DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

SEEA Revision
Issue 10
Outcome Paper

Outcome Paper for Global Consultation

Issue #10: Classification of assets[1]

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[1] This outcome paper has been prepared by the SEEA Editor. It is based on papers presented to the London Group of Experts on Environmental Accounting and discussions among those experts. Investigation and research for this outcome paper was led by Alessandra Alfieri and Ivo Havinga of the UN Statistics Division.

A. Introduction

1. The measurement of natural resources and other assets is a central feature of the System of Environmental and Economic Accounts (SEEA). Many of the assets discussed in the SEEA are also recorded in the System of National Accounts (SNA) but there are differences in the asset boundary and in the way in which the assets are considered which means that different definitions and classifications are required in the SEEA.

2. The issue of the definition and classification of assets in the revised SEEA has been discussed at several meetings of the London Group on Environmental Accounting. The UN Committee of Experts on Environmental Accounts (UNCEEA) also discussed the issue more broadly at its last meeting in June 2010 with a focus on relationships between economic assets and ecosystems.

3. This outcome paper presents proposals on the definition and classification of assets for the revised SEEA. The definition of assets for the SEEA is discussed in Section B and aims to be sufficiently broad to cover assets included in the scope of SEEA Volumes 1 and 2. In Section C the paper outlines an overall structure for the classification of assets for Volume 1. Section D discusses more detailed aspects of the classification for different asset types. Section E discusses potential memorandum items for the revised SEEA. The final section, Section F, identifies changes in the 2008 SNA that have implications for the SEEA asset classification. Recommendations for the revised SEEA are included at relevant points through the paper.

B. The definition of assets in the revised SEEA

4. The asset boundary defined in the SEEA-2003 covered so-called "environmental assets", which were defined in terms of their 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 two types of benefits: use and non-use benefits (SEEA-2003 para 7.35) and 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).

5. Unfortunately, the description of the boundary around environmental assets in the SEEA-2003 runs over several paragraphs that makes it difficult to identify a clear definition of the assets themselves. Nonetheless, discussion in the London Group has broadly confirmed that the scope of environmental assets as presented in the SEEA-2003 is appropriate for the revised SEEA. This section therefore aims to capture the essence of the SEEA-2003 scope in a single definition.

6. A useful starting point is consideration of the definition of economic assets in the 2008 SNA. The 2008 SNA defines an asset as:

> *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).

7. An economic benefit is defined as denoting a gain or positive utility arising from an action. This is elaborated in an SNA context such 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 received 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)

8. Both the definition of economic assets in the 2008 SNA and the description of the asset boundary in the SEEA-2003 are based on the identification of benefits. Thus, assets may be defined in the revised SEEA as being based on a broader range of benefits – use and non-use benefits – than the SNA that is based only on economic benefits.

9. The second key element of the definition of economic assets is that the benefits must accrue to an economic owner. In the context of the SEEA, given its broader range of benefits, a broad range of "owners" are needed to whom the benefits accrue. It is proposed here that the benefits should be considered to accrue to humanity as a whole.

10. Based on this discussion the following definition of assets for the revised SEEA is proposed:

> *An asset is an entity that provides use and non-use benefits to humanity now or in the future.*

11. The benefits are linked to the functions that environmental assets provide. They can be use and non-use benefits and can be represented in terms of the services provided by the asset, e.g. provisioning, regulatory, cultural and supporting services, consistent with the discussion in the SEEA-2003.

12. This proposed definition of assets is sufficiently broad to cover all assets in the revised SEEA, encompassing natural resources, land and ecosystems that were the three primary categories of environmental assets in the SEEA-2003. However, for the purposes of SEEA Volume 1 a slightly restricted scope is required as it is intended that Volume 1 present statistical standards relating to those areas on which there is relatively clear agreement on measurement concepts and techniques.

13. In physical terms the starting scope for the asset boundary is the economic territory of a country. Within this territorial limit the logic of the Volume 1 asset boundary is built up by individual asset type – along similar lines to the 2008 SNA. Inclusions beyond this logic are fish stocks over which countries have ownership rights that may be located in the high seas or may straddle the EEZ and the high seas.

14. Specifically excluded from the scope of Volume 1 are ecosystems including terrestrial, aquatic and atmospheric ecosystems. What is meant by this exclusion is not that the various components of different ecosystems are excluded (for example the forests, rivers, animals, etc) indeed all of these components are within scope of Volume 1. Rather the exclusion refers to the complex interactions between these components that together form ecosystems and deliver ecosystem services. For the purposes of an international statistical standard it is considered that measurement concepts and techniques for ecosystems have not yet reached a sufficient level of development.

