BOOK OF ABSTRACTS

SESSION DESCRIPTION

Session ID:
T11

Title of session:
Ecosystem accounting: Advances, Lessons learned, and Implications for Decision-Making

Hosts:

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<th>Name</th>
<th>Organisation</th>
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</thead>
<tbody>
<tr>
<td>Host:</td>
<td>Dr. Rosimeiry Portela</td>
<td>Conservation International</td>
<td><a href="mailto:rportela@conservation.org">rportela@conservation.org</a></td>
</tr>
<tr>
<td>Host:</td>
<td>Ms. Mandy Driver</td>
<td>South African National Biodiversity Institute (SANBI)</td>
<td><a href="mailto:m.driver@sanbi.org.za">m.driver@sanbi.org.za</a></td>
</tr>
<tr>
<td>Host:</td>
<td>Dr. David Vačkář</td>
<td>Global Change Research Centre and IUCN CEM</td>
<td><a href="mailto:vackar.d@czechglobe.cz">vackar.d@czechglobe.cz</a></td>
</tr>
<tr>
<td>Co–host:</td>
<td>Dr. Glenn–Marie Lange</td>
<td>The World Bank</td>
<td><a href="mailto:glange1@worldbank.org">glange1@worldbank.org</a></td>
</tr>
<tr>
<td>Co–host:</td>
<td>Dr. Jeanne Nel</td>
<td>Council for Scientific &amp; Industrial Research (CSIR)</td>
<td><a href="mailto:jnel@csir.co.za">jnel@csir.co.za</a></td>
</tr>
<tr>
<td>Others involved:</td>
<td>Daniel Juhn</td>
<td>Conservation International</td>
<td><a href="mailto:djuhn@conservation.org">djuhn@conservation.org</a></td>
</tr>
<tr>
<td></td>
<td>Hedley Grantham</td>
<td>Conservation International</td>
<td><a href="mailto:hgrantham@conservation.org">hgrantham@conservation.org</a></td>
</tr>
<tr>
<td></td>
<td>Sofia Alroth</td>
<td>The World Bank</td>
<td><a href="mailto:sahlroth@worldbank.org">sahlroth@worldbank.org</a></td>
</tr>
<tr>
<td></td>
<td>Joel Houdet</td>
<td>African Centre for Technology Studies (ACTS)</td>
<td><a href="mailto:j.houdet@acts-net.org">j.houdet@acts-net.org</a></td>
</tr>
<tr>
<td></td>
<td>Mark Eigenraam</td>
<td>United Nations Statistics Division (UNSD)</td>
<td><a href="mailto:eigenraam@un.org">eigenraam@un.org</a></td>
</tr>
<tr>
<td></td>
<td>Carl Obst</td>
<td>Independent consultant</td>
<td><a href="mailto:carl_obst@me.com">carl_obst@me.com</a></td>
</tr>
<tr>
<td></td>
<td>Prof. Lorenzo Fioramonti</td>
<td>University of Pretoria, Director of Centre for the Study of Governance Innovation</td>
<td><a href="mailto:lorenzo.fioramonti@gmail.com">lorenzo.fioramonti@gmail.com</a></td>
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Abstract:

The aim of the session is to review and discuss recent developments in incorporating ecosystem services into economic and other activities, in accordance with the System of Environmental Ecosystem Accounting (SEEA), following constraints of the international standard System of National Accounts (SNA). Ecosystem Accounting is defined in the System of Environmental–Economic Accounting (SEEA) as a coherent and integrated approach to the assessment of the environment through the measurement of ecosystems, and measurement of the flows of services from ecosystems into economic and other human activity. The SEEA–Experimental Ecosystem Accounting, with a proposed structure for ecosystem accounts, as well as the current knowledge on ecosystems measurement and valuation, has been recently released by UN Statistical Division and is now being piloted and tested in several countries. Presentations will highlight the latest advances on conceptual framework for ecosystem accounting as well as integrated assessments, indicators and measurement of ecosystem condition, assets, their ability to provide for goods and services now and over the long-term.

We are particularly interested in attempts to develop ecosystem accounts at a detailed spatial scale for a relatively large area, such as a whole province, state or country. This could include integrated physical accounting based on a range of metrics/indicators, and relying on spatially explicitly biophysical and monetary approaches, or a combination. We are also interested in the extent to which ecosystem accounting is being taken up by or mainstreamed into planning and policy-making in a range of sectors, and the institutional arrangements by which this is sought or achieved.

