



System of
Environmental
Economic
Accounting

Introduction to land accounting

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Outline

- Why account for land?
- Key features and scope of land accounts
 - > Land cover
 - > Land use
- Compilation
- Link to ecosystem accounting



Why account for land?

- Spatial foundation for policies
 - > Inform land and resource management, conservation policies, land tenure
- Can answer questions such as:
 - > What is the distribution of and quality of land?
 - > How is land used and what are the trends in this use?
 - > How quickly is urbanization occurring and what kinds of lands are being converted to urban land?
- Supports many SDGs

SEEA land accounts

- Three accounts
 - > Physical asset accounts for land
 - Land cover
 - Land use
 - Ownership
 - > Monetary asset account for land use
- Focus on physical asset accounts
- Land accounts—can also extend to EEZ

Land cover

- *The observed physical and biological cover of the Earth's surface and includes natural vegetation and abiotic (non-living) surfaces*
- Current land cover is a function of natural changes in the environment and of previous and current land use
- Often misinterpreted or combined with land use

Land cover

- Land cover classification (interim)
- Based on definitions from the Land Cover Classification System (LCCS) of the FAO

Category	
1	Artificial surfaces (including urban and associated areas)
2	Herbaceous crops
3	Woody crops
4	Multiple or layered crops
5	Grassland
6	Tree covered areas
7	Mangroves
8	Shrub covered areas
9	Shrubs and/or herbaceous vegetation, aquatic or regularly flooded
10	Sparsely natural vegetated areas
11	Terrestrial barren land
12	Permanent snow and glaciers
13	Inland water bodies
14	Coastal water bodies and inter-tidal areas

Land use

- Land use
 - > *reflects both (i) the activities undertaken and (ii) the institutional arrangements put in place; for a given area for the purposes of economic production, or the maintenance and restoration of environmental functions*
 - > Land that is “used” implies existence of some human intervention, including active management, e.g. protected areas
 - > Land accounts should be complete
 - Includes land in use and land not in use

Land use

- Categories not defined on economic activity, but rather general purpose and role of the user of the area
 - > Often aligns with scope of economic activity, but not always
 - > If multiple uses, go with primary/dominant use

1 Land

1.1 Agriculture

1.2 Forestry

1.3 Land used for aquaculture

1.4 Use of built up and related areas

1.5 Land used for maintenance and restoration of environmental functions

1.6 Other uses of land n.e.c.

1.7 Land not in use

2 Inland waters

2.1 Inland waters used for aquaculture or holding facilities

2.2 Inland waters used for maintenance and restoration of environmental

2.3 Other uses of inland waters n.e.c.

2.4 Inland waters not in use

Land cover versus land use

- **Land use focuses on social and economic function while land cover focuses on physical and biological surface features**
- Q: Example where land use and land cover do not align?
- Natural tree-covered area in the middle of a city
 - > Land cover: tree-covered area
 - > Land use: built up and related area
- Grazing land
 - > Land cover: grasslands or sparse trees
 - > Agricultural land use

Land account: basic form

	Artificial surfaces	Crops	Grassland	Tree-covered area	Mangroves	Shrub-covered area	Regularly flooded areas	Sparse natural vegetated areas	Terrestrial barren land	Permanent snow, glaciers and inland water bodies	Coastal water and inter-tidal areas
Opening stock of resources	12 292.5	445 431.0	106 180.5	338 514.0	214.5	66 475.5	73.5	1 966.5		12 949.5	19 351.5
Additions to stock											
Managed expansion	183.0	9 357.0									
Natural expansion			64.5								1.5
Upward reappraisals			4.5								
<i>Total additions to stock</i>	183.0	9 357.0	69.0								1.5
Reductions in stock											
Managed regression		147.0	4 704.0	3 118.5	9.0	1 560.0	1.5				
Natural regression					1.5	64.5					
Downward reappraisals						4.5					
<i>Total reductions in stock</i>		147.0	4 704.0	3 118.5	10.5	1 629.0	1.5				
Closing stock	12 475.5	454 641.0	101 545.5	335 395.5	204.0	64 846.5	72.0	1 966.5		12 949.5	19 353.0

- Managed → due to human activity
- Natural → resulting from natural processes
- Reappraisals → reflect changes due to use of updated information (e.g. new satellite imagery)

