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**Issues note on crosscutting issues related to natural
capital/resources in the context of the finalization of the 2025 SNA**

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Introduction

1. This issues note discusses some (additional) issues related to accounting for natural resources, that were raised during the global consultation of the draft 2025 SNA, and that may affect the text in quite a number of chapters. Generally, these issues do not affect the guidance per se; it is more about how certain topics are framed and/or explained, while other comments requested for clarification regarding the treatment of certain quite specific phenomena related to accounting for natural resources.
2. The issues can be broken down into four categories. The first one concerns the precise wording of the relationship between ecosystem services and the production boundary applied in the integrated framework of the SNA. The second category relates to the framing, the definition and the classification of natural capital and natural resources. The third category concerns the recording of flows involving the harvest of biological resources by units other than the economic owner or where there is no economic ownership. The final category discusses the accounting for the economic activities of non-resident units making use of quota established for fishing in a country's Exclusive Economic Zone (EEZ).

Ecosystem services and the production boundary applied in the integrated framework of the SNA

3. There are a number of places across the SNA where the link between ecosystem services and the production boundary of the integrated framework of national accounts are discussed. The most comprehensive discussion is in Chapter 35. The text – shown in Annex 1 – aligns directly with the intent in SEEA Ecosystem Accounting in terms of the links to the production boundary applied in the integrated framework.
4. Key features of these links are as follows:
 - Ecosystem services are natural processes which are, by definition, outside of the production boundary of the integrated framework since they do not reflect the combination of labour and capital used by economic units in the production of goods and services.
 - Another way of considering this is that from a supply and use perspective the integrated framework of the SNA only records flows between economic units and hence the flow of crops is not recorded as a flow between land and farmers, but as flows between farmers and others in the food supply chain. Ecosystem services reflect a flow between land and farmers that is embodied in the subsequent chain of flows but is outside the scope of transactions in the integrated framework.

- Ecosystem services, in many but not all cases, contribute to the production of goods and services inside the production boundary of the integrated framework (SNA benefits), essentially providing capital inputs/services. But this does not imply that the ecosystem services themselves are inside the production boundary.
 - Ecosystem services will also contribute to the supply of benefits that are outside the production boundary of the integrated framework (non-SNA benefits) such as by providing air filtration services that lead to, for example, health benefits.
 - Ecosystem assets reflect the combined value of all future ecosystem services whether they contribute to SNA benefits or non-SNA benefits.
 - Some ecosystem assets will, in physical terms, relate to the same spatial area as land areas that are considered economic assets – e.g., agricultural land, forest land. For this reason, there will be an overlap between the value of ecosystem assets (following SEEA Ecosystem Accounting) and economic assets (i.e., land) to the extent that the land provides services that are inputs to the production of SNA benefits (e.g., crops).
5. Based on this logic, no changes are proposed to the text in Chapter 35 in relation to this issue. But in other chapters – notably chapters 1, 2, 11 and 34 – some changes are proposed to be consistent with this logic. Annex 1 below provides proposed changes to text in all of these chapters.

Framing, defining and classifying natural capital and natural resources

6. A number of comments and suggestions made during the global consultation of the draft 2025 SNA related to the framing, the definition and the classification of natural capital and natural resources. This feedback was especially provided in the context of chapters 11 and 35. The following provides a short summary of the more generic comments and suggestions:
1. In the current guidance of the draft 2025 SNA, reference is often made to “natural capital”, consisting of both natural resources and ecosystem assets. Some respondents argued that it is preferable to refer to “natural resources” or to “natural capital (excluding ecosystem assets)”. More generally, respondents argued that referring to natural capital, consisting of both natural resources and ecosystem assets, in the integrated framework of the SNA, was not appropriate, because ecosystem assets are beyond the asset boundary of the integrated framework.
 2. In defining natural capital (see, for example, paragraph 11.11), some respondents argued that not all natural capital “occurs naturally”, and that the latter words should be avoided. Alternatively, one could consider defining natural resources as only consisting of natural resources whose growth is not managed and controlled by human activity.
7. Other, more detailed, comments and suggestions related to the following:
1. The question was raised where to classify costs of ownership transfer on non-produced assets. Currently, they are all classified as part of produced non-financial assets (excluding natural capital), while a significant part is related to natural capital.

