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Other issues for Volume 2 of the revised SEEA

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OTHER ISSUES FOR VOLUME 2 OF THE REVISED SEEA

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1. The London Group meeting in Wiesbaden will discuss the range of issues likely to be included in volume 2 of the revised SEEA. Separate notes and presentations will address the issues of ecosystem accounting and certain valuation issues. This note proposes a preliminary list of remaining issues for inclusion in volume 2 of the revised SEEA (hereafter referred to as the 'SEEA Rev').

Criteria for inclusion in the SEEA Rev Volume 2

2. UNCEEA has determined that volume 2 of the SEEA Rev would

> *"cover best practices in the implementation of those accounts that are highly policy relevant but for which there is not yet an agreement on the methodology."* (UNCEEA/2/7)

That is, environmental economic accounts belong in volume 2 of the SEEA Rev only if they satisfy the dual criteria of high policy relevance and absence of agreed estimation methodology.

3. Therefore the list of issues included in the SEEA Rev volume 2 will depend to some extent on the list of standard accounts selected for volume 1 of the SEEA Rev —if an account is judged too developmental for inclusion in volume 1, then the issue preventing its inclusion becomes a prime candidate for inclusion in volume 2. The 15th London group meeting in Wiesbaden will discuss standard accounts for inclusion in volume 1 of the SEEA Rev and the decisions taken during that discussion will therefore affect the list of issues selected for inclusion in volume 2 of the SEEA Rev.

Rationale for Volume 2 of the SEEA Rev

4. The rationale for developing volume 2 of the SEEA Rev follows largely from the objectives of volumes 1 and 3 of the SEEA Rev.

5. A range of environmental accounting issues are at present insufficiently understood to support agreed estimation methodologies. These issues tend to be both controversial and difficult to measure in practice and it has therefore been agreed to quarantine these issues from volume 1 of the SEEA Rev (and therefore from the SEEA Rev volume 3). In particular, volume 1 of the SEEA Rev is expected to be elevated to the status of an international statistical standard—meaning that its content should reflect broad agreement on conceptual matters within relevant international forums. There must be strong evidence that estimates contained in the standard tables of the SEEA Rev volume 1 can be produced using well-established methodologies. Identifying the controversial and difficult-to-measure issues and placing them away from SEEA Rev volume 1 is designed to assist the acceptance and uptake of volume

1. The list of issues included in volume 2 of the SEEA Rev also becomes, in effect, a very public and important part of the future SEEA research agenda.

6. Tables selected as 'standard' SEEA tables in the SEEA Rev volume 1 will have a history of use, preferably by a number of countries (de Haan, 2007, LG/11/3). That is, it must be clear that these tables *can* be produced and *do* serve demonstrated uses. Though there are some exceptions to this rule—i.e. where an overwhelming policy importance attaches to a particular issue, and where it seems reasonably clear that accounts can be produced and which data users will accept as informative. For example, it is clear that data related to the evaluation of emission trading schemes must feature in the SEEA Rev.

7. To be included in SEEA Rev volume 2, an issue is characterised by few (if any) examples of measurement. Issues included in volume 2 must be important—irrelevancies do not warrant inclusion in the SEEA Rev volume 2.

Structure of volume 2

8. Because the issues included in volume 2 are linked only by being contentious to measure, it may not be obvious how to structure a complete volume of these issues in a meaningful way. It may be best to wait until a final list of inclusions is determined before ultimately deciding on an appropriate presentation structure. However, it also seems that volume 2 will be dominated by issues related to the measurement of degradation of the environment. There will also be a range of other loosely related matters to address. A possible broad structure is:

- 'guidelines on non-standard accounts related to measurement of degradation'
- 'guidelines on other non-standard accounts'

9. The latter category could be further organised into non-standard accounts relating to physical stocks, physical flows, monetary stocks, monetary flows and other environmentally-related transactions.

