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Definition and classification of assets in the revised SEEA
A proposal

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[1] The paper represents the views of the authors and not those of the United Nations.

DEFINITION AND CLASSIFICATION OF ASSETS IN THE REVISED SEEA A PROPOSAL

Issue paper

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A. Introduction

1. The higher order questions that have to be addressed when discussing the topic of the asset classification are the following: Is the SEEA a satellite system of the SNA? Or is it a system in its own right? What sets the SEEA apart from the SNA? These questions are fundamental regardless of what the conclusion and the actual structure of the classification may look like in Volume 1 of the revised SEEA

2. The SNA represent the system approach for economic statistics providing information on the state of the economy. Is the SEEA a simple extension and complement to the SEEA – a satellite of the SNA that expands the flow accounts and the asset boundary of the SNA? or is it a system in its own right - the system approach for the environment providing information on the state and quality of the environment?

3. These questions came about as a result of increasing demands from the policy makers for high quality statistics on the environment. The main questions have to do with whether the quality of the environment and health of the ecosystems are such that they can support their rendering of services. These services are not only provisioning services, that is serving as source for natural resources and raw materials but also other types of services such as flood protection, carbon sequestration, cleansing of the air and water, etc. Obviously the quality and health of the ecosystems depend on the interactions with other ecosystems as well as other systems including the economy.

4. This is not to imply that questions on the economic impacts and responses are no longer on the agenda of policy makers but that the perspective in which they should be analysed is different. There is a need for a holistic approach to the environment which looks at the state of the environment and its changes as a result with the interactions with other systems. The point of the departure is not the economy but the environment.

5. We believe that the SEEA is a system in its own right having distinctive features from the SNA. Its strength is to use the rigour and integration of the economic statistics to a field that has developed in an ad-hoc fashion to answer specific policy questions. Until present the SEEA has been portrayed as an

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information system to show the interaction between the economy and the environment. This is only one aspect of the policy which SEEA can inform. The asset accounts are an integral part of the system and their features should be portrayed more prominently in the system. We believe that it is important that the SEEA embraces more firmly the ecosystem approach. This point should be made clear in Chapter 1 and 2 of the SEEA and reiterated throughout the document.

6. A question which then follows from the above considerations is whether we should maintain the current name "System for Environmental-Economic Accounting" or drop one of the "E's" and rename it as the "System for Environmental Accounting".

7. The asset classification and the asset accounts describe the state of the environment and the changes which come about from other subsystems of the environment and the economy. They are much closer to the information systems of the scientific community than to the statistical community. For example, the asset accounts, allow for the derivation of water balances. The flow accounts (physical supply and use table) on the other hand are closer to the statistics and in particular the economic statistics way of measurement. The strength of the SEEA is to be able to combine the flow accounts with the asset accounts in a system approach. This approach brings within its remit the scientific and statistical community. It provides the policy makers with a system approach to measure the state and the changes in state of the environment.

8. The objectives of this paper are to present proposals for a definition of an asset and a classification of assets for the revised SEEA, Volume 1. The paper builds on a previous paper which was discussed at the London Group meeting in Rome and elaborates on on-going discussions on coverage and presentation/communication of statistics derived from the SEEA.

B. Economic or environmental perspective?

9. The revision of the SEEA presents an opportunity to re-discuss the definition of assets and the classification of asset in relation to the increasing demand from the users' community and also in relation with the SNA-2008. Before embarking into a detailed discussion of the items in the classifications, it is worth recalling some of the basic principles of the SEEA and raise some important issues which will determine the structure, format and coverage of the asset classification.

10. The SEEA-2003 presents a limited view of what the SEEA can actually measure. It reads: the SEEA an information system to measure the interactions between the economy and the environment in terms of impacts of the economy on the environment and the contribution of the economy to the environment (SEEA-2003, Chapter 1). In reality the scope of the SEEA is broader as it allows to measure the state and changes in state of the environment.

11. The SEEA consists of physical and monetary flow accounts, physical and monetary asset accounts. Physical flow accounts include flows from the environment to the economy describing the impacts of the economy on the environment through extraction of raw material (provision of raw material); flows within the economy describing the reuse of materials within the economy; and flows back to the environment describing the release of emissions and waste back to the environment (sink functions provided by the environment). Monetary accounts measure the response of the economy to reduce or control such pressures (extraction and release of waste) on the environment through economic instruments such as taxes, subsidies and permits. The hybrid accounts bring together the physical accounts with the monetary accounts and allow to derivation of resource productivity/intensity indicators.

12. The asset accounts present the state of the environment. They describe the natural capital consisting of natural resources including land and ecosystems. The asset accounts describe not only the stock of natural capital at the beginning of the accounting periods but all the changes in stock due to the economy (e.g. extraction of resources used as input in production) or natural causes (e.g. natural growth and death, etc.).