2. The current guidance in paragraphs 10.140 to 10.145, which concerns produced non-financial assets (excluding natural capital), still refers to work-in-progress in, for example, agricultural crops, which seems to be inconsistent with how other types of work-in-progress in biological resources is classified.
8. After giving further consideration to the more generic comments and suggestions, it can indeed be argued that it is preferable to refer to natural resources in the guidance for the integrated framework of national accounts, and to remove references to the notion of natural capital, including ecosystem assets, from the chapters which cover the integrated framework. The main argument for doing so is that in this way the relevant guidance does not mix up the asset boundary applied in the integrated framework with the broader notion of natural capital. As a consequence, natural capital would only be discussed when presenting concepts of capital which go beyond the asset boundary applied in the integrated framework, thus primarily in chapters 2 and 35.
9. The above would have an impact on the introduction of acquisitions, less disposals, of natural capital (to be changed to “natural resources”) in chapter 11 on the capital account, more specifically paragraphs 11.178 to 11.182. In addition, all references to “natural capital” in the classification hierarchies for the integrated framework would need to be changed to “natural resources”.
10. The second generic comment raised a broader issue, namely the definition of natural resources, and its consistency with the coverage of natural resources in SEEA Central Framework. In the latter standards, natural resources only consist of non-produced natural resources, thus excluding cultivated biological resources, while in the guidance of the 2025 SNA, natural resources also include cultivated biological resources.
11. Given the above, the words “occur naturally” seem more appropriate in the context of the definition of SEEA Central Framework than the one applied in the integrated framework of the SNA. However, one can also argue that even in the case of most cultivated biological resources nature plays a significant role, despite them being labelled as cultivated. Moreover, when it comes to defining “environmental assets”, SEEA Central Framework also refers to “occur naturally”, while this category also includes cultivated biological resources.
12. More generally, one can observe a divergence between the SNA and SEEA Central Framework in the way “natural resources” are defined, and one has to ask the question whether this is considered acceptable. Here, it can be argued that the extent of natural resources in the integrated framework of national accounts already deviates from the one in SEEA Central Framework, for two reasons: (i) although similar in monetary terms, in physical terms, the asset boundary of the SEEA Central Framework is broader and includes all natural resources and areas of land of an economic territory that may provide resources and space for use in economic activity, thus not limiting the scope in physical terms to those assets with economic value; and (ii) in the integrated framework of national accounts, natural resources

also include radio spectra and renewable energy resources, which are excluded in SEEA Central Framework.