Emphasis will be given to measurement approaches to key accounting elements such as ecosystems extent and condition, capacity to provide ecosystem services, flows of ecosystem services – focusing on supply and use of ecosystem services, and the linkages between those and the economy. These will be discussed from the perspective of pilot initiatives, including examples from the, for example, the Advancing the SEEA–EEA Project, the Wealth Accounting and Valuation of Ecosystem Services (WAVES) global partnership, the Ecosystem Values, Assessment and Accounting (EVA), UNDP–UNEP Poverty–Environment Initiative and other national, as well as other projects.

The session will conclude with a panel discussion on lessons learned and steps necessary for mainstreaming ecosystem services into national accounts, development policies and poverty reduction planning. We hope to be able to provide an opportunity for researchers and practitioners engaged in ecosystem accounting work to engage in substantive discussion about issues and challenges they face, including both technical and implementation issues. We encourage those involved in ecosystem accounting work to submit abstracts for this session.

Voluntary contributions accepted:

Yes, if relevant to the session.

SPEAKERS

Oral presentations

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<td>Castaneda</td>
<td>The World Bank</td>
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<td>Mandy</td>
<td>Driver</td>
<td>South African National Biodiversity Institute (SANBI)</td>
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<td>La Notte</td>
<td>University of Torino</td>
<td>Physical and monetary ecosystem service accounts for Europe: a case study for in-stream nitrogen retention</td>
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<td>Naicker</td>
<td>Department of Environmental Affairs, South Africa</td>
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<td>Femi</td>
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<td>David</td>
<td>Vačkář</td>
<td>CzechGlobe – Global Change Research Centre, Academy of Sciences of the Czech Republic</td>
<td>Experimental ecosystem accounting: testing, implementation and use in decision-making, with examples from Central Asia</td>
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<tr>
<td>Yanzhao</td>
<td>Yang</td>
<td>Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences</td>
<td>The compilation of natural resources asset balance-sheet (NRABs) in Anji county ,China</td>
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<td>Stefan</td>
<td>Schmidt</td>
<td>Helmholtz Centre for Environmental Research</td>
<td>Estimating uncertainties of monetary valued ecosystem services – a value transfer model for</td>
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Towards national ecosystem accounting: Informing development policy in Guatemala

Presenting author: Juan Pablo Castaneda
Affiliation: The World Bank, United States of America
Contact: jpcastaneda@worldbank.org

In Guatemala, despite significant efforts for compiling Natural Capital Accounts (NCA) in the past, there are still major needs for institutionalization and most importantly, for aligning it to policy demands. WAVES is currently supporting the production of ecosystem accounts for policy relevant decision-making. Guatemala, as all countries in LAC is making efforts to strengthen drivers for development and this requires to deepen the analysis of strategic natural capital to meet priorities of economic and social policy, while sustaining the capital base in the long term. Specifically, there is a special need to understand potential impacts and design policy responses to climate change threats, as well as enhancing tourism potential as a growth sector in the country. The potential reduction in stocks of ecosystems and the services they provide, including protection against the threats caused by climate change, may adversely affect the potential for future economic growth. It is expected that the ecosystem accounts tested will inform decisions at both the macro level, and specific areas of study by a scale down – scale up approach. Such accounts would give greater certainty about the strategic ecosystems in the country according to social, economic, environmental and strategic relevance.

Keywords: Ecosystem accounting, ecosystem services, indicators, decision–making, natural capital, policy–making, scaling down, scaling up
Ecosystem Accounting in South Africa: Initial results and Lessons

Presenting author: Amanda Driver
Other author: Jeanne Nel
Affiliation: South African National Biodiversity Institute (SANBI), South Africa
Contact: m.driver@sanbi.org.za

South Africa began work on ecosystem accounting in mid-2013, and in mid-2014 joined six other pilot countries in a global project on Advancing SEEA Experimental Ecosystem Accounting, led by the United Nations Statistics Division in partnership with the United Nations Environment Programme (UNEP) and Convention on Biological Diversity (CBD), with funding from the Government of Norway. Ecosystem accounting is being approached in South Africa as a multi-partner initiative which spans institutional boundaries and mandates. The lead institutions are Statistics South Africa, the national statistical office, and the South African National Biodiversity Institute (SANBI), a government agency mandated to monitor and report on the state of biodiversity amongst other functions. Other key partners include the national departments of environmental affairs and water affairs, the Council for Scientific and Industrial Research (CSIR) and one of the nine provincial conservation authorities (Ezemvelo KwaZulu-Natal Wildlife). The presentation will give an overview of results to date, focusing on integrated land and ecosystem accounts as well as national accounts for river ecosystems. It will also summarise some of the challenges and lessons learnt to date, including those relating to mapping ecosystem units and assessing ecosystem condition for ecosystem accounts. Lastly it will outline the South Africa’s proposed programme of work on ecosystem accounting going forward.