15. At the same time it is clear that ecosystems and the services they deliver need to be understood and assessed. A conceptualisation of how this can be done and a description of relevant measurement techniques in both physical and monetary terms is to be presented in the SEEA Volume 2.

16. In monetary terms, within the physical boundary just defined it is proposed that for Volume 1 the valuation principle of the 2008 SNA should be followed and hence only the economic benefits of assets within the asset boundary should be valued. This means that, for example, if it is not economic to exploit a forest because of its location, the value of the timber in the forest will be zero in the SEEA Volume 1 asset accounts even if it might be possible to value other benefits that the forest provides such as regulatory services. The valuation of other use and non-use benefits is to be considered in Volume 2. It is noted that

even if the value of the forest in this example is zero for Volume 1 purposes, the forest itself remains within the overall asset boundary in physical terms.

Recommendation 10.1: That in the revised SEEA an asset should be defined as an entity that provides use and non-use benefits to humanity now or in the future.

Recommendation 10.2: That, in Volume 1 of the revised SEEA the asset boundary should be extended beyond the asset boundary of the 2008 SNA to include other entities with use and non-use benefits now or in the future but excluding ecosystems in terms of the ecosystem services they provide.

Recommendation 10.3: That in Volume 1 of the revised SEEA, the asset accounts in monetary terms should only reflect the value of economic benefits consistent with the scope and approaches to valuation recommended in the 2008 SNA.

C. The broad structure for the SEEA classification of assets

17. In the SEEA-2003 three broad categories of assets were defined –land and associated surface water, natural resources and ecosystems. In this section each of these categories is discussed and a broad structure proposed.

Land and associated surface water

18. Land is a complex asset that performs two distinct functions in the context of environmental accounts. On the one hand it delineates the space in which we live, within which ecosystems operate and where different entities are located. In these contexts land can provide a unit for observation and measurement. For example, we can look at an area of land and consider and categorize all of the entities within it. On the other hand, land consists of the ground including soil and associated surface water. It has a tangible connotation.

19. Depending on the situation one may wish to account for land in either of these ways. For example, when considering the valuation of the housing stock focus tends to be on the value of the location of the land relative to other pieces of land such that the same house in different locations usually has a different over all value. In the SNA this is recognised by the separation of the value of the house as a produced asset and the value of the land as a non-produced asset.

20. However, when considering the value of agricultural land this separation tends not to be made even though it is possible to see that both the location of the land and the productive capacity of the soil might be separated. Generally, the value of land and the soil are considered as one tangible entity.

21. There seems little doubt that there are high levels of interest in measuring all of the aspects of land – its value in terms of location value, the total area of land and associated surface water in terms of various land uses and land covers and the total area of agricultural and forestry land and the volume and value of associated soil resources.

22. Based on these considerations the following two part treatment of land and soil is proposed.

i. That at the top level of the asset classification Land and associated surface water should be defined as pertaining to space defining characteristics of land and thus measures of the total area of land and its overall value are relevant. Sub-classifications such as land use and land cover may be applied to better understand the nature of the area of land.

ii. That as part of the category of natural resources, a sub-category – Soil resources – be defined as relating to the volume and location of soil.

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23. At the top level of the classification the proposal retains the essence of the definition of land and surface water assets as defined in the SEEA-2003.

> *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)

24. Combining this definition with the general definition of assets proposed for the revised SEEA in paragraph 10 the following is the proposed definition of land and associated surface water for the revised SEEA

> *Land and associated surface water assets are defined as the areas within the national territory that provide use and non-use benefits to humanity now or in the future through the provision of space.*

25. Maintaining this definition of land will provide an important link between the classification of assets in Volume 1 and the classification of ecosystems to be developed in Volume 2 since an ecosystem asset classification will entail a description of the assets providing ecosystem services within a spatial unit.

26. The sub-classes within land and associated surface water are being considered from two perspectives in the SEEA revision process. Outcome papers on classifications for land cover and land use have been completed under SEEA revision issue #19a: Land use classification and #19b: Land cover classification and based on the results of consultation on those classifications recommendations for the classification of land in the revised SEEA will be finalized.

27. The proposed treatment of soil resources is considered further in Section D.

Recommendation 10.4: That in the revised SEEA the characteristic of land as providing benefits to humanity through the provision of space should be recognized by distinguishing land and associated surface water at the top level in the asset classification.