Land account: change matrix

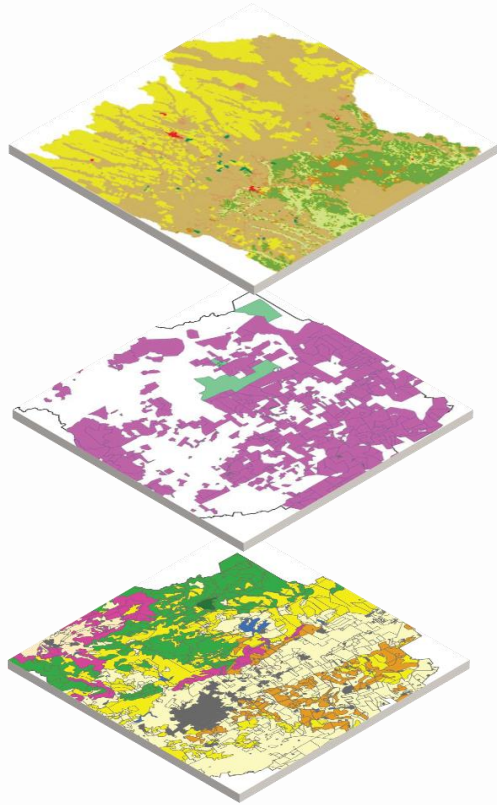
- Shows conversions
- Net changes only

	OPENING STOCK	Net Increase (+) and decrease (-) from other land covers (1,000 ha)														NET CHANGE	CLOSING STOCK	
		Artificial surfaces	Herbaceous crops	Woody crops	Multiple or layered crops	Grass-land	Tree covered areas	Mangroves	Shrub covered areas	Shrubs and/or herbaceous vegetation, aquatic or regularly flooded	Sparsely natural vegetated areas	Terrestrial barren land	Permanent snow and glaciers	Inland water bodies	Coastal water bodies and inter-tidal areas			
Artificial surfaces	12292.5		147			27	9										183	12475.5
Herbaceous crops	271517	-147				4677											4530	276047
Woody crops	117295						3119										3118.5	120414
Multiple or layered crops	56619							1560	1.5								1561.5	58180.5
Grass-land	106180.5	-27	-4677					69									-4635	101546
Tree covered areas	338514		-3118.5														-3118.5	335396
Mangroves	214.5	-9															-1.5	204
Shrub covered areas	66475.5		-1560			-69											-1629	64846.5
Shrubs and/or herbaceous vegetation, aquatic or regularly flooded	73.5		-1.5														-1.5	72
Sparsely natural vegetated areas	1966.5																	1966.5
Terrestrial barren land	0																	0
Permanent snow and glaciers	1657.3																	1657.3
Inland water bodies	11292.2																	11292.2
Coastal water bodies and inter-tidal areas	19351.5							1.5									1.5	19353

Land account: change matrix

Land cover change matrix (hectares)						
Opening land cover	Closing land cover					Opening stock
	Artificial surfaces (urban)	Herbaceous crops	Grassland	Inland water bodies	Shrubs..regularly flooded (wetland)	
Artificial surfaces (urban)	20	0	0	0	0	20
Herbaceous crops	3	142	8	0	0	153
Tree-covered areas	0	2	88	0	0	90
Inland water bodies	0	0	0	19	0	19
Shrubs..regularly flooded (wetland)	0	1	0	0	5	6
Closing stock	23	145	96	19	5	288

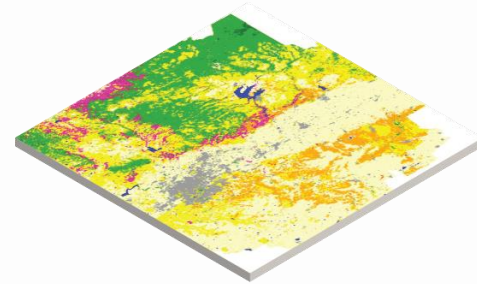
Compilation



Many data sources

Processing

	OPENING	Net Increase (+) and decrease (-) from other land covers (1,000 ha)													NET	CLOSING	
	STOCK	Artificial surfaces	Herbaceous crops	Woody crops	Multistorey or layered crops	Grass land	Trees covered areas	Rangelands	Shrub covered areas	Shrub and/or herbaceous vegetated areas or regularly flooded	Openly natural vegetated areas	Terrestrial barren land	Permanent snow and glaciers	Inland water bodies	Coastal water bodies and inter-tidal areas	CHANGE	STOCK
Artificial surfaces	12292.5		147		27				9							183	12475.5
Herbaceous crops	271517	-147			4677											4530	276047
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Compilation

