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### **The process of drafting SEEA Experimental Ecosystem Accounting**

Prepared by the Bureau of the Committee of Experts on  
Environmental-Economic Accounting

## **The process of drafting the SEEA Experimental Ecosystem Accounting**

### **A. Background**

1. The SEEA Experimental Ecosystem Accounting was drafted as part of the revision of the System of Environmental-Economic Accounting (SEEA) undertaken under the control and management of the United Nations Committee of Experts of Environmental-Economic Accounting (UNCEEAA). The revision of the SEEA consisted of the drafting of three parts previously referred to as volumes: part 1, the SEEA Central Framework was adopted as initial international statistical standard by the United Nations Statistical Commission at its 43<sup>rd</sup> session in February 2012, part 2 consisting of those topics for which consensus could not be reached but which are highly policy-relevant, and part 3 consisting of applications and extensions. During the drafting of the SEEA Central Framework it became evident that the topics for which consensus could not be reached were mostly related to ecosystem accounting, except for a few which were included in the research agenda of the SEEA Central Framework. Because of the above consideration, it was decided to make Part 2 a cohesive document addressing ecosystem accounting.

2. The SEEA Experimental Ecosystem Accounting provides a complementary perspective to the accounting approaches described in the SEEA Central Framework by providing an approach to the assessment of the environment through the measurement of ecosystems and the flows of services from ecosystems to economic and other human activity. While it will not be an international statistical standard, it marks the beginning of a more integrated and multi-disciplinary research programme in this area.

3. The drafting of SEEA Experimental Ecosystem Accounting has been undertaken under the control and management of the UNCEEAA as part of the SEEA revision process, as mandated by the UN Statistical Commission. It has followed an agreed project management framework and will be submitted to the 44<sup>th</sup> session of the UN Statistical Commission in February 2013 for its consideration.

### **B. SEEA Experimental Ecosystem Accounting process of drafting**

4. Work on the SEEA Experimental Ecosystem Accounting started when the UNCEEAA, at its fifth meeting in June 2010, requested the UN Statistics Division (UNSD), the World Bank and the European Environment Agency (EEA) to develop a broad outline and road map for a volume on ecosystem accounting in the SEEA. The road map and general concept for experimental ecosystem accounts received broad support from the Committee at its sixth meeting in June 2011.

5. Three expert meetings have taken place in the course of 2011. The first meeting was held in March 2011 hosted by the World Bank in Washington D.C. which focused on current practices in the measurement of physical and monetary ecosystems stocks and flows in conjunction with launch the Global Partnership for Wealth Accounting and the Valuation of Ecosystem Services (WAVES). The second meeting was hosted by

European Environmental Agency in Copenhagen in May 2011. This meeting showed an emerging consensus on the conceptual framework for ecosystem accounts, provided input in the formulation of a list of issues for SEEA Experimental Ecosystem Accounting and the articulation of the roadmap for its development within the context of the revision process of the SEEA. The third meeting was hosted by the Office for National Statistics and the Department for Environment, Food and Rural Affairs of the United Kingdom in London in December 2011, which made further progress in the resolution of issues formulated for the drafting of SEEA Experimental Ecosystem Accounting.

6. In 2012, a fourth expert meeting took place from 16 to 18 May in Melbourne, Australia hosted by the Australian Bureau of Statistics, the Bureau of Meteorology and the Department of Sustainability and Environment of Victoria. The discussions during the meeting provide input in the drafting of the SEEA Experimental Ecosystem Accounting.

7. At its seventh meeting in June 2012 in Rio de Janeiro, Brazil, the UNCEEA stressed the importance of bringing together the different relevant communities given the multi-disciplinary nature of ecosystem accounts and the supporting data.

8. The drafting of the SEEA Experimental Ecosystem Accounting was undertaken by the SEEA Editor, Carl Obst, with the assistance of the Editorial Board and technical inputs from members of the expert group. It was reviewed by experts in different communities, including the London Group on Environmental Accounting at its 18<sup>th</sup> meeting in October 2012. In November 2012, the draft was submitted to broad consultation to national statistical offices, members of UNCEEA and the London Group on Environmental Accounting, selected experts in the scientific and economics communities as well as participants in the expert meetings mentioned above.

9. An international seminar entitled “Towards linking ecosystems and ecosystem services to economic and human activity” was held in New York from 27 to 29 November 2012. The seminar was jointly organized by UNSD, the United Nations Development Programme (UNDP), the United Nations Environmental Programme (UNEP), the World Bank and EEA. Over 60 participants from national statistical offices, government agencies (e.g. ministries of environment, finance, etc.) and experts from the scientific and economics communities attended the seminar.

