

## Operationalizing Environmental-Economic National Accounts

### A Brief Report on a Workshop on Valuing and Accounting for the Environment in Asia

October 8<sup>th</sup>–10<sup>th</sup>, UNESCAP, Bangkok, 2013

#### Introduction

It is rare to see statisticians, ecologists, economists and policy analysts sit across the table and talk to each other on a common agenda. On October 8–10, some 100 such professionals met at the UN Conference Centre in Bangkok, Thailand to discuss mechanisms for making our national accounts go “Beyond GDP” to address inter-linkages between natural capital and human well-being. While the participants discussed a variety of challenges related to integrating environment into national accounts in Asia, three priority issues emerged: a) the need for raising awareness and advocacy within governments at multiple levels to show the links between environmental-economic accounts and policy needs; b) institutionalization of efforts to build environmental accounts through identification of coordinating mechanisms and piloting of accounts,

particularly in sectors such as forests, water and land; c) training and skill building related to environmental-economic accounting and valuation of ecosystem services. There is a clear role for governments and international agencies in addressing these tasks, which should pave the way for better measures of sustainable development.



## Going Beyond Gross Domestic Product

Sir Partha Dasgupta stressed in his keynote address that planners and economists' pre-occupation with the Gross Domestic Product (GDP) has given primacy to the welfare of the present generation over future generations. However, the future may not be as distant as it seems. Thus, a high GDP, which is a measure of current economic activity, may not be cause for jubilation if it is at the cost of reductions in the productive capital base of the economy. GDP may be a good measure of economic changes in a country, but it is a poor measure of sustainable changes.

The national accounting device, Net Domestic Product (NDP), which accounts for depreciation in the physical capital stock of an economy, is a better measure of economic development. However, NDP is still inadequate as a measure of sustainability because it disregards changes in the natural resource base. To ensure sustainability, welfare changes over time are best tracked by identifying changes in the 'comprehensive wealth' of an economy. Box 1 showcases the Inclusive Wealth Report, which is one attempt to measure comprehensive wealth.

Accounting for changes in wealth requires identifying changes in the aggregate value of the capital base of an economy. While traditionally, only physical capital has been given attention, the scope of capital accounting has, over time, expanded to include both human and natural capital. The challenge now remains to find a common metric to both measure and sum up human, physical and natural and other forms of capital in a manner that is both practical and complements the frameworks and principles that underlie existing systems of national accounts.

The Workshop on Valuing and Accounting for the Environment had several objectives. It sought to illustrate the policy need for better measures of wealth and income and to provide information on statistical tools to measure the contribution of the environment to the economy and the impacts of economic activity on the environment. The workshop also discussed various methods for valuing the environment and examined current practices in Asia in implementing environmental-economic accounts. The broader context for the workshop was the United Nations' mandate to help and enable countries to implement the System of Environmental Economic Accounts (SEEA).

## Connecting a Community of Practice

The workshop was organized by multiple regional and international organizations and brought together practitioners from some 13 countries in Asia and several from outside the region. The organizers of the Workshop were the United Nations Environment Programme (UNEP), the South Asian Network for Development and Environmental Economics (SANDEE) and United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Other organizations who collaborated with this effort were the ASEAN Center for Biodiversity in partnership with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Asian Development Bank's Core Environment Programme, the Economy and Environment Program for South East Asia (EEPSEA), the Indian Society for Ecological Economics, the Poverty Environment Initiative of the United Nations Environment and Development Programmes (UNDP-UNEP) and the United Nations Statistics Division (UNSD) and the World Bank.

Workshop participants came from South Asia (Bangladesh, Bhutan, India, Pakistan and Sri Lanka) and East Asia (China, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand and Vietnam). In addition there were resource persons from countries such as Australia, the Netherlands, the United Kingdom and the United States and donors representing multiple agencies. The workshop provided an opportunity to take stock of advances made by different countries, such as Australia, Bhutan, Malaysia, Philippines, India, Indonesia, Sri Lanka and Vietnam, in implementing the SEEA.

