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Forest accounts standard tables

Jukka Muukkonen

Statistics Finland

Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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Forest accounts standard tables

Contents

1. Introduction

The key objective of the standard tables of forest accounting is to give condensed information on forest assets and changes in them. As in the SEEA-2003 asset classification, forests are taken into account according to the four main roles of forests: as soil resources, as a source of timber resources, as wooded land, and as forest ecosystems. However, the focus is on timber, wooded land and forest ecosystems. The soil is merely linked to carbon binding function of forests.

The proposed standard tables are based on the SEEA-2003 asset classification, definitions of the System of National Accounts 2008 on cultivated/non-cultivated assets, produced/non-produced assets, natural resources, and on definitions and classifications used in FAO Global Forests Resources Assessment 2010. Tables on asset accounts follow closely the structure of tables presented by Peter Comisari in document 'SEEA standard tables ASSETS (LG15_25a_Add4.xls)'

2. Some main definitions in the SNA 2008 related to forests and timber

In the SNA 2008 'Chapter 10: The capital account' definitions are given for cultivated/non-cultivated and produced/non-produced assets, as well as for asset boundary for natural resources. A brief summary on definitions directly related to forests and timber is given below:

Non-financial assets
Produced assets

10.11 Fixed assets are produced assets that are used repeatedly or continuously *in production processes for more than one year*.... Fixed assets include... also cultivated assets such as trees or animals that are used repeatedly or continuously to produce other products such as fruit or dairy products...
10.12 Inventories are produced assets that consist of *goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date.*

Non-produced assets

10.15 *Natural resources consist of naturally occurring resources such as* land, water resources, *uncultivated forests* and deposits of minerals that have an economic value.

▊▊▊ Statistics Finland

Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

Cultivated biological resources

10.88 Cultivated biological resources cover... *tree*, crop and plant resources *yielding repeat products whose natural growth and regeneration are under the direct control, responsibility and management of institutional units.*
10.89 In general, *when the production of fixed assets takes a long time to complete, those assets whose production is not yet completed at the end of the accounting period are recorded as work-in-progress.* ...also apply to the production of *cultivated assets such as animals or trees that may take a long time to reach maturity....*
10.95 ...Tree, crop and plant resources yielding repeat products... include trees... cultivated for fruits and nuts, for sap and resin and for bark and leaf products. *Trees grown for timber that yield a finished product once only when they are ultimately felled are not fixed assets...*
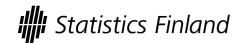
Non-cultivated biological resources

10.182 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 or regeneration is not under the direct control, responsibility and management of institutional units. Examples are virgin forests* and fisheries within the territory of the country. Only those resources that are currently, or are likely soon to be, exploitable for economic purposes should be included.

Natural resources
The asset boundary

10.167... Only those naturally occurring resources over which ownership rights have been established and are effectively enforced can therefore qualify as economic assets and be recorded in balance sheets... *there may be others that cannot be treated as economic assets because they do not actually belong to any particular units... including uncultivated forests, that... remain so remote or inaccessible that, in practice, they are not under the effective control of any units.*
10.168 ....natural assets must not only be owned but must also be capable of bringing economic benefits to their owners... or expected to do so in the near future.
10.169 Naturally occurring assets in the form of biota (trees, vegetation, animals, birds, fish, etc.) are renewable. *The growth and regeneration of trees... may take place under the direct control, responsibility and management of institutional units. In this situation, the assets are cultivated*, and the activity is treated as falling within the production boundary of the SNA. ...*growth of uncultivated vegetation in forests, is not an economic process of production so that the resulting assets cannot be classed as produced assets.* Nevertheless, *when the forests... are actually owned by institutional units and are a source of benefit to their owners, they constitute economic assets. ...forests or other vegetation growing in locations such that no institutional unit is able to exercise effective ownership rights over them fall outside the asset boundary... are not counted as economic assets.*

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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2. Classifications and definitions in the FAO Global Forest Resource Assessment 2010

Forest statistics compiled at national level for the FAO Global Forests Resources Assessment (FRA) are the most important data source for the SEEA forest accounts. These statistics are also used as a basis for national greenhouse gas inventories for land use, land use change and forestry according to the UN climate convention and the Kyoto protocol. Specification of national reporting tables for FRA 2010 including definitions and classifications has been published by the FAO in November 2007.

