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Advancing the System of Environmental-Economic Accounting (SEEA) Experimental Ecosystem Accounting: Expert Forum Minutes

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(for information)

Forum of Experts in SEEA Experimental Ecosystem Accounting[1]

28-30 April, 2015

United Nations, New York

Outcomes and Summary of Discussions

[1] The full agenda, concept note, presentations for each of the sessions as well as related background documents are available at: http://unstats.un.org/unsd/envaccounting/workshops/eea_forum_2015/lod.asp

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Disclaimer: The views and opinions expressed in this report are those of the author and do not necessarily reflect the official policy or position of the United Nations or the Government of Norway.

1. Introduction

1. This report has been prepared as part of a project on Advancing Natural Capital Accounting[2] through testing of the System of Environmental-Economic Accounting (SEEA) Experimental Ecosystem Accounting. The objective of the report is to provide a summary of the Second Forum of Experts in SEEA Experimental Ecosystem Accounting, held at the United Nations in New York from 28-30 April 2015.

2. Agenda

Session 1: Opening
Session 2: Ecosystem accounting units – discussion of approaches and methods
Session 3: Ecosystem service classification and links to ecosystem function and conditions
Session 4: Measurement and modelling of ecosystem conditions, functions and services
Session 5: Structure of ecosystem accounts – compilation of accounting outputs and tables
Session 6: Summary of working group session – Recommendation and way forward for the testing of SEEA Experimental Ecosystem Accounting
Session 7: Strategy and roadmap
Session 8: Closing

Sessions 2, 3, 4 and 5 were each structured as 30-minute presentations, followed by a round of questions and comments. The presenters suggested six discussion topics for breakout groups. Each breakout group discussed an assigned topic and reported back in plenary. This was followed by an additional round of questions and comments. The notes reflect this structure. For Session 6, each presenter summarized the key points from the discussion on the topic. Each presentation was followed by an additional round of questions and comments.

[2] See http://unstats.un.org/unsd/envaccounting/eea_project/default.asp.

3. Session 1: Opening

2. **Stefan Schweinfest**, Director of the United Nations Statistics Division (UNSD), opened the meeting with a review of role of the UN Statistics Commission and the development of the integrated statistical framework including the System of National Accounts, SEEA Central Framework and Experimental Ecosystem Accounting in measuring and monitoring sustainable development. He emphasized the important role of integrated statistics in supporting the policy debate regarding the SDGs.

3. He noted that the SEEA is linked to all three major statistical initiatives: to inform the SDGs, to support the initiative on Global Geospatial Information Management (GGIM) and providing integrated information for policy. The challenge is to position the SEEA, as a statistical measurement framework to describe the metadata of the indicators for the SDGs and to be part of the SDG implementation programme, for which the Interagency and Expert Group (IAEG) on SDG is responsible. This will require global and national consultative process for identifying those SDG indicators before the end of 2015 that can be informed by the SEEA.

4. The four main opportunities for integrated statistical programme include:

    - The SEEA is an opportunity to broaden the traditional stakeholder base of National Statistical Offices,
    - The Data Revolution will require innovative approaches to providing evidence for decision making,
    - Big Data will open new opportunities for statistical offices, and
    - The GGIM will revolutionize geospatial data management.

5. He urged the participants to move the work forward by supporting national pilot accounts, by considering means of scaling up the implementation of the SEEA to address the needs of all 193 countries to improve their national statistical systems, and to inform national policy debates with respect to the SDGs.

6. **Alessandra Alfieri**, Chief of the Environmental-Economic Accounts Section of UNSD, followed with an overview of the SEEA and the need for integrated information systems. While several international initiatives, such as the World Bank WAVES (Wealth Accounting and the Valuation of Ecosystem Services), the OECD Green Growth Strategy, The European Union Beyond GDP, and the Convention for Biodiversity (CBD) Aichi Target 2 address different policy targets, the System of National Accounts (SNA) and the SEEA (Central Framework and EEA) have been accepted as the underlying statistical measurement frameworks.

7. With the recognition of the SEEA as measurement framework , the statistical architecture of the national statistical system can address the existing thematic information silos, which have existed between international and national institutions and within national statistical offices (NSOs). That is, in the past, each policy initiative tended to develop its own measurement framework, information sources and statistical production processes. NSOs have historically been organized to support these silos, each with its own statistical infrastructure (IT systems, dissemination mechanisms, analytical techniques, processing systems, surveys and administrative data sources, registers and frames, and metadata and standards). With the adoption of a system's approach as measurement framework, the modernization of statistical systems will promote a

transformative process in institutional arrangements and statistical production process that will introduce the centralization of common functional services within the NSO as well as across the national statistical system (NSS) related to statistical methods, data collection, IT related services and the organisation of geospatial information in integrated national maps.

8. As integrated measurement frameworks, the SNA and SEEA will ensure that future indicators are of higher quality, have international comparability and incorporate a comprehensive basis for aggregation and disaggregation. As statistical standards, they ensure that definitions and concepts are aligned, support the comparison and combination of statistics from different sectors, and serve as the basis of coherent and comprehensive datasets.

9. Around 70 countries have implemented or have planned to implement one or more SEEA Central Framework account. Several countries, such as Canada, Australia and the Netherlands have conducted work in testing the SEEA-EEA. As well, seven countries (Bhutan, Chile, Indonesia, Mauritius, Mexico, South Africa and Vietnam) are developing plans for piloting the SEEA-EEA as part of the Advancing SEEA Experimental Ecosystem Accounting project. There have been recent advances in creating common institutional mechanisms for implementing the SEEA Central Framework in conjunction with the SEEA Experimental Ecosystem Accounting in Chile and Indonesia.

4. Session 2: Ecosystem accounting units – discussion of approaches and methods

10. **Kristine Grimsrud**, Statistics Norway, opened the session with an overview of the topic, and introduction of the speakers. She suggested the breakout groups review the issues, criteria and options for testing by ecosystem account type: Land/Asset, Water, Carbon, Biodiversity, Condition & Capacity, and Services.

11. **Michael Bordt**, ANCA project consultant, presented an overview of the need for coherent spatial units for ecosystem accounting, the SEEA-EEA model of spatial units, and issues for testing and further research. He suggested a set of criteria that could be applied in assessing the appropriateness of spatial units for ecosystem accounting. The current SEEA-EEA model of spatial units (Basic Spatial Units, Land Cover Functional Ecosystem Units, Ecosystem Accounting Units), satisfied several of the criteria, but not all. Spatial units based on land cover satisfied criteria for availability, hierarchy and scalability and mutual exclusivity and comprehensiveness. Further testing and research were recommended in areas of homogeneity, representativeness and time invariance.