List of issues suggested for inclusion in the SEEA Rev Volume 2

1. Environmentally damaging subsidies
2. Catastrophes
3. Volume measures of relevant assets and flows
4. Environmentally beneficial activities and the minimisation of natural hazards
5. Valuation of water stocks
6. Water quality accounts
7. Stocks and flows of soil carbon
8. Recording soil and its valuation
9. Bio-economic modelling (especially for assessing sustainability of fish stocks)
10. Degradation

Brief description of issues suggested for inclusion in the SEEA Rev Volume 2

1. Environmentally damaging subsidies

10. Some types of subsidies, in effect, promote various types of environmentally damaging economic activities. For example, subsidising producers of fossil fuels can deliver various results: lessen incentive to introduce more fuel-efficient processes; discourage uptake of sustainable renewable energy; and disadvantage public transport. At present we require agreement on criteria used to define these subsidies and to subsequently quantify both the value of the subsidies (in monetary terms) and the type of physical damage being perpetrated.

11. Possible types of accounts would include monetary valuation of environmentally-damaging subsidies by type of subsidy and by the industry receiving the subsidy. Subsidy-specific damage e.g. subsidies to fossil fuel producers causes additional fuel consumption (in comparison to situation in which no subsidy is paid) leading to a measurable quantity of additional emissions.

12. A key difficulty is in determining criteria for 'environmentally damaging' subsidies since virtually all subsidies are designed to increase production and production invariably causes some environmental damage. It is also very difficult to identify specific damage caused by a subsidy (and to quantify this damage).

2. Catastrophes

13. While 'catastrophic losses and uncompensated seizures' appears as a change category in the SEEA-2003 Asset Account (Table 7.5), the SEEA-2003 does not generally deal with catastrophes—instead it is included as part of future SEEA work (SEEA-2003 para 1.134). However, some catastrophes such as flooding and erosion are increasingly seen as the consequence of economic activities in current and previous years. The SEEA-2003 (para 1.134) notes that it may be desirable to bring some of these types of catastrophe into the field of environmental accounting.

14. The SEEA Asset accounts record 'catastrophic losses and uncompensated seizures' as a change category. A time series of asset accounts will therefore show, over time, whether assets are increasingly being damaged by catastrophic events. The question could be asked what quantity of current catastrophic events is directly attributable to previous economic activity.

15. It is a difficult task to determine which current catastrophic events are directly attributable to previous economic activity and to what degree the severity of the event is linked to this activity. Any estimation will be complicated by the fact that most of the responsible economic activity is likely to have taken place outside of the country where the catastrophic event has occurred.

3. Volume measures of relevant assets and flows

16. In monetary accounts it is often important to measure changes in the volume of an asset or a product over time. In economic thinking, it is important point that if the quality or character of an asset or a product changes over time, the resulting price change should typically be seen at least partly as a volume (quality) change rather than as a pure price change.

17. A time series expressed only in current prices will embody elements of both volume change as well as a 'pure' inflation component. A current price time series can therefore be very misleading—an apparent increase in production of a particular product or in the level of an asset may be entirely driven by price change. A volume measure therefore removes the 'pure' inflation effect from the time series. If we wish to determine, for example, whether increased spending on environmental protection products adds to or subtracts from economic growth, it is important to know whether the increased costs have been treated as a price or a volume effect. Volume measures are necessary for productivity analyses.

18. In principle, all monetary measures of assets and expenditure can be expressed in both current price and volume terms. That is, the asset accounts and various expenditure measures contained in the SEEA (e.g. environmental protection expenditure) could be expressed in volume terms.

19. It is usually relatively straightforward to generate volume estimates for a homogenous product. However, products (and assets) may change subtly over time and nevertheless experience a significant change in volume. For example, a car running on unleaded fuel is a higher quality product than the car it replaced (which ran on leaded fuel) though they are indistinguishable in all other ways. To what extent does this technical change represent a quality change (converted to a volume change) and what is the impact on a volume measure of car sales? In other cases, the product may not have changed at all but a quality change has nevertheless occurred. For example, a parcel of land may experience no physical change, but its quality (volume) has risen because it has become urban rather than rural land. The CPI and PPI manuals and the 2008 SNA set out the principles and practice of volume measurement but careful thought needs to be applied to the case of environmental expenditures and environmental assets.

20. Since the measurement of volumes is closely linked to quality change, it is therefore also intimately related to measures of degradation (which is essentially concerned with changes in quality). Efforts to improve volume measures contained in the SEEA should coordinate closely with developments in the area of measurement of degradation.

4. Environmentally beneficial activities and the minimisation of natural hazards

21. While environmental protection activities are reasonably well-defined and measured, this does not appear to be the case for environmentally beneficial activities and the minimisation of natural hazards. These latter items relate to such things as research, surveillance, hazard warning systems and structures to combat hazards (e.g. fire roads in forests, levee banks on rivers). A complete coverage of environmental activities should include environmentally beneficial activities and the minimisation of natural hazards.

