Issues arising from work on developing guidance on Natural Capital

Cover Note for Note on Issues relating to Natural Capital

The attached Issues Note discusses five issues relating to natural capital that have arisen from work in developing guidance for the 2025 SNA. It was prepared Bram Edens (OECD, and Chair of the OECD Expert Group on Natural Capital) and Peter van de Ven (SNA Update Lead Editor).

The issues, and the recommendation for each of them, are as follows:

Issue 1: Recording of regeneration of biological resources

It is recommended to record regeneration as negative depletion, rather than as GFCF, which would lead to a symmetric treatment of depletion and regeneration and avoid issues in consolidation.

Issue 2: Asset classification of non-renewable mineral and energy resources

It is recommended to change the asset classification of non-renewable mineral and energy resources to:
- Coal and lignite
- Oil and natural gas (together)
- Minerals
- Other

Issue 3: Treatment of land, specifically forest land

It is recommended that the 2025 SNA will record forest land under land resources. Forest land is understood as a produced asset. No change will be made to the SNA definition of land. However, it will be made clear that forest land (and under certain instances also agricultural land for instance in case of agro-forestry) can be depleted, only bare land cannot be subject to depletion.

The issue note also recommends to slightly revise the classification of biological resources as presented in figure 1 below.

Figure 1: Proposed classification of biological resources

AN.313 Biological resources
AN.3131 Biological resources yielding repeat products
AN.31311 Animal resources yielding repeat products
AN.31312 Tree, crop and plant resources yielding repeat products
AN.3132 Biological resources yielding once-only products
AN.31321 Non-cultivated biological resources yielding once-only products
AN.31322 Cultivated biological resources yielding once-only products
AN.3133 Work-in-progress on cultivated biological resources

An alternative classification following a different logic would classify biological resources based on what they are (e.g. timber, aquatic resources); see figure 2 below.

Figure 2: Proposed classification of biological resources (alternative)

AN.313 Biological resources
AN.3131 Tree, crop and plant resources
AN.31311 Timber resources
AN.31312 Crops
AN.31313 Plants and other trees
AN.3132 Aquatic resources
AN.31323 Aquaculture
AN.31323 Natural aquatic resources
AN.3133 Animal resources
AN.31331 Animal resources yielding repeat products
AN.31332 Animals for slaughter
AN. 31333 Wild animals

The AEG is asked to express its preference for the classification of biological resources.

Issue 4: Classification of land improvements

It is recommended to classify land improvements as natural capital, close to land in the classification of natural capital assets.

Issue 5: Treatment of long-term leases on land

It is recommenced to classify further payments for the extension of long-term leases on land for another long-term period as transactions in land. The coming into existence of these leases would be recorded as other changes in the volume of assets.

Outcome sought

AEG members are invited to express their views on these recommendations.

Issues arising from work on developing guidance on Natural Capital
Prepared by Bram Edens (OECD) and Peter van de Ven[1]

Issue 1: Recording of regeneration of biological resources

Short description

In case of non-migrating biological resources yielding once-only products (such as timber resources)[2], Guidance Note WS.8 on "Accounting for biological resources" recommends recording regeneration as GFCF, while depletion is recorded as cost of production. The issue (raised by France during discussions of the Biological resources timber subgroup of the OECD Expert Group on Natural Capital, EG NC) is that the amount of regeneration and depletion will depend on the granularity of the analysis (level of disaggregation, e.g. are we analysing landscapes for individual land parcels or for whole forest areas). For example, it would be possible to have an economy wide measure of depletion (of forest land) of 10, while if we take a plot level granular approach, we would find say depletion of 110 and regeneration of 100. This would lead to the same NDP figure, however as regeneration is recorded as GFCF and thus output, the level of GDP would become dependent on the scale of the analysis – which is considered problematic.

It would be possible to recommend consolidating at the national scale. However, this would lead to problems in the case of disaggregation into (sub)sectors, as a consequence of which the capital account will not represent reality. For instance, if a country's forests are on two pieces of land, one government owned, the other owned by the private sector, and if the regeneration occurs on the government owned land (say of 100) and the depletion on the privately owned land (of 110), then one would need to allocate the total depletion cost at the national level (10) to the two sectors. Doing so, one could choose to allocate the total of 10 to privately owned land as this is where the depletion supposedly takes place; however, this would give a large difference with the actual depletion costs on privately owned land (110). The same holds for government owned land, where the regeneration of 100 is not accounted for.

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[1] The authors are grateful to Carl Obst and Pete Harper for their helpful comments.