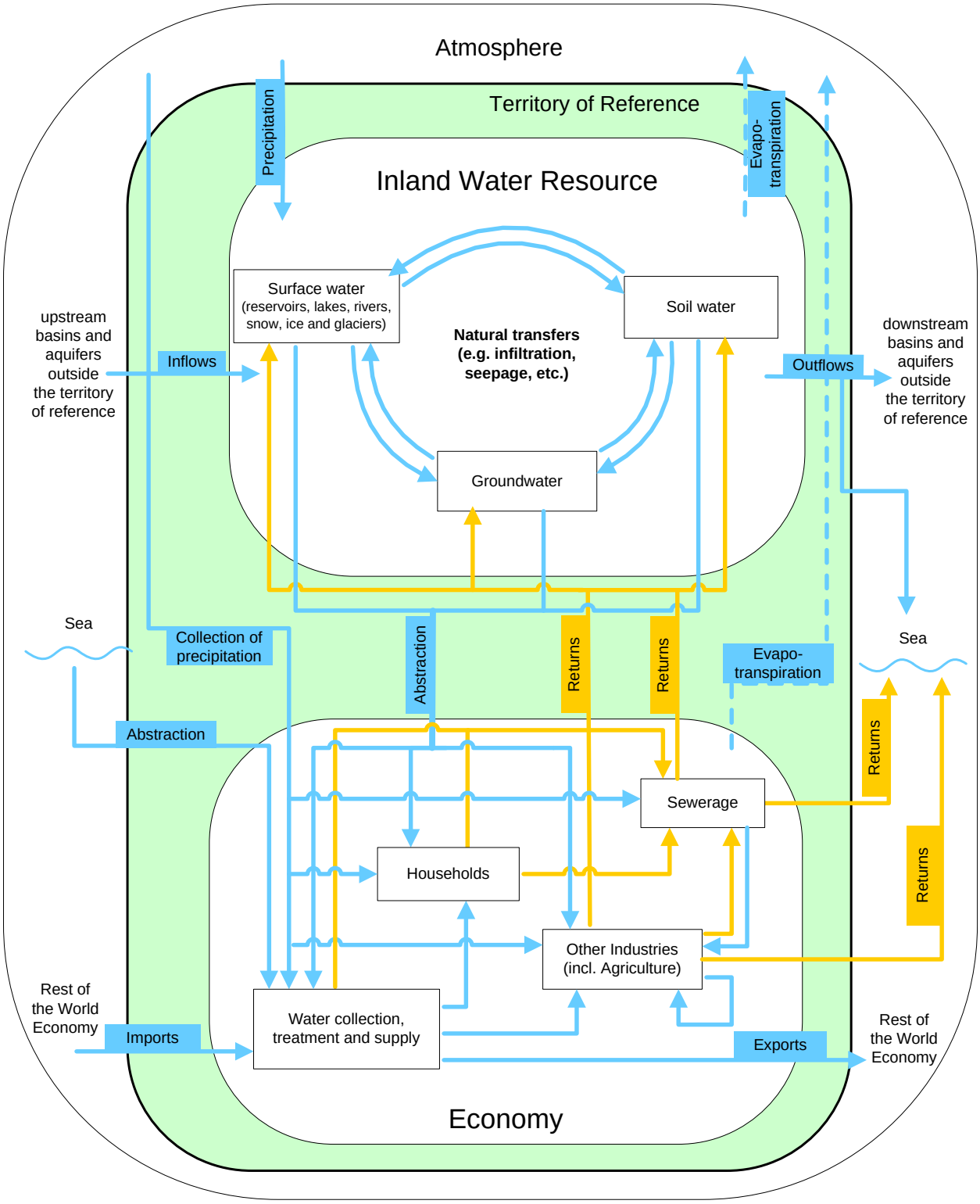
13. The approach taken in the flow accounts is clearly to take the economy as the system of reference and measure those flows for which the economy interacts with the environment. Figure 1 from the SEEA-Water is a very clear example of the scope of the flow accounts. All flows that link the economy to the environment (abstraction, or returns of water, emissions of pollutants added to water, etc.) find their place in the physical supply and use tables. Similarly, all flows within the economy are included in the physical and monetary accounts.

14. In the SEEA-Water, the asset accounts cover all water in the inland water system, that is surface and ground water and soil water. The asset boundary could in principle easily be extended to include ocean and atmosphere, and the flows within the hydrological system that is those flows that take place within the atmosphere and oceans as well as between the subsystems. The SEEA-Water defines the asset boundary of the environment in a narrow sense that is only covering inland water (surface water, ground water and soil water) and the flows within inland water (inflows and outflows to the sea and downstream territories, infiltration to groundwater, etc.). The reason for adopting the narrow presentation is not conceptual but rather practical considering that official statistics do not measure the variables related to the broader boundary.

15. As illustrated in the case of water, while the flow accounts describe the exchanges between the economy and the environment, the asset accounts describe the state of the environment and the exchanges between the environment and the economy and within the environment itself. The asset accounts measure the capacity of the ecosystems to render services such as provisioning services (e.g.

16. While in the flow accounts the SEEA takes the economy as the system of reference and looks at how the economy interacts with the environment, in the asset accounts the SEEA takes the environment as the system of reference and tries to explain the changes in the state of the environment as a result of human intervention as well as natural conditions.

Figure 1. Main flows within the inland water system and the economy

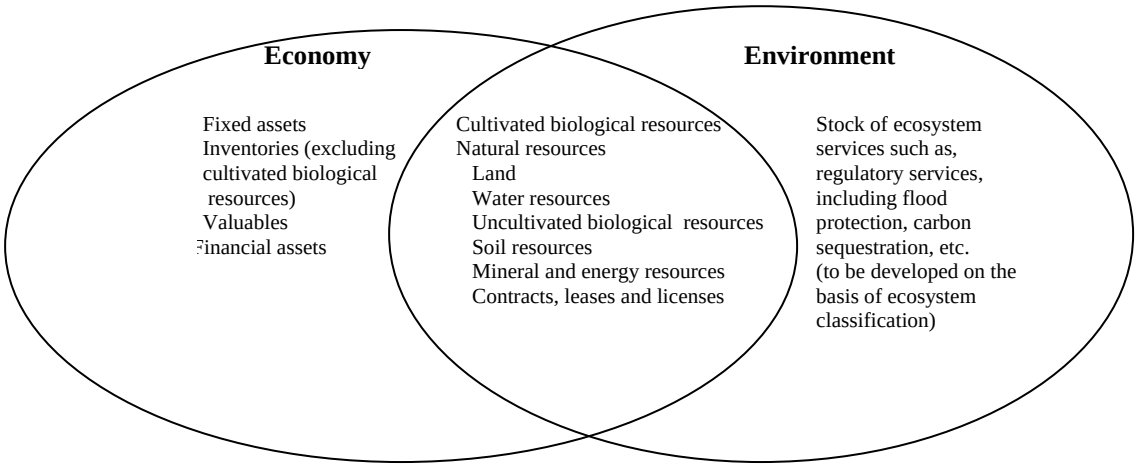


17. The asset accounts offer a total change in perspective from the flow accounts which also seem to meet different policy demands. Traditionally, the flow accounts are more appealing to economists and environmental economists in finance ministries. Conversely, the asset accounts are more appealing to the scientific community by providing a description of the state and quality of the environment and its functions and services. They try to organize the scientific information in a format which can be linked to the economic analysis. The strength of the SEEA is to be able to include in a common system for the environment information which is informs on the state of the environment and health of the ecosystems appealing to the two groups using common terminology and a common framework.