12. **Roger Sayre**, USGS, agreed on the need for common units, selection criteria and that further work needed to be done in terms of other approaches, especially in terms of the treatment of scale and resolution. He presented an overview of the USGS/ESRI work on Global Ecological Land Units (ELUs), which used an ecophysiographic approach to delineating 3,923 global ELUs at a base resolution of 250m. This is based on overlaying global maps of bioclimate, landform, lithology and land cover. The approach contributes to a more objective definition and delineation of eco-regions (detailed into ecological units), that have been often drawn on expert knowledge previously. Work is ongoing to additionally define freshwater and marine units using "volumetric pixels" (i.e., 3-dimensional structures or *voxels* and polygons). The global ELU maps were proposed as an option for testing in countries that have not yet established detailed ecological classifications and may be particularly appropriate for countries with large territories. The results are available as an ESRI white paper and through ARC/GIS Online[3].

13. **Gregory Scott**, Inter-Regional Advisor on Global Geospatial Information Management, UNSD, also endorsed the approach to common spatial units and the need for globally available, reliable and frequent geospatial data. He noted that geospatial data are fundamental to the SDG process at the global and local levels. Land cover, for example, is linked to at least five of the SDGs. He suggested that global data need not be spatially coarse or out of date. However, mapping agencies are often disconnected from the needs of science and policy. The challenge is to link spatial data over space and time and to better understand the uncertainty of spatial interpretation to better address the needs of modelling and analysis.

14. **François Soulard**, Statistics Canada, noted that the Canadian Measuring Ecosystem Goods and Services (MEGS) project used spatial units, based on land cover, soil, hydrology, the Canadian Ecological Classification and elevation to develop national Extent Accounts. Methodologies for assessing ecosystem conditions and flows of services are still under development, but progress is being made. He noted that at 250m

[3] See http://www.arcgis.com/home/item.html?id=e55c8b1919854715a0d0ca5762c4dec9.

resolution, there was a lack of comparability with local conditions. For example, identifying peatlands required alternative, higher-resolution sources. He emphasized the need to understand sources of uncertainty, especially in official statistics. There was a 15-25% error rate in identifying agricultural land from satellite data. When assessing changes over time, the opportunities for misinterpretation are multiplied. To remedy this, he suggested reducing the number of categories in the land classification to the minimal amount require to address specific policy needs. For example, analysing urban sprawl requires only three classes (built-up, agricultural and other). There is also a need to address the confidentiality of spatial data, since at lower resolutions, individual properties may be identifiable. This would constitute a problem if data were derived from administrative sources.

15. Questions and comments from the participants included:

    - What are the opportunities to develop predictive analysis?
    - Maintaining spatial data at appropriate scales will require intergovernmental cooperation on a common spatial framework.
    - There is a need to view options for spatial units in terms of what they convey to decision makers.
    - There are alternative approaches to delineating spatial units, including river and marine units that are appropriate for immediate testing.
    - Land Cover is a useful proxy to biophysical setting. The USGS/ESRI ELUs could be used for comparing the physical potential (bioclimate, landform and lithology) with the biotic outcomes (such as land cover and species diversity). The ELUs will not be updated annually, but could be revised over 5-year periods. Also, there is a need for developing a logical framework for reducing the number of categories for reporting purposes.
    - There is a need to better understand what gets lost in aggregating thematic spatial classes. For example, global land cover (GLC) data available from China is at a resolution of 30m, but only 10 classes.
    - There is a cost to users of assessing new spatial data for quality and coherence with existing data.

16. Breakout groups reported on the results of discussion on the implications for spatial units with respect to specific accounts:

    - **Land/Asset Account**: There is a need to improve the measurement of error in spatial data. There is a need to look to other sources of data to ground truth satellite data. This could improve "back casting" land cover into the past, based on more accurate current information.
    - **Water Account**: Units used depend on the policy requirements. For example, a spatial framework should consider cross-border flows. River basins should be considered primary reporting units. The atmosphere should be included in delineating spatial units.
    - **Carbon Account**: Carbon accounting requires more detailed land cover and land use classes than are available from most sources. There is a need to distinguish natural from recently modified land cover types, since carbon sequestration rates and emissions differ significantly between the two. There should be a linkage with IPCC classes. Albedo (reflectivity) should be considered in carbon-based

climate assessments. For example, planting trees in snow-covered areas could result in higher global warming potential. Use of topographic maps to assess the historical information was also suggested.

- **Biodiversity Account**: Biodiversity is more related to the condition of an area than its land cover. There is a need for an indicator of resilience. This should be investigated with respect to the criteria for spatial units. For example, at what spatial level should resilience be measured?
- **Condition Account**: The spatial model should be able to capture the continuum of conditions that link to specific services. What are the spatial frameworks used in models that link ecosystem condition with services generation? There is also a need to capture seasonality, since some conditions are evident only in certain seasons.
- **Services Account**: There is a need to use different spatial units for different services and to investigate approaches to linking these together. There is a need to better understand interactions between ecosystems, especially ecotones, with respect to their ability to generate services.

17. Additional questions and comments from the participants included:

- To avoid differences in interpretation inherent in combining spatial data, there is a need to agree on a common shared layer of spatial units and data including land cover, land use and ownership.
- What scale is required if reporting for ecosystem accounting is to be at the macro level? Understanding marginal values (the cost/benefit of converting one additional unit, or "shadow price") requires spatial detail that can be aggregated to inform macro-economic policy.
- How can the spatial framework support making ecosystem data more representative of connectivity and diversity?
- The representativeness of land cover information for ecosystem unit should also be elaborated.

5. Session 3: Ecosystem service classification and links to ecosystem functions and conditions

18. **Pushpam Kumar**, UNEP, opened the session with a note that this Forum is an opportunity to bring together an important community of practice to develop good practices and engage in peer-to-peer learning. He noted the need to link classifications with policy uses and to link them among international and national initiatives.

19. **Mark Eigenraam**, UNSD, presented an overview of issues in defining and classifying ecosystem assets. The objectives of the background paper (A Functional Approach to Environmental-Economic Accounting for units and ecosystem services) were to clarify the definition of ecosystem services, and to link services to ecosystem assets. The paper also suggested investigating the need for SEEA to go beyond the limits of "final" services and to better incorporate supporting and intermediate services. He proposed the delineation of spatial units in terms of a Functional Ecosystem Units (FEU), which is based upon the association of biotic (producers, consumers and decomposers) and abiotic components of ecosystems. This would incorporate ecological principles of ecosystem function, structure and composition into the spatial structure proposed in the SEEA, rather than basing it on land cover alone. The paper also proposed an alternative classification of ecosystem services that would incorporate both final and intermediate ecosystem services and link these to specific FEU types. He suggested that the concept of FEU and a more inclusive classification of services would support a variety of causal models linking ecosystem assets, condition and services.

