

Estimating Natural Capital: Current Methodology and Planned Improvements

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Natural Capital: What is estimated? What is missing?



Missing Natural Capital – Water and Fisheries

Forests: Current Methodology

- Value of Forest Wealth = Sum of
 1. value of standing stock of commercial wood and woodfuel
 2. value of forests from provision of (i) watershed protection (ii) recreation, hunting, and fishing; and (iii) non-wood forest products
- Value = present value of stream of expected rents
- Incorporates concept of sustainable use

Forest Methodology: Critique

- Methodology sound, data needs to be improved (more easily addressed at the country-level)
- Key data limitations –
 - Export prices used to calculate gross timber value
 - Regional rental rates used to derive net timber revenue
 - Limited coverage of data on woodfuel and non-wood products
 - Use of outdated parameter values for non-wood services

Agricultural Lands: Current Methodology

- Sum of value of croplands and pasturelands
- For each, value is estimated as the net present value of the flow of rents
- Croplands: rents across range of commodities – cereals, vegetables, fruit, nuts, etc. - are added
- Pasturelands: rents across range of animals for production of meat, milk, etc.

Ag. Lands Methodology: Critique

- Methodology sound, data needs to be improved (more easily addressed at the country-level)
- Key data limitations
 - Absent data on cost of production, constant rental rates are use (30% of crops, 45% for pastures)
 - Impact of land degradation and climate change not accounted for
 - Diversity of production systems not accounted for (industrial production versus open grazing)

Protected Areas: Current Methodology and Critique

- Current methodology
 - Opportunity cost approach
 - Lower of per hectare value of croplands or pasture lands
 - Terrestrial protected areas (IUCN categories I to VI)
- Critique
 - Potential double-counting with forests wealth
 - Marine protected areas

Marine Fisheries: Current Methodology and Critique

- One time estimate
- Fisheries wealth is present value of resource rents
 - Harmful/ambiguous subsidies are treated as costs
 - Adjustments made for ownership of high seas
 - If resource rents are negative then wealth is capped at zero
- Methodology and data needs improvement

Current plans to improve natural capital estimates

Asset	Scoping Study	Implementation	Expected Completion
Forests (and protected areas)	Completed	Ongoing	June 2015
Agricultural Land	Ongoing	-	December 2015
Sub-soil Assets	Ongoing	-	December 2015
Fisheries	Under planning	-	-

Changing Wealth of Nations (Update – 2015)

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Changing Wealth of Nations Update

- Use existing methodology (relax generational cap, and account for TFP)
- Focus on
 - Sustainability Indicator – Change in wealth per capita
 - Diversified Development – Change in asset portfolio
 - Produced capital
 - Natural Capital
 - Human Capital
 - Institutional Capital

Change in wealth per capita

- Measure of sustainable development
 - Arrow et al. (2012): Intergenerational welfare increase (decreases) iff change in comprehensive wealth is positive (negative)
- Account for TFP and population:
 - ...comprehensive wealth plus TFP growth is positive
 - ...percentage rate of change in population size plus the rate of change in wealth is non-decreasing

Diversified Development: Measures of Human Capital

- Estimates of human capital
 - Cost-based approach - Value of inputs that enter its production
 - Based on educational attainment
 - Income-based approach – discounted value of future streams of income over lifetime
- Indicators
 - Public expenditure on education, total (% of GDP)
 - Average years of schooling (of adults)
 - PISA reading scores

Diversified Development: Measures of Institutional Capital

- Measure as Total Wealth residual
- Indicators of key components (resource-rich economies)
 - Robustness of rules to manage natural resource rents (Inflation Volatility)
 - Quality of public services (Political Institutions, Government Effectiveness)
 - Ability of governments to create level playing fields (Ease of Doing Business – Distance to Frontier Measure)