Keywords: Ecosystem accounting, ecosystem services, indicators, decision-making, natural capital, biodiversity, rivers
Type of submission: Voluntary contribution

T11 Ecosystem accounting: Advances, Lessons learned, and Implications for Decision-Making

Accounting for Water Provision Service in San Martín, Peru

Presenting author: Miroslav Honzák
Other authors: Mahbubul Alam, Hedley Grantham, Fabiano Godoy, Daniel Juhn, Trond Larsen, Rosimeiry Portela, Kim Reuter, Ana Maria Rodriguez
Affiliation: Conservation International, United States of America
Contact: mhonzak@conservation.org

Natural capital accounting is emerging as a useful approach for understanding the different values of ecosystems to people and the economy. In San Martín, Peru, the water provision service has been identified as one of the most important ecosystem services in the region. We implemented ecosystem accounting the following way. First, we measured the flows of direct water provision from water bodies to different economic sectors. To do this we utilized data on annual water use permits supplied to us by three local water authorities and remote sensing data. The permit data contains detailed information about water allocation permits for the following sectors: domestic and industrial use, energy production, mining, and aquaculture. For these sectors, water allocation was used as a proxy for actual water use. For the agricultural sector we utilized maps of irrigated agriculture derived from analysis of remote sensing data. Second, we accounted for inter-ecosystem service flows between terrestrial ecosystems and freshwater bodies through using geographic locations of irrigated fields and spatially related this to water runoff originating from terrestrial ecosystems. Various methods of economic valuations were used depending on the type of water use. For valuing water in agriculture we used the net return to water (NRTW) approach. A similar cost–based approach, consistent with the System of National Accounts (SNA), was used to estimate value of water used by other sector. Finally, we show how to integrate these values into ecosystem accounts and developed these accounts over time to gain trends.

Keywords: Water provision, natural capital accounting, ecosystem service, San Martín, Peru
Physical and monetary ecosystem service accounts for Europe: a case study for in-stream nitrogen retention

Presenting author: Alessandra La Notte
Other authors: Neville Crossman, Silvana Dalmazzone, Joachim Maes
Affiliation: University of Torino, Italy
Contact: alessandra.lanotte@unito.it

In this paper we present a case study of integrated ecosystem and economic accounting based on the System of Environmental – Economic Accounting — Experimental Ecosystem Accounting (SEEA–EEA) developed and recommended by the United Nations Statistical Division, the United Nations Environment Programme TEEB Office, and the Secretariat of the Convention on Biological Diversity. We develop stock and flow accounts, in physical and monetary terms, for the water purification ecosystem service in Europe over a 20-year time period (1985–2005). We use a biophysical model (GREEN) to estimate nitrogen retention and we impose a sustainability threshold for nitrogen retention to obtain the physical indicators of capacity – the ability of an ecosystem to sustainably supply ecosystem services – required for the accounts. While our study retains the general structure of SEEA–EEA, some adaptation is made to asset account tables to guarantee consistency. Our application highlights several points of discussion which represent the key messages of our paper: i) the notion of capacity as referred to individual ecosystem services rather than to the ecosystem as a whole; ii) the difference between sustainable flow and actual flow of the service; iii) the definitions of stocks and flows in ecosystem service accounting; iv) the integration of ecosystem accounts with traditional economic accounts.

Keywords: Ecosystem accounting, ecosystem services, water purification, capacity, sustainable flow, actual flow
Type of submission: Voluntary contribution

T11 Ecosystem accounting: Advances, Lessons learned, and Implications for Decision-Making

A State of Play of Natural Capital Accounting (NCA) in Southern African development Cooperation member (SADC) countries

Presenting author: Kiruben Naicker (Department of Environmental Affairs)
Other authors: Joël Houdet (African Centre for Technology Studies (ACTS), Derick DeJongh, Albert Luthuli (University of Pretoria)
Affiliation: Department of Environmental Affairs and the University of Pretoria, South Africa
Contact: knaicker@environment.gov.za

The concept of Natural Capital is widely described as the stock of natural resources which enables the supply of ecosystem goods and services to people. Though the concept of Natural Capital Accounting (NCA) has been widely accepted amongst nations, its application and how it informs decision making, policy development and overall leadership requires exploration and analysis. Using green economy strategies and national policy provisions as entry points, this paper aims to determine a state of play of natural capital accounting application amongst Southern African Development Cooperation member countries (SADC) selected. This comparative analysis will include (i) who / what is driving NCA, (ii) the types of accounts (metrics) and values accounted for and (iii) what are the users and end-users of NCA. We hope that this research will inform policy dialogue at the SADC level with a view to strengthening NCA practices and associated communities of practice.

