Research Agenda for SEEA Experimental Ecosystem Accounting

Prepared by the Committee of Experts on Environmental-Economic Accounting

**Research Agenda for
SEEA Experimental Ecosystem Accounting**

A.   Introduction

Ecosystem accounting is a relatively new and emerging field dealing with integrating complex biophysical data, tracking changes in ecosystems and linking those changes to economic and other human activity. Although considerable experience exists in related areas of statistics such as land cover and land use statistics, the integration of these and other information into an ecosystem accounting framework is new. Considering the increasing demand for statistics on ecosystems related to analytical and policy frameworks on environmental sustainability, human wellbeing and economic growth and development, there is a need to advance this emerging field of statistics.

SEEA Experimental Ecosystem Accounting provides a synthesis of the current knowledge in this area and provides a starting point for the development of ecosystem accounting at national and sub-national levels. It represents an important step forward on ecosystem accounting, providing a common set of terms and concepts, the integration of measures of ecosystem services and ecosystem condition, an integrated approach for ecosystem accounting in both physical and monetary terms, the recognition of spatial areas as forming the basis for coordinated measurement, and generally, the provision of a framework that facilitates collaboration between the key fields of research and practice.

Notwithstanding the important steps that have been taken, a number of conceptual and practical issues remain to be addressed. To advance ecosystem accounting, work is required to research the conceptual issues that remain to be elaborated or are the subject of discussion. Testing of the concepts and methodologies in SEEA Experimental Ecosystem Accounting will provide valuable inputs in the development of concepts, methods and classifications on ecosystem accounting. Considering the multidisciplinary nature of ecosystem accounting, the advancement of the research agenda as well as the testing of the SEEA Experimental Ecosystem Accounts will require engagement across disciplines and organisations.

The research agenda presented in this paper provides a general overview of the main issues to be addressed. The issues have been organized according to broad research areas. These areas reflect the general nature of the focus of the intended work but all issues are closely interconnected and need to be addressed in a coordinated fashion. Following consultation among the ecological, economics, policy and statistics communities, the proposed research agenda will be implemented through a programme of work, with priorities, timelines and deliverables, and governance arrangements, taking into account initiatives underway in countries and by international agencies.

An expert group on ecosystem accounting has been proposed to develop and steer the programme of work to be undertaken under the auspices of the Committee of Experts on Environmental-Economic Accounting (UNCEEA). The expert group would consist of experts from different disciplines considering the multidisciplinary nature of the issues to be addressed. The UNCEEA at its next meeting in June 2013 will

consider a proposal on the programme of work as well as the governance and process to address the issues on the research agenda.

B.   Areas of research

Three areas of research are proposed – each of these are explained below.

    a. Physical ecosystem accounting
    b. Monetary ecosystem accounting
    c. Communication and dissemination.

Physical ecosystem accounting

This area of research aims to advance understanding of the classifications, concepts and data sources required for the physical measurement of ecosystem services and ecosystem condition and the application of these measures into accounts in physical terms. Some of this work relates to the research agenda for the SEEA Central Framework, including for example topics such as land use and land cover classifications, accounting for soil resources and the measurement of depletion of biological resources. A combined approach to these topics would be desirable.

This area of research encompasses work on:

- Delineating spatial units following the broad conceptual model outlined in SEEA Experimental Ecosystem Accounting. This should initially focus on spatial units for terrestrial areas (including rivers, lakes and other inland waters) and extend to units for marine areas and the atmosphere.
- Developing the classification of spatial units, in particular Land Cover Ecosystem functional Units (LCEU).
- Identifying possible ways for compiling land and ecosystem accounts from available geospatial sources of information such as remote sensing data and other "big data" sources for ecosystem accounting.
- Investigating techniques for linking data related to ecosystem measurement to geo-referenced social and economic data. This multi-dimensional geo-referencing may be considered in the delineation of spatial units for ecosystems.
- Identifying the main ecosystem services and relevant indicators of service flow for each type of ecosystem (e.g. forests, agricultural land, etc) including understanding measurement of the supply, demand and distribution of ecosystem services and the associated benefits. This work should consider the appropriateness of the proposed classification of ecosystem services (CICES) and the general measurement boundaries discussed regarding ecosystem services in Chapter 3.
- Identifying the main ecosystem characteristics for the measurement of ecosystem condition and relevant indicators of condition for each type of ecosystem (e.g. forests, wetlands, etc). This work should consider the links to spatial units delineation.
- Considering the links between expected flows of ecosystem services and measures of ecosystem condition and extent, including assessment of relevant models and the connections to issues such as resilience and thresholds. This work should also advance understanding of ecosystem degradation in physical terms.
- Investigating different approaches to determining reference conditions for the assessment of ecosystem condition based on practical experience in countries.

- Developing specific topics of research on measures related to biodiversity and carbon in the context of ecosystem accounting.
- Examining aggregation methods for both ecosystem services and ecosystem condition indicators, to derive measures across and within ecosystems. In conjunction, methods of downscaling and upscaling information should be investigated.
- Examining the treatment of the so called ecosystem disservices in the ecosystem accounting such as pests and diseases.
- Considering to the assessment of data quality and the accreditation of data sources, particularly scientific and modeled data.

Monetary ecosystem accounting
This area of work focuses on the pricing and valuation of ecosystem services and ecosystem assets and the possible augmentation of the standard economic accounts of the SNA using these valuations. Valuation of water has been included in the research agenda of the SEEA Central Framework and would benefit from being discussed also in the context of ecosystem accounting.

This area of work encompasses work on:
- Clarifying the alternative ecosystem service pricing techniques and their relevance to determining (i) prices for ecosystem services connected to market goods and services; and (ii) prices for ecosystem services connected to non-market goods and services. The choice of underlying assumptions for ecosystem accounting purposes (covering both economic and social approaches to valuation), and the general feasibility for implementation (including any requirements for information in physical terms) should be identified.
- Applying information from emerging environmental markets, including Payments for Ecosystem Services (PES) to the valuation of ecosystem services and ecosystem assets.
- Identifying ecosystem related transactions and expenditures within the standard economic accounts and aligning these transactions with measurement of ecosystems in physical terms.
- Determining methods for the valuation of ecosystem assets, ecosystem degradation as well as possible derivation of degradation-adjusted macro-economic aggregates.
- Developing the sequence of accounts by institutional sector that incorporate flows relating to ecosystem services and ecosystem assets. This work should distinguish between flows already within scope of the standard economic accounts and extensions to standard measurement boundaries. Also, the work should consider options for the attribution of ecosystem degradation to institutional sector and industry.
- Investigating extended national balance sheets including consideration of overlaps between the valuation of individual environmental assets (especially land) and ecosystem assets. Links should be drawn to alternative measures of wealth. Links should also be considered to the recording of entries in the capital account and connections between flows related to ecosystem enhancement and land improvement.

Communication and dissemination
This area of work focuses on communicating the results of ecosystem accounting. This work should encompass:

- Developing combined presentations that show ecosystem accounting information against data from the SEEA Central Framework, the SNA and other sources.
- Proposing ecosystem accounting tables, dashboards, headline and composite indicators, maps and other communication tools.
- Illustrating the range of uses of ecosystem accounting information including, but not limited to the analysis of trade-offs – for example between alternative land uses.