13. Another argument for having a broad definition of natural resources is that in some cases it is notoriously difficult to differentiate between cultivated and non-cultivated biological resources. Applying the broad definition would also lead to minimal changes of the guidance that was sent out for global consultation. Furthermore, the alternative of having a more restricted definition of natural resources would result in having to refer to “natural resources and cultivated biological resources” in all relevant classification hierarchies, or referring to either “natural resources” or “cultivated biological resources”, depending on whether it is referring to produced non-financial assets or non-produced non-financial assets (e.g., “produced non-financial assets (excluding biological resources)” versus “non-produced non-financial assets (excluding natural resources)”), which may potentially lead to quite some confusion.
14. All in all, it is proposed to stick to the broader definition of natural resources, i.e., including cultivated biological resources, in the integrated framework of national accounts. In applying this broader definition, it is obviously of the utmost importance to clearly describe the differences between the definition of natural resources in the integrated framework of national accounts and the scope of measurement in the SEEA Central Framework, especially in paragraphs 11.178 to 11.182 already mentioned in the above.
15. Furthermore, using the broader definition of natural resources, it seems warranted to change the definition of natural resources from “Natural resources are assets that naturally occur, such as land, water resources, timber and fish stocks, and mineral and energy resources that have an economic value and over which ownership may be enforced and transferred” to the following (affected text highlighted by underlining): “Natural resources are assets that naturally occur, such as land, mineral and energy resources, water resources, and animal, tree, crop and plant resources that have an economic value and over which ownership may be enforced and transferred”, or alternatively make reference to “such as land, mineral and energy resources, water resources, and biological resources”.
16. A recap of the links between the integrated framework of the SNA and SEEA Central Framework is presented in the annexed figure, which is an updated version of table 35.1 of the draft 2025 SNA.
17. Regarding the first detailed comment, i.e., where to classify costs of ownership transfer on non-produced assets, it has already been noted in the above that these costs are currently classified as part of produced non-financial assets (excluding natural capital/resources). Instead of applying this guidance, one could consider to reallocate this category to “natural resources”. An alternative is to split the category into the costs related to natural resources, and the costs related to other non-produced assets.
18. Even though the main part of these costs of ownership transfer will most probably relate to natural resources, in particular land, classifying the whole category to natural resources does not seem justified. For conceptual reasons, it is preferable to

apply the alternative, by splitting the category, and add each of the two components to the relevant main category of non-financial assets.

19. One may also wonder about the classification of work-in-progress in, for example, agricultural crops, or biological resources more generally. The current guidance in paragraphs 10.140 to 10.145, which relates to produced non-financial assets (excluding natural resources), still refers to work-in-progress in, for example, agriculture. Paragraph 10.145 implies that work-in-progress on cultivated biological resources is classified under natural resources, while other work-in-progress is to be classified as produced non-financial assets (excluding natural resources).¹ As a minimum, one could say that there is a need to provide more clarity, others may say that the guidance is somewhat ambiguous.
20. In view of consistency with the terminology used and also in line with the issues note on natural capital regarding which the AEG was already consulted, it is proposed to further clarify that all work-in-progress related to biological resources, i.e., resources yielding repeat products as well as resources yielding once-only products, are to be classified as part of natural resources in the capital account and on the balance sheet, and to make the necessary amendments to paragraphs 10.140 to 10.145 as well as paragraphs 11.218 to 11.221.

Recording of flows involving the harvest of biological resources by units other than the economic owner or where there is no economic ownership

21. The issue of recording flows involving the harvest of biological resources by units other than the economic owner or where there is no economic ownership has been raised via a number of entry points including the treatment of the household collection of firewood and the recording of depletion for illegal fishing.
22. The underlying feature is that the economic unit undertaking the extraction of the resources (timber or fish are good examples but can apply more broadly to, for example, hunting, non-wood forest products, etc.) is different from the economic owner of the resource and/or there is no economic ownership of the resource.
23. The following paragraphs discuss the relevant issues arising with recording relevant stocks and flows under two scenarios. First, note that it is clear that productive activity does occur and where harvesting does take place, whether legally or illegally, it should be included in the measures of output of the unit undertaking the extraction.
24. Scenario #1: If an economic asset – a natural resource – has been identified following the principles applied in the integrated framework of national accounts, then the following is considered relevant:

¹ Similarly, other categories of inventories, such as materials and supplies, finished goods and goods for resale, will include agricultural products (and, for example, timber as well). However, these concern final products or products for use in the production of other goods and services, and should therefore remain to be classified as part of produced non-financial assets (excluding natural capital/resources). It would also not be feasible, or better to say nearly impossible, to make a distinction between those which are, and those which are not, related to biological resources.