20. **Jan-Erik Petersen**, European Environment Agency, emphasized the need to simplify the approach to linking natural capital with well-being, due to data limitations. He suggested keeping ecosystem accounting simple and modular following the cascade model. He suggested that rather than aggregating across disparate indices, to take the worst index component (the Liebig Law that growth is controlled by the limiting resource not by the total resources available). He noted that the European Environment Agency is planning a new CICES consultation that would benefit from the input of the experts present.

21. **Dixon Landers,** US EPA, described the FEGS-CS (Final Ecosystem Goods and Services Classification System), which links final ecosystem services with beneficiaries. He noted that there are two sets of production functions of interest: (a) ecological production functions that link ecosystem characteristics to their capacity to produce services and (b) economic production functions that link ecosystem services to benefits. FEGS-CS is intended to address ecological production functions and therefore focusses on the supply of final services. In FEGS-CS, for example, crops are not considered final ecosystem services because of the predominant human input required for their production. FEGS also considers biodiversity and carbon sequestration as intermediate services, since they are not directly consumed or enjoyed by beneficiaries.

22. **Charles Rhodes**, ORISE Post-doctoral Fellow, presented the NESCS (National Ecosystem Services Classification System), which further links FEGS-CS to uses and users. Using a four-part structure, the NESCS links environmental components with the end products of nature (supply, i.e., FEGS-CS), direct use/non-use and the direct user (demand). The supply side therefore links to FEGS-CS and the demand side links to the industry classification of the user. He noted the NESCS is an identification tool and that

metrics of ecosystem condition are required to better understand the capacity for each ecosystem type to produce services.

23. **Lucy Wilson**, UNEP-WCMC, presented the work of the Biodiversity Indicators Partnership, which is building on the CICES and UK National Ecosystem Assessment in developing indicators for biodiversity assessment. She noted the need for both global and national perspectives on these indicators since, for example, a given species may be threatened globally, it may not be scarce within a given country. She also noted the need for additional work on developing indicators with respect to Aichi Targets 14 (restoring and safeguarding ecosystem services related to water, health, livelihoods and well-being) and 15 (enhancing resilience and the contribution of biodiversity to carbon stocks).

24. **Mandy Driver**, SANBI, noted that that the FEU is closer in principle to the ideal spatial unit than land cover, but that this need not necessarily be based on phytosociological data. South Africa has already defined terrestrial ecosystems, based on vegetation maps, geology, soil, rainfall, temperature and altitude, at a resolution of 90m. South Africa has also defined marine habitat types, which differentiates between pelagic and benthic habitats. This top-down approach is combined with field studies to capture both the structure and function of ecosystems. The ecosystems, as defined, can be linked to the generation of ecosystem services such as grazing capacity, sediment retention and carbon sequestration. Wetlands are classified into geomorphic types, which relates to their ability to control floods and remove toxins. River ecosystems have been classified by condition class (Classes A-F, representing pristine, good, fair, poor), wherein a poor condition means the ecosystem provides limited services. She noted that an increase in provisioning services (such as crops) often leads to a decrease in overall condition. However, increases in regulating services are associated with increases in condition as this shows that ecosystems are more functionally intact. She further suggested that perhaps land cover information could be overlaid on the ecological classification to capture how these ecosystem types have changed over time. Changes land cover could be interpreted as changes in their condition.

25. Questions and comments from the participants included:

    - There is a need to untangle the confusion between intermediate and final services. Ecological and economic production functions require local data, which is scarce for most ecosystem services.
    - There is a need to return to the concept of the services cascade and to trace final services back to the functions that support them. Where are regulating services in FEGS-CS? They are not meant to be hidden, but should be addressed in the production function. When people appreciate as final products, they would be included as such.
    - This work needs to be better linked with the needs of SDG and Aichi indicators.
    - There is difficulty in linking spatial data with specific beneficiaries.
    - There seems to be no conceptual framework for defining ecosystem services. Ideally, we would capture all contributions of ecosystems to the economy and human activities. How do we know we have captured all of them? FEGS is seen as comprehensive with respect to final services services (about 550 have been identified). It is also flexible in that priority ecosystem types (such as caves) have been added. If any future services emerge, they can be included in FEGS as well.

- There is concern with the ability to provide data to delineate FEUs. At present the approach aims to demonstrate correctly working principles.

26. Breakout groups reported on the results of discussion on the implications for ecosystem services classification with respect to specific issues:

    - **Linking spatial units to ecosystem function**: The group suggested that spatial units should remain flexible to take into account their local conditions and extent, multiple functions and scales at which each function takes place (like foodweb and chain, nutrient cycle, energy flows and primary and secondary production), and the need to link these to appropriate decision contexts. All these variations need to be taken into account when delineating FEUs.
    - **Ecological production functions**: The production function describes changes in the delivery of an ecosystem service. The group suggested focusing on spatial units, changes in conditions of which could be linked to the generation of ecosystem services. Further, ecological production functions should not be aggregated, but developed for specific services. They also need to take into account lag and non-linear effects and be based on empirical data.
    - **Linking functions to services**: The group suggested that this should be seen in the context of the function, structure and composition of ecosystems. Function can be understood differently in ecology, economy and other disciplines. Therefore it may be more appropriate to base the classification on structural rather than functional traits.
    - **Ecosystem condition indicators**: The group suggested both top-down and bottom-up approaches would benefit the development of policy-relevant indicators.
    - **Separating land cover from ecosystem units**: The group suggested separating land cover from ecosystem function. The group discussed using ecosystem units to establish the spatial framework for ecosystem accounting, and to use land cover as a means to monitor changes in condition. More work is required to establish the role of land cover and its link to condition.
    - **Criteria for ecosystem services classification**: The group recommended including the ability to monitor degradation in ecosystem services. To avoid double-counting, they suggested a clear decision tree linking functions to services and specifying exact metrics.

27. **Pushpam Kumar**, UNEP, closed the session noting that there is a need to capture the current momentum in the community of practice and to focus quickly on what is doable and scientifically defensible. Given the current demand for solutions in this area, there is a risk that sectoral experts will define those solutions rather than adopt a systems approach to the interactions and inter-dependencies.