Keywords: Natural capital, national accounting, valuation
Incorporating ecosystem services loss in national accounting – an illustrative study on global deforestation

Presenting author: Le Nghiem
Other author: L. R. Carrasco
Affiliation: National University of Singapore, Singapore
Contact: nghphuongle@nus.edu.sg

To prevent externalization of natural capitals in developing sustainability performance indicators for global economies, the World Bank has incorporated natural resource depletion and damages from pollutants to create a comprehensive indicator entitled corrected genuine savings, or adjusted net savings (ANS). Yet, a number of ecosystem services have not been accounted for in the calculation, largely due to the lack of a comprehensive data on ecosystem services values at a large scale. In this study, build on two recent studies at the global scale which provides map of ecosystem services values (Carrasco et al 2014) and a high-resolution deforestation map (Hansen et al. 2013), we will calculate the yearly loss of ecosystem services as a result of deforestation that are unaccounted for in the World Bank indicator for tropical countries from 2001–2012.

Keywords: Ecosystem services, national accounting, deforestation, sustainability indicators
Mapping and Assessment of Freshwater Ecosystem Services and Values – The Case of Waikato Region

Presenting author: Femi Olubode
Other authors: Rebecca Eivers, Michael Pingram, Mark Hamer, Blair Keenan, Yvonne Phillips, Matthew Middleton, Hamish Dean, Hannah Mueller, Gerry Kessels, Brenda Baillie, Richard Yao
Affiliation: Waikato Regional Council, New Zealand
Contact: femi.olubode@waikatoregion.govt.nz

The proposed Waikato Regional Policy Statement aims to recognise and maintain or enhance freshwater ecosystem services to enable their ongoing contributions to regional wellbeing. Monitoring ecosystem services and socio-economic and cultural values could increase the productivity and efficiency of resource use for community wellbeing. This is because ecosystem services approach to natural resource management considers all services to all sections of a community. To facilitate this approach, tools such as ecosystems maps and database of services and values are useful at a level of detail at which policy and management decisions are made. This study provides more understanding of services and values of freshwater bodies (rivers, streams, lakes and wetlands) in Waikato region by developing maps underlined with interactive database system showing current and potential ecosystem services and values. The system allows structured querying, searching and updating of the database. The ecological status and health of the ecosystems are reflected on services and values of these natural resources using the Millennium Ecosystem and Assessment (MEA) and the Common International Classification of Ecosystem Services (CICES) frameworks. This helps the regional council’s capacity in monitoring the effectiveness of its natural resource management and policies.

Keywords: Natural capital accounting, governance of ecosystem services, ecosystem spatial planning, impact assessment
Implementing the SEEA Experimental Ecosystem Accounting: Conceptual Framework and Results from the Ecosystem Values and Accounting (EVA) Pilot in San Martin, Peru

**Presenting author:** Rosimeiry Portela  
**Other authors:** Daniel Juhn, Hedley Grantham, Ana Maria Rodriguez, Miroslav Honzák, Mahbubul Alam, Fabiano Godoy, Trond Larsen, Kim Reuter  
**Affiliation:** Conservation International, United States of America  
**Contact:** rportela@conservation.org

In this session, we will provide an overview of environmental–economic accounting with a focus on recent advances in Experimental Ecosystems Accounting (EEA). Ecosystem Accounting is defined in the SEEA as a coherent and integrated approach to the assessment of the environment through the measurement of ecosystems, and measurement of the flows of services from ecosystems into economic and other human activity. The presentation will highlight the latest advances on i) a conceptual framework for ecosystem accounting as well as ii) on integrated assessments and measurement of ecosystem assets, goods and services. Emphasis will be given to measurement approaches to key accounting elements such as ecosystems’ extent and condition accounts; ecosystem services accounts (biophysical and monetary, supply and use tables), assets and integrated accounts. These will be discussed from the perspective of the Ecosystem Values and Accounting (EVA), a project designed to field–test a replicable and scalable framework for incorporating nature’s benefits into decision–making. The presentation will provide an overview of methodological approaches toward the development of accounts, discussing results and potential policy applications, as well as recommendation for the future.

