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Wealth Accounting and the Valuation of Ecosystem Services (WAVES): A Global Partnership

Paper prepared by the World Bank

(for discussion)

Wealth Accounting and the Valuation of Ecosystem Services (WAVES): A Global Partnership Program

Background and project rationale

Human wellbeing is entirely dependent on ecosystems and biodiversity - but these resources are being degraded at alarming rates, and with them, the capacity to support human well-being, a problem that is exacerbated by climate change. The systematic under-valuation of ecosystem services and failure to capture their value was identified by the Millennium Ecosystem Assessment is one of the main causes underlying the ongoing crisis of ecosystem degradation and biodiversity loss (MA 2005). Part of the solution to this problem lies in policy making that takes into account the full value of ecosystem services—the benefits from ecosystems to individuals, communities and the economy, and the costs if those benefits are lost.

Considerable progress in the measurement and valuation of ecosystem services has been made, and a large number of case studies and demonstration projects have been undertaken. The recently concluded study on 'The Economics of Ecosystems and Biodiversity' (TEEB) pulled together much of this work and succeeded in focusing international policy attention on the economic contribution of ecosystems and biodiversity. Valuation has been widely accepted in the environment community, but a challenge remains to engage Ministries of Finance and economic planning agencies in dialogue about growth and ecosystem services.

To meet this challenge, ecosystem valuation has increasingly focused on 'greening' national income accounts. National income accounts are crucial because they constitute the primary source of information about the economy and are widely used for assessment of economic performance and policy analysis in all countries. Thus, they are key to communicating the importance of ecosystems to Ministries of Finance, planning agencies, and other key decision-makers, for informed decision-making on sustainable management of a country's natural capital.

National income accounts have a number of well-known shortcomings regarding the treatment of the environment and natural capital. For example, while the income from harvesting timber is recorded in national accounts, the simultaneous depletion of natural forest assets is not; perhaps more importantly, essential life-support services provided by forest ecosystems are not explicitly recognized at all. This can result in quite misleading economic signals about economic growth. One of the primary motivations for the early environmental accounting efforts in the mid-1980s was concern that rapid economic growth in some countries was achieved through liquidation of natural capital – a temporary strategy that creates no basis for sustained advances in wealth and human well-being, unless this natural capital is converted efficiently into other forms of wealth.

Progress with green accounting

Work on green accounting has been an off-and-on–again focus of the global environment community since the 1980s. There is a large body of theoretical literature showing that

development and long-term growth depends on the wealth of a nation, where wealth is broadly defined to include produced capital, natural capital, human and institutional capital and net foreign financial assets (see Arrow et al. 2003, Dasgupta 2001, Dasgupta and Mäler 2000, Hamilton and Clemmens 1999). The World Bank took up the challenge of green accounting early on, supporting work such as Ahmed at al. (1989) and Lutz (1993). In the 1990s, the World Bank began constructing a global database for Comprehensive wealth accounts; the natural capital component includes agricultural land, forest land, protected areas and subsoil assets. If wealth is decreasing, for example from depletion or degradation of natural capital, then a country will not be able to sustain its current level of income. Adjusted Net Savings (ANS) is a related indicator developed by the World Bank which measures whether a country is building its wealth or running it down ANS is intended to be used alongside traditional macroeconomic indicators such as GDP: GDP indicates whether an economy is growing; ANS indicates whether that growth is sustainable.

The World Bank has now published two reports on wealth accounting: the wealth accounts were first reported in *Where is the Wealth of Nations: Measuring Capital for the 21st Century* (World Bank 2006) and recently updated for 150 countries in *The Changing Wealth of Nations: Measuring Sustainable Development for the New Millennium* (World Bank, 2010). Adjusted Net Saving is reported annually in *World Development Indicators*. In addition to this on-going work program, the World Bank has supported a number of related background papers and convened expert group meetings on valuation of ecosystems in the accounting framework in 2009 and 2010. The wealth accounting approach was endorsed by President Zoellick who formally launched the Partnership for Wealth Accounting and the Valuation of Ecosystem Services (WAVES) at the Conference of Parties to the Convention on Biodiversity in Nagoya in October, 2010.

In parallel, there has been considerable effort over the past 20 years to develop statistical methodology for environmental accounting under the aegis of the UN Statistical Commission. The UN Statistical Commission has established a high-level group, the United Nations Committee of Experts for Environmental Accounting (UNCEEA), and a technical group, the London Group to prepare guidelines and methodologies for environmental accounting. A manual was prepared in 2003 'Handbook of National Accounting - Integrated Environmental and Economic Accounting', commonly referred to as the *System of Environmental and Economic Accounting*, or SEEA (UN et al. 2003). The World Bank has participated in the development of the SEEA as a member of both the London Group and the UNCEEA.