6. Session 4: Measurement and modelling of ecosystem conditions, functions and services

28. **Bridget Emmett**, UK Centre for Ecology and Hydrology, opened the session noting that modelling ecosystem services is possible at a national scale, given the experience in Wales with the LUCI model. One comprehensive model may offer the best "bang for the buck" in terms of short-term assessments.

29. **Wilbert van Rooij,** Plansup Consultancy, presented an overview of the issues in measuring and modelling of ecosystem condition, functions and services. In terms of measuring ecosystem condition, there is generally a lack of detailed data. However, modelling does not always require detailed data and available data is often sufficient. Measuring condition requires the establishment of a reference state to which condition measures are compared. The selection of the reference state, however will affect the interpretation of the condition. He suggested that NSOs assess their needs for ecological models in terms of their purpose, resolution, required data, technical capacity and budget. He suggested a matrix of criteria with which to assess "pre-packaged" models. Completing this matrix would help inform the process of model selection. He noted that the concept of ecosystem capacity was still being discussed. One proposed definition was "*The ability of the ecosystem to generate an ecosystem service under current ecosystem conditions and uses at the maximum level that does not lead to a decline in condition of the ecosystem.*" He proposed the concept of a driver account as a means to systematize socio-economic and environmental information that could explain changes in ecosystem extent, condition and capacity. He further emphasized the need for scenario analysis, both to support the assessment of future capacity and for modelling future services using models such as GLOBIO.

30. **Bethanna Jackson**, Victoria University of Wellington/Polyscape/LUCI, noted the need for modellers to adapt their models to the needs for ecosystem accounting. She noted that the LUCI (Land Utilisation and Capability Indicator) model views capacity at the landscape and site level and that this is one of the few models that can work at both scales. The model uses national and local data such as soil type, digital elevation and land cover. It has been ground trusted in New Zealand and the UK. It views capacity as service production capability, and ecosystem condition degradation in terms of the costs of restoration. She noted that ecosystem spatial units should focus on the origin of ecosystem services – for instance water filtration coming from up catchment areas. .

31. **Stefan van der Esch,** Netherlands PBL, presented an overview of current work in testing the GLOBIO model in the Netherlands and other countries, supported by the UNSD, OECD and CBD. He suggested that the current characterization of ecosystem condition in the SEEA provided an arbitrary categorization of ecosystem condition that was not readily measurable and could lead to double counting (of services linked to different condition measures). Since ecosystem condition is the most important aspect of linking ecosystems to their generation of services, this should be a priority for further refinement.

32. **Ferdinando Villa**, Basque Centre for Climate Change, described the potential of the ARIES modelling platform to assess the potential provision of services while maintaining a record of uncertainty. He suggested that the focus on spatial pixels did not conform to the needs for understanding the nature of "agents" involved in the provision

of services, which could be spatial areas, but also beneficiaries and "transactors", such as the atmosphere. ARIES includes models for each agent and their relationships.

33. **Bob McKane**, US EPA, presented an overview of Modelling Ecosystem Services and Trade-offs for Multi-Objective Decision-making using the VELMA (Visualizing Ecosystem Land. Management Assessments) ecohydrological model. The model has been applied to develop outcomes of alternative management scenarios on a forest case study. Although the case study looked at multiple ecosystem services, he noted the need to further investigate the assessment of sustainability, trade-offs and reliability. The model includes ecosystem processes at the plot scale, using the same equations for all ecosystem types. In terms of its applicability to SEEA, he suggested that 30m grids would be sufficient to support the model.

34. **Bridget Emmet** summarized the common themes for the presentations, suggesting that there is a pressing need to evaluate and test the models with respect to ecosystem accounting. She suggested that these tests be based on standard data that is available globally. In addition, she suggested the modellers be trained to better collaborate with economists and statisticians working on ecosystem accounting, and hence create a next generation of models suited for SEEA-EEA.

35. Questions and comments from the participants included:

    - The implications of much of the modelling seems to be that "natural" is better as embedded in the choice of reference condition, which may be understood of the use a target condition. There should be an understanding of the gradient from natural to intensive use and a social choice as to which is preferable.
    - Is it recommendable to use models able to assess multiple services or models targeting individual services?
    - A special issue of Ecosystem Services (Vol. 4, June 2013[4]) reviewed the robustness, transparency, accuracy and stakeholder relevance of current ecosystem services modelling and mapping approaches. An article in this issue, by Crossman, et al., presents a framework for recording the attributes for ecosystem mapping and modelling studies.
    - There is a need to assess models from a national accounting perspective. There is a need to measure the same variables over time, although the source data may change. What is the possibility of linking the outputs of different models over time?
    - Sometimes it is impossible to compare the results of different models over time. Modellers use "provenance analysis", that is, tracking data through all transformations, analyses and interpretations, to document what has changed. Also, users often do their own comparisons in terms of gap analysis. Divergence in data and models requires an assessment of whether changes are due to the data or the change in model.
    - If GLOBIO models pressures as a proxy for impacts on mean species abundance (MSA), this discounts the importance of ecosystem composition, structure and function. MSA was chosen as a simple indicator that could be presented to policy makers. It is not intended to reflect the complexity of ecosystems.

[4] http://www.sciencedirect.com/science/journal/22120416/4

- Reference states are not intended as targets. Perhaps they could be developed based on the "most natural" existing ecosystems.

36. Breakout groups reported on the results of discussion on the issues:

    - **Selection of models**: There is no individual model that can satisfy all the needs of ecosystem accounting. Criteria suggested for combining or developing models included:

        - a structure to solve specific problems for users,
        - a trade-off between complexity and ease of use,
        - the use of readily accessible data,
        - the ability to identify priorities for new data collection,
        - if models are combined, they should use the same data,
        - scientific credibility,
        - transparency (i.e., equations and assumptions should be documented),
        - connectivity (i.e., the ability to connect to more detailed models),
        - results should add up to a message that can be easily communicated,