10. Participants in the seminar recognized that the SEEA Experimental Ecosystem Accounting is a major step forward in the development of a conceptual framework for measuring ecosystems in support of policy formulation, while acknowledging that the work is still experimental in nature and that a number of issues on data and methods remain to be resolved and further developed. It was recommended that an international research and testing agenda be developed to give guidance to countries ready to undertake experimental work in the area. The role of the UNCEEA as the central governing body responsible for managing work on ecosystem accounting at the international level was reaffirmed. It was proposed that a standing expert group on ecosystem accounting be established under the auspices of the Committee to address issues in the research agenda accompanying the SEEA Experimental Ecosystem

Accounting. The expert group, to consist of experts from scientific, economic, policy and statistical communities, will complement the work of the London Group on Environmental Accounting, which will be kept abreast of developments.

11. The proposed research and testing agenda will be presented as a background document to the Statistics Commission at its forty-fourth session in February 2013. A proposed programme of work, to be elaborated in consultation with the expert group taking into account early initiatives in countries and international initiatives, will be submitted for consideration by the Committee of Experts at its next meeting in June 2013 and reported to the Statistical Commission at its forty-fifth session in February 2014.

### **C. Governance of the drafting of the SEEA Experimental Ecosystem Accounting**

12. The drafting of the SEEA Experimental Ecosystem Accounting was undertaken under the management and control of the UNCEEA, which received the mandate to revise the SEEA in February 2005 from the United Nations Statistical Commission. The Bureau of the UNCEEA reviewed progress made and managed the process. The United Nations Statistics Division provided Secretariat services to the process.

13. The SEEA Editor, Carl Obst drafted the SEEA Experimental Ecosystem Accounting on the basis of the technical papers prepared by the expert group, reviewed and analyzed all the comments received, and chaired the numerous meetings of the Editorial Board.

14. An Editorial Board<sup>1</sup> for the SEEA Experimental Ecosystem Accounting was established by the Bureau of the UNCEEA to assist the editor in reviewing and commenting on various versions of the draft chapters and take decision on how to address controversial issues.

15. The SEEA Experimental Ecosystem Accounting have been submitted for a 9 weeks consultation to national statistical offices and experts with interest in the topic starting 13 November 2012 and ending 15 January 2013. As of 6 February, a total of 55 comments were received during the broad consultation process on the complete draft text, of which 44 from national statistical offices or ministries of environment, 5 from international organizations and 6 from research institutes or NGOs. A summary of the outcome of the consultation and recommendations on how to address the issue in the final draft is presented in the Annex to this paper.

16. To ensure transparency of the drafting and approval process a website “Towards the revision of the SEEA” was established by the Secretariat. The website includes all

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<sup>1</sup> Carl Obst (SEEA Editor, Chair), Michael Vardon (Australian Bureau of Statistics), Warwick McDonald (Bureau of Meteorology, Australia), Michael Bordt (previously with Statistics Canada), Bram Edens (Central Bureau of Statistics, Netherlands), Per Arild Garnåsjordet (Statistics Norway), Lars Hein (Wageningen University, Netherlands), Jawed Khan (Office for National Statistics, United Kingdom of Great Britain and Northern Ireland), Jock Martin and Jean-Louis Weber (European Environmental Agency), Anton Steurer (Eurostat) and Glenn-Marie Lange (World Bank).

issue papers and outcome papers submitted for broad consultation, the recommendations prepared by the editor and the editorial board, and the revised consultation draft submitted to the UN Statistical Commission. All comments, received during all stages of broad consultation, which ranged from helpful editorial suggestions to detailed technical input, are available on the SEEA Revision website ([unstats.un.org/unsd/envaccounting/seearev/](http://unstats.un.org/unsd/envaccounting/seearev/)).

## **Annex: Summary of the outcomes to the broad consultation on the SEEA Experimental Ecosystem Accounting and suggested way to address comments**

### **Responses to substantive technical comments**

The comments received through the broad consultation process were generally favourable and supportive of SEEA Experimental Ecosystem Accounting. On the whole, the feedback supported the general content, focus, balance and style of the draft text, noting that further research and testing will be required before definitive recommendations and broad implementation can be considered.