The FAO requests countries to submit their country report for FRA 2010 according to a format of 17 reporting tables. For most of the tables reporting years are 1990, 2000, 2005 and 2010. For structure of the SEEA forest accounts the main reporting tables are:

- T 1 Extent of forest and other wooded land
- T 3 Forest designation and management
- T 4 Forest characteristics
- T 6 Growing stock
- T 11 Wood removals and value of removals
- T 12 Non-wood forest products removals and value of removals

A summary on categories and definitions by these reporting tables is presented below in this and the next page:

T1 Extent of forest and other wooded land

Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.

Other land
  - Other land with tree cover
    (sub-category)
	All land that is not classified as "Forest" or "Other wooded land".
	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.

Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

T3 Primary designated functions

Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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T 4 Forest characteristics

Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
- of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduces species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
- of introduced species	Planted/seeded trees are predominantly of introduced species.

For tables T1, T3 and T4 unit of reporting is 1000 hectares.

More detailed description on forest characteristics is presented in annex

T 6 Growing stock

Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

Unit of reporting is million cubic meters over bark of roundwood.

T11 Wood removals and value of removals

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

Units of reporting are 1000 m3 of roundwood (measured over bark) and Unit value (average value in local currency per cubic meter over bark of roundwood).

T 12 Non-wood forest products removals and value of removals

Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

NWFP categories	Plant products / raw material
	    1. Food 2. Fodder
	    3. Raw material for medicine and aromatic products
	    4. Raw material for colorants and dyes
	    5. Raw material for utensils, handicrafts & construction
	    6. Ornamental plants 7. Exudates
	    8. Other plant products

	Animal products / raw material
	    9. Living animals 10. Hides, skins and trophies
	    11. Wild honey and bee-wax 12. Wild meat
	    13. Raw material for medicine 14. Raw material for colorants
	    15. Other edible animal products
	    16. Other non-edible animal products

For quantity of removals the unit must be number, weight or volume. Value of removals is 1000 local currency.

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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4. FRA classifications in the SEEA forest accounts

The FRA classifications on tables T1 Extent of forest and other wooded land, T3 Forest designation and management, and T4 Forest characteristics (Table 4.1.) are primary to the SEEA forest accounts.

Table 4.1. FRA classifications primary to the SEEA asset accounts

FAO Global Forest Resources Assessment		

T1 'extent'
- Forest
- Other wooded land
- Other land
  with tree cover
	T4 'characteristics'
	- Primary Forest
	- Other naturally
	  regenerated forests
	- Planted forest
		T3 'designation'
		- Production
		- Protection of soil and water
		- Conservation of biodiversity
		- Social services
		- Multiple use
		- Other or Unknown

In the current SEEA asset classification item 'EA.23 Wooded land and associated surface water' includes FRA categories 'Forest' and 'Other wooded land'. SEEA asset categories 'Timber resources', 'Forested land' and 'Forest ecosystems' have connections to the FRA classifications 'Forest designation and management' and 'Forest characteristics'. 'Timber resources' in the SEEA is compatible with the 'Growing stock' in the FRA table T6.

5. Proposed standard tables for forest accounts

5.1. Basic principles

The proposed standard tables are based on SEEA-2003 asset classification, definitions of the SNA 2008, categories and classifications used in the FRA 2010, and on basic structure of asset accounts in the SEEA 2003. Asset accounts in physical units are proposed for resources of wooded land, forest ecosystems and timber. Standard tables in monetary units are proposed only for timber resources and removals of non-wood products of forests.