## The System of Environmental Economic Accounting (SEEA)

Given that the natural resources have a direct impact on production as well as consumption, Pushpam Kumar (UNEP) emphasized the urgency for monitoring resources within an accounting framework. The existing System of National Accounts (SNA) was designed to measure economic performance. It is now timely to move forward on implementing the SEEA, which complements the SNA.

Broadly speaking, the SEEA is a systems approach that identifies relationships between environment-economic stocks and flows, measured both in physical and monetary terms. The SEEA consists of three parts: the SEEA *Central Framework*, the statistical standard dealing with the measurement of the environment and its relationship with the economy, the SEEA *Experimental Ecosystem Accounting*, which proposes an accounting framework to measure ecosystem conditions and services and the capacity of ecosystems to continue

## Box 1: Inclusive Wealth Index

Anantha Duraiappah and Pablo Munoz of the International Human Dimensions Programme of the United Nations University (UNU-IHDP) discussed the Inclusive Wealth Report (IWR) 2012 and how it measures comprehensive wealth. The inclusive wealth index attempts to overcome the limitations of GDP or the Human Development Index as welfare indicators by incorporating long term changes in all forms of capital, including natural capital. The IWR assessed 20 countries over the period 1990-2008. A quick look at the country ranking in terms of the average annual growth in the three indices (GDP per capita, HDI and IWI per capita) shows differences among countries in how they stand relative to each indicator. So, for example, a country like Nigeria, which has exhibited high GDP and HDI growth, does not do so well in terms of sustainability measured in IWI per capita (see full report at <http://www.ihdp.unu.edu/file/get/9927.pdf>).

**Table 1: Average annual economic performance of 20 countries when assessed with IWI per capita, GDP per capita, and HDI over a period of 19 years (1990-2008).**

GDP per capita	HDI	IWI per capita
9.6 China	1.7 China	2.1 China
4.5 India	1.4 India	1.8 Germany
4.1 Chile	1.3 Nigeria	1.4 France
2.5 Nigeria	0.9 Colombia	1.2 Chile
2.3 Norway	0.9 Brazil	0.9 Brazil
2.2 Australia	0.8 Russia	0.9 India
2.2 U.K.	0.8 Venezuela	0.9 Japan
1.8 Ecuador	0.7 Chile	0.9 U.K.
1.8 U.S.	0.7 France	0.7 Norway
1.7 Colombia	0.7 Germany	0.7 U.S.
1.6 Brazil	0.6 Ecuador	0.4 Canada
1.6 Canada	0.6 Norway	0.4 Ecuador
1.5 Germany	0.6 U.K.	0.1 Australia
1.3 France	0.5 Saudi Arabia	0.1 Kenya
1.3 South Africa	0.4 Japan	-0.1 Colombia
1.3 Venezuela	0.4 Kenya	-0.1 South Africa
1.2 Russia	0.3 Australia	-0.3 Russia
1.0 Japan	0.3 Canada	-0.3 Venezuela
0.4 Saudi Arabia	0.2 U.S.	-1.1 Saudi Arabia
0.1 Kenya	-0.1 South Africa	-1.8 Nigeria

to provide services to the economy and, more broadly, to humans; and the SEEA *Applications and Extensions*, which presents examples of how the SEEA can be used to derive indicators and for scenario modelling.

After many years of consultation and deliberation, the *Central Framework* of the System of Environmental Economic Accounts was completed in 2011, and the United Nations Statistical Commission (UNSC), in its 43rd Session in 2012, adopted the *Central Framework* as the first international standard for environmental-economic accounting. As discussed by Ivo Havinga (UNSD), the UNSC also adopted an implementation strategy that will be rolled out in four phases. In the first phase, the objective is to establish a national institutional mechanism bringing together users and producers of statistics. This would be followed by a second phase to identify priorities on the basis of country-level self-assessment of policy issues and broad data availability. The third phase would consist of pilot compilation of selected priority accounts, followed by an assessment of data quality and strategic development plans (<http://unstats.un.org/unsd/envaccounting/seea.asp>).