      The group asked if it would be possible to compare results in different countries, whether a core set of data could be recommended and the current IPBES assessment of models could be linked to the SEEA mandate.
    - **Generic versus detailed (data and models)**: Modellers and users require specific outputs, which are linked to stakeholders and scale. When these outputs include the flows of ecosystem services, since different metrics are used, it becomes a challenge to compare them. There is a need to better understand the data available and to use common data across different modelling platforms. Scenario analysis requires more detailed models and data than simply accounting for flows of expected ecosystem services.
    - **Reference state and indicators**: There is a need for a common set of reference states, but these need to be specific to each component account. As with the discussion of classifying ecosystem services, carbon sequestration may increase when natural grasslands are replaced by intensive other land uses such perennial crops and forestry.
    - **Link between asset condition and capacity**: The concepts of condition and capacity are sometimes considered synonymous, when the concepts should be strictly distinguished. Capacity is the ability to generate future ecosystem services under current condition and use. However, there are conceptual difficulties in valuing these potential services, since they are not used. This could possibly be done constructing a baseline scenario (current basket of services, implications of status quo management on conditions and flows of services constrained by potential capacity). Alternative scenarios could be developed by users to investigate the implications of alternative management initiatives.
    - **Driver account**: There is a need for linking direct and indirect drivers of change to specific ecosystem accounts. These drivers should be considered the explanatory variables for in biological components and abiotic components, including changes in climate factors. These drivers should include the socio-economic and environmental factors that impact ecosystem conditions and their changes. The change of land use is such as driver, including changes in levels of exploitation. However, given the current structure of the accounts, it is difficult

to identify the precise role of such driver accounts. Perhaps drivers could be consolidated and classified in terms of their impact on land cover and condition of the structure and functions.

- **Scenario analysis**: Scenarios were seen as an analytical application of ecosystem accounting not integral to the accounting framework. Perhaps scenario analysis could be developed as an analytical application and extension to the SEEA and approaches could be recommended.

37. Additional questions and comments from the participants included:

- Policy questions should guide model development and selection.
- Would it be possible to use ecosystem accounts as inputs to ecosystem services modelling? The SEEA could help define a modular set of required modelling components.
- If the SEEA accounts are used to populate the models and subsequently the outputs are used to fill gaps in the SEEA accounts, this opens the possibility of circularity (i.e., making estimates based on other estimates). Modellers should be aware of whether their models are based on observed data or on estimates. The SNA uses 80-90% observed data and this is possibly a good practice for ecosystem accounting as well. However, the models also represent what should be measured and could provide insights into new data collection.
- A Tier structure of accounts may be recommendable, where most aggregate form of data (i.e., Tier 1) would be needed for international comparability.

7. Session 5: Structure of ecosystem accounts – compilation of accounting outputs and tables

38. **Joe de Beer**, Statistics South Africa, introduced the topic and the speakers, noting that it is not always evident in statistical development which comes first: the data or the policy.

39. **Carl Obst**, SEEA Editor, presented an overview of the current suggested structure of the SEEA accounts, noting that several are still under development. These include the Capacity Account, the Ecosystem Asset Account, the Augmented Input-Output Table and Integrated Sector Accounts and Balance Sheet. The latter two are required to integrate ecosystem accounting into the standard set of national accounts. He requested advice from the forum on the inclusion, naming, sequencing and prioritization of the recommended accounts. He suggested that testing could provide insights into: the appropriate scale for international comparisons, developing common practices for the Condition Account, and the need for the Component Accounts (Land, Water, Carbon and Biodiversity). He also suggested that further research is required to define ecosystem capacity and to link this to calculating the net present value of ecosystem assets. Further research questions include: (a) Defining, valuing and attributing degradation, (b) the treatment of expenditures on ecosystem enhancement and (c) linking the integrated accounts with the SNA.

40. **Anton Steurer**, Eurostat, noted that the SNA is used for administrative and policy purposes, such as the distribution of budget between member countries. For this reason, the SNA is consistent and protected from radical changes. NSOs develop satellite accounts for analytical purposes and these do not affect the core SNA, although the concept of degradation-adjusted aggregates could be incorporated in these satellite accounts. Accounts should be developed top-down, first defining the concept they are trying to measure and then by developing data to measure these concepts. He noted that the value of an asset is highly dependent on its condition and capacity to provide services. He suggested that the SEEA EEA distinguish between exchange and welfare values, and ensure that only exchange values were compared to real dollars as in the SNA. Welfare values, however, may still be useful for making local trade-offs. Further, many ecosystem service flows are already implicit in the SNA, such as the hedonic price of real estate. He suggested that other flows were not identified and not visible and the ecosystem accounting may help disentangle these. He raised the question as to whether or not the final aggregates produced in ecosystem accounting would be sufficiently precise to detect changes of 1-2%. Furthermore, resources and quality assurance are needed to ensure that the quality of these GDP-related aggregates is robust.

41. **Rocky Harris**, UK DEFRA, described the UK's approach to implementing ecosystem accounting by the year 2020. He noted that the approach was to work within the framework of existing definitions of broad habitats and selecting the key services they provide. Rather than the sequence implied in the SEEA-EEA Technical Guidance, the UK's approach is to identify extent, services, condition and value. He noted that indicators would be different for each habitat type and there will be no aggregation across habitat types to arrive at overall national figures. There may be comprehensive local accounts, for example, for protected areas. The ONS published report on freshwater

natural capital[5] in March 2015. He suggested a standard time-frame of 50 years would be used to calculate the net present value of assets.

42. **Kimberly Dale Zieschang**, formerly of the IMF, noted the importance of the SEEA-CF in supporting the sustainable management of natural resources of member countries for economic development. The SEEA-EEA provides additional interconnections that will help identify and manage economic risk across national boundaries. Some countries are more affected than others, such as small island states at risk of sea level change. The extension of the SNA to include considerations of natural resources and ecosystem services generation will expand the notion of production, capacity and national assets. The linkage between final ecosystem services and economic production is already evident and could be further developed as components of capital services. Currently, the contributions of ecosystems to economic production is embedded in operating surplus (profit). The EEA could be used to develop alternative scenarios and to help determine which are more sustainable than others. He noted the importance of bridging the language gap concerning "capacity" in this community of practice, since the concept of how over-deployment feeds back to reduce future production is essential to inform policy and market deployment. He suggested focusing testing on informing macro-economics and taking a broad view of welfare that includes the long-term integrity of ecosystems. He noted that monetary values are essential to managing in real-time and that imprecision was acceptable so long as uncertainty was appropriately communicated. He agreed with the concept of degradation as a reduction in the net present value of future flows of ecosystem services, but that this needs to be allocated, however imprecisely, to economic units. This would further inform market strategies with respect to natural resource contracts and payments for ecosystem services. He suggested that ecosystem enhancement be considered gross fixed capital formation (investment in capital) and that the recommended approach to integration with the SNA is exactly what is needed to better inform management decisions.

43. **Jean-Louis Weber**, formerly of the EEA, presented an overview of the SCBD Quick Start Package (QSP) for natural capital accounting. The QSP suggests integrating terrestrial areas with linear units for rivers to define a coherent spatial framework. By calculating an average per km^2, net landscape ecosystem potential (NLEP) and net river ecosystem potential (NREP) can be aggregated to total ecosystem infrastructure potential (TEIP). The package calculates the sustainable access to ecosystem services and, when this level is exceeded, there is a maintenance cost to the economy.