1. Implications for the asset classification

18. The change in perspective in the asset classification implies also a different look at the classification of assets. The question is: are we expanding the asset boundary of the SNA to take into account assets in the environment not included in the SNA? or are we considering assets in the environment and then analyze whether they also are also within the SNA asset boundary? The answer to this question affects the structure of the classification but not its coverage. In both cases in principle all assets within the environment are within the scope of the SEEA. The Figure below attempts to illustrate the situation.

Figure 2. Schematic presentation of the coverage of the classification



19. Figure 2 shows clearly that there are assets that belong to both the economy and the environment. The assets in the intersection cover mostly the provisioning services including provision of space and sink in the Millennium Ecosystem Assessment terminology. The asset classification can organize the above items that are exclusively in the environment or that belong to the intersection either expanding the SNA asset classification or starting from a classification of

ecosystems and ensuring a bridge with the items in the intersection included in the SNA.

20. Table 1 below, attempts to show the two different presentations in the case of forest: one is showing the economy as the system of reference, the other is showing the environment as the system of reference. Both presentations have exactly the same coverage, but the structure and hierarchy of the classification differ substantially.

Table 1. Asset classification in the environment or in the economy – same coverage, different structure

Economy	**Environment**
Cultivated biological resources	Ecosystems
Timber resources	Terrestrial
Natural resources	Forest
Land	Forest land
Forest land	Timber resources (from cultivated and uncultivated forests)
Uncultivated biological resources	Other services
Timber resources	
Ecosystems	
Forest	
Other services	

21. In the first column the items are presented following the SNA asset classification structure. Note that although the structure of the classification is the same the coverage as the SNA, the coverage is broader because it covers a broader set of benefits than economic benefits. In the second column items are presented following an ecosystem approach with ecosystems providing services to the including natural resources and raw materials as well as other services.

22. At this stage there is no agreed classification of ecosystems. Although it would have been advisable to start from the ecosystems to develop the classification of assets to respond to increasing policy demands, this is not feasible because of practical reasons. The SEEA standard should feature a single presentation in particular considering that the items in the classification will need to be coded and each item should receive only one code. Volume 2 and Volume 3 can discuss this issue further. In particular Volume 2 could present an alternative presentation starting from the ecosystems and Volume 3 could present how to link the ecosystems to the driver, pressure, state response model or any of its variants as a way to communicate the statistics generated from the accounts.

Q1: <u>Do you agree that the classification of assets presented in Volume 1 should take follow the structure of the classification of assets in the 2008 SNA as a point of departure?</u>

2. Implications for the monetary valuation of assets

23. The assets that belong to the intersection between the economy and the environment can be valued either following the SNA market valuation principles or more broadly different valuation principles which will have to be used when valuing purely environmental assets (those assets not at the intersection).

24. In general, the assets at the intersection of the Venn diagram in Figure 1 are valued using the SNA principle. Outstanding issues remain with regard to the valuation of permits and in particular emission permits and permits to use the resources as material inputs or as sink. The question is whether the valuation should reflect the extended asset boundary of the SEEA and thus recording the flows not as taxes but more as rents or to maintain full consistency with the SNA. This topic is addressed in a separate agenda item.

C. Definition of an asset in the 1993 SNA, 2008 SNA and proposal for the revised SEEA

1. Definition of an asset in the 1993 SNA

25. The 1993 SNA defines economic assets, the assets recorded in the balance sheets of the System, as entities:

(a) Over which ownership rights are enforced by institutional units, individually or collectively; and

(b) From which economic benefits may be derived by their owners by holding them, or using them, over a period of time. (1993SNA para 10.2)

26. Assets do not necessarily have to be owned by individual units and may be owned collectively by groups of units or governments on behalf of the communities. In addition there may be others that cannot be treated as economic assets because they do not actually belong to any particular units. These include not only those whose existence is unknown but also those including uncultivated forests, that may be known to exist but remain so remote or inaccessible that in practice they are not under the effective control of any units. (1993SNA para.10.10)

27. In order to comply with the general definition of an economic asset, natural assets must not only be owned but capable of bringing economic benefits to their owners, given the technology, scientific knowledge, economic infrastructure, available resources and set of relative prices prevailing on the dates to which the balance sheet relates or expected in the near future. (1993SNA para.10.11)

2. Definition of an asset in the 2008 SNA

28. It is useful to recall some basic concepts on the definition of assets in the 2008 SNA that are relevant for the SEEA. The 2008 SNA defines an asset as follows:

> *An asset is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of transferring value from one accounting period to another.* (2008 SNA, para 3.30).

29. An *economic benefit* is defined as denoting a gain or positive utility arising from an action. It implies a comparison between two states. This can be elaborated within the SNA so that benefits are seen as rewards for providing services, such as those of labour and capital to production and also the means of acquiring goods and services for production, consumption or accumulation in the current period or in future periods. (2008 SNA para 3.19) Sometimes the immediate benefit is in terms of goods and services directly, for example own account production or wages and salaries in kind. More often a benefit is in the form of the medium of exchange (money), for example as wages and salaries. Consumption is an activity that takes place in the current period only but may be financed from past benefits. Production and accumulation also involve benefits postponed to future periods. Thus, means of allowing benefits to be moved from one accounting period to another have to be recognized. These take the form of assets and liabilities where a benefit in one period is converted to a benefit in one or more future periods. (SNA 2008 para 3.20)

30. The *value* in the definition represents the market's view of the total of the benefits embodied by the asset and it is represented by a monetary value (modified from SNA 2008, para 3.38).

