Environmental Economic Accounts for Forests (CEAF): Proposal of a Methodological and Institutional approach for Application in Brazil

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Forest Accounts responds to demands of great relevance for Brazil, due to the huge territorial extension of Brazilian forests, enormous stocks and the magnitude of the flows of this natural resource for economy as well as the importance of this resource for international trade.
There is a large forest database in Brazil, which often needs to be adapted to the international statistical standards and the necessary specifications defined by the SEEA methodology for Forestry. In addition to the issue of exploring the timber, there are related issues such as climate change (CO2 emissions), water availability issues and biodiversity.
**Timber**: the cultivated timber resources and the natural timber resources should be considered in the accounts. According to the SEEA Methodology as well the related *Land Use and Land Cover* Accounts, for which IBGE has already published and disseminated works.
2 Approaches:
Forest Stocks – Land Use

Timber Products - Measured by economic surveys of IBGE.

Methodologically, according to the UNSD, the forest accounts are "coupled" with the land use accounts, and IBGE has works related to this subject.
The land cover and use is central to economic and environmental accounts. Some of the issues that can be considered are the impacts of urbanization, the intensity of agricultural production and animal husbandry, forestry and deforestation, water use and other direct and indirect land uses.
According to the SEEA Central Framework (UNSD, op. cit.), the accounts of forests and other wooded land, must be presented together with the timber resource accounts, as showed in the following diagram:
The Brazilian Institute of Geography and Statistics (IBGE) conducted a work that applies the methodology of Environmental Economic Accounts to land use, showing where and how much changes occurs in a regular period of time.

The project Changes in Land Cover and Use (IBGE, 2015) aims to monitor changes in Land Cover and Use in Brazil every two years. The present report lists the changes between the years 2000, 2010, 2012 and 2014.
Comparing these changes and those that occurred in the previous period can highlight some situations, such as the expansion of agriculture, managed grassland, forestry and artificial areas, and reductions of forest vegetation and natural grassland (Graphs 1 and 2).
Graph 1: Changes in Land Cover and Use between 2010 and 2012

Variation between 2010 and 2012 (%)

Main classes of cover and use selected

- ARTIFICIAL AREA
- AGRICULTURE AREA
- MANAGED GRASSLAND
- FORESTRY
- FOREST VEGETATION
- NATURAL GRASSLAND

Source: IBGE. Directorate of Geosciences. Project: Changes in Land Cover and Use in Brazil
Graph 2: Changes in Land Cover and Use between 2012 and 2014

Source: IBGE. Directorate of Geosciences. Project Changes in Land Cover and Use in Brazil
Land Use and Land Cover - Brazil - 2012

Legend:
1. Artificial surfaces
2. Croplands (woody+herbaceous)
3. Artificial pasture (seeded grassland)
4. Croplands with remaining forests
5. Forestry
6. Forests
7. Mosaics of predominantly forested areas and multiple or layered crops
8. Shrub-covered areas
9. Shrub-covered areas permanently or regularly flooded
10. Natural pastures
11. Artificial surfaces
12. Inland water bodies
13. Coastal water bodies
14. Terrestrial barren land
Timber Statistics

IBGE systematizes economic information on timber products and plant extraction through the National Classification of Economic Activities (CNAE 2.0) and the Survey on the Production of Plant Extraction and Forestry (PEVS).
The tables present the information available on the subject in the IBGE surveys and have periodicity compatible with the formation of an accounting system for timber and non-timber forest products. This information is a relevant input for the future preparation of the forest accounts.
Conclusions

Two important aspects:

(i) present the methodology of the Environmental Economic Accounts – Central Framework (SEEA – CF) of the United Nations Statistics Division, as well as the limitations for its adaptation to the Brazilian reality.
(ii) the sources of information available in the country, that can serve as inputs for the preparation of the Forest Accounts according to the SEEA Central Framework methodology, targeting an initial assessment of data and gaps to fill the reference tables of this methodology.
(iii) show the technical and institutional state of art in the trajectory of the implementation of the Environmental Economic Accounts for Forests in Brazil.
A limitation found in the methodology proposed by the SEEA Central Framework is the treatment of non-wood products, which have not been highlighted on this methodology, but which have significant importance for the Brazilian reality. We believe that the development of forest accounts in Brazil may contribute and collaborate with the UN Statistics Division (UNSD) for the development of this methodological approach.
Conclusions:

i) The methodologies for the construction of Environmental Economic Accounts for Forests from SEEA-CF and the System of Environmental Economic Accounts – Agriculture, Forests and Fisheries (SEEA-AFF) of FAO, although not fully consolidated as other satellite accounts are available for use and needs to be improved and tested.

ii) There are data, information, studies and surveys in Brazil which are dispersed and can be used as inputs for the construction of Environmental Economic Accounts for Forests;

iii) The urgent need to build an institutional platform for the development of the Environmental Economic Accounts for Forests in Brazil.
Thank You

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