Natural resources

28. Natural resources are considered in terms of their extraction and use in the economy and their provision of use and non-use benefits. Because of their importance to a wide range of economic activity, natural resources are also a key component of the asset classification in the SNA. Thus in order to facilitate effective connections between the descriptions and classification of economic activity in the SNA and the description and classification of the environment in the SEEA the classification of natural resources in the SEEA needs to take into account the SNA definition and treatment of natural resources.

29. Four types of natural resource were defined in the SEEA-2003: mineral and energy resources, soil resources, water resources and biological resources. Biological resources included timber resources, crop and plant resources, aquatic resources and animal resources. Biological resources may also be separated into those that yield one-off benefits (such as timber resources) and those that yield repeat products (such as sheep for wool).

30. Careful consideration is needed regarding the treatment of biological resources. Unlike other resources, biological resources may be either cultivated or not cultivated depending on the extent to which an economic owner manages the growth in the resource. Cultivated biological resources are ones that are under the active management of economic owners such as plantation forests, livestock, orchards and vineyards. Non-cultivated biological resources are not under active management but still have economic value. Included in this category are natural forests, wild animals and fish (excluding aquaculture).

31. In effect, the distinction concerns the extent to which the growth of the natural resource is managed by economic owners. Where the growth is managed then the output is equal to the amount of growth recorded as the growth occurs. Where the growth is not managed the output is recognized only at the time the resource is extracted or harvested.

32. In the SEEA-2003 this distinction between cultivated and non-cultivated biological resources was recognized at a relatively low level in the asset classification (see Annex 1 where the SEEA-2003 asset classification is presented). For two reasons it is proposed to raise the profile of this distinction in the asset classification for the revised SEEA.

33. First, raising the profile helps to better connect the SEEA asset classification and the SNA asset classification and hence allow clearer links to be made to national accounts concepts and measurement techniques.

34. Second, because the distinction fundamentally affects the measurement of output it has an important role to play in the definition of the boundaries for physical flows. In broad terms the classification of physical flows requires consideration of when natural resources become products and hence are recorded as flowing from the environment to the economy. Ideally this product boundary would be defined consistently with the SNA production boundary that, in part, is defined by the treatment of cultivated and non-cultivated resources. Thus, by raising the profile of the cultivated and non-cultivated distinction in the asset classification it should also be possible to make clearer the connections to the classification of physical flows. (This issue is discussed in more detail under the SEEA Revision issue #2: Classification of physical flows.)

35. One drawback of making the distinction between cultivated and non-cultivated biological resources at high levels in the classification is that the same type of resource (eg forests) are split in the classification depending on the type of forest (cultivated or non-cultivated). Presentationally this may seem unusual since many users would be interested in the total for a single resource. From a measurement perspective the distinction needs to be made from a national accounts perspective and the requirements are no different for SEEA. While the SEEA asset boundary might be broader, the extension beyond the SNA asset boundary should not bring into consideration additional cultivated biological resources.

36. By giving more prominence to the cultivated / non-cultivated distinction the question is raised as to whether cultivated biological resources should be considered part of natural resources. In the SEEA-2003 they are included as part of natural resources, while in the 2008 SNA they are excluded.

37. On balance it is proposed to exclude cultivated biological resources from the scope of natural resources. Thus the definition of natural resources becomes the following. It is noted that a change in this definition may be needed depending on the outcome of the proposal to treat water in artificial reservoirs as the output of a production process (see SEEA Revision Issue #16: Treatment of water in artificial reservoirs) and in this regard some water resources could be considered cultivated.

> *Natural resources consist of naturally occurring assets such as mineral and energy resources, soil resources, water resources and non-cultivated biological resources that provide use and non-use benefits to humanity now or in the future.*

38. Cultivated resources are defined following the definition of cultivated biological resources in the 2008 SNA:

> *Cultivated resources consist of cultivated biological resources which cover animal, tree, crop and plant resources yielding repeat products or yielding a single use products whose natural growth and regeneration are under the direct control, responsibility and management of institutional units.* (based on 2008 SNA para 10.88 an 10.140).

Recommendation 10.5: That in the revised SEEA a distinction should be made at the highest level in the asset classification between cultivated and non-cultivated resources and that the definitions of cultivated resources and natural resources should be as presented in paragraphs 37 and 38 of the outcome paper.

Ecosystems

39. In the SEEA-2003 ecosystems are presented as a category of the asset classification. The SEEA-2003 notes that there are overlaps between ecosystems and the other asset classes and in that respect the various classes in that classification are not mutually exclusive.