- a. The value of the asset will be equal to the benefits accruing to the economic owner – i.e., future resource rents – recognizing that the value of the asset may be shared between the legal and the economic owner.
 - b. A loss in value of the asset due to the productive activities of the economic owner should be treated as depletion and attributed to the economic owner.
 - c. If another economic unit harvests resources from that economic asset without payment to the economic owner, then this cannot increase the benefits accruing to the owner, as a consequence of which the loss of resources to the economic owner as a result of harvesting by other economic units should be treated as an other change in volume of resources (OCV) – an uncompensated seizure.
 - d. Since the recording of depletion should be limited to the effects of actions by the economic owner, then the loss of resources as a result of harvesting by other economic units would not be treated as depletion.
 - e. While these harvesting activities by non-owning economic units may not generate depletion, the effect of the activities on the balance sheet as a whole will emerge through the recording of OCV.
25. Scenario #2: If harvesting is being undertaken but the resources are being removed from a location where there is no economic asset identified following the principles applied in the integrated framework of national accounts (e.g., forests not available for wood supply or fish stocks outside of quota regimes), then – following the current SNA – there can be no depletion recorded in the accounts, since there is no economic asset.
26. This treatment arises because the entry point to the balance sheets in the integrated framework of the SNA is the institutional unit rather than the natural resource itself. Put differently, if a future flow of (non-monetary) economic benefits from a particular resource (e.g. forest/fish stock) can be identified, the question is whether this flow of benefits can satisfy the definition of an economic asset, even if the economic unit undertaking the harvesting does not have legal ownership of the resource (which may be owned by government).
27. Related examples might arise in the context of indigenous rights to harvest resources or the presence of common pool resources. The question that arises is whether these would be cases of being able to establish a natural resource value (economic asset) for that group of people as distinct from valuing the rights themselves.
28. If the economic benefits alone (without legal ownership) can establish a balance sheet value, then a range of implications emerge in terms of the balance sheets and related measures of depletion – with each economic unit accessing the resource reflecting a value of future benefits on their balance sheets and recording relevant depletion costs.
29. However, this discussion raises a range of challenges that require further consideration as part of the 2025 SNA Research Agenda, to arrive at a full reconciliation between the entries in the production accounts and the balance sheets, in such a way that where there are economic benefits accruing to the economic unit harvesting the resources (reflected in measures of production and

consumption), changes in the balance sheets of the resources may also need to be considered.

30. It is noted that there are no obvious conventions that might be applied since it cannot be known a priori whether the harvesting of resources is necessarily leading to depletion, taking into consideration that recording depletion costs without corresponding balance sheet entries is not to be recommended.
31. The complementary asset accounts of the SEEA Central Framework, including accounts in physical terms, will also support the discussion of these issues. At the same time, the current text in the SEEA Central Framework does not explicitly consider these issues and it is recommended that they be considered in the SEEA Central Framework revision process that is just commencing.

The accounting for the economic activities of non-resident units making use of quota established for fishing in a country's Exclusive Economic Zone (EEZ)

32. The fourth issue concerns the accounting for economic activities of non-resident units making use of quota established for fishing in a country's Exclusive Economic Zone (EEZ). Concerns about the recording of these fishing rights were raised in the relation to the accounting for depletion in such cases. Even though the issue as such already existed in the 2008 SNA, the accounting for depletion as a cost of production highlights additional complications, amongst others for the recording in the balance of payments, where transactions in the capital account are restricted to capital transfers and acquisitions, less disposals, of non-production non-financial assets.
33. The current guidance on fish resources (paragraphs 27.36 to 27.45) aims to cover a number of different types of arrangements between legal owners of fish stocks within an EEZ (assumed to be general government) and those economic units harvesting fish. Three situations are highlighted, linked to the earlier discussion in chapter 27 (paragraph 27.16 to 27.19) on the ways in which economic units access natural resources:
 1. annual payments of rent to the legal owner;
 2. sale of an asset when quotas are issued in perpetuity;
 3. quotas for a certain period of time (e.g., 5 years).
34. In the first case, while it is not explicit in the current guidance, it is implicitly assumed that the payment of an annual fee implies a resource lease and, following the guidance in paragraph 27.18, the full value of the asset remains on the balance sheet of the legal owner in which case the legal owner incurs the full cost of the depletion. However, the relevant paragraph on fish stocks (paragraph 27.38) further notes that if the resource rent is greater than the value of the rent in a given period then the split asset approach might be applied. In retrospect, this guidance should be refined, in the sense that for the split asset approach to be applied there needs to be a longer term arrangement in which the resource rent and rent is split between legal and economic owner. This basically only arises in the third case above.
35. With this treatment in mind, but now considering that the economic unit harvesting the fish stock is a non-resident unit, then the following treatments could be applied:

