Environmental Information Network (AEIN) project, and 2) the requirement from government at the international level to monitor Sustainable Development Goals (SDG) process, particular in the context of the Small Island Development States (SIDS).

Statistics Mauritius has already been engaged in the implementation process of the SEEA Central Framework. Preliminary set of accounts have been compiled on water, energy and GHG emission, material flows. In addition, a preliminary set of pilot ecosystem accounts was developed by Statistics Mauritius in collaboration with IOC and MIDC though support with technical assistance from the regional project ISLANDS. All these development could form the basis for the next phase of work for the pilot testing of SEEA Experimental Ecosystem Accounting.

To date, one mission has been conducted in July 2014. With the exception of water accounts, most of the environmental-economic and ecosystem accounting were no part of a recurrent programme and further capacity building is necessary to strengthen the institutional capacity and infrastructure for a sustainable production of environmental-economic and ecosystem. Training and knowledge transfer was a repeated emphasis during the bilateral discussion with stakeholders. It is expected capacity building, training and knowledge transfer will be a main focus of the work plan.

A draft National Plan was formulated based on the assessment of the first mission. However, the Plan needs to be deepened during the second mission expected to take place in the third quarter of 2015

## **Indonesia**

There is high level support from Statistics Indonesia (BPS) for the development of environmental accounting to support decision making on sustainable development. BPS is recognized as trusted custodian and producer of statistical data, and has excellent contact with various line ministries that would either supply or use data from environmental accounts, including ecosystem accounting. There are several pilot studies, among others conducted in Kalimantan, on which further piloting of ecosystem accounting can be built.

A first mission was held in October, 2014, which examined the scope of ecosystem accounting support in the country, including synergies between SEEA-Agriculture, the World Bank WAVES and the UNSD/UNEP SEEA-EEA. A second mission was held in April 2015, which included a regional technical training workshop and a high level consultative meeting to obtain further insights into policy priorities, stakeholders and data availability in preparation. Prior to the second mission, a draft National Plan has been circulated for broad consultation among line ministries and relevant stakeholders for comments and reviews. At the high level consultative meeting the SEEA was recognized as an important statistical framework in support of the information system for sustainable development. Currently, a high-level national steering and related technical committees are being

established to create the institutional arrangements and statistical production processes for the production of environmental accounts in support of the information needs of the medium term plan for Indonesia.

## **Mexico**

Mexico's National Development Plan (NDP) sets preserving the country's national heritage as an important objective. However, the NDP is largely sectorial, in that its objectives are linked to the mandates of individual Secretariats (Ministries). The Secretariat for the Environment has integrated many of the objectives of the NDP into its Sustainable Development Strategy for further articulation in the national planning dialogue.

Technical and scientific capacity to produce environmental economic accounting including ecosystem accounting is excellent across the government. Currently, there is strong collaboration between the statistical institute (INEGI) and the Environment Sector at the technical level. There is an opportunity for these groups to work in closer collaboration on a pilot ecosystem account to improve integration, but also to focus on standard classifications, concepts and methods, which can be applied to much of their source data. The assessment mission was held on October 2014, and the second one is expected to be held in July 2015 to present the National Plan for bilateral consultations with sectoral ministries and agencies and at a high level meeting to seek endorsement of the SEEA as an important statistical framework in support of the information system of sustainable development.

## **Vietnam**

In recent years the Government of Vietnam has promulgated various strategies for sustainable development at the national and sectorial level. The first mission to the country determined that the governance, coordination and capacity to create, maintain and share information on sustainable development needs significant investment. A World Bank funded initiative has supported the compilation of preliminary forest account covering both aggregates from the SEEA Central Framework and Experimental Ecosystem Accounting. This initiative has demonstrated a feasible institutional model of bringing various technical partners together and recognised the importance for both the central framework and ecosystem perspective. This statistical collaboration determined that significant data gaps exist and data quality has to be improved to prepare SEEA accounts, but that initial estimates can be prepared. It also formulated clear recommendations to close the data gaps and improve the data quality and to take the forest accounts to the next level. The assessment mission also determined other international and bilateral initiatives related to the SEEA account on which National Plan should be built, e.g. development of land cadaster by New Zealand (which can support the development of land cover and use accounts), forest inventory by Finland (that can support the development of forest accounts), support in biodiversity by Japan International Cooperation Agency (JICA), UNSPIDER provides support in strengthening the GIS capability, USIAD is supporting the development of water information system using the SEEA Water Accounts, etc.