44. Breakout groups reported on the results of discussion on the issues:

    - **Structure and sequencing of the accounts**: Overall, the type of accounts described in the EEA Technical Guidance were considered appropriate. However, in taking the guidance forward, suggestions were made to ensure that the need for the full range of accounts was made clear, that initial designs of accounts were needed for discussion, that the inclusion of the capacity account be considered further and that the name and role of "component" accounts be re-considered. The discussion highlighted that the set of accounts might be

[5] http://www.ons.gov.uk/ons/rel/environmental/uk-natural-capital/freshwater-ecosystem-assets-and-services-accounts/art.html

compiled following various pathways, in particular concerning the connection between the measurement of ecosystem condition and ecosystem services/use. It was recommended that the modular but connected nature of the set of accounts be explained and to recognize different entry points for compilation.

- **Implications for the structure of the condition and services accounts for component accounts (carbon, water, biodiversity)**: On the measurement of condition it was clear that multiple approaches need to be tested with a combination of different indicators and indexes being possible. There was general agreement on the need for the use of reference or benchmark conditions but no agreement on the appropriate choice of such a reference. The discussion in this session and in other sessions confirmed the relevance of the "cascade" model linking ecosystem assets and services, but it was clear that for accounting purposes a better delineation is needed of (i) the boundaries between final ecosystem services and benefits; (ii) the place of intermediate and supporting services; and (iii) the concepts and practice of ecological production functions.
- **Ecosystem capacity**: Ecosystem capacity was discussed a number of times throughout the forum. It is clearly a concept which can be interpreted in a number of ways, often dependent on the original discipline of the expert. Overall, it would appear that the definition and measurement of ecosystem capacity should be considered a research issue with a high priority. A particular focus should be explaining the role and relevance of capacity in the accounting sequence.
- **Ecosystem degradation**: The discussion on ecosystem degradation was also productive and highlighted a number of important issues. A general definition suggested that degradation involved declines in condition and declines in service flow and hence there would be a link to capacity. At the same time it was noted that there was a need to be able to understand annual flows of degradation compared to accumulated degradation and, importantly, to be able to account for the significant effects of land use change around cities where ecosystems are being converted rather than incrementally degraded.
- **Integration with the National Accounts**: The focus here was on the potential to integrate ecosystem asset and service values in monetary terms with the existing national accounts. The discussion suggested that, assuming data compilation was possible, there was good potential to develop integrated accounts. However, there is likely a significant challenge in separating ecosystem values from current values in SNA (e.g. within market prices of land). This requires further consideration of economic production functions and the identification of ecosystem services embedded within "operating surplus".
- **Indicators**: The discussion here was on what broad indicators might be sourced or derived from SEEA EEA accounts. It was observed that there was a need to consider indicator production in account design and that accounts are not just tables of data. Possible indicator areas included ecosystem condition, linking biodiversity to food, energy, water and poverty; an index of regulating services and as a source of indicators for the three Rio conventions, BIP (Biodiversity Indicators Partnership) and SDGs.

45. Additional questions and comments from the participants included:

- The SEEA needs to address the needs of the three Rio conventions in terms of providing a framework for organizing information and producing indicators. However, ecosystem accounts also need to address national policy priorities.
- There is a need for a common vision of the structure of the accounts. Perhaps graphics could be used to represent this.
- The naming and role of the current Component Accounts should be revisited. Biodiversity, Water and Carbon are not components, they are cross-cutting several of the 'accounting boxes'.
- In the European Union, there are data and conceptual issues in developing simple first accounts for extent and condition and their dependencies.
- Perhaps a way forward would be to conduct case studies of how certain industries, such as subsistence farming, are dependent on ecosystem services. This would help address issues of equity and support the development of market systems to address it.
- Separating concepts into specific accounts helps understand the intermediate calculations rather than suggesting a sequential approach. Building ecosystem accounts will require iteration to develop a consistent story.

8. Session 6: Summary of working group session - Recommendation and way forward for the testing of SEEA Experimental Ecosystem Accounting

46. **Ivo Havinga**, UNSD, opened the session noting that the presenters will provide short provisional summaries of the outcomes and actions of the four main sessions.

8.1 Outcomes and actions - Session 2: Ecosystem accounting units – discussion of approaches and methods (Michael Bordt)

47. **Spatial infrastructure**: There was general agreement on the need for a standard spatial infrastructure, including recommendations for standard spatial units. These are important not only to link accounts within national ecosystem accounting activities, but also to coordinate international efforts at providing coherent core data for ecosystem accounting. International agencies should agree on and make available a core set of the most appropriate spatial data that includes land cover, land use and ownership together with standard classifications of these units. Piloting in countries should test alternative approaches to applying these units and classifications and recommend best practices.

48. **Delineation of spatial units**: Although land cover provides a pragmatic starting point to delineate spatial units for ecosystem accounting, other information should also be considered. For example, hydrological networks, topography, bioclimate, soil types, ecological classifications, topography, land use, degree of human modification and ownership. Pilot testing should identify appropriate methods of collapsing these potentially large numbers of classes into appropriate aggregates for linking to ecosystem services generation and policy. River and marine units also need to be tested.

49. **Recommended spatial units**: There is a need to clarify the terminology with respect to units in the SEEA Technical Guidance. The definition of BSU should include an option to be based on existing ecological classifications and not only a pixel of land cover. The current LCEU should be renamed EU (for Ecosystem Unit) and include, as well, the option to be based on contiguous aggregates of areas of similar ecological properties. EAUs could be renamed ERAs (Ecosystem Reporting Areas) to reflect that ecosystem accounts could be reported on many scales.

50. **The treatment of uncertainty in spatial data**: There is an urgent need to better understand, document and treat uncertainty in spatial data. This could commence with an assessment of current global spatial datasets. It could be further informed by comparison with comparable national datasets and existing field studies in country pilots. Such an assessment could identify the "best datasets" for delineating spatial units in ecosystem accounting.

51. **Linking spatial units to ecosystem services**: Further research is required on linking spatial units with the generation of ecosystem services. For example, what are the trade-offs in terms of availability and ability to link with services generation of spatial data on land cover and ecological classifications? What scale is appropriate for assessing the macro-economic implications of marginal changes in ecosystems.