40. In line with earlier discussion it is considered that the measurement of ecosystems should not be discussed in the revised SEEA Volume 1 and therefore ecosystems are excluded from the proposed asset classification in Volume 1.

Proposed higher level structure for the classification of assets

41. Based on the considerations in the preceding paragraphs Table 1 presents a high level structure for the classification of assets in the revised SEEA.

Table 1: Proposed structure of SEEA classification of assets

Land and associated surface water (area)

Cultivated resources

Cultivated biological resources

includes animal, tree, crop and other plant resources resources yielding repeat products or yielding single use products

Natural resources

Mineral and energy resources

Soil resources

Water resources

Non-cultivated biological resources

includes animal and plant resources

D. Definitions and classification for specific resources

Mineral and energy resources

42. 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*. (SEEA-2003 para 7.43)

43. To align this definition of mineral and energy resources to the general definition of natural resources the following definition is proposed:

Mineral and energy resources include known deposits of mineral and energy resources that provide use and non-use benefits to humanity now or in the future.

44. The scope of this definition – known deposits - is dependent on the confidence surrounding the geological and economic knowledge for each deposit. As discussed under SEEA revision issue #11: Categorization of mineral and energy resources, and consistent with the scope of SEEA-2003, the known deposits can be defined following certain criteria which have been outlined in the UN Framework Classification for Fossil Energy and Mineral Reserves and Resources (UNFC). Using the language of the SEEA-2003, known deposits include those which are considered proven, probable and possible resources.

45. A finer level classification of mineral and energy resources has yet to be determined. Some suggested classes for mineral and energy resources were presented as part of the outcome paper on SEEA revision issue #11 and feedback on these suggestions will help finalise proposals in this area.

Recommendation 10.6: That in the revised SEEA mineral and energy resources should be defined as known deposits of mineral and energy resources that provide use and non-use benefits to humanity now or in the future.

Water resources

46. The SEEA-Water defines water resources as:

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.

47. To harmonize the definition of water resources with the proposed definition of natural resources in the revised SEEA, the following definition is proposed:

Water resources are defined as water found in fresh and brackish surface and groundwater bodies that provide use and non-use benefits to humanity now or in the future.

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

- Water Resources
  - Surface water
    - Artificial reservoirs
    - Lakes
    - Rivers and streams
    - Glaciers, snow and ice
  - Groundwater
  - Soil water

49. The SEEA-Water asset classification is broader than the SEEA-2003 classification with regard to water since it includes the categories “Glaciers, snow and ice” and “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 SEEA-Water asset classification reflects the increasing importance of these resources in terms of available resources (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.

50. 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.

51. As noted in paragraph 39, there is ongoing consideration as part of the SEEA revision concerning the treatment of water in artificial reservoirs (SEEA Revision issue #16). Depending on the outcome from consideration of that issue changes may be needed to the classes listed above.

Recommendation 10.7: That in the revised SEEA the classification of water resources from the SEEA-Water should be used pending the decision on SEEA revision issue #16 on the treatment of water in artificial reservoirs.

Biological resources

52. Biological resources have been discussed at some length in Section B. It is noted here that the distinction between cultivated and non-cultivated biological resources should be reflected in the SEEA asset classification. While the definition of cultivated biological resources should align exactly to the definition in the 2008 SNA the definition of non-cultivated biological resources needs to be broader in the revised SEEA compared to the 2008 SNA to reflect the overall broader asset boundary.

53. Within the context that biological resources refer to all animals and plants that provide use and non-use benefits to humanity the following definition of non-cultivated biological resources is proposed.

> *Non-cultivated biological resources consist of naturally occurring animal and plant resources that provide use and non-use benefits to humanity now or in the future.*

54. For cultivated biological resources the distinction between those resources which yield ongoing output and those yielding once-only outputs is applied as appropriate to enable alignment to the relevant 2008 SNA asset classes. This distinction is not required in the case of non-cultivated biological resources.

55. Further disaggregation of the different types of biological resources will be proposed in the draft chapters of the revised SEEA. At this stage it is not anticipated that much disaggregation will be undertaken although the disaggregation of timber resources has been proposed under SEEA revision issue #21: Forest accounts and feedback on that issue will be taken into account in finalising the overall asset classification. For aquatic resources consideration is being given to defining two groups: aquatic resources in national waters including the exclusive economic zone (EEZ) and fish stocks in the high seas that are subject to international agreement.