31. Two types of *ownership* can be distinguished, legal ownership and economic ownership.

> *The legal owner of entities such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled in law and sustainable under the law to claim the benefits associated with the entities.* (2008 SNA para 3.21)

> *The economic owner of an entity such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled to claim the benefits associated with the use of entity in the course of an economic activity by virtue of accepting the associated risks.* (2008 SNA para 3.26)

32. The definition of an asset in the 2008 SNA has become broader than the 1993 SNA. It also clarifies what is intended with benefits.

3. Definition of an asset in SEEA-2003

33. The asset boundary in the SEEA-2003 applies to environmental assets, which are defined in terms of the provision of environmental functions. Environmental functions are the uses to which the physical surroundings are put for economic ends (SEEA-2003 para 7.31). These environmental functions yield benefits to the

economy. Those benefits can be grouped into two categories use and non-use benefits (SEEA-2003 para 7.35). Economic benefits are a small portion of those benefits and are included in "direct use benefits". The inclusion of benefits such as option and bequest benefits broadens the scope of the SEEA asset boundary to include all land and natural resources and ecosystems (SEEA-2003 para 7.35-7.39).

34. The definition of environmental assets in the SEEA-2003 is presented in terms of the description of the functions the assets provide. It runs over several paragraphs making it difficult to have a clear cut definition.

35. The definition of an asset in the SEEA-2003 relates closely to the definition of an asset in the 2008 SNA. The type of benefits that can be derived from the asset are broader than economic benefits and include also use and non-use benefits.

4. Definition of an asset in the revised SEEA – A proposal

36. The definition of an asset in the SEEA-2003 needs to be tightened and linked to the benefits that the asset may provide. The definition of asset in the 2008 SNA could be used as the starting point to broaden the scope of the definition. We would suggest the following:

> ***An asset is a store of value representing a benefit or series of benefits accruing to the owner.***

37. *Value* is intended in the broad sense of providing services[3]. Some of these services may be market based (e.g. provision services of goods) and have a monetary value and some may not (e.g. regulatory services, cultural and aesthetic services, etc.).

38. *Benefits* represent the rewards for providing services such as provision of habitat to biodiversity, flood protection etc. in addition to those covered in the SNA of for example labour and capital for production, consumption and accumulation. The benefits are linked to the functions that environmental assets provide and can be represented in terms of the use and non-use benefits now or in the future provided by the assets. This should be elaborated as part of the development on the ecosystem classification.

Q2: <u>Do you agree with the proposed definition of asset in the revised SEEA?</u>

Q3: <u>Do you agree with the explanation of what is intended with value and benefits in paras 37 and 38 respectively?</u>

[3] Services here is used to include both goods and services as used in the Millennium Ecosystem Assessment terminology. Provision services usually cover goods.

C. From the 1993 SNA to the 2008 SNA to revised SEEA classification of assets – Main changes relevant for the revision of the SEEA

39. The main changes in the classification of assets in the 2008 SNA, relevant to the SEEA include the following:

(a) Replacing the term “tangible non-produced assets” with “natural resources”;

(b) Split the old category “intangible non-produced assets” into "Contracts, leases and licences" and "Goodwill and marketing assets”. The first category is of relevance to the SEEA. The SEEA will have to be amended to follow the 2008 SNA. The relevant text in the 2008 SNA may have to be elaborated to discuss the various cases for specific natural resources;

(c) Land improvements are treated as a creation of a new fixed asset and not regarded as giving rise to an increase in the value of the natural resource. This is a major change as compared to the 1993 SNA, where land improvements were recorded as capital formation to the non-produced asset “land”. The SEEA-2003 followed the 1993 SNA. The revised SEEA should be updated to follow the 2008 SNA;

(d) Costs of ownership transfer on land are recorded as a part of land improvement, that is part of a produced asset. For all other natural resources other than land, the value of the natural resources in the balance sheet includes the value of the costs of ownership transfer. This asymmetry is not conceptually correct but may not be significant.

(e) The item "mineral exploration" has been modified to "mineral exploration and evaluation" to emphasize that the coverage (and probably data source) is aligned with that of the international accounting standards.

Q4: <u>Do you agree that the revised SEEA asset classification should align with the changes above in the 2008 SNA (para 34 (a) – (e)?</u>

Q5: <u>Is there a need to rectify the asymmetry in recording the costs of ownership transfer on non-produced assets other than land as part of produced assets and thus diverging from the SNA (para 34 (d))?</u>

D. Definition and classifications of land and natural resources

1. Definition of natural resources in 2008 SNA

40. The 2008 SNA defines natural resources as follows:

Natural resources consist of naturally occurring assets such as land, water resources, uncultivated forests and deposits of minerals that have an economic value. (2008 SNA, para 10.15).

41. In the 2008 SNA Land is included as part of natural resources.

2. Definition of natural resources and land in the SEEA-2003

42. The SEEA-2003 defined natural resources as follows:

> *Natural resource assets are defined as those elements of the environment that provide use used in economic activity (or that may provide such benefits one day) and that are subject primarily to quantitative depletion through human use. They are sub-divided into four categories: mineral and energy resources, soil resources, water resources and biological resources.* (SEEA 2003, para 7.42)

> *Land and surface water assets are defined as the areas within the national territory that provide direct or indirect use benefits (or that may provide such benefits one day) through the provision of space for economic and non-economic (for example recreational) human activities. .* (SEEA 2003, para 7.61)

43. The definitions of natural resources are different between the 2008 SNA and the SEEA-2003, hence the difference in the hierarchy of classifications in the two systems. The two main differences:

(a) In the 2008 SNA land is included as part of natural resources. In the SEEA 2003 land is considered separately as a provider of space.

(b) The SNA considers only naturally occurring assets as natural resources. The SEEA-2003 instead considers all materials whether they are the result of a production or a natural process as part of natural resources.