8.2 Outcome and actions - Session 3. Ecosystem service classification and links to ecosystem functions and conditions (Mark Eigenraam)

52. **Linking ecological production functions to ecosystem services**: It was generally accepted that further work is needed to link ecological production functions to the generation of ecosystem services. If one production function per service were developed, this would need to also take into account linkages between services. Much of this work is already included in existing modelling approaches and should be further investigated.

53. **Indicators of ecosystem services**: There is a need to harmonize existing indicators of ecosystem services and to better link them to policy requirements. The Technical Guidance should specify which indicators, not only of ecosystem services, are possible with which accounts and to link these specifically to the needs of the SDGs.

54. **Ecosystem services classifications**: There is a need to harmonize aspects of current classification systems (CICES, FEGS-CS, NESCS), since each have their strong points, but none addresses all the requirements for ecosystem accounting. There is already significant convergence between these classification systems. Criteria should be developed that can guide the further development of a systematic ecosystem services classification for ecosystem accounting. For example, a comprehensive classification would be based on a comprehensive conceptual framework, be mutually-exclusive and collectively exhaustive, and be linked to measures of degradation. By recognizing ecosystems as beneficiaries, the classification would support the disentangling of intermediate and supporting services, ecological structure, processes and functions in generating ecosystem services. Such a classification could include: a minimal set of services and recommendations for selecting appropriate metrics. The current terminology of provisioning, regulating and cultural services should be reconsidered. Any comprehensive services classification should also be based on a better articulation of the "cascade model", as well as recognition of both intra-ecosystem and inter-ecosystem services linked to ecosystem functions and their links to final ecosystem services.

55. **Land cover and ecosystem function**: Land cover should be separated from ecosystem structure, function and composition in the classification of ecosystem assets. There is a need to develop harmonized and standardized classifications of land cover.

8.3 Outcome and actions - Session 4: Measurement and modelling of ecosystem conditions, functions and services (Wilbert van Rooij)

56. **Enhanced collaboration**: There is a need for modellers to collaborate with policy makers, accountants and economists to set priorities for better linking models to ecosystem accounting efforts. The UN could possibly initiate a discussion between national statistical offices and modellers as a subgroup of the GGIM.

57. **Assessment of models**: Existing models and their components (i.e., embedded functional relationships) should be reviewed according to requirements for ecosystem accounting. Such criteria could include: data requirements, transparency, uncertainty, embedded functional relationships, and others to be developed.

58. **Reference states for indexing ecosystem condition**: It is recognized that reference states are not targets, but that a common concept of reference state is required to set benchmarks for ecosystem condition measures. The implications of difference reference

states (pristine, pre-development, optimal, sustainable…) will likely need to be tested in pilot ecosystem accounts.

59. **Drivers of change**: More guidance is required on drivers of change. This should not be viewed as a separate account, but should be standardized in terms of supporting information for several accounts including assets, condition and services production.

60. **Ecosystem capacity**: There is a need for further discussion of ecosystem capacity. The first step may be to develop an approach to building a baseline scenario and to show how this can be used to estimate expected flows of ecosystem services.

8.4 Outcome and Actions - Session 5: Structure of Ecosystem accounts – compilation of accounting outputs and tables (Carl Obst)

61. **Structure of the accounts:** The need for the full range of accounts needs to be made clear. Initial designs of accounts are needed for discussion. The capacity account requires further consideration. Component accounts could possibly be renamed "Thematic Accounts", illustrating that they have linkages to the Condition Account, but that they can also be considered stand-alone accounts.

62. **Sequencing of accounts:** The set of accounts might be compiled following various pathways and entry points. The modular but connected and iterative nature of the set of accounts needs to be explained.

63. **Condition measurement:** Multiple approaches to the measurement of condition need to be tested with a combination of different indicators and indexes. Further testing will help understand the implications of different reference states.

64. **Accounting logic**: A better delineation is needed of (i) the boundaries between final ecosystem services and benefits; (ii) the place of intermediate and supporting services; and (iii) the concepts and practice of ecological production functions.

65. **Ecosystem capacity**: The definition and measurement of ecosystem capacity should be considered a research issue with a high priority. A particular focus should be explaining the role and relevance of capacity in the accounting sequence.

66. **Ecosystem degradation**: Degradation involves declines in condition and declines in service flow and hence there needs to be a link to capacity. There is a need to be able to understand annual flows of degradation compared to accumulated degradation.

67. **Integrated accounts**: Assuming data compilation is possible, there is good potential to develop integrated accounts. However, there is likely a significant challenge in separating ecosystem values from current values in SNA (e.g. within market prices of land).

68. **Indicators**: There is a need to consider indicator production in account design since accounts are not just tables of data. Possible indicator areas included ecosystem condition, linking biodiversity to food production and consumption, energy generated and use from hydropower and feedstock, water access and use and poverty; an index of regulating services and as a source of indicators for the three Rio conventions, BIP and SDGs.

8.5 Conclusions

69. **Ivo Havinga**, UNSD, concluded the session with at note that the current Technical Guidance document will be sent for comments to be received before 15 May. An updated version, incorporating these comments as much as possible, will be produced before the end of June. The second half of the year will see the implementation of the SEEA-CF and EEA in many countries. He noted that this is an opportunity to extend to the modernization of statistical processes.

9. Session 7: Strategy and roadmap

70. **Ivo Havinga**, UNSD, opened the session noting that the implementation strategy for the SEEA-CF should be expanded to include the SEEA-EEA. Indonesia is developing One Map and One Data programs to promote consistency and efficiency among many government and non-government initiatives. Similarly, the international community and donors need to recognize that the development of environmental-economic accounts should be considered as one statistical process that focuses mainly on the development of national statistical systems to produce statistical information for policy use.

71. **Alessandra Alfieri**, UNSD, noted that the United Nations Statistical Commission recommended the stepping up of the implementation of the SEEA-CF and SEEA-EEA to better address the evolving international policy landscape. This landscape includes not only the SDGs, but also Green Growth, Green Economy, Beyond GDP, the Aichi Targets and Natural Capital Accounting. There is also a need to link these to statistical initiatives such as the modernization of national statistical systems, bringing Big Data and geospatial data into official statistics and the harmonization of geospatial data through the GGIM. The SEEA is a catalyst for this.

72. The objective of the strategy is to support the implementation of the SEEA through the development of the technical and institutional capacity to regularly report on a minimum set of nationally-relevant environmental-economic accounts. Eurostat, for example, has mandated the development of six SEEA accounts (air emissions by industry and households, environmental taxes, material flow accounts, environmental goods and services sector, environmental protection expenditure and physical energy flow accounts).