The primary correspondences between the SEEA categories Timber resources, Wooded land, Forest ecosystems and the FRA categories Extent of forest and other wooded land, Forest designation and management, Forest characteristics, and Growing stock are shown in Table 5.1. Other correspondences exist as well, e.g. the Forest ecosystems could be seen through division of Forest designated for Production, Multiple use, Protection, Conservation, Social services and other functions of forests. Primary correspondences presented in Table 5.1. were chosen for the next main reasons:

- For Timber resources, the correspondence is rather compatible with the SNA definitions on cultivated/non-cultivated biological resources.
- For Forested land there is a link to land use dimension of forests.
- For Forest ecosystems the division to Primary, Other naturally regenerated, and Planted forest reflects biodiversity levels of forests.
- Link between Timber resources and Forest ecosystems is quite clear.
- For the SEEA Forested land (EA.231), category 'Primarily for production of forest products or multiple use' (FRA T3)' consists mainly of 'Planted forest' (FRA T4) and 'Other naturally regenerated forest' (FRA T4)

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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Table 5.1. Primary correspondences between the SEEA and the FRA

> **EA.141 Timber resources (FRA T6)**
> **EA.1411 Cultivated**
> Timber in Planted forest (FRA T4)
> Timber in Other naturally regenerated forest (FRA T4)
> **EA.1422 Non-Cultivated**
> Timber in Primary forests (FRA T4)
>
> **EA.23 Wooded land and associated surface water**
> **EA.231 Forested land (FRA T1 Forests)**
> EA.2311 Primarily for production of forest products or multiple use (FRA T3)
> EA.2312 Primarily for protection, conservation and social services (FRA T3)
> **EA.232 Other wooded land (FRA T1 Other wooded land)**
>
> **EA.313 Forest ecosystems**
> Primary forest (FRA T4)
> Other naturally regenerated forest (FRA T4)
> Planted forest (FRA T4)

In addition to the FRA tables on extent, designation, characteristics, growing stock and removals of products, very important information for forest accounts can be derived from FRA tables:

> T 5 Forest establishment and reforestation
> T 9 Forest fires
> T 10 Other disturbances affecting forest health and vitality.

Also data from table T 2 on forest ownership and management rights can be used in the SEEA asset accounts for forests. An example on the FRA data for the SEEA asset accounts is presented in table 5.2.

Table 5.2. FRA as a data source for forest accounts

SEEA EA.231 Forested land	FRA as a data source		
Opening stocks	T1 Forest area, T3 Forest designation and management		
Additions to stock			
Afforestation	T5 Forest establishment and reforestation; Afforestation		
Natural expansion	T5 Forest establishment…;Natural expansion of forests		
Reclassifications / reappraisals			
Deductions from stock			
Deforestation	T1 Forest area (net changes during accounting period)		
Natural regression	T9 Forest fires, T10 Other disturbances		
Reclassifications / reappraisals			
Other changes in stock			
Catastrophic losses and uncompensated seizures	T9 Forest fires, T10 Other disturbances		
Change in classifications and structure	T1 Forest area, T3 Forest designation and management		
Closing stocks	T1 Forest area, T3 Forest designation and management		

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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5.2. Asset accounts for wooded land and forest ecosystems

EA.313 Forest ecosystems: 1000 hectares
Total area of EA.313 equals to Total area of EA.231 Forested land

Primary forests / Other naturally regenerated forest / Planted forest / Total

For EA.231 Forested land (FRA T1 Forests)
production and multiple use / protection, conservation and social services* / Total
*including FRA T3 'Other' and 'Unknown'

SEEA Asset Account - EA.313 Forest ecosystems, 1000 hectares

	Primary forests	Other naturally regenerated forests	Planted forest	Total
Opening stocks				
Additions to stock				
Afforestation	-			
Natural expansion				
Reclassifications / reappraisals				
Deductions from stock				
Deforestation				
Natural regression				
Reclassifications / reappraisals				
Other changes in stock				
Catastrophic losses and uncompensated seizures				
Change in classifications and structure				
Closing stocks				

SEEA Asset Account - EA.231 Forested land, 1000 hectares

	Production and multiple use	Protection, conservation and social services	Total
Opening stocks			
Additions to stock			
Afforestation			
Natural expansion			
Reclassifications / reappraisals			
Deductions from stock			
Deforestation			
Natural regression			
Reclassifications / reappraisals			
Other changes in stock			
Catastrophic losses and uncompensated seizures			
Change in classifications and structure			
Closing stocks			