- For the first case, with annual payments of rent, there is no economic asset for the non-resident unit and any depletion that arises from the activities of the non-resident unit are costs incurred by the legal owner (government).
- For the second case, if the sale of an asset occurs (and one would imagine that this might be an extreme/very unusual case for non-resident units), then it would seem essential that a notional unit is created, otherwise you would have a non-resident owning national fish stock, which does not seem appropriate.
- In the third case, the split-asset approach applies. Here, one may assume, as a starting point, that the underlying asset, the fishery (fishing area) where the fish is harvested, should be considered a domestic/national economic asset. Hence, it would seem that any partitioning must be between two (or more) domestic economic units. One is the legal owner (government) and the other would be a notional unit.

36. Having said that, under both the second and the third case, the issue arises as to what exactly is to be attributed to the notional unit. If one assumes that the notional unit (owning the underlying economic asset, or part thereof) also undertakes the productive activity of catching fish, this would be aligned with the establishment of branches undertaking economic activity in other countries. Following this approach would involve recording quite a number of transactions in the national accounts and balance of payments that are not currently recorded. For example, the employees of a unit resident in country A with fishing rights in country B would become employees of the notional unit in country B, and any payments by the unit which is resident in country A would need to be recorded as remuneration of employees by the notional unit in country B to the employees in country A (assuming that they are residents of country A). On the other hand, the payment of rents by the unit resident in country A would not constitute international transactions, but a transaction within country B, between the notional unit and the government.

37. While recording all of these various transactions can be envisaged conceptually following standard SNA and BPM principles, there are likely many practical compilation issues to consider, if only because it may require the international exchange of data on the economic activities of the non-resident operators (unless the national statistical office would be able to collect data from the non-resident operator directly).

38. Alternative conceptual framings to describe the economic ownership of the fishery by a non-resident may also be envisaged but these have not been elaborated at this stage, nor has a complete working through of the wider implications for any approach on balancing items, macroeconomic aggregates and related matters.

39. As explained in the above, in the case of short-term arrangements, such as licenses which are short-term, in the sense of being renewable on an annual basis, it is not appropriate to create a notional unit. So, in these cases, following long-standing convention, the production activities would be recorded as being undertaken by non-residents and not recorded in the host country's production accounts. As there is no change of ownership to the underlying asset, there are also no cross-border depletion transactions to record.

40. For longer-term arrangements, the case looks much stronger to create a notional unit, as the activity has more “permanence”. From a conceptual point of view, but contrary to current convention, one could also argue that the production associated with fishing in a country’s EEZ should be included within the national accounts of that country as the production is occurring within the economic territory of that country.
41. All in all, and taking into account the available time, it is not considered possible to arrive at an agreed resolution of this issue, which appropriately balances all of the ins and outs from a conceptual and a practical perspective, and also provides for an adequate consultation process. Therefore, it is proposed to also put this issue on the 2025 SNA Research Agenda. It is also proposed to refer the topic to the SEEA Central Framework revision process for their consideration of potential recording approaches within a SEEA context.