Recommendation 10.8: That in the revised SEEA non-cultivated biological resources should be defined as naturally occurring animal and plant resources that provide use and non-use benefits to humanity now or in the future

Soil resources

56. The 2008 SNA, explicitly mentions soil in the definition of land.

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 by their owners by holding or using them (2008 SNA para 10.175).

57. The SEEA-2003 asset classification identifies soil as a separate item. SEEA-2003 recognises that soil provides important services including for example nutrients and sequestration of carbon, that it is subject to depletion (loss in quantity) when topsoil is lost and to degradation (loss in quality) depending on agricultural or other industrial practices. The services provided by soil are quite distinct from the function of the provision of space by land.

58. Nonetheless, as discussed in Section C separating land and soil is not generally meaningful, especially in monetary terms. When farmers earn income from agricultural production and sell land both the productive capacity of the soil and the location of that soil are intertwined.

59. Thus in defining soil resources as a separate category within the SEEA asset classification the intent is to recognise that there are different forms of accounting regarding and soil. Recognising soil as a natural resource gives focus to efforts to account for the volume of soil, the loss of soil through erosion, the nutrient balance of soil and the productive capacity of soil.

60. It is proposed to define soil resources in the revised SEEA as

Soil resources constitute the layer of the earth's crust between the surface and the bedrock within the national territory that provide use and non-use benefits to humanity now or in the future. They are formed of mineral particles, organic matter, water, air and living organisms.

61. It is acknowledged that little work has been completed in developing statistical standards concerning the classification and measurement of soil but significant amounts of work have been undertaken in the scientific community. It is an important component of the environment that underpins much economic activity and this should be recognised in the SEEA.

Recommendation 10.9: That in the revised SEEA soil resources should be treated as a separate natural resource within the asset classification.

E. Memorandum items for the revised SEEA asset classification

62. In the SEEA-2003 a number of memorandum items were included in the asset classification to highlight that some assets other than natural resources in scope of the SNA asset boundary may be of interest in the compilation of environmental and economic.

63. Four assets were identified

- Mineral exploration
- Transferable licences and concessions for the exploitation of natural resources
- Tradable permits allowing the emission of residuals
- Other intangible non-produced environmental assets.

64. These assets and their definitions were taken from the 1993 SNA. The revised 2008 SNA has led to changes in the terms used for these assets. Taking into account the changes the following list of memorandum items is proposed for the revised SEEA. There may be additional assets that may be of interest and feedback is sought to propose additions.

- Mineral exploration and evaluation
- Contracts, leases and licences: Permissions to use natural resources

- Contracts, leases and licences: Permissions to undertake specific activities

Recommendation 10.10: That in the revised SEEA memorandum items should be added to the asset classification including mineral exploration and evaluation and various contracts, leases and licences.

F. Changes in the 2008 SNA of relevance for the revised SEEA

65. On the whole the SEEA-2003 followed as appropriate the definitions and treatments presented in the 1993 SNA. The recent revision of the SNA has led to changes to the 1993 SNA and some of these are of relevance in determining the general treatment and classification of assets in the revised SEEA. Some of these changes have been taken into account in the presentation of the recommendations in the earlier sections of this paper. This section highlights some smaller yet important alignment issues that should be considered in the revised SEEA.

66. The main changes in the classification and treatment of assets in the 2008 SNA, relevant to the SEEA are

i. Replacing the 1993 SNA term “tangible non-produced assets” with “natural resources”

ii. Splitting the 1993 SNA category “intangible non-produced assets” into "Contracts, leases and licences" and "Goodwill and marketing assets”. The first category is of relevance to the revised SEEA and the relevant text in the 2008 SNA may need to be elaborated to discuss the various cases for specific natural resources;

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iii. In the 2008 SNA 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 underlying asset, land. This is a major change as compared to the 1993 SNA, where land improvements were recorded as capital formation but added to the non-produced asset “land” in the balance sheet.

iv. In the 2008 SNA costs of ownership transfer on land are now recorded as a part of land improvement, a produced asset, rather than with the non-produced asset land. However, for all 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.

v. The label “mineral exploration” has been modified to become “mineral exploration and evaluation” to emphasize that the coverage is aligned with that of the international accounting standards.

Recommendation 10.11: That the revised SEEA asset classification should align with the changes introduced in the 2008 SNA as described in the outcome paper paragraph 66.

Annex 2: 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.

Notes to the SEEA-2003 Classification of assets

[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,

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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.

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