44. Table 2 presents an example of the different presentation in the 2008 SNA and the SEEA-2003. The 2008 SNA groups items according to whether they are the result of a production process or a natural process and according to whether they are used more than once in the production process. This also involves different valuations. The SEEA-2003 groups items according to the resource and further subdivides them on whether they are produced or non-produced.

Table 2. Presentation of cultivated and uncultivated biological resources n the 2008 SNA and the SEEA -2003

2008 SNA*	SEEA-2003
Produced assets	Biological resources
Fixed assets	Timber resources
Cultivated biological resources	Cultivated
Animal resources yielding repeat products	Non-cultivated
Tree, crop and plant resources yielding	Crop and plant resources other than timber

repeat products Inventories Work in progress Work in progress on cultivated biological resources Non-produced assets Natural resources Non-cultivated biological resources	Cultivated Yielding repeat products Yielding one-time harvests Non-cultivated Aquatic resources Cultivated Non cultivated Animal resources Cultivated Non cultivated

* Elaborated from the 2008 SNA asset classification

3 Proposal for the definition of natural resources, including land in the revised SEEA

45. When doing a search of a definition of natural resources, there seems to be a broad range of definitions ranging from the broadest, that is including aesthetic, bequest and recreational services much beyond space and provision of raw materials (USGS), to the narrowest (only provision of spaces as it is in the SEEA-2003).

46. Given the above consideration, in the context of the revised SEEA, it may be useful to maintain consistency with the 2008 SNA and the hierarchy of its classification. A proposed definition of natural resources in the revised SEEA that would align natural resources within the SNA with the revised SEEA is the following:

> ***Natural resources consist of naturally occurring assets such as land, mineral and energy resources, soil resources, water resources and uncultivated biological resources that can be primarily used for economic activities now or in the future by the owner.***

47. Note that the above definition is broader than the SNA definition of asset in the sense that it includes also those natural resources that may be exploited in the future that is that provide option benefits. As discussed earlier the broadening of the definition of assets is linked with the broad definition of benefits.

Q6: Do you agree with including land as part of natural resources (with a changed definition)?

Q7: What is your opinion on maintaining the distinction between produced and non-produced assets in the presentation of the asset classification, that is maintaining the hierarchy of the classification as in the 2008 SNA?

Q8: Do you agree with the proposed definition of natural resources?

E. Recommendations on specific items in the classification

1. Land

48. The 2008 SNA introduces a major change with respect of the treatment of land. In principle, the value of land to be shown s in the balance sheet is the value of land excluding the value of improvements, which are shown separately under fixed assets, and excluding the value of buildings on the land which are also to be shown separately under fixed assets (2008 SNA para13.44).

49. When the value of land cannot be separated from the building, structure, or plantation, vineyard, etc. above it, the composite asset should be classified in the category representing the greater part of its value. Similarly, if the value of the land improvements (which include site clearance, preparation for the erection of buildings or planting of crops and costs of ownership transfer) cannot be separated from the value of land in its natural state, the value of the land may be allocated to one category or the other depending on which is assumed to represent the greater part of the value. (2008 SNA para 13.46).

50. De facto this implies that land is split into two: with one part recorded as land improvements under the category fixed asset and the other part as natural land recorded as a natural resources under non-produced assets.

51. The 2008 SNA defines land as follows:

> *Land consists of the ground, including the soil covering and any associated surface waters, over which ownership rights are enforced and from which economic benefits can be derived be their owners by holding or using them.* (2008 SNA para 10.163)

52. The 2008 SNA does not specify a disaggregation of land, but it recommends that if a disaggregation is required, it should be according to that used in the SEEA-2003 (2008 SNA para 10.178):

53. The SEEA-2003 defined land as follows:

> *Land and surface water assets are defined as the areas within the national territory that provide direct or indirect use benefits (or that may provide such benefits one day) through the provision of space for economic and non-economic (for example recreational) human activities.* (SEEA-2003 para 7.61)

54. Land and surface water assets are sub-divided into five categories: land underlying buildings and structures; agricultural land and associated surface water; wooded land and associated surface water; major water bodies; and other land.

55. The definition of land as well as a disaggregation of land would result from the discussion on the classification of land cover/land use.

56. At the London Group meeting in New York it was agreed to remove the category "*of which recreational land*" as a disaggregation of the land in the revised SEEA-2003.

Q9: <u>Do you agree to revisit the definition and breakdown of the land classification to ensure it is aligned with the SEEA classification of assets?</u>

2. Soil resources

57. The 2008 SNA, explicitly mentions soil in the definition of land. The value of the soil is in fact intrinsic to the value of the land.

58. The SEEA-2003 asset classification identifies soil as a separate item. It is defined as follows:

> *Soil resources include soil found on agricultural land as well as that found elsewhere within the national territory.*

59. Soil provides important services including for example nutrients and sequestration of carbon. It is subject to degradation (loss in quality) depending on agricultural or other industrial practices and depletion (loss in quantity) when topsoil is lost.

Q10: <u>Should soil be maintained as a separate item in the asset classification (Volume 1) or should it combined with land? Should it appear as part of the ecosystem classification?</u>

Q11: <u>If soil is combined with land, will it appear explicitly as an item in the classification or only included in the definition?</u>

3. Mineral and energy resources.

60. In the 1993 SNA, the terminology used subsoil assets. They are defined as:

> *Subsoil assets are proven reserves of mineral deposits located on or below the earth's surface that are economically exploitable given current technology and relative prices. Mine shafts, wells and other extraction sites are included with structures rather than with the subsoil asset.* (1993 SNA, para. 13.59)

61. In the 2008 SNA definition of mineral and energy resources are defined as follows:

> *Mineral and energy resources consist of mineral and energy reserves located on or below the earth's surface that are economically exploitable, given current technology and relative prices.* (2008 SNA para 10.179)

62. Although the 2008 SNA has aligned the terminology to that of the SEEA-2003 and no longer uses “proven reserves”, it did not change the text with regard to the explanatory text.