The feedback comprised comments of both a general and a specific technical nature. Some issues were raised by just one country or agency, while for other issues several respondents provided similar or related feedback. The Editorial Board reviewed all of the comments and, on the whole, most comments were able to be integrated in the redrafted document. This reflected a consistency of feedback on a number of general issues and also that the technical comments were generally requests or suggestions for clarification of concepts.

The comments reflected varying levels of understanding of the relevant measurement issues but this was to be expected given the experimental nature of the work in this area. As far as possible, the re-drafted document has explained better those issues about which there was a lack of comprehension. At the same time, it should be recognised that this is an area of measurement that requires some time to absorb and a full understanding should not be expected on a single reading. Further, since not all issues have been resolved it was sometimes not possible to provide clear answers to the questions and comments provided in the feedback.

Noting the experimental nature of the work in this area, several comments highlighted the considerable measurement challenges that are likely to be faced in progressing ecosystem accounting at national and sub-national levels. The tone of these comments pointed to the need for a degree of caution to be placed around the ambitions for ecosystem accounting. This message was recognised and efforts have been made to ensure that expectations reflect the challenges involved. This included recognition of the possible resource costs and the need to consider step-wise testing and development rather than a focus on implementing a complete system from the start.

This annex focuses on those comments of a significant nature either in relation to the general messages to be conveyed from the document or in relation to comments on specific concepts, definitions and treatments in the draft. A number of other comments were editorial and typographical in nature and, as appropriate, these comments were adopted in the revised draft to the UNSC. Editorial comments are not discussed further in this annex.

1. Context for SEEA Experimental Ecosystem Accounting. Many responses pointed to a desire for a clearer explanation of the scope, purpose and context of SEEA Experimental Ecosystem Accounting in relation to other work including but not limited to, the SNA,

the SEEA Central Framework, environmental statistics (including FDES), and the general area of ecosystem assessment/analysis (e.g. Millennium Ecosystem Assessment, The Economics of Ecosystems and Biodiversity, UNEP Inclusive Wealth Report).

The text, primarily in Chapter 1, has been re-drafted to provide a clearer scope, purpose and context for both ecosystem accounting and the role of SEEA Experimental Ecosystem Accounting. In particular, the text considers the link between ecosystem accounting in physical and monetary terms and highlights the role of SEEA Experimental Ecosystem Accounting in providing a basis for ongoing research and testing.

2. Issues in valuation of ecosystem services and ecosystem assets. There were many pieces of feedback on valuation related issues. This was to be expected as it remains the most contentious area in ecosystem accounting. In some cases the respondents indicated that the draft had presented too negative a view on the potential for valuation, while others felt the presentation was too positive. A number of responses indicated that the balance of text was about right in terms of presenting the various options and their potential for use in the context of standard economic accounts.

Given this range of feedback the revised draft has retained the generally cautious tone regarding valuation. However, additional text has been incorporated to make clearer the link between the choice of valuation concept and the purpose of analysis. In particular, it has been highlighted that where valuations of ecosystem services and assets are to be compared or integrated with valuations from standard economic accounts then exchange values should be used.

Consideration of comments on specific valuation approaches and on the relationship between exchange values (used in the SNA) and welfare economic values, has led to a slight re-working of the explanation of the technical valuation issues presented in Chapter 5.

3. Links between ecosystems and biodiversity. A number of comments pointed to a lack of clarity in the description of the relationship between ecosystems and biodiversity with the general feedback being that better explanation was required. In response, the re-drafted text introduces biodiversity and its relationship with ecosystems early in Chapter 2 (rather than later in Chapter 4) and explains that the general focus in ecosystem accounting is on biodiversity as it relates to species. In Chapter 4, Section 4.5 on accounting for biodiversity builds on this earlier text and provides a clearer explanation of the rationale for the discussion of accounting for biodiversity in the context of ecosystem accounting. Some specific technical comments on the description and measurement of biodiversity have also been taken on board.

4. Linking ecosystem services to beneficiaries. A number of responses indicated a preference for more explicit recognition of the link between flows of ecosystem services and the beneficiaries of those services. This is an important point that has been given greater recognition in the re-drafted text, although the measurement challenges in making the relevant connections have also been noted.

5. Non-linear relationship between ecosystem assets and ecosystem services. A number of responses observed that more could be said about the complex and non-linear nature of the relationship between ecosystem assets and the services they provide and also that the implications of the non-linear nature of the relationship should be discussed. This was useful and appropriate feedback and was incorporated in various sections of the draft, including noting the connections to concepts of resilience, thresholds and irreversibilities in ecosystems. It is noted that no specific assumption has been made about the relationship between ecosystem assets and ecosystem services which remains an ongoing focus in ecological research.