Request to the Advisory Expert Group (AEG) on National Accounts

42. The Advisory Expert Group (AEG) on National Accounts is requested to express its opinion, especially on the following issues:
- Do you agree with the description of the relationship between ecosystem services and the production boundary applied in the integrated framework of national accounts (see paragraphs 3 to 5 of the note, and annex 1 for the concrete editorial suggestions)?
 - Do you agree with referring to “natural resources”, instead of “natural capital”, in the integrated framework of national accounts (see paragraphs 8 to 9 of the note)?
 - Do you agree with the application of the broad definition of “natural resources” in the integrated framework of national accounts (i.e., including cultivated biological resources), and the related change in the definition of “natural resources” (see paragraphs 10 to 16 of the note, and the annexed table)?
 - Do you agree with the separate classification of costs of ownership transfer under the relevant main category of assets (see paragraphs 17 to 18 of the note)?
 - Do you agree with further clarifying the treatment of work-in-progress on biological resources (see paragraphs 19 to 20 of the note)?
 - Do you agree to put the recording of flows involving the harvest of biological resources by units other than the economic owner or where there is no economic ownership on the 2025 SNA Research Agenda (see paragraphs 21 to 31)?
 - Do you agree to put the accounting for the economic activities of non-resident units making use of quota established for fishing in a country’s EEZ on the 2025 SNA Research Agenda (see paragraphs 32 to 41)?
43. Any other feedback or questions in respect of the issues presented in this note are also welcomed.

Table 35.1: Components of four capitals and the links to asset boundaries applied in the integrated framework of the SNA and SEEA

Type of capital	Main components	Links to asset boundaries			
		SNA	SEEA		
Economic capital	Produced non-financial assets (excluding natural resources)	Assets in the integrated framework of national accounts			
	Non-produced non-financial assets (excluding natural resources)				
	Financial assets and liabilities				
Natural capital	Natural resources <ul style="list-style-type: none"> • Land • Mineral and energy resources (renewable and non-renewable) • Biological resources • Water resources • Other natural resources 		Environmental Assets	Individual natural resources*	
	Ecosystem assets			Ecosystem assets	
Human capital					
Social capital					

* Please note that the SEEA excludes the radio spectrum and renewable energy resources.

Annex 1: Proposed changes to relevant paragraphs on the issue of the production boundary and ecosystem services

Current text in Chapter 35 – no changes proposed except for clarifying references to the SNA framework

- 35.15 Third, while some flows associated with each stock are recorded in the sequence of economic accounts, all stocks of capital have additional flows that should be considered in a complete assessment of sustainability. These additional flows lie outside the ~~SNA~~-production boundary applied in the integrated framework of national accounts, and include ecosystem services generated by natural capital (i.e., the contributions of ecosystem assets to the benefits that are used in economic and other human activity (SEEA Ecosystem Accounting, para 2.14)), unpaid household service work (including volunteering contributions), and intrinsic values associated with historic and heritage sites. Recording information about these flows, in particular those beyond the ~~SNA~~-production boundary of the integrated framework, facilitates a wider discussion on sustainability since the implications of policy choices and investment decisions can be considered more holistically.
- 35.28 A further important point of difference between accounting for natural resources and accounting for ecosystem assets lies in the range of benefits which are within scope of measurement. For individual natural resources, for example timber resources, accounting in monetary terms in both the integrated framework of the SNA and the SEEA is limited to recording the contributions of natural resources to benefits that are within scope of the ~~SNA~~-production boundary applied in the integrated framework of national accounts. For example, for timber resources, only the contribution of the trees to the output of the forestry industry is recognized. In effect, for most natural resources other than land, this limits the accounting to recording those products that are harvested or extracted from the environment.
- 35.29 In contrast, when accounting for ecosystem assets a wider measurement scope is applied that recognizes ecosystem services, i.e. the contributions of ecosystem assets (such as a forest), to benefits both within the ~~SNA~~-production boundary (such as timber) and outside the ~~SNA~~-production boundary applied in the integrated framework of national accounts, recognizing that the scope of measurement may change over time as institutional contexts change, for example through the development of environmental markets or payments for ecosystem services schemes. To facilitate this recording, in ecosystem accounting the contributions of ecosystem assets are separately recorded as flows of ecosystem services, whereas in the standard sequence of economic integrated framework of the SNA-accounts the contributions of natural capital to the production of goods and services SNA-products are implicit in measures of gross operating surplus. The use of a broader scope of benefits and the explicit recording of ecosystem services permits the recognition of a range of contributions from natural capital, including among other things, air filtration services, flood mitigation services, coastal protection services, global climate regulation services, water purification services and recreation-related services. A more complete introduction to ecosystem accounting is provided in section C below.
- 35.30 Overall, the combination of natural resources and ecosystem assets provides for the comprehensive measurement of the stock of natural capital. However, given the overlapping scope of these two components, careful partitioning of monetary values is required if there is a requirement for aggregation so that there is no double counting.
- 35.61 For some types of land, in particular agricultural land, forest land and urban areas, all of which are in scope of ecosystem accounting, there will be an overlap between the monetary value of ecosystem assets and the value of the land recorded in the ~~SNA~~-balance sheets of the integrated framework of the SNA. This overlap arises because the ecosystem services generated by those areas include some services which contribute to economic benefits for the owners of the land. For example, the value of agricultural land will be linked to the supply of crop provisioning services. Consequently, care needs to be taken in integrating measures of ecosystem asset