5. Valuation of water stocks

22. Certain water stocks are now economic assets according to the SNA (and the SEEA) and should therefore appear with a monetary value in the balance sheet and the asset account.

23. Stocks of water do not typically enter the market place and the price of water reflected in sales of part of this stock is unlikely to be representative of the entire water stock at any one point in time. A number of techniques have been suggested (e.g. NPV of relevant expected resource rents etc.) but, to date, little in the way of experimental estimates, much less official estimates, has been attempted.

6. Water quality accounts

24. Water quality is very important to the use and potential use of water. Quality accounts are experimental at present, but would show quality changes over time and between different locations.

25. There are a number of fundamental questions about how water quality can be meaningfully presented in an accounting framework. For example, how should quality classes be defined for water? How best to aggregate across pollutants to obtain a quality index? How best to aggregate over space and over time? What is the precise link between changes in quality of water and emissions?

7. Stocks and flows of soil carbon

26. A full accounting for stocks and flows of carbon would require that stocks and flows related to soil carbon be recorded. While the science around what is soil carbon, fractions of soil carbon and the factors influencing soil carbon are all well understood, there is still uncertainty around the quantifiable effects of different factors on total soil carbon potential. In addition, there is little systematic, wide-scale accounting for soil carbon accounting. This is in large part due to the scale of the measurement process. In any case, there appears to be little likelihood of a significant number of countries developing comprehensive accounts of stocks and flows of soil carbon in the near future.

8. Recording soil and its valuation

27. In the SNA, soil is considered an integral component of land and not as a separate asset. Where soil quality is a factor in the potential use of a parcel of land, this quality will be reflected in the SNA as part of the price of the land parcel. In the SEEA-2003, the SEEA asset classification identifies soil as an asset separately from the land asset. This reflects the fact that soil has a distinct physical dimension and that physical flows of soil occur within the economy (for example, through sales of soil) and within the environment (through erosion and other soil flows).

28. There are a number of possible types of accounts for providing analytically useful information about soil. For example, physical flows of soil from one location to another, by type of flow (erosion, volcanic activity etc.). And a physical asset account for soil, that is, stocks of soil (by soil characteristics) and various changes to these stock levels between opening and closing stock positions. Ideally, we would produce corresponding monetary valuations for these stocks and flows, though this would seem to be extremely challenging.

29. In addition, to these physical stocks and flows, it is highly desirable to record qualitative changes to soil—both in physical terms and in monetary terms. This is a integral component of efforts to measure degradation of the environment (in both physical and monetary terms).

30. These types of accounts are difficult to produce. While many of the physical flows of soil are large, they generally do not generally enter the market and information is likely to be scarce. There are challenging valuation issues for soil, since soil is typically valued as part of a bundle of factors and called 'land'. Valuation of soil degradation is similarly highly problematic.

9. Bio-economic modelling (especially for assessing sustainability of fish stocks)

31. If the SEEA is a manual for assessing sustainable development, then its measures of renewable natural resource stocks and flows should indicate whether these resources are being used in a sustainable manner. If the harvest of a renewable natural resource exceeds its net natural growth, then it might reasonably be contended that the resource is being used in an unsustainable manner. However, this is not necessarily true and ideally we want to understand the ecological dynamics of the population in question before we can make a fully informed assessment. The use of bio-economic modelling therefore is potentially important to understanding and assessing the sustainability of our use of various renewable natural resources.

10. Degradation

32. In a clear statement of purpose, the SEEA-2003 (para 9.1) states that it addresses three major environmental issues, namely: depletion; defensive expenditures and degradation. The first two are reasonably well defined and we can point to a substantial body of relevant work and estimates—they therefore belong to volume 1 of the SEEA Rev. On the other hand, measurement of degradation remains the most substantial undeveloped area of environmental economic accounting and will be addressed in volume 2 of the SEEA Rev.

33. Volume 2 of the revised SEEA will discuss concepts, accounts and methodologies for a range of conceptual and methodological issues that are not ready for volume 1—but it should also discuss the potential policy applications of any environmental economic accounts described in volume 2. This is because the policy applications described in volume 3 should be restricted to those 'standard' accounts contained in volume 1 of SEEA Rev. Within volume 2, policy applications need to be clearly distinguished from accounts and estimation techniques.