[2] Please note that the current text in the chapters of the 2025 SNA does not refer anymore to "migrating" and "non-migrating" biological resources. A distinction is currently made between resources regarding which the human involvement is very limited, such as the establishment of quota regimes, and resources where one can observe a continuum from intensive to extensive forms of control, responsibility and management. (2025 SNA 11.207)

Recommendation

There seem to be two options to resolve this:
- To provide guidance on the average forest asset size (in hectares) that countries are expected to do the analysis at (like in SEEA Ecosystem Accounting where the notion of ecosystem assets is introduced as areas contiguous and homogeneous in land cover and condition.)
- To change the recommendation from recording regeneration as GFCF towards recording regeneration as negative depletion.

Option 1 seems a quantum leap for the SNA, as we would not only need to ground estimates in physical units but also in spatially explicit units. Therefore, the recommendation is to choose option 2, i.e. record regeneration as negative depletion. This would lead to a symmetric treatment of depletion and regeneration.

Moreover, the additional advantages of this solution are that the issue is resolved that there seems to be no proper product class (in CPC) for recording regeneration as part of output and that regeneration could be seen to lie outside the SNA production boundary (an argument put forward during earlier global consultation).

Another issue is about whether we should be talking about depletion or about depreciation. Depreciation could be considered a more logical solution as the underlying asset (the forest land) is considered to be a produced asset.

However, the main rationale for referring to (negative) depletion, instead of (negative) depreciation, in the case of biological yielding repeat products, is that this is more aligned to the language typically used for this type of natural resources. It would also be consistent with the SEEA CF. Moreover, depreciation is typically derived within a Perpetual Inventory Model, while the valuation of biological resources yielding once-only products typically takes place based on the Net Present Value method of resource rents, where the cost of depletion is derived based on a physical asset account. Finally, in line with the first argument, referring to biological resources yielding once-only products as being depreciated (instead of depleted) may pose communication challenges (e.g. in case of the Amazon). All in all, it is therefore recommended to apply depletion in case of biological resources yielding once-only products.

Issue 2: Asset classification of non-renewable mineral and energy resources

Short description

The proposed SNA asset classification distinguishes between three non-renewable mineral and energy resources: oil, natural gas, other; see figure below). Based on discussions in the subsoil subgroup of the EG NC so far, it seems problematic for all countries to separate out oil and gas (revenue side is fine, but costs are difficult to breakdown).

AN.3121	Non-renewable mineral and energy resources
AN.31211	Oil resources
AN.31212	Natural gas resources
AN.31213	Other non-renewable mineral and energy resources

A better measurable breakdown (as better aligned with 2-digit ISIC; see figure on the right) and with the SEEA would be:
- Coal and lignite
- Oil and natural gas (together)
- Minerals
- Other

Section B
Mining and quarrying

Division	Group	Class	Description
Division 05			**Mining of coal and lignite**
	051	0510	Mining of hard coal
	052	0520	Mining of lignite
Division 06			**Extraction of crude petroleum and natural gas**
	061	0610	Extraction of crude petroleum
	062	0620	Extraction of natural gas
Division 07			**Mining of metal ores**
	071	0710	Mining of iron ores
	072		Mining of non-ferrous metal ores
		0721	Mining of uranium and thorium ores
		0729	Mining of other non-ferrous metal ores
Division 08			**Other mining and quarrying**
	081	0810	Quarrying of stone, sand and clay
	089		Mining and quarrying n.e.c.
		0891	Mining of chemical and fertilizer minerals
		0892	Extraction of peat
		0893	Extraction of salt
		0899	Other mining and quarrying n.e.c.
Division 09			**Mining support service activities**
	091	0910	Support activities for petroleum and natural gas extraction
	099	0990	Support activities for other mining and quarrying

Recommendation

Change the asset classification of non-renewable mineral and energy resources as specified above.

Issue 3: Treatment of land, specifically forest land

Short description

The GN WS.8 makes a key distinction between <u>inventories</u> (work-in-progress of standing timber on the land) and what is being framed as the <u>underlying asset</u> (e.g. forest land). The latter captures the potential of the forest to continue generating resource rents beyond the current stock of standing timber (and can be looked upon as the value of forest land in terms of providing provisioning services of timber). The value of the underlying asset can be obtained as a residual by subtracting the value of inventories from the NPV of future benefits derived from the asset.

Positive changes in the inventories are labelled natural growth, while negative changes are referred to as extractions. For the underlying asset, the terms regeneration and depletion are used. The GN

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WS.8 proposes to record these two assets in different asset classes under biological resources[3] respectively (see figure 1 on the left):

- AN 31323 Work-in-progress on non-migrating biological resources, and
- AN 31322 Non-migrating biological resources yielding once-only products.