73. The implementation of the SEEA requires a strategic approach that better links national statistical office and their stakeholders into the policy framework. The entry points for accomplishing this will be different in each country and with each international organization. However, it is important that this implementation is country-owned and is based on national priorities. There needs to be support for sub-regional, regional and south-south cooperation. This also links to the SNA 2008 implementation and the Global Strategy for Agriculture. By 2020, it is hoped that at least 50 countries will have developed pilot ecosystem accounts in addition to SEEA-CF accounts.

74. The elements of implementation include (a) a national assessment of policy priorities, data availability and institutional arrangements among the policy and statistical stakeholders and (b) the creation of a national plan that is agreed by all stakeholders at a high level. For example, Indonesia and Chile have established senior committees to oversee the implementation of environmental-economic accounting. Formal coordination mechanisms at the senior and technical levels should include, for example, not only statistical offices, but finance, planning, environmental and natural resource ministries. Initial work will focus on early experimental results. This will identify data gaps and overlaps and lead to further harmonization as well as plans for regular production of these accounts.

75. To accomplish this, there is a need for enhanced communication and engagement between international agencies, with academia and with the business community. Each agency has its own approaches and datasets and there are opportunities for aligning

concepts by leveraging common statistical measurement framework (that is the SEEA), objectives and expertise.

76. The UNSD is developing tools to support this implementation strategy. Training materials on the SEEA-CF and SEEA-EEA have been piloted. The SEEA-CF Implementation Guide has been drafted and will be expanded to cover the SEEA-EEA. Compilation manuals have been developed for water and energy accounts. Diagnostic tools for both SEEA-CF and SEEA-EEA are available. This needs to be further supported by recommending core accounts, tables and indicators.

77. There is a need to advance the research agenda by focusing on priority issues and developing agreed methods. For example, the classifications in the SEEA-CF are still provisional and require standardization. The London Group as well as this annual Expert Forum will provide valuable input to this.

78. A high priority is also to provide baseline data for the SDGs. Once the indicators are finalized, these can be linked to the SEEA accounts. At the moment, most countries have little data that are SEEA compliant. However, by using available data, the SEEA can be mainstreamed in national statistical systems to provide provisional indicators that can be improved over time with new data collections.

79. A good test of the SEEA would be to develop national baselines using global data for SDG number 15, which states: *Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*.

80. Discussion from the participants included:

- There is a need to clarify the coordination mechanisms among international agencies and the processes for deciding which components and classifications are considered standard.
- It should be recognized that national statistical offices are, by principle, not linked to national policy processes. They are, however, in a position to address information needs, to package that information and to play a conceptual role. As with the business community, accounts can be used to manage a country's risks in terms of changing investments as the supply of natural capital changes. The entry points for these applications however are in national planning and other decision making fora. A roadmap and sequencing for the implementation of core accounts is required. This can advise countries with lower capacities to leverage their existing investments in statistical infrastructure to address these new challenges.
- Statistical offices are generally averse to experimentation. There is a need for experienced countries to demonstrate to the less experienced ones aspects of the SEEA that are less "experimental".
- There is a need to provide more guidance on valuation of ecosystem services. There is still a lack of agreement as to whether contingent valuation studies, conducted according to the principles established by Arrow et al. (1993)[6]

[6] Arrow, K., Solow, R., Portney, P. R., Leamer, E. E., Radner, R., & Schuman, H. Report of the NOAA Panel on Contingent Valuation. http://www.darp.noaa.gov/library/pdf/cvblue.pdf.

incorporated consumer surplus. Although psychometric methods are considered weak evidence, they are the only means of establishing the importance of non-use ecosystem service values.

- There is a need toprovide guidance for statistical offices to engage policy departments through the creation of an appropriate structure of the technical working groups by SEEA accounts taking into account national agencies responsible for the provision of functional services (policy, methods, maps) and the subject matter sectoral ministries and departments . The implementation strategy should take into account the alternative relationships NSOs have with policy departments. Rolling out this multidisciplinary strategy may require UNSD to establish relationships with national policy departments as well. However, it is largely the role of the NSOs, in the modernization of their statistical processes to take the lead in conducting outreach to policy departments and to move towards a common statistical infrastructure across the national statistical system.
- There is a need to balance the degree of prescriptiveness in the implementation strategy. Under-prescription would only provide options and best practices, but may be counter-productive since each agency will need to make its own decisions and may produce internationally incomparable results. The SEEA-EEA TG should give clear recommendations on how to proceed.
- The term “experimental” in the SEEA-EEA does not convey that some components are more ready for standardization than others are. Perhaps some accounts can be standardized and recommended to all countries. The less developed accounts could become the focus of a joint development effort that focuses the efforts of NSOs, data providers and research institutions on further developing these accounts.

10. Summary of outcomes and actions

81. There is an urgent need and an opportunity for national statistical systems to better support integrated policies on sustainable development.

82. The SEEA is one of the core components for addressing the Post-2015 Agenda and Sustainable Development Goals (SDGs), for linking statistics with geospatial information and for providing harmonized information to policy making.

83. The Technical Guidance Document will augment the current Implementation Guide for the SEEA Central Framework and the SEEA-EEA document, to provide a coherent platform for moving forward with national pilots.

84. Over the short-term, the UNSD will:

- Revise the Technical Guidance, taking into account as much as possible the recommendations of the Expert Forum, including:
- Including stronger recommendations on the compilation of core ecosystem accounts
- Revising the naming of the spatial units and include options for basing them on existing ecological classifications
- Renaming "Component Accounts" to "Thematic Accounts" and better defining their role with respect to Ecosystem Asset, Ecosystem Condition and Ecosystem Services Supply and Use Accounts
- Suggesting a simple approach to measuring capacity and providing baseline scenarios for linking capacity with the expected future flows of services
- Engage the user community in a broader discussion on the use of the accounts, including indicators and how they can be linked with the needs of the SDGs
- Support the revision of the CICES, with the goal of harmonizing it with FEGS-CS by recommending a coherent conceptual framework and criteria for further development.
- Support the creation of an international land cover classifications in consultation with GEO.
- Engage international agencies and GGIM in: determining the best global spatial datasets for delineating spatial units; and

  developing approaches to assessing and treating uncertainty in spatial data.
- Engage modelling experts and NSOs in the development of criteria for assessing existing models and their embedded functional relationships with respect to their appropriateness for use in ecosystem accounting. This could be initiated by recommending criteria for such an assessment.
- Initiate work on a coherent communications and engagement strategy that will communicate the main concepts and objectives of the SEEA to a broader audience.
- Continue elaborating on the community of practitioners through recurrent meeting of the Forum of Experts on SEEA Experimental Ecosystem Accounting.

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