values in monetary terms with the value of land and other assets in the SNA balance sheet. A discussion on this topic is presented in SEEA Ecosystem Accounting, Chapter 11.

In Chapter 1

- 1.66 These examples show that many activities or processes that may be of benefit to institutional units, both as producers and consumers, are not processes of production in an economic sense. For example, rainfall and other ecosystem services such as pollination may be vital to the agricultural production of a country but they are not processes of production whose output is explicitly recorded and can be included in GDP notwithstanding the fact that the outputs to which these processes contribute, such as crops, are recorded in GDP. Similarly, a range of ecosystem services that do not produce any direct monetary benefit are excluded. However, As explained in chapter 34-35 Measuring the sustainability of well-being, the compilation of complementary accounts covering ecosystem services according to the System of Environmental-Economic Accounting (SEEA) Ecosystem Accounting 2021 is encouraged.

In Chapter 2

- 2.51 The potential to describe a coherent set of accounts and tables sequence of economic accounts arises from the application of a single production boundary and a single asset boundary across the various accounts. The boundaries are defined and applied through chapters 4-20. One key outcome from the use of these boundaries is that there is a coherence across measures of income, consumption, accumulation and wealth. At the same time, the consistent application of production and asset boundaries means that there is a number of elements relevant to measurement of well-being and sustainability that are excluded from the measures within the integrated framework of national sequence of economic accounts. For example, unpaid household service work and ecosystem services are both excluded from the production boundary of the integrated framework of national accounts SNA and hence the full benefits of these flows are not recorded/captured in measures of national income or wealth. Thus, as explained in the earlier sections, a more complete basis for the measurement of well-being and sustainability requires consideration of areas outside the SNA's standard boundaries applied in the integrated framework of national accounts.
- 2.85 In relation to environmental assets, to cover the breadth of stocks and flows, the SEEA's measurement boundary is broader than the one applied in the integrated framework of the SNA's. In the SEEA Central Framework the extension is made to include within scope all environmental assets in non-monetary terms whether or not they have an exchange value within scope of the integrated framework of the SNA sequence of economic accounts. Thus, for example, the area of land without an exchange value is included within the scope of the land accounts of the SEEA Central Framework. The SEEA Ecosystem Accounting places direct focus on the measurement of ecosystems and the services they supply. It extends the measurement-asset boundary for environmental assets relative to the coverage of the SNA economic assets in the integrated framework of national accounts by including all ecosystems within a country and extends the production boundary by recording flows of ecosystem services between ecosystems and economic units.
- 2.87 The SEEA Ecosystem Accounting framework presents standards and recommendations for the measurement and analysis of ecosystem stocks and flows. Accounting for ecosystem assets and the services they generate is crucially important for reflecting the importance of natural capital to a fuller extent and hence providing more complete measures of well-being and sustainability. In accounting for stocks, ecosystem accounting incorporates measurement of both the extent (size) and composition of ecosystem types and the condition (or health) of ecosystems. In accounting for flows, ecosystem accounting provides a framework for recording flows of ecosystem services such as biomass provisioning, air filtration, water purification, coastal protection, pollination and recreation related services that collectively contribute to human

material well-being, either as inputs to the production of market goods and services or in providing additional non-market benefits (e.g., health). The SEEA Ecosystem Accounting thus recognizes stocks and flows that are outside the SNA's production and asset boundaries applied in the integrated framework of national accounts, and presents an associated sequence of accounts.