### Country Experiences

In the last two decades, there have been several attempts to build frameworks to generate green accounts. Historically, efforts to build natural capital accounts in developing countries have been episodic, and have not necessarily lead to consistent development of accounts. Government agencies collect a lot of data, but these data may not meet national accounting needs. Data over a period of time that are systematically collected may not be available. Further, since data needs to be gathered from different agencies and line Ministries, this requires

planning and coordination as well as budget allocations.

Many countries in Asia already have experience with building environment-economic accounts. In Indonesia, this effort started as early as the 1980s, and by 2000, an annual satellite accounting system for national accounts was introduced by BPS-Statistics Indonesia. BPS-Statistics Indonesia's strategy now is to initiate a three year roadmap to compile indicators for Sustainable Development Goals (SDGs). The plan is to expand coverage of asset accounts, which currently cover timber, minerals and energy, construct physical supply and use tables for energy and water, compile functional accounts of production and consumption of different environmental goods and services, integrate the accounts and generate SDG indicators. There is also a plan to conduct a study on ecosystem



## SEEA Experimental Ecosystem Accounting

Alessandra Alfieri (UNSD) discussed SEEA Experimental Ecosystem Accounting and its evolution as a broader process for revising the SEEA 2003. SEEA *Experimental Ecosystem Accounting* represents the state of the art in the measurement and accounting of ecosystem conditions and services. Stocks are represented by spatial areas with a range of characteristics such as land cover, biodiversity, soil type, altitude and slope, etc., which describe the operation and location of the ecosystem. Flows reflect flows between and within ecosystem assets, including ongoing ecosystem processes, and flows to the economy and humans, namely ecosystem services (i.e. provisioning, regulating and cultural services). Thus, the focus is on the overall quality of ecosystem assets as well as ecosystem services.

There are many challenges in implementing ecosystem accounts including the delineation of the spatial units, the classifications of ecosystem assets and the non-market valuation of services and assets. At the country level, it will need institutional leadership as well as skills to integrate geospatial and non-market valuation information with statistical data. A number of international initiatives such as the World Bank's Wealth Accounting and the Valuation of Ecosystem Services (WAVES) (see [www.wavespartnership.org](http://www.wavespartnership.org)), UNEP supported the Economics of Ecosystems and Biodiversity (TEEB) (<http://www.teebweb.org>), and research networks in Asia (EEPSEA and SANDEE) have been strengthening policy demand, piloting methodological tools, and building skills related to environmental valuation. Thus, there is a definite, albeit slow, building up of local expertise in many countries.

accounting, but strengthening capacity building and coordination among line ministries is a first priority.

The Philippines has also had an early start. In 1991, the Department of Environment and Natural Resources started the Environmental and Natural Resources Accounting Project. In 1995, the Integrated Environmental Management for Sustainable Development Programme was initiated with a sub-programme on Environment and Natural Resource Accounting (ENRA) I based on the UN 1993 SEEA framework. In 1998, the ENRA II project was initiated and institutionalized through the Philippine Economic-Environmental and Natural Resources Accounting (PEENRA) System. This involved updating of accounts till 1998 and piloting of environmental accounts at the sub-national levels. Physical and monetary accounts for dipterocarp forests, minerals, agricultural land, as well as in the industrial sector (paint industry, cement, tuna canning, etc.) were created. There was also a compilation of expenditures made privately and by government agencies in environmental protection. Going forward, the Philippines seeks to update various accounts and sees the need for institutionalization through the creation of a special unit that can focus on compiling environmental accounts.

