

Natural capital accounting: land

Land accounts use consistent concepts and a variety of data sources and methods to present information on land cover and land use. They follow an internationally approved protocol, ensuring that information is compatible across time and space. This enables countries to monitor and understand change better to achieve their development objectives and to make global comparisons.

Potential benefits

- Land accounts help integrate environmental and economic information in a coherent way
- Through land accounts it is possible to explore issues such as ownership and wealth, urbanization, and intensity of crop and animal production
- The accounts help to understand changes in types of land cover and use, and underpin the creation of ecosystem accounts
- Information on coastal and marine areas can be used for managing fishing rights, offshore mining, and exploration and protection of coral reefs.

“The land account [in the Philippines] provided the basis to build a forest account, carbon account, and ecosystem condition account. The process pulls information that is usually dispersed in different agencies and line ministries into an aggregated and coherent format. This facilitates the ability to provide useful, fast and low-cost policy advice.”



Sofia Elisabet Ahlroth, WAVES Secretariat

Grounding the data through land accounts

Land accounts characterize the physical location where economic and environmental activities take place. Combining satellite-derived imagery with other forms of data, the accounts systematically show how land cover and use change across time. Land accounts are important for implementing national and regional plans and international commitments such as Goal 15 of the Sustainable Development Goals ‘to protect, restore and promote sustainable use of terrestrial ecosystems’.

Land accounts are the basic building block of natural capital accounts. Their main role is to map the physical location of economic activities and environmental processes. They provide the key information needed for resource management: how much forest, desert and cropland exists? Where are the cities or glaciers, and how much land area do they cover? And importantly, they show how this cover is changing through time and what the impact is of this change on the economy and ecosystems.

How are land accounts produced?

Figure 1 shows the main processes underpinning the production and use of land cover accounts. A series of maps is prepared using satellite imagery processed using

 **Figure 1. Basic framework for land accounts**

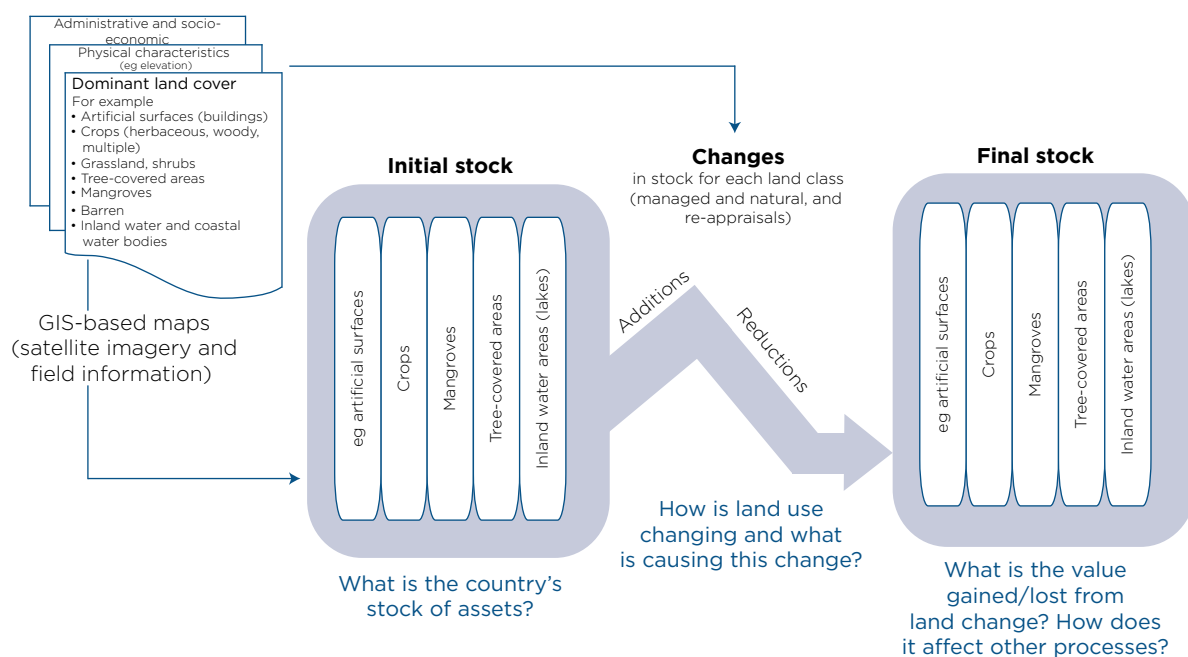




Image credit: Rosalind Goodrich/IIED

remote sensing and verified through field surveys. They can include environmental data such as topography (mountains and plains) and elevation. Land use accounts require economic data, such as the area of land owned by different institutional sectors, and land zoning (eg residential, industrial, conservation) that is obtained from a range of sources, including administrative and spatially located economic surveys. This information is used to determine the initial stock of assets (land cover) and how this is used (land use) in a geographic space — for a country or a watershed at one point in time.