A second mission held from 8 to 12 June, presented the National Plan drafted during bilateral consultations at various ministries and agencies and the high-level consultative meeting. The SEEA was recognised as the statistical framework for the development of a common information system for sustainable development. However, to reach an overall buy-in across the administration, technical and scientific capacity to produce environmental-economic and ecosystem accounts has been strengthened and mobilised with the right incentives. Therefore, it was considered to seek the promulgation of a decree on the SEEA like a decree was issued by the Prime Minister to adopt the System of National Accounts for the organisation of the economic information system of economic planning and policy

making in the early 1990s. Moreover, it is expected that the coordination of the initiatives of the development partners in a collective action would further the institutional and technical capacity of the Government to prepare on a recurrent basis the statistics and indicators required to inform the policies for sustainable development.

### **2.1.1 National Assessments Reports**

National assessment reports (NAR) were completed for each pilot country following a common template, which includes:

- a review of policy priorities, as stated in national plans and relevant legislation;
- institutional settings, introducing the role of each institution in the national statistics production system;
- availability of data and tools to produce environmental and ecosystem accounts
- existing capacity and expertise for developing ecosystem accounts and further capacity building needs.

The template has been updated based on feedback identified during the preparations for the second country missions. Further as the NPW template is updated based on experience these changes are also included in the NAR to ensure consistent collection of information and alignment between the documents.

### **2.1.2 National Programs of Work**

A common template for a National Programme of Work (NPW) on SEEA is now available for use in other countries. This template contains section on rationale, high-level (generalized) objectives and common methodology (building blocks), as well as action development guidelines. The country specific information complements issues related to countries' environmental and ecosystem problems, policy drivers and targets, concrete data and methods, and finally specific work packages. All the pilot countries are engaged in the drafting NPWs. National consultants have been hired in three of the pilot countries (Mexico, South Africa and Chile). The rest of the countries are advancing their pilot projects within existing resources and capabilities (and with correspondingly more intensive support from UNSD).

## **2.2 SEEA EEA Technical development – advancing the research agenda**

The paper “Towards a medium-term programme of work for the SEEA Experimental Ecosystem Accounting” was presented in the Eighth meeting of the UNCEEA in 2013 for discussion. The UNCEEA expressed strong support for testing and experimentation in ecosystem accounts using SEEA Experimental Ecosystem Accounting and agreed on a set of priorities for the research agenda, identifying the short-term priorities as: (a) delineation of spatial units and associated classifications, including their link to economic units; (b) methods to measure ecosystem services and ecosystem assets; (c) presentation of structure, including structure of the tables and relevant indicators that can be derived from the accounts; (d) linkages with socioeconomic data; and (e) valuation of ecosystem services. It also agreed with the proposed medium to long term research priorities: (1) accounting concepts, (2) connection between ecosystem services and ecosystem condition, and (3) aggregation and ecosystem-wide indicators and expressed support for organizing a forum of experts in late 2013 and an international conference in late 2015 to discuss issues related to ecosystem accounting.

A thorough process of technical development was undertaken within the project, to supply comprehensive support to the countries wishing to pilot SEEA-EEA. This process started with the



development of nine thematic research papers, which served as an input to compilation of a generic Technical Guidance (TG) document and a series of training modules. The thematic papers and the TG were the subject of discussions during the second meeting of the forum on experts on Ecosystem accounting held in April 2015.

### 2.2.1 Thematic research papers

Nine thematic research papers were developed to feed in to the drafting of the TG, training materials and expert forum. These papers discuss both generic and specific concepts, methods and data options across a number of accounting themes. The following thematic papers are completed, and accessible on the UNSD website<sup>1</sup>:

- Spatial units, scaling and aggregation
- A Functional Approach to Environmental-Economic Accounting for units and ecosystem services
- Biophysical Modelling and Analysis of Ecosystem Services in an Ecosystem Accounting Context
- Linkages between ecosystem service accounts and ecosystems asset accounts
- Land accounts and Ecosystem Extent
- Land and Ecosystem Condition and Capacity
- Water and Ecosystem Accounting
- Carbon and Ecosystem accounting
- Compilation of data, tools, methods and pilots in Canada

An additional paper is being finalized that aims to clarify some of the issues surrounding biodiversity in ecosystem accounting.

### 2.2.2 Technical Guidance

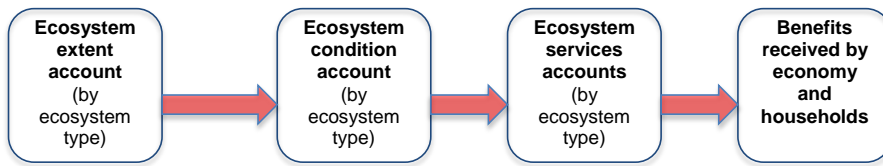
The Technical Guidance document present an updates and extensions of ecosystem accounting concepts, methods and structures building on the White cover document of 2012. Some concepts and definitions have been refined substantially including ecosystem units, and the introduction of fundamental ecological principles in the accounting concepts and methods. These principles refer to ecosystem function, structure and composition as the key entry points to defining and classifying ecosystem assets and services.