63. The 2008 SNA does not recommend a disaggreagation of the classification and it recommends to follow that in the SEEA. (2008 SNA para 10.181)

64. The SEEA-2003 defined mineral and energy resources as follows:

> *Mineral and energy resources include subsoil deposits of fossil fuels, metallic minerals and non-metallic minerals.*

65. In the SEEA, these include not only the proven reserves (which are equivalent to the .subsoil assets. category AN.212 of the 1993 SNA) but also probable, possible and speculative resources.

66. The SEEA-Energy defines energy resources as known (subsoil) deposits of energy resources such as coal, oil, natural gas and uranium ore. The SEEA-Energy asset boundary with respect to mineral and energy resources is broader than the SNA. While the 2008 SNA includes only those resources that have an economic value, the SEEA-Energy includes all known deposits, even those parts of the resources that have no present economic value but might obtain a value in the future, or bring in other ways benefits in the form of non-market value to the owner. (SEEA-Energy, para 3.1)

67. To align the definition of mineral and energy resources to the general definition of natural resources, we would suggest the following definition:

> ***Mineral and energy resources include known deposits of mineral and energy resources such as petroleum resources, non-metallic minerals and metallic minerals that can be primarily used for economic activity no or in the future by the owner.***

68. Further discussion during the preparation of the SEEA-Energy has led to consider the breakdown of the classification of mineral and energy resources presented in Table 3. The aggregation of mineral and energy resources is different from the classification in the SEEA-2003.

69. This is because the SEEA-2003 seems to be inconsistent for example coal is both a fossil fuel and a non-metallic mineral. The distinction between petroleum resources and minerals is useful and is in line with the United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC). The classification needs to undergo further review with the energy statistics experts to ensure that the hierarchy and coverage is correct and it is consistent with the Standard Classification of Energy Products being developed by the Oslo Group.

Table 3. Classification of mineral and energy resources (SEEA-Energy)

EA.1	Natural resources

	EA.11	Mineral and energy resources		
		EA.111	Petroleum resources	
			EA.111.1	Natural gas (including NGL and condensate)
			EA.111.2	Crude Oil
			EA.111.3	Natural bitumen, extra heavy oil, shale oil , sand oil and others n.e.c.
		EA.112	Non-metallic minerals and solid fossil energy resources	
			EA.112.1	Non-metallic minerals except for coal and peat
			EA.112.2	Coal
			EA.112.3	Peat
		EA.113	Metallic minerals	
			EA.113.1	Uranium ores
			EA.113.2	Other metallic minerals

Source: Table 3.1 SEEA-Energy.

70. The SEEA-Energy does not include renewable energy resources, such as wind, solar and wave-energy in the natural resource classification. Similarly, firewood in forests and other types of biomass are not included explicitly as energy resources. However, both cultivated and non-cultivated timber resources, and other crop and plant resources are included as Biological Resources in the classification of natural resources. Further, waste and renewables, as well as heat and electricity produced from renewable energy resources, are included as energy products in the flow accounts (SEEA-Energy para 3.7).

Q12: <u>Do you agree with the proposed definition of mineral and energy resources?</u>

Q13: <u>Do you agree with the proposed breakdown of the classification of mineral and energy resources in the SEEA-Energy (Table 3)?</u>

4. Biological resources

71. Non-cultivated biological resources are defined in the 2008 SNA as:

> *Non-cultivated biological resources consist of animals, birds, fish and plants that yield both once-only and repeat products over which ownership rights are enforced but for which natural growth and regeneration is not under the direct control, responsibility and management of institutional units.* (2008 SNA para 10.182)

72. In the SEEA, this category is further split into aquatic resources, animal resources other than aquatic resources, tree, crop and plant resources. Aquatic resources is further split into aquatic resources in national waters including the exclusive economic zone (EEZ) and those in the high seas. (2008 SNA para 183)

73. We would suggest the following definition for the revised SEEA:

> ***Non-cultivated biological resources consist of animals, birds, fish and plants that yield both once-only and repeat products that can be primarily used for economic activity now or in the future by the owner.***

74. Further disaggregation of biological resources in the revised SEEA will depend on the development in the forest accounts.

Q14: <u>Do you agree with the proposed definition of non-cultivated biological resources?</u>

5. Water resources

75. They are defined in the 2008 SNA as:

> *Water resources consist of surface and groundwater resources used for extraction to the extent that their scarcity leads to the enforcement of ownership or use rights, market valuation and some measure of economic control.*

76. The definition of water resources seems to encompass only those resources that are used for extraction. If a water body is used for example to discharge waster water or for in-situ use, it is not within the SNA asset boundary. The return of water and the in-situ use are very much linked to the quantity of water in the water bodies and not to the space only. We therefore would suggest changing the definition

77. The SEEA-2003 defines water resources as:

> *Water resources are defined as the water found in fresh and brackish surface water and groundwater bodies within the national territory.*

78. The SEEA-Water defines water resources

> *Water resource assets are defined as water found in fresh and brackish surface and groundwater bodies within the national territory that provide direct use benefits, now or in the future (option benefits), through the provision of raw material, and may be subject to quantitative depletion through human use.*

79. To harmonize the definition of water resources with the proposed definition of natural resources in the revised SEEA, we propose the following change:

> ***Water resource assets are defined as water found in fresh and brackish surface and groundwater bodies that can be primarily used for economic activity now or in the future by the owner***

Note that the new definition does not imply a change in substance.

