



ISSUES RELATING TO NATURAL CAPITAL

26TH MEETING OF THE ADVISORY EXPERT GROUP

ON NATIONAL ACCOUNTS

BRAM EDENS AND PETER VAN DE VEN



Outline

- Issue 1: Recording of regeneration of biological resources
- Issue 2: Asset classification of non-renewable mineral and energy resources
- Issue 3: Treatment of land, specifically forest land
- Issue 4: Classification of land improvements
- Issue 5: Treatment of long-term leases on land



Issue 1 – regeneration of biological resources

- In case of cultivated (non-migrating) biological resources yielding once-only products (such as timber resources), Guidance Note WS.8 on “Accounting for biological resources” recommends recording regeneration as GFCF, while depletion is recorded as cost of production.
- Problem (raised by France during EGNC):
 - This makes GDP depend on the granularity (level of disaggregation) of the analysis
 - Example: suppose country with 2 forests, one regenerating (value 100), and other depleted (110)
 - Analysis at national / aggregate level -> record only a depletion cost of 10.
 - Same NDP number, but different GDP
- Two options to resolve this:
 1. Provide guidance on average forest asset size (in hectares) that countries are expected to do the analysis at (like SEEA EA where we define ecosystem assets as contiguous and homogeneous in land cover and condition)
 2. We change the recommendation from recording of GFCF towards negative depletion.
- Option 1 seems a quantum leap for the SNA.
- Regeneration could be seen to lie outside the SNA production boundary
- **Recommendation:** record regeneration as negative depletion, rather than as GFCF, which leads to symmetric treatment of depletion and regeneration and avoid issues in consolidation.



Depletion or depreciation?

- Related issue: as timber resources are treated as cultivated assets, should we be talking about depletion or about depreciation?
- Main rationale for using (negative) depletion, instead of (negative) depreciation:
 - More aligned to language typically used for this type of natural resources (consistent with the SEEA CF)
 - Methodological: depreciation is typically derived within a Perpetual Inventory Model, while the valuation of biological resources yielding once-only products typically based on the Net Present Value method of resource rents, where the cost of depletion is derived based on a physical asset account.
 - Depreciation may pose communication challenges (e.g., in case of the Amazon).
- **Recommendation:** to use the term “depletion” in case of biological resources yielding once-only products.



Issue 2 – classification of non-renewable mineral and energy resources

- The initially proposed SNA asset classification distinguished between 3 non-renewable mineral and energy resources
- Discussions in subsoil subgroup of the EG NC-> problematic to distinguish oil and gas resources
- From measurement perspective, better to align with ISIC division level
- **Recommendation:** revised classification
 - Oil and gas
 - Coal and lignite
 - Minerals
 - Other

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

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



Issue 3: Treatment of land, specifically forest land

- The GN WS.8 makes a key distinction between inventories (work-in-progress of standing timber on the land) and what is being framed as the underlying asset (e.g., forest land).
 - Latter captures potential of the forest to continue generating resource rents beyond the current stock
 - Value of underlying asset can be obtained as a residual by subtracting the value of inventories from the value of land (the latter measured based on transactions in land or through NPV of future benefits derived from the asset).
- Terminology:
 - 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 WS.8 proposes to record these two assets in different asset classes under biological resources respectively:
 - AN 31323 Work-in-progress on cultivated (non-migrating) biological resources
 - AN 31322 Cultivated (non-migrating) biological resources yielding once-only products
- Issue of consistency: several draft chapters of the 2025 SNA currently suggest to record forest land under land resources – where to classify?



2025 SNA Asset classification – natural capital

AN.3 Natural capital

AN.31 Natural resources

AN.311 Land

AN.312 Mineral and energy resources

AN.3121 Non-renewable mineral and energy resources

AN.31211 Oil resources

AN.31212 Natural gas resources

AN.31213 Other mineral and energy resources

AN.3122 Renewable energy resources

AN.31221 Wind energy resources

AN.31222 Solar energy resources

AN.31223 Water energy resources

AN.31224 Geothermal energy resources

AN.31224 Other renewable energy 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 Migrating biological resources yielding once-only products

AN.31322 Non-migrating biological resources yielding once-only products

AN.31323 Work-in-progress on non-migrating biological resources.

AN.314 Water resources

AN.315 Radio spectra and other natural resources

AN.3151 Radio spectra

AN.3152 Other

AN.32 Ecosystem assets



Considerations (1)

- Following considerations may be relevant:
 - 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
 - Produced or non-produced asset?
 - The implication of GN WS.8 is that forest land is to be looked upon as a cultivated asset. However, when recording it under land one would be inclined to look upon it as a non-produced asset.
 - Consistency with the treatment of agricultural land
 - The GN WS.8 implies that agricultural land is recorded under land, which may raise an issue of consistency when forest land is recorded under biological resources.
 - 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



Considerations (2)

- Additional considerations

- During EG NC discussions, it was mentioned that the value of forest land closer to urban areas (with the potential to be converted to urban land use) is higher
- 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.”*



Recommendations

- Both recording of forest land under land and the recording 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 (partly) produced asset
 - No change will be made to the SNA definition of land
 - 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
 - Finally, it is recommended to put the definition and treatment of land on the SNA research agenda



Revised classification of biological resources

Recommendation to slightly revise the classification of biological resources (on the right)

Key changes:

- Reinstated cultivated / non-cultivated, as 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)
- WIP category is moved to a higher digit-level, to account for work-in-progress for resources yielding repeat products as well as resources yielding once-only products

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



Alternative proposal

- An alternative classification following a different logic would classify biological resources based on what they are (e.g., timber, aquatic resources)
- Advantages:
 - being clearer to users
 - consistent with the way other natural resources are described (e.g., mineral and energy resources classified as oil and gas, coal).
- However - one would lose, even more, link to the traditional categories of GFCF and changes in inventories

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



Issue 4: Classification of land improvements

- *“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 paragraph 11.87 of the 2025 SNA)
- How to classify land improvements: natural capital or produced non-financial assets
 - Not 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.
 - Land as such also contains elements which are hardly related to its characteristics as being a natural resource. Even more true for the value of land, where a substantial part relates to provisioning of space
- **Recommendation** : all in all, 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



Issue 5: Treatment of long-term leases on land

- Paragraph 27.27 of the 2025 SNA (carried over from 2008 SNA) states the following:
- *“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).*
- Remarkable: 1) suggests treating something that has never been produced as a produced asset; 2) not clear how the asset would come into existence.
- **Recommendation:** 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.



- **Questions to AEG:**

- Do you agree with the recommendations made for solving the 5 issues?
- Specifically, what is your preference for the classification of biological resources?