Figure 1: Classification of biological resources [4]

AN.311 Land	AN.311 Land
..	..
AN.313 Biological resources	AN.313 Biological resources
AN.3131 Biological resources yielding repeat products	AN.3131 Biological resources yielding repeat products
AN.31311 Animal resources yielding repeat products	AN.31311 Animal resources yielding repeat products
AN.31312 Tree, crop and plant resources yielding repeat products	AN.31312 Tree, crop and plant resources yielding repeat products
AN.3132 Biological resources yielding once-only products	AN.3132 Biological resources yielding once-only products
AN.31321 Migrating biological resources yielding once-only products	AN.31321 Non-cultivated biological resources yielding once-only products
AN.31322 Non-migrating biological resources yielding once-only products	AN.31322 Cultivated biological resources yielding once-only products
AN.31323 Work-in-progress on non-migrating biological resources.	AN.31323 Work-in-progress on cultivated biological resources.

The GN makes clear that the value of the forest land is to be recorded under the value of the biological resource: *"If some value is estimated for forest land, which is not very probable, one should add this value to the value of the biological resources, which could also be defended as constituting the main part of the asset."*

However, after further reflection of the classification of the underlying asset in the case of timber resources, several draft chapters of the 2025 SNA currently suggest to record forest land under land resources, the classification of which needs to be confirmed. In this respect, some of the following considerations may be relevant as well:

- If one classifies forest land under land resources, then one would have to allow for the depletion of land, which would be in contradiction with the recommendation that land cannot be depleted or depreciated (see paragraph 11.228 of the 2025 SNA as well as the relevant paragraph in the 2008 SNA).
- Produced or non-produced asset? The question can be asked whether the underlying asset (forest land) is to be considered as a produced or non-produced asset. The implication of GN WS.8 is that forest land is to be seen as a cultivated asset. However, when recording it under land one would be inclined to see it as a non-produced asset.
- Consistency with the treatment of agricultural land. The GN WS.8 mentions *"However, unlike forest land, the price of agricultural land will most probably include the Net Present Value of the provisioning services provided by this type of land to the growth of crops and animals."* It is implied here that agricultural land is recorded under land, which may raise an issue of consistency when forest land is recorded under biological resources. It also implies that agricultural land cannot be depleted.

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[3] GN WS.8, paragraph 64: "Here it is proposed to try to capture all these assets in one asset class, and to classify them under biological resources."
[4] See footnote 2 regarding the change in the use of the terms "migrating" and "non-migrating".

- Alignment with the EFA (European Forest Accounts handbook) which is based on the 2008 SNA but describes the state of the art in measuring and valuing stocks of standing timber and wooded land.

During discussions of the subgroup on timber of the EG NC, it was mentioned that it is to be expected that market transactions of forest land will reflect that forest land closer to urban areas (with the potential to be converted to urban land use) will fetch a higher price (this was also confirmed by two of the countries that have transactions in forest land data to value the asset). Therefore, one can think of a piece of forest as a composite asset, consisting of three separate assets: a) inventories/work-in-progress of standing timber; b) underlying land (or provisioning service of timber); c) the provisioning of space.

Following this logic, one possibility may consist of recording part a) and b) under biological resource and part c) under land. Such a recording would be consistent with the SEEA CF understanding of land as the mere provisioning of space. However, this would be a change from the 2008 SNA definition of land as consisting 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."*

Recommendation 1

Land is not an easy topic, and both options, recording forest land under land resources, and recording land under biological resources have pros and cons. All things considered, the following recommendations are made:

The new SNA will record forest land under land resources. Forest land is understood as a produced asset. No change will be made to the SNA definition of land. However, it will be made clear that forest land (and under certain instances also agricultural land, for instance in case of agro-forestry) can be depleted, only bare land cannot be subject to depletion.

More generally, it can be noted that the 2008 SNA is perhaps too firm in stating that land cannot depreciate/deplete, in the sense of not adequately qualifying this statement. Bare land may not depreciate/deplete. However, land is often combined with other non-financial assets such as land improvements, biological resources (as the above case), or structures. In these cases, it should be made clearer that one may have depreciation and/or depletion of the underlying assets.

Recommendation 2

In light of the above, one could also question whether there remains a need for distinguishing within biological resources yielding once-only products between work-in-progress and the underlying asset as the latter would be classified under land. However, for some cultivated biological resources, it may not be possible to separately identify the underlying asset.

Finally, it can be noted that the current classification does not explicitly account for work-in-progress for (cultivated) biological resources yielding repeat products. Here, one can think of cattle for milk production or trees for the production of fruits, which have not yet matured. For this reason, it is proposed to have a category which groups together all work-in-progress related to cultivated

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biological resources, instead of singling out work-in-progress for cultivated biological resources yielding once-only products.