In Chapter 11

- 11.179 Natural resources are assets that naturally occur, such as land, water resources, timber and fish stocks, and mineral and energy resources that have an economic value and over which ownership may be enforced and transferred. Environmental assets over which ownership rights have not, or cannot, be enforced, such as open seas or air, are excluded. (~~s~~See below for a more detailed discussion). In monetary terms, the asset boundaries of the SEEA 2012 Central Framework and the integrated framework of national accounts are the same. In physical terms, the asset boundary of the SEEA 2012 Central Framework is broader and includes all natural resources and areas of land of an economic territory that may provide resources and space for use in economic activity. Thus, the scope in physical terms is not limited to those assets with economic value.²
- 11.180 Ecosystem assets are contiguous spaces of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions, from which benefits can be derived that are used in economic and other human activity. Ecosystem assets are not explicitly recognised as economic assets ~~recognised~~ in the integrated framework system of national accounts, ~~mainly because no monetary benefits can be derived from them.~~ However, part of the value of some ecosystem assets will ~~An exception may be related to certain provisioning types of services which result in monetary benefits and as such may~~ be implicitly included in the value of some natural resources, ~~particularly such as~~ agricultural land ~~and~~ ~~or~~ forest land, since the economic value of the provisioning services and other ecosystem services supplied by these ecosystem assets will also be reflected in the values of the natural resources. The recording of data about ~~Ecosystem assets~~ and the services they supply is ~~are~~ at the heart of SEEA Ecosystem Accounting.

In Chapter 34

- 34.2 As introduced in Chapter 2, there are four aspects of most relevance in framing the measurement of well-being. First, the goods and services consumed by people as recorded in measures of household actual final consumption (i.e., the sum of household final consumption expenditure and social transfers in kind)³, including the consumption of goods produced for own-use and from the informal economy. Second, the goods and services consumed by people that are outside the scope of the SNA production boundary applied in the integrated framework of national accounts. These will include unpaid household service work, ecosystem services sourced from the environment, and the connections and relationships people hold with each other. Third, people's functioning and capabilities – i.e., the freedom and possibilities they have to satisfy their needs. Fourth, the distribution of well-being across different groups within the population.
- 34.4 The second column focuses on those aspects of material well-being whose measurement incorporates extended accounting treatments using data from outside the integrated framework of the SNA sequence of economic accounts, but which often have direct connections to data within the integrated framework sequence of economic accounts. These aspects include unpaid

² This paragraph will also need to be changed, if the proposals of this issue note on the framing of natural resources are endorsed.

³ The text between brackets was originally included in a foot-note. As the SNA typically does not make use of foot-notes, it has been transferred to the main text.

household service work and ecosystem services.

- 34.73 Also outside of the general production boundary, households benefit from a wide range of ecosystem services. Following the SEEA Ecosystem Accounting ~~(SEEA EA)~~, *ecosystem services are the contributions of ecosystems to the benefits that are used in economic and other human activity*. Examples of ecosystem services of benefit to households include provisioning services from agricultural and forest land that are embodied in crops, livestock and timber products that are ultimately consumed by households; cultural services from, for example national parks and rivers, that provide such as those related to recreational opportunities and amenity values; and regulating and maintenance services such as air filtration, water regulation and purification, flood mitigation, soil erosion control, noise attenuation and global climate regulation that contribute to a range of benefits including health.