Statistics Finland

Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

5.3. Asset accounts for timber resources

EA.141 Timber resources (FRA T6): million m^3 over bark of roundwood
Timber resources in: EA.231 Forested land / EA.232 Other wooded land / Total
Cultivated / Non-Cultivated / Total
Coniferous species / Broadleaved species
Removals by Industrial roundwood / Woodfuel / Total

In monetary units only for Cultivated timber resources

SEEA Asset Account - EA.141 Timber resources, 1000 cubic metres over bark
SEEA Asset Account - EA.1411 Cultivated Timber resources, Monetary unit

	Cultivated		Non-Cultivated		Total	
	Forest	Other wooded land	Forest	Other wooded land	Forest	Other wooded land
Opening stocks						
Coniferous						
Broadleaved						
Changes due to transactions						
Changes in inventories						
Acquisitions less disposals of non-produced assets						
Additions to stock						
Natural growth						
Coniferous						
Broadleaved						
Reclassifications / reappraisals						
Deductions from stock						
Extraction of natural resources						
Felling of timber						
Removals						
Industrial roundwood						
Coniferous						
Broadleaved						
Woodfuel						
Timber left in the forest						
Reclassifications / reappraisals						
Environmental degradation of non-produced assets						
Other changes in stock						
Catastrophic losses and uncompensated seizures						
Change in classifications and structure						
Closing stocks						
Coniferous						
Broadleaved						

Statistics Finland

Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

5.4. Accounts for Non-wood forest products

Related to SEEA-2003 assets EA.142 'Crop and plant resources other than timber', and EA.144 'Animal resources, other than aquatic'

Nationally the most important Non-wood forest products

Physical amount and monetary value of removals

SEEA Account for non-wood products of forests, EA.142 and EA.144

	Removals		
	Unit	Quantity	Value
Plant products / raw material			
1. Food			
2. Fodder			
3. Raw material for medicine and aromatic products			
4. Raw material for colorants and dyes			
5. Raw material for utensils, handicrafts & construction			
6. Ornamental plants			
7. Exudates			
8. Other plant products			
Animal products / raw material			
9. Living animals			
10. Hides, skins and trophies			
11. Wild honey and bee-wax			
12. Wild meat			
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products			
Total			

Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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Jukka Muukkonen
Email: jukka.muukkonen@stat.fi

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ANNEX

FRA T 4 Forest characteristics							
Term	Definition						
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.						
	1. In this context, predominantly means that the trees established through natural regeneration are expected to constitute more than 50% of the growing stock at maturity.						
	2. Includes coppice from trees established through natural regeneration.						
	3. Includes naturally regenerated trees of introduced species.						
Introduced species	A species, subspecies or lower taxon, occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).						
Category	Definition						
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.						
	1. Some key characteristics of primary forests are:						
	-they show natural forest dynamics, such as natural tree species composition, occurrence of dead wood, natural age structure and natural regeneration processes;						
	-the area is large enough to maintain its natural characteristics;						
	-there has been no known significant human intervention or the last significant human intervention was long enough ago to have allowed the natural species composition and processes to have become re-established.						
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.						
	1. Includes selectively logged-over areas, areas regenerating following agricultural land use, areas recovering from human-induced fires, etc						
	2. Includes forests where it is not possible to distinguish whether planted or naturally regenerated.						
	3. Includes forests with a mix of naturally regenerated trees and planted/seeded trees, and where the naturally regenerated trees are expected to constitute more than 50% of the growing stock at stand maturity.						
Other naturally regenerated forest of introduced species (sub-category)	Other naturally regenerated forest where the trees are predominantly of introduces species.						
	1. In this context, predominantly means that the trees of introduced species are expected to constitute more than 50% of the growing stock at maturity.						
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.						
	1. In this context, predominantly means that the planted/seeded trees are expected to constitute more than 50% of the growing stock at maturity.						
	2. Includes coppice from trees that were originally planted or seeded.						
	3. Excludes self-sown trees of introduced species.						
Planted forest of introduced species (sub-category)	Planted forest, where the planted/seeded trees are predominantly of introduced species.						
	1. In this context, predominantly means that the planted/seeded trees of introduced species are expected to constitute more than 50% of the growing stock at maturity.						