The guidance also presents an overall ecosystem accounting structure containing a number of related tables, starting **Ecosystem asset account** and its characteristics e.g. ecosystem extent, condition and monetary account (where possible); **Ecosystem service accounts**, including supply and use tables in physical and monetary (where possible) terms; and **Integrated accounts** including tables with institutional sectors and national sector balance sheets (See Figure 1 from Technical Guidance).

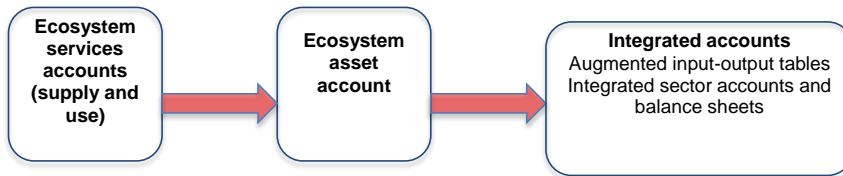
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<sup>1</sup> [http://unstats.un.org/unsd/envaccounting/workshops/eea\\_forum\\_2015/lod.asp](http://unstats.un.org/unsd/envaccounting/workshops/eea_forum_2015/lod.asp)

*a. Steps in physical terms*



*b. Steps in monetary terms*



**Figure 1 Basic steps in compiling ecosystem accounts**

Thematic cross-cutting accounting tables on land, water, forest etc are retained for consistency with the SEEA-CF structure. The draft version of the TG which was presented at the Expert Forum 2015 is accessible online<sup>2</sup>. All the forum experts were invited to review this version and their feedback is now being incorporated into the document. As a next step it is planned to conduct a broader review of the Technical Guidance.

### 2.2.3 Expert Forum

An Expert Forum was established with meetings on an annual basis to discuss progress of testing of the SEEA-Experimental Ecosystem Accounting and advance the research agenda as defined by the UNCEEA. The work of the group would lead to a large multi-stakeholder, international conference bringing together various stakeholders and communities is proposed to be held in 2016 with the objectives of:

- showcasing advances in research and testing on the SEEA-Experimental Ecosystem Accounting;
- highlighting to the potential for more definite methods and guidelines;
- providing recommendations for the revision of the SEEA Experimental Ecosystem Accounting.

The meeting of 2015 was attended by more than 60 experts, combining expertise from many fields including national accounting, modelling, remote sensing, assessment and classification of ecosystem services etc.

### 2.2.4 Training materials and sessions

A package of training materials was compiled, covering a number of selected modules, namely those that can be deemed robust enough and recommendable for testing. The training materials consist of PowerPoint presentations, spreadsheets of exercises (and answers) and compilation guidelines. Each module is structured in three levels: level 0, introducing the main questions of what is accounting, why we need it, what does the account look like, expertise and data required and links to existing training materials; level 1 introduces the key concepts followed by compilation exercises; level 2 offers additional concepts (more sophisticated), followed by data options and examples from existing applications in ecosystem accounting. The following modules are available at present:

<sup>2</sup>

[http://unstats.un.org/unsd/envaccounting/workshops/eea\\_forum\\_2015/12.%20SEEA%20EEA%20Tech%20Guid%20Exp%20Forum%20Draft%20Deliv%202.c%203Apr2015.pdf](http://unstats.un.org/unsd/envaccounting/workshops/eea_forum_2015/12.%20SEEA%20EEA%20Tech%20Guid%20Exp%20Forum%20Draft%20Deliv%202.c%203Apr2015.pdf)

- Introduction to SEEA;
- Classifications and data sources in ecosystem accounting;
- Key concepts;
- Spatial units;
- Ecosystem condition;
- Ecosystem extent;
- Carbon accounts;
- Water accounts;
- Generation of ecosystem services;
- Biophysical modelling and Diagnostic tool for scoping the experimental accounts in relation to policy priorities, institutions, data and knowledge and context.

The training packages were first delivered to an audience of various experts engaged in national statistics, environmental and geo-processing techniques, during two regional training workshops held in April 2015 in Indonesia and Chile. The groups of experts provided very positive feedback and a strong appreciation of the training sessions. As a next step it is foreseen to develop these training modules into e-learning.