34. It would not appear feasible to develop standard accounts for volume 2 of the SEEA Rev since, almost by definition, the developmental nature of the topics involved requires that the necessary progress remains to be made through an accumulation of exploratory and experimental studies. That is, our understanding of topics is simply not mature enough to allow the definition of standard accounts within volume 2.

35. Chapter 9 of the SEEA-2003 forms the starting point in developing structure and text for volume 2 of the SEEA Rev. In measuring environmental degradation, we

need to describe what are we trying to measure and why is it important. We also need to describe what valuation techniques can be used, and what are the strengths/weaknesses and potential application of each technique. When measuring degradation, what special issues apply to the relationship between flows (e.g. of emissions) and stocks (e.g. cumulated emissions); with the latter measure providing the context for discussing the notion of 'environmental debt'.

36. But how can the approach taken in chapter 9 of the SEEA-2003 be improved upon? The remainder of this section provides input to this question, where comments provided are substantially taken from those made by the World Bank and the European Environment Agency at the first meeting of the UNCEEA.

Clarifying concepts

37. In principle, are the various techniques described for measuring degradation conceptually aligned, or do they represent fundamental philosophical differences? That is, are the different measurement techniques reconcilable?

38. Volume 2 needs to distinguish between monetary accounts (previous-period measures of production and consumption, level of assets, additions to and subtractions from assets) and models (applications of the accounts to explore scenarios and analyse policy options). Modelling approaches such as 'maintenance costing' and 'greened economy modelling' should be clearly presented as applications in volume 2. Valuing degradation then becomes a matter of valuing the damage to assets (produced, natural or human) associated with use of the environment, and is akin to consumption of fixed capital.

Which assets are to be valued?

39. If degradation is equivalent to damage to assets, then it is necessary to decide which assets to value (beyond the SNA boundary). Some assets seem inherently difficult to value, such as atmospheric ecosystems, but it is still possible to link physical change in air quality or ozone layer coverage to damages to other assets which can be valued. Damage to human health (morbidity and mortality) represents damage to human capital (an amalgam of healthfulness, skills and knowledge). Do we require an asset value for human capital in order to arrive at damage-adjusted accounting aggregates, that is, does the SEEA need to integrate human capital measures?

Valuation techniques

40. Most of the *revealed preference* and *stated preference* methods described in the SEEA-2003 would seem to apply to valuing non-market assets such as protected areas. Should this material appear in volume 2? *Dose-response* approaches used in damage-based valuation techniques appear to be the best match to the question of damage valuation. New material needs to be added on valuing morbidity and mortality, that is, damages to human capital associated with exposure to pollution.

Valuation of degradation

41. The SEEA-2003 presents three approaches to the valuation of degradation, namely: damage cost; maintenance cost (cost-based); and the modelling approach. These three approaches apply different concepts and reflect different philosophical approaches to analysis. Although further research in this area would certainly promote a standardisation process, which is needed, it does not seem plausible that these approaches can be reconciled.

42. There is very little practical experience in the valuation of degradation in an accounting context. To date only a few countries have experimented with the techniques recommended in the SEEA and no country has implemented the three approaches and compared the results in relation to environmental accounting. Volume 2 should adopt a pragmatic approach and encourage countries to undertake pilot studies to experiment with the various approaches.

Damage-adjusted aggregates for income, product and saving

43. In addition to adjustments to income, product and saving aggregates, it should be emphasised that the asset account contain corresponding changes in the asset accounts (if a fully integrated accounting system is the goal). The asset account in the SEEA Rev volume 1 has 'degradation' as one of its change categories. Even though volume 1 does not address the measurement of degradation, the inclusion of this category in the SEEA asset account is entirely appropriate if we are ultimately aiming for a fully integrated accounting system.

Environmental debt

44. This notion is presented only very briefly in the SEEA-2003 and needs further thought. It appears to be a useful concept but would benefit from relevant illustrative examples. A stock pollutant such as CO2 would seem to be good candidate for one of these.

Treatment of transboundary pollution

45. A more complete treatment is needed for transboundary pollution—the question of damages caused versus damages borne needs to be explored. Underlying this question are assumptions about property rights—for example, whether countries have the right not to be polluted by their neighbours.

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