80. The SEEA-Water asset classification of water resources consists of the following categories:

EA.13 Water Resources (measured in cubic metres)
- EA.131 Surface water
  - EA.1311 Artificial reservoirs
  - EA.1312 Lakes

EA.1313 Rivers and streams
EA.1314 Glaciers, snow and ice
EA.132 Groundwater
EA.133 Soil water

81. The SEEA-Water asset classification expands the SEEA-2003 classification by including the categories EA.1314 Glaciers, snow and ice and EA.133 Soil water. While the SEEA-2003 acknowledges the importance of these resources in terms of flows, it does not include them in the asset classification because they represent only a temporary storage of water. The explicit inclusion of glaciers, snow, ice and soil water in the SEEAW asset classification reflects the increasing importance of these resources in terms of stocks (in particular soil water) and also allows for a clearer representation of water exchanges between water resources. Water in the soil, for example, is a very important resource (both in terms of stocks and flows) for food production as it sustains rainfed agriculture, pasture, forestry, etc. Water management tends to focus water in rivers, lakes etc. and neglects soil water management, even though the management of soil water holds significant potential for water savings, increasing water use efficiency and the protection of vital ecosystems.

82. Glaciers are included in the asset classification even though their stock levels are not significantly affected by human abstraction. The melt derived from glaciers often sustains river flow in dry months and contribute to water peaks. Moreover, monitoring glacier stocks is also important for monitoring climate change.

Q15: Do you agree with the proposed definition of water resources assets?

Q16: Do you agree with aligning the revised SEEA with the SEEA-Water asset classification as in para 80?

E. Contracts, leases and licenses

83. The 2008 SNA has clarified the treatment of contracts leases and licenses. In particular, it includes under the category contracts, leases and licenses the entry *Permission to use natural resources* as part of third party property rights. The revised SEEA should be updated to reflect the changes. Further, text should be developed for specific resources to clarify the treatment of the permits to use the resources under the most common conditions under which those resources are exploited. The OECD/Eurostat Task Force on Emission Permits is working on addressing the recoding of emission permits and hopefully will extend its mandate. The revised SEEA should closely consider the recommendations of the Task Force.

F. Ecosystems

84. The classification of ecosystems should cover all those services that are not covered in the other parts of the classification, namely all services excluding provisioning services and space. It will be elaborated as part of Volume 2. It is included here only as a place holder.

G. Questions to the London Group

Q1: Do you agree that the classification of assets presented in Volume 1 should take the economy as the system of reference and thus structure the classification as an extension to the 2008 SNA asset classification?

Q2: Do you agree with the proposed definition of asset in the revised SEEA?

Q3: Do you agree with the explanation of what is intended with value and benefits in paras 32 and 33 respectively?

Q4: Do you agree that the revised SEEA asset classification should align with the changes above in the 2008 SNA (para 34 (a) – (e))?

Q5: Is there a need to rectify the asymmetry in recording the costs of ownership transfer on non-produced assets other than land as part of produced assets and thus diverging from the SNA (para 34 (d))?

Q6: Do you agree with including land as part of natural resources (with a changed definition)?

Q7: What is your opinion in maintaining the distinction between produced and non-produced assets in the presentation of the asset classification, that is maintaining the hierarchy of the classification as in the 2008 SNA?

Q8: Do you agree with the proposed definition of natural resources?

Q9 Do you agree to revisit the definition and breakdown of the land classification to ensure it is aligned with the SEEA classification of assets?

Q10 Should soil be maintained as a separate item in the asset classification (Volume 1) or should it combined with land? Should it appear as part of the ecosystem classification?

Q11: If soil is combined with land, will it appear explicitly as an item in the classification or only included in the definition?

Q12: Do you agree with the proposed definition of mineral and energy resources?

Q13: Do you agree with the proposed breakdown of the classification of mineral and energy resources in the SEEA-Energy (Table 3)?

Q14: Do you agree with the proposed definition of non-cultivated biological resources?

Q15: Do you agree with the proposed definition of water resources assets?

Q16: Do you agree with aligning the revised SEEA with the SEEA-Water asset classification as in para 80?

SEEA-2003 asset classification

Asset category	Within SNA boundary	Outside SNA boundary
EA.1 Natural resources		
EA.11 Mineral and energy resources	(AN.212) [1]	[2]
EA.111 Fossil fuels (cubic metres, tons, tons of oil equivalent, joules)	(AN.2121)	
EA.112 Metallic minerals (tons)	(AN.2122)	
EA.113 Non-metallic minerals (tons)	(AN.2123)	
EA.12 Soil resources (cubic metres, tons)	Not applicable [3]	
EA.121 Agricultural		
EA.122 Non-agricultural		
EA.13 Water resources (cubic metres)		
EA.131 Surface water	Not applicable [4]	[16]
EA.1311 Artificial reservoirs		
EA.1312 Lakes		
EA. 1313 Rivers and streams		
EA.132 Groundwater	(AN.214)	
EA.14 Biological resources		
EA.141 Timber resources (cubic metres)		
EA.1411 Cultivated	(Part of AN.1221)	Not applicable
EA.1412 Non-cultivated	(Part of AN.213) [5]	[6]
EA.142 Crop and plant resources, other than timber (cubic metres, tons, number)		
EA.1421 Cultivated		Not applicable
EA.14211 Yielding repeat products (vineyards, orchards etc.)	(AN.11142)	
EA.14212 Yielding one-time harvests (crops etc.)	(Part of AN.1221)	
EA.1422 Non-cultivated	(Part of AN.213) [7]	[8]
EA.143 Aquatic resources (tons, number)		
EA.1431 Cultivated		Not applicable
EA.1432 Non-cultivated	(Part of AN.213) [9]	[10], [17]