All in all, it is recommended to slightly revise the classification as presented in figure 2 below.

Figure 2: Proposed classification of biological resources

AN.313 Biological resources
AN.3131 Biological resources yielding repeat products
AN.31311 Animal resources yielding repeat products
AN.31312 Tree, crop and plant resources yielding repeat products
AN.3132 Biological resources yielding once-only products
AN.31321 Non-cultivated biological resources yielding once-only products
AN.31322 Cultivated biological resources yielding once-only products
AN.3133 Work-in-progress on cultivated biological resources

An alternative classification following a different logic would classify biological resources based on what they are (e.g. timber, aquatic resources); see figure 3 below.

Figure 3: Proposed classification of biological resources (alternative)

AN.313 Biological resources
AN.3131 Tree, crop and plant resources
AN.31311 Timber resources
AN.31312 Crops
AN.31313 Plants and other trees
AN.3132 Aquatic resources
AN.31323 Aquaculture
AN.31323 Natural aquatic resources
AN.3133 Animal resources
AN.31331 Animal resources yielding repeat products
AN.31332 Animals for slaughter
AN. 31333 Wild animals

This latter approach would have the advantage of being clearer to users and consistent with the way other natural resources are described (e.g., mineral and energy resources classified as oil and gas, coal). On the other hand, one would lose, even more, the link to the traditional categories of GFCF and changes in inventories. The AEG is asked to express its preference for the classification of biological resources.

Finally, it is recommended to put the definition and treatment of land on the SNA research agenda. This research item may include issues such as the alignment between SEEA and SNA definition of land, the relationship with provisioning services as defined in SEEA Ecosystem Accounting, the recording of land conversions in the national accounts (e.g. forest land to agricultural land), and the treatment of land degradation costs (e.g. loss in soil fertility.)

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Issue 4: Classification of land improvements

Short description

Land improvements are defined, in paragraph 11.87 of the 2025 SNA, as follows: "*Land improvements are the result of actions that lead to major improvements in the quantity, quality or productivity of land, or prevent its deterioration. Activities such as land clearance, land contouring, creation of wells and watering holes that are integral to the land in question are to be treated as resulting in land improvements*".

In this respect, the question arises on how to classify land improvements: as part of natural capital, or as part of produced non-financial assets (excluding natural capital). One could argue that land improvements should not be classified as part of natural capital, mainly because it does not necessarily relate to natural resources. It is a mixed category of improvements to say agricultural land and forest land, and improvements to land for building structures. For example, site clearance to make land fit for building dwellings or other structures on it would also qualify as land improvements, while it has nothing in common with natural resources.

On the other hand, one could argue that land as such also contains elements which are hardly related to its characteristics as being a natural resource. This is even more true for the value of land, where one can observe that a substantial part of the value, perhaps even the most significant part, is related to its designation for the use of providing space for buildings and other structures.

All in all, it seems more appropriate to classify all land improvements to natural capital, as this would result in a classification of all land and land improvements closely together.

Recommendation

It is proposed to classify land improvements as natural capital, close to land in the classification of natural capital assets.

Issue 5: Treatment of long-term leases on land

Short description

Paragraph 27.27 of the 2025 SNA (carried over from 2008 SNA) states the following on long-term leases on land: "*In some jurisdictions, the land under buildings remains in the legal ownership of a landlord other than the owner of the buildings. If regular payments are made to the landlord, these are recorded as rent. However, it is sometimes the case that, even though the land legally belongs to another unit, the right to occupy it for an extended period is paid for in a single upfront payment often when the building is acquired. As explained in the previous section, this suggests recording the payment as the sale of the asset. In such a case, when the building changes ownership, the purchase price includes an element representing the present value of future payments. In such a case, the land is recorded in the SNA as if the ownership is transferred along with the building above the land. If, at the end of the land lease, a further payment is liable for extension of the lease for another long-term period, this should be recorded as capital formation and an acquisition of an asset in a manner similar to costs of ownership transfer on purchase and sale of an asset*" (bolding by the authors).

The last sentence is quite remarkable, as it suggests treating something that has never been produced as a produced asset. It is also not clear how the asset would come into existence. One may only assume

that it appears as an other change in the volume of assets, as the only alternative would be to record capital formation in the accounts of government, while – as noted – nothing has been produced with the use of labour and capital. Therefore, it is proposed to treat these further payments as acquisitions, and disposals, of land. The coming into existence would still qualify as and other change in volume of assets.

Recommendation

It is proposed to classify further payments for the extension of long-term leases on land for another long-term period as transactions in land. The coming into existence of these leases would be recorded as other changes in the volume of assets.