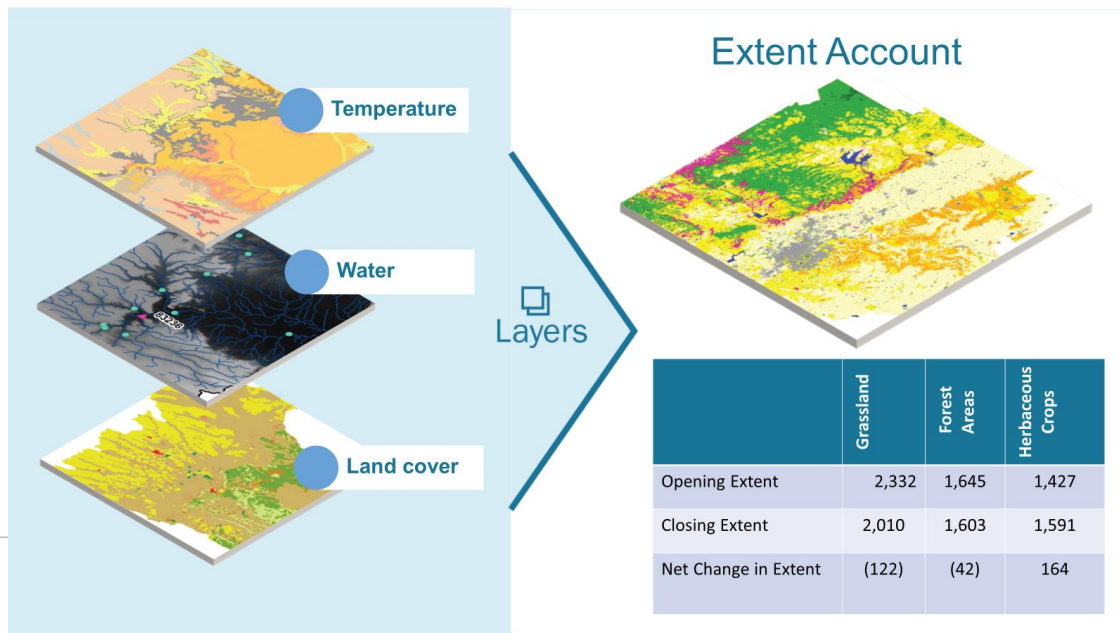
- Data collection
 - > Input data is usually from many different sources
 - > Use of an integrated spatial (GIS) database
- Land cover data
 - > Satellite, aerial photography, etc
 - > Hydrological, topographic
- Land use data
 - > Agriculture, population census
 - > Administrative data
 - > Forest inventories
- Ownership data (optional)
 - > Cadastral (ownership, tenure, zoning, tax, etc)
- Processing
 - > Ensure consistent resolution and projection
 - > Reconciliation between classifications of imported data and classifications for accounts
 - > Ground truthing
 - > Validation of outcomes
- Importance of engaging with data producers from the start

Link to ecosystem accounting

- Both are spatially explicit
- Land accounts, particularly land cover, are a basis for ecosystem accounting
- For terrestrial and freshwater areas, should be a reasonable concordance between land cover and ecosystem extent
- But key differences between land cover and ecosystems
 - > Definition of ecosystems in SEEA EA: *a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit*
 - > vs. definition of land cover: *the observed physical and biological cover of the Earth's surface and includes natural vegetation and abiotic (non-living) surfaces*

Link to ecosystem accounting

- Land cover is a key variable in delineating ecosystem types
 - > Identification of ecosystem types through delineation of various ecosystem characteristics, e.g. animals, plants, fungi, water, soil, minerals
 - > Land cover is a fundamental layer
 - > Other layers may include temperature, aridity, topography/elevation maps



THANK YOU

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