A matrix of different land cover types (eg forest, cropland, urban) is prepared showing the quantity of each physical asset in hectares or square kilometers. The process is repeated at different points in time to estimate what change has taken place over each period. Importantly, the account also provides detail on how the changes took place — for example additions (eg new urban areas), reductions (eg forest lost through deforestation) and reappraisals (eg new mapping technologies that provide better estimates of wetland areas).

Estimating value through land accounts

Land accounts can also be linked to monetary values, helping decision making by

providing comparable monetary units for comparison with other national economic accounts. Valuing land is complex, even in countries with an active land market, well-defined property rights and systems to track land value and exchanges. In some cases administrative data provide information on land values — where land taxes are levied, for instance. The value of land depends on many things — for example, its physical attributes, associated assets and accessibility.

The System of Environmental-Economic Accounting protocol provides a format to link the physical and monetary aspects of land. This is the combination of the land cover and land use accounts. Restrictions such as prohibitions of certain activities on public, private or common lands, or limited access due to remoteness, mean that a given land cover type may have diverse land uses. Some areas are not used for traditional economic activity — eg a national park or designated wilderness area — but they support ecosystems and biodiversity and provide recreational opportunities for people.

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Case study: preparing land accounts in the Philippines

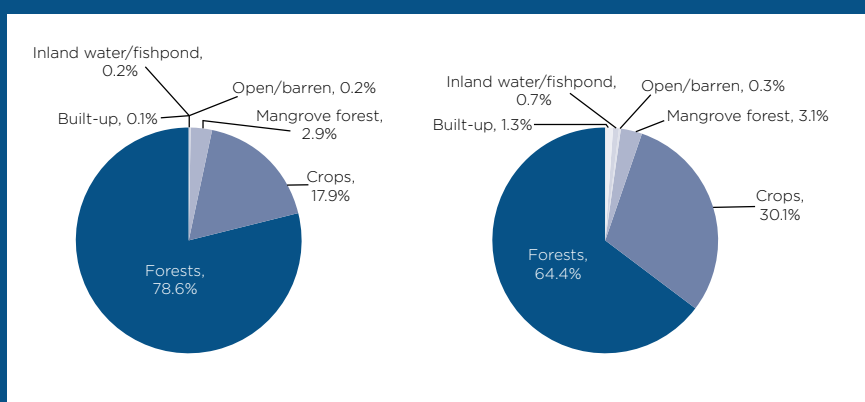


Image credit: Ana P Santos/World Bank



Figure 2. Land cover change in Southern Palawan

Land cover (hectares)	2003	2010	2014
Built-up	709	6,966	7,425
Annual crop	52,869	47,950	50,340
Perennial crop	46,130	113,735	115,845
Closed forest	130,121	28,025	33,206
Open forest, (wooded) grasslands, shrubs	305,086	334,713	322,817
Open/barren	1,383	961	1,761
Mangrove forest	16,297	17,020	17,054
Fishpond	720	1,440	407
Inland water	193	2,696	3,653
Grand total	553,508	553,508	553,508



The Philippines has just completed the Southern Palawan Pilot Ecosystem Account. The first land accounts were created there following an interactive process, which involved pre-processing and interpreting existing data, field validation and the completion of land cover maps. The account shows major deforestation that took place in Southern Palawan between 2003-2014

(see Figure 2). A large growth in plantation crops took place in the period, in particular coconut and oil palm plantations. Limited rainfall in the region is affecting the productivity of these plantations, which increasingly rely on water diverted from rivers. This reduces water available for downstream users, including paddy farmers.

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Wealth Accounting and the Valuation of Ecosystem Services

Wealth Accounting and the Valuation of Ecosystem Services (WAVES) is a global partnership led by the World Bank that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts.



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