**Keywords:** Ecosystem accounting, ecosystem services, ecosystem extent, assets, indicators, decision–making, natural capital
Ecosystem accounting presents a coherent and integrated approach to the assessment of the environment through the measurement of ecosystems, and measurement of the flows of services from ecosystems into economic activity and human well-being. System of Environmental Economic Accounting – Experimental Ecosystem Accounting (SEEA – EEA) has been recently adopted by the international community as an extension of traditional statistics, with the aim to account for valuable assets and services provided by ecosystems. However, even if benefits of implementing experimental ecosystem accounting are to a large extent recognized, countries are still facing proper implementation of ecosystem accounting and its use in decision-making. The aim of this contribution is to address various aspects of development of System of Environmental Economic Accounting – Experimental Ecosystem Accounting (SEEA – EEA) at the national level. I review selected aspects and review benefits of implementing SEEA–EEA into national accounting structures, and possible barriers we are facing today. Experiences from developing SEEA–EEA at the national level in the Kyrgyz Republic (Central Asia) are presented, including the preparatory process, training and compilation of pilot accounts. Challenges of implementation and use in decision-making are presented. Moreover, possible use of SEEA–EEA in decision-making is analysed, based on indicators and related frameworks which aim to account for sustainability of human demand on natural capital and ecosystems.

**Keywords:** Ecosystem accounting, ecosystem services, indicators, decision-making, natural capital
The compilation of natural resources asset balance–sheet (NRABs) in Anji county, China

Presenting author: Yanzhao Yang
Other authors: Zhiming Feng
Affiliation: Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China
Contact: yangyz@igsnrr.ac.cn

Exploring the compilation of natural resources asset balance–sheet (NRABs) and its practical application is of great importance for improving the national management system of natural resources asset. This paper gave an assessment of natural resources accounting in Anji county during 2003–2013, which could provide the scientific basis for natural resources reasonable development. The NRABs including categorized physical sheet and integrated monetary sheet of natural resources was developed in Anji county. The results showed that, (i) From the physical volume, land resources were decreased by 2.4%, water resources were increasing by 53.4% overall, the resources of tree forest and bamboo forest showed an increasing trend, which increased by 104.5% and 34% respectively. (ii) From the monetary volume, the total natural resources assets showed increasing trend, increase by about 0.5%. The land resources assets reduced 1.27 billion yuan, decline by 0.4%. The water resources assets increase by 65.3%. The forest resources increasing 2.1 billion yuan, increase by 91.2%.

Keywords: Natural resources accounting (NRA), physical accounts, monetary accounts, natural resources asset balance–sheet(NRABs)
Estimating uncertainties of monetary valued ecosystem services – a value transfer model for global spatial explicit mapping

Presenting author: Stefan Schmidt
Other authors: Ameer M. Manceur, Ralf Seppelt
Affiliation: Helmholtz Centre for Environmental Research, Germany
Contact: stefan.schmidt@ufz.de

Growing demand of resources increases pressure on ecosystem services (ES) and biodiversity (1). It is frequently argued, that monetary valuation of ES supports decision-making by providing explicit values for unconsidered, non-market goods and services (2, 3). Based on a synthesis of 194 case studies (839 monetary values) on monetary valuation of ES, we here present the first comprehensive global value transfer models. They explain the monetary variability of 12 ES influenced by socio, economic and environmental variables. We provide the first global quantification of uncertainties and transferability of valuation studies. Our models explain 18% (water provision) to 44% (food provision) of monetary variance and provide for 70% (water provision) to 91% (food provision) of the terrestrial earth surface statistically reliable extrapolations. Although the application of different valuation methods are source of uncertainty, we found evidence that ecosystem related uniformity errors are most distortive. Food provision is positively correlated with better life domains and variables indicating positive conditions for human well-being. Water provision and recreation service show that weak ownerships affect valuation of other common goods negatively (e.g. non-privately owned forests). Furthermore, we found support for the shifting baseline hypothesis in valuing climate regulation. The model for extreme event prevention shows that both ecological conditions and societal vulnerability matters for monetary valuation. Valuation of habitat services is negatively correlated with indicators characterizing less favorable areas (marginal areas). Our analysis represents a stepping stone along the path to establish a standardized integration of and reporting on uncertainties for reliable and valid benefit transfer as an important component for decision advice.

Keywords: Ecosystem services, uncertainty, benefit transfer, spatial value transfer, global