EA.144 Animal resources, other than aquatic (number)		
EA.1441 Cultivated		Not applicable
EA.14411 Livestock for breeding purposes	(Part of AN.11141)	
EA.14412 Livestock for slaughter	(Part of AN.1221)	
EA.1442 Non-cultivated	(Part of AN.213) [11]	[12]
EA.2 Land and surface water (hectares)	**(AN.211)**	**Not applicable [13]**
Of which, recreational land	(AN.2113)	
EA.21 Land underlying buildings and structures	***(AN.2111)***	
EA.211 In urban areas		
EA.2111 For dwellings		
EA.2112 For non-residential buildings		
EA.2113 For transportation and utilities		
EA.212 Outside urban areas		
EA.2121 For dwellings		
EA.21211 Farm		
EA.21212 Non-farm		
EA.2122 For non-residential buildings		
EA.21221 Farm		
EA.21222 Non-farm		
EA.2123 For transportation and utilities		
EA.21231 Roads		
EA.21232 Railways		
EA.21233 Electric power grids		
EA.21234 Pipelines		
EA.22 Agricultural land and associated surface water	***(AN.2112)***	
EA.221 Cultivated land		
EA.2211 For temporary crops		
Of which, drained		
Of which, irrigated		
EA.2212 For permanent plantations		
Of which, drained		
Of which, irrigated		
EA.2213 For kitchen gardens		
EA.2214 Temporarily fallow land		
EA.222 Pasture land		

EA.2221 Improved		
EA.2222 Natural		
EA.223 Other agricultural land		
EA.23 Wooded land and associated surface water	***(Part of AN.2112, AN.2113 and AN.2119)***	
EA.231 Forested land		
EA.2311 Available for wood supply		
EA.2312 Not available for wood supply		
EA.232 Other wooded land		
EA.24 Major water bodies	***(Part of AN.2119)***	
EA.241 Lakes		
EA.242 Rivers		
EA.243 Wetlands		
EA.244 Artificial reservoirs		
EA.25 Other land	***(Part of AN.2119)***	
EA.251 Prairie and grassland		
EA.252 Tundra		
EA.253 Sparsely vegetated/barren land		
EA.254 Permanent snow and ice		
EA.3 Ecosystems [14, 15]	**Not applicable**	
EA.31 Terrestrial ecosystems		
EA.311 Urban ecosystems		
EA.312 Agricultural ecosystems		
EA.313 Forest ecosystems		
EA.314 Prairie and grassland ecosystems		
EA.315 Tundra ecosystems		
EA.316 Dryland ecosystems		
EA.317 Other terrestrial ecosystems		
EA.32 Aquatic ecosystems		
EA.321 Marine ecosystems		
EA.322 Coastal ecosystems		
EA.323 Riverine ecosystems		
EA.324 Lacustrine ecosystems		
EA.325 Other aquatic ecosystems		

EA.33 Atmospheric systems		
EA.M Memorandum item: intangible environmental assets		
EA.M1 Mineral exploration	(AN.1121)	Not applicable
EA.M2 Transferable licences and concessions for the exploitation of natural resources	(Part of AN.222)	
EA.M3 Tradable permits allowing the emission of residuals	(Part of AN.222)	
EA.M4 Other intangible non-produced environmental assets	(Part of AN.222)	

Note: Light shading indicates that monetary valuation is normally possible; dark shading that, while physical valuation is possible, it may be doubtful that monetary valuation is possible.

[1] The mineral and energy resource assets that fall within the SNA boundary are those that are defined as proven reserves. In practice, though, some countries may include a wider class of resources even within the SNA accounts.

[2] The mineral and energy resource assets that fall outside the SNA boundary are those that are defined as probable, possible and speculative reserves.

[3] The value of soil resources cannot be separated from the value of the land of which they form an integral part. Therefore, only the physical extent of soil resources is measured in the SEEA.

[4] The value of surface water as a natural resource cannot be separated from its value as an integral component of the national territory. Therefore, only the physical extent of surface water resources (measured in volumetric terms) is included in the natural resource category of the asset classification.

[5] The non-cultivated timber resources that fall within the SNA boundary are those that are capable of producing a merchantable stand within a reasonable period of time, are accessible for logging purposes, and are not protected from logging.

[6] The non-cultivated timber resources that fall outside the SNA boundary are those that are not suitable for timber harvesting, because of low productivity, inaccessibility and/or protection from logging.

[7] The non-cultivated crop and plant resources that fall within the SNA boundary are those that provide harvestable materials that may be traded in the market or used for subsistence purposes, that are accessible and that are not protected from harvesting.

[8] The non-cultivated crop and plant resources that fall outside the SNA boundary are those that potentially provide harvestable materials, but that are not suitable for harvesting because of inaccessibility or protection from harvesting.

[9] The non-cultivated aquatic resources that fall within the SNA boundary are those that are the target of commercial or subsistence fishers, are found within the exclusive economic zone (EEZ) of the nation, are close enough to existing markets to be profitably exploitable and are not protected from harvesting.

[10] The non-cultivated aquatic resources that fall outside the SNA boundary are those that are potentially harvestable, but that are not currently the target of fishers because they are not of commercial or subsistence interest, are located in remote fishing zones or are protected from harvesting.

[11] The non-cultivated animal resources that fall within the SNA boundary are those that are the target of commercial, subsistence or sport hunters, are accessible for hunting and are not protected from harvest.

[12] The non-cultivated animal resources that fall outside the SNA boundary are those that are potentially harvestable, but that are not currently the target of hunters because they are not of commercial, subsistence or sport interest, are located in remote areas or are protected from harvesting.

[13] In principle, the entire national territory is included within the SNA asset boundary. For small densely populated countries, this should almost certainly be so. For large, sparsely populated countries, especially those with large areas that are remote and climatically hostile to mankind, there may be areas of land that are not thought to have any economic value. These would be included in this SEEA heading together with any recreational land not covered elsewhere.

[14] In principle, ecosystems can be measured in both monetary and physical terms. In practice, valuing these systems may be extremely difficult and physical measures may be all that is possible.

[15] Depending on the aspect of the ecosystem being measured, many different units of measure may be appropriate for describing environmental systems in physical terms. For example, biodiversity might be measured in terms of number of species or in terms of the area of suitable habitat. Waste assimilation capacity might be described in terms of the concentration of some key pollutant in the system. Other aspects will call for other units of measure.

[16] With the increasing establishment of property rights over water, valuation may in some cases be possible.

[17] Fish that are located outside a country's EEZ but over which internationally agreed quotas exist, may also be included.