India too has made some progress in environmental accounting. Since 1997, the Central Statistical Organisation (CSO) has published a Compendium of Environmental Statistics, which provides data on various environmental variables such as biodiversity, the atmosphere, land and soil, water, and human settlements. Based on the recommendations of the Technical Working Group on Natural Resource Accounting, set up in 1997, CSO commissioned a set of 8 studies (land, forests, air, water, and subsoil resources in eight Indian states) to better understand how to develop environment related accounts. Subsequently, in 2011, an Expert Group under the Chairmanship of Sir Partha Dasgupta was set up to provide a conceptual framework for natural resource accounting. The committee's report in 2013 recommends a five step process to move from the existing SNA to more comprehensive accounts, building on the UN SEEA.

### Role for Research

Two research networks that were co-organizers of this workshop – SANDEE and EEPSEA – emphasized and demonstrated the merit in undertaking local research on ecosystem services and their valuation. Research is required on assessing physical changes in order to match physical information with administrative units of measurement. There are also difficulties with aggregation and scaling up of ecosystem services to the national level. Further, as Priya Shyamsundar (SANDEE) noted, one of the crucial roles that the networks can play is in generating valuation studies that are locally adapted. This may be critical in implementation of the SEEA in the Asia Pacific region as values cannot easily be transferred from one region to another, particularly in the case of ecosystem services that are geographically defined. Hermi Francisco (EEPSEA) pointed out the need for many more such studies, as they require multidisciplinary work, which is still very limited in Asian countries.



**Table 1: Country Discussions and Priorities**

Country	Priority Sectors selected	Research Needs	Capacity and Related Needs
Bangladesh & Bhutan	<ul style="list-style-type: none"> <li>Water</li> <li>Forest</li> </ul>	<ul style="list-style-type: none"> <li>Valuation of ecosystem services and implications for human well being</li> </ul>	<ul style="list-style-type: none"> <li>Training on SEEA</li> <li>Training on Valuation</li> <li>Exchange programs for capacity building</li> <li>Coordination needed among various line ministries</li> </ul>
China	<ul style="list-style-type: none"> <li>Soil</li> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Assessment tools and methodology</li> </ul>	<ul style="list-style-type: none"> <li>SEEA expertise</li> <li>Data assessment systems (standards)</li> <li>Software tools for managing data</li> </ul>
India	<ul style="list-style-type: none"> <li>Forest</li> <li>Land</li> <li>Sub-soil minerals</li> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Ecosystem assessment/measurement</li> <li>Pilot studies on ecosystem accounts and SEEA sub-systems</li> </ul>	<ul style="list-style-type: none"> <li>Training on SEEA Central Framework and Ecosystem accounting</li> <li>Environmental valuation techniques</li> <li>Piloting accounts</li> </ul>
Indonesia	<ul style="list-style-type: none"> <li>Energy</li> <li>Land use</li> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Valuation (focusing on physical flow accounts)</li> <li>Selected cases for ecosystem services</li> <li>Pilots at the provincial level to show inter-linkages</li> </ul>	<ul style="list-style-type: none"> <li>Methodology for implementation and analytical skills</li> <li>Policy formulation and linkages</li> <li>Staffing</li> <li>Advocacy to top levels, parliament/legislatures, line ministries and local governments</li> </ul>
Lao PDR	<ul style="list-style-type: none"> <li>Water</li> <li>Energy</li> <li>Forestry</li> <li>Land</li> </ul>	<ul style="list-style-type: none"> <li>Assessment of physical data and gaps</li> <li>Monetary base research on valuation</li> </ul>	<ul style="list-style-type: none"> <li>Awareness raising within Government</li> <li>Technical training</li> <li>Piloting of Accounts</li> </ul>
Malaysia, Myanmar & Thailand	<ul style="list-style-type: none"> <li>Forestry</li> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Ecosystem services valuation</li> <li>Resource depletion and economic development linkages</li> </ul>	<ul style="list-style-type: none"> <li>Training on SEEA Central Framework</li> <li>Accounts development and policy formulation/interpretation</li> <li>Communication to the public</li> <li>Ecosystem services and valuation</li> </ul>
Philippines	<ul style="list-style-type: none"> <li>Minerals</li> <li>Water (Laguna Lake)</li> <li>Terrestrial ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>Valuation for small-scale mines (to update the parameters currently used, and capture the impact of production)</li> <li>Pilot studies on ecosystem valuation/accounting methodology</li> </ul>	<ul style="list-style-type: none"> <li>Training (SEEA, UN-revised framework for environmental statistics, mineral accounts, ecosystem accounts, FDES)</li> <li>Hard and soft ware support</li> </ul>
Sri Lanka	<ul style="list-style-type: none"> <li>Agriculture (crops, livestock, fisheries, forestry)</li> <li>Industry (manufacturing)</li> </ul>	<ul style="list-style-type: none"> <li>Resource valuation</li> <li>Valuation of ecosystem services</li> <li>Damage cost estimation</li> <li>Industrial pollution value</li> </ul>	<ul style="list-style-type: none"> <li>Data generation and management</li> <li>Training in valuation</li> <li>SEEA and Experimental Eco-system accounting</li> <li>Need for national coordination committee</li> <li>Exposure to international practices</li> </ul>
Vietnam	<ul style="list-style-type: none"> <li>Forest</li> <li>Water</li> <li>Land</li> </ul>	<ul style="list-style-type: none"> <li>Biophysical and ecosystem modeling</li> <li>Valuation</li> </ul>	<ul style="list-style-type: none"> <li>SEEA and development of accounts</li> <li>Coordination among line ministries</li> <li>Policy formulation/linkages from accounts</li> </ul>