6. Ecosystem services embedded in SNA transactions. It was observed that, in the discussion of ecosystem services in both physical and monetary terms, a more explicit articulation of the links between those services and the SNA production boundary was required. In particular, it was noted that for many ecosystem services the transactions recorded in the SNA may well implicitly contain values pertaining to ecosystem services including transactions related to houses and land (and associated rentals). At the same time, the difficulty of determining the ecosystem services component from values recorded in the SNA must be recognised. Given the importance of the links between the SEEA and the SNA it is important that these connections are explained and additional text has been incorporated in various sections.

7. Clarification of the units model. In general, the basic units model described in Chapter 2 was supported. However, it was suggested that the explanation and use of the model may be improved. Various suggestions for improvement have been taken on board with particular changes relating to being more flexible in how the model might be implemented, and distinguishing the concept of units for ecosystem accounting purposes more clearly from other uses of the term “units” in official statistics.

8. The concept of ecosystem assets. There were various pieces of feedback concerning ecosystem assets, largely focusing on the need for improved explanation of the links between ecosystem assets, environmental assets and individual environmental assets; and on the links to the SNA asset boundary. Additional text has been incorporated to explain these connections.

9. Rationale for section on carbon accounting. A few responses requested a clearer rationale for the section on carbon accounting in Chapter 4. A clearer rationale has been incorporated which highlights that accounting for carbon can provide an important indicator of ecosystem condition as well as providing information for the measurement of some ecosystem services and for consideration of a range of other policy issues. A proposal to include accounting for carbon in SEEA Applications and Extensions was not pursued.



10. Ecosystem disservices. Some responses indicated that more was needed to explain or rationalise the treatment/exclusion of so-called ecosystem disservices within the accounting model. At this stage there is no clear agreement on how this can be achieved and hence the issue has been included within the proposed research agenda.

11. Data quality and accreditation. Additional material has been incorporated in Chapter 2 on data quality and the accreditation of scientific and other data, particularly targeting those readers who do not have a strong appreciation of the way in which data quality is considered in official statistics.

12. Common International Classification of Ecosystem Services (CICES). The development of CICES has been an ongoing process over a number of years, and over the past 12 months in parallel with the drafting of SEEA Experimental Ecosystem Accounting. One response to the consultation was from the consultants who have been engaged to develop CICES over that time. They had completed a review of CICES in parallel with the recent consultation on SEEA Experimental Accounting and, based on that review, they proposed recommendations on the conceptual basis for CICES and a reworked version of the classification.

It is considered that the discussion of measurement boundaries related to ecosystem services in SEEA Experimental Ecosystem Accounting is in line with the recommendations from the review of CICES. At the same time, there is a general sense that the classification itself requires further testing and hence, on balance, the Editorial Board is of the view that the version of CICES presented in the Consultation Draft should be retained as an interim, provisional version rather than updated to reflect the more recent proposal from the reviewers. In part, this is due to some distinct differences between the two CICES versions that will take some additional time to review and discuss. This discussion is best handled through the proposed research agenda for SEEA Experimental Ecosystem Accounting. At the same time, to facilitate ongoing research and development in this area appropriate references will be made to the recent CICES review and the updated proposal for CICES.

13. Ecosystem degradation. Some feedback was obtained on the terminology and description of ecosystem degradation. In response, it is proposed to retain the basic logic and terminology from the Consultation draft, and to add in some text explaining the relationship between ecosystem degradation and depletion as defined in the SEEA Central Framework.

14. Explanation of tables. Feedback indicated that a number of tables could be more effectively described. In the re-drafted text this has focused on improved explanations of tables 2.3, 4.1 and 6.1.

15. Examples. It was noted that the discussion of the concepts would benefit from more examples, especially examples of the link between ecosystem services and ecosystem assets. Although some additional smaller examples have been included in the updated draft it has not been possible to incorporate more integrated examples. However, reference will be made to the on-line knowledge base managed by UNSD containing examples of ecosystem accounting as well as to other sources of relevant case studies.

16. References and Glossary. It is recognised that the Consultation Draft did not provide a list of references or significant recognition of supporting documents. It is intended to include a structured list of references to recognise the research that underlies the synthesis in the document, to support the content of the text itself and to facilitate the work of those wishing to test and compile ecosystem accounts. A Glossary will also be drafted to support understanding of the terms used in the document.