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## An Agenda for Action

On Day 3 of the conference, participants were divided into country groups. Their task was to discuss the following issues: a) identify top two priority sectors for which the country would like to compile accounts; b) discuss the policy questions that these accounts might address; c) identify key stakeholders who would need to be coordinated for these priority accounts; d) examine important capacity- building needs for implementing the sector accounts; and e) identify key research priorities related to the sector accounts.

Different areas of priority accounts, research needs and capacity building needs identified by country groups are presented in Table 1. Several results emerge:

- Countries identified several priority sectors for initial implementation of environmental accounts. **Forests, water and land emerge as three resources that are prioritized across several countries.** The SEEA Central Framework can be used to implement accounts in these sectors initially, with experimental ecosystem accounts created as feasible.
- **Two important criteria in identifying priority environmental accounts are local and national policy needs and ease of implementation.** Thus, both the capacity for implementation and demand need careful consideration. A critical part of the challenge is inter-agency coordination and how institutional arrangements and leadership responsibilities are managed between different line-ministries or agencies.
- **The capacity to implement SEEA, its production and use is currently weak in most countries and needs to be bolstered.** This would require hardware and software support, staff skill up-gradation, and advocacy and awareness raising to the top levels and to local governments.
- **Training in the use of the SEEA Central framework is an important first step in building capacity, followed by the SEEA Experimental Ecosystem Accounting, including physical and monetary accounts.** Almost all the countries requested training in valuation and identified the lack of knowledge on what it means to measure and value ecosystem services as a serious gap.
- **Countries discussed the need to come together as a community of practice.** As they launch environmental-economic accounts, it would be useful to be able to engage with others to see if they are 'getting it right' and to seek help on how to proceed.
- **Research priorities include assessing gaps in existing data for sectoral accounts, preparing pilot studies on ecosystem accounting and finalizing valuation methodologies for ecosystem services.** Local natural resource values may need to be scaled up using acceptable methodologies.

Environmental accounting cannot be as an isolated goal. Rather, this has to be part of a larger strategy to find pathways for achieving sustainable development that are inclusive and equitable. This is the challenge that countries take forward in implementing environmental-economic national accounts.

*This Policy Brief was developed by Pranab Mukhopadhyay and has received extensive comments from different workshop sponsors.*

*Photo Credit: François Langella*

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