The SEEA provides a comprehensive and broadly accepted framework for incorporating the role of the environment and natural capital into the conventional system of national income accounts through a system of satellite accounts for the environment. The SEEA includes both asset accounts for stocks of natural capital, such as those constructed by the World Bank, as well as accounts with detailed statistics for the annual supply and use of material, energies and water, as well as the emission of pollutants. From these accounts, macroeconomic indicators such as Adjusted Net Saving and Adjusted Net National Income can be derived. This manual is currently under revision and parts of it will become part of the statistical standard like the System of National Accounts (European Commission et al., 2008) that sets out methodology for national accounts.

The challenge of green accounting was also the focus of President Sarkozy's recent commission on economic performance and social progress led by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi (2010). The Commission identified sustainability as a key pillar of better measures of economic progress (improved measurement of conventionally defined national income and quality of life issues were the other pillars) and called for a greater focus on accounting for natural capital in the national income accounts, supporting the concept of Comprehensive Wealth, termed 'extended wealth' in the report. The new Green Economy Agenda of both the OECD and the UN has also taken on the issue of national indicators of sustainability and economic progress that take into account natural capital.

Ecosystem services in green accounting

While accounting for marketed natural resources such as minerals have advanced significantly over the past two decades, accounts for non-marketed ecosystem services are still quite underdeveloped. The Millennium Ecosystem Assessment provides a useful starting point for thinking about different categories of ecosystem services:

- Provisioning services are the products people obtain from ecosystems such as food, fuel, fiber, fresh water, and genetic resources.
- Cultural services, tourism and recreation are the non-material benefits people obtain from ecosystems through spiritual enrichment, recreation, etc.
- Regulating services are the benefits people obtain from the regulation of ecosystem processes, including nutrient cycling, erosion control, natural hazard regulation (protection from floods, storms), pollination, waste processing and water purification, regulation of human diseases.
- Supporting services are those that are necessary for the production of all other ecosystem services, such as primary production, production of oxygen, and soil formation.

The Provisioning and Cultural/recreation services directly affect human welfare (corresponding largely to what environmental economists call Direct Use Values), while the Regulating and Supporting services contribute only indirectly to welfare, as intermediate inputs to the production of final goods and services (corresponding to Indirect Use Values).

Accounting for the value of Provisioning and Recreation services, and their associated ecosystem assets, is relatively straight forward because the services often have market prices, or 'near market' prices, which can be used to estimate their value. This component of natural capital is relatively well represented in the World Bank's wealth accounts and methodology for accounting is largely established in the revised SEEA[1].

The challenge lies with accounting for the Regulating services, whose value derives indirectly from their use as inputs to the production process, like other intermediate inputs to production in the national accounts.[2] Most often there are no markets for these services[3] and their value is already included, implicitly, in the value of other assets for which we have markets--for example,

[1] The full draft is expected at the end of 2011. Papers on individual issues and methodologies are currently available from the website established for global consultations: http://unstats.un.org/unsd/envaccounting/default.asp

[2] The challenge of accounting for regulating services is discussed further in World Bank 2010.

[3] Although Payments for Environmental Services schemes sometimes try to create such markets.

agricultural land includes the value of natural pollination or groundwater. But because the value of Regulating services is not explicit their values are hidden. Following the adage, "what we do not measure, we cannot manage," an objective of ecosystem accounting is to identify and make explicit the value of Regulating services.

A theoretical approach to ecosystem accounting was provided by Mäler et al. (2008). Many studies have worked to estimate the value of regulating services as an input to production (e.g., Barbier 2007, Barbier et al. 2008, Kareiva et al, forthcoming 2011). The World Bank's wealth accounts do not explicitly identify non-market ecosystem services[4] and the 2003 SEEA does not currently provide guidance on ecosystem accounting. However, in the current revision of the SEEA, a section will be included on ecosystem accounting, which will consider both physical measures and valuation.

Ecosystem services are especially important for developing countries, where the livelihoods of many subsistence communities depend directly on healthy ecosystems. In addition, these countries contain most of the world's biodiversity, and ecosystem services such as water provisioning and regulation, and soil protection are under greatest threat while they often have fewer resources to cope with loss of ecosystem services.

An accounting system that enables measurement of who benefits and who bears the costs of ecosystem changes is essential to developing approaches for restoring and maintaining ecosystem services. This requires that we disaggregate the value of ecosystem services, tracking the benefits to each stakeholder group, much as the Social Accounting Matrix disaggregates national accounts for different types of households and other institutions.

While climate change increases the threat to ecosystems, it also provides a unique opportunity to mobilize international support to jointly achieve mitigation/adaptation objectives and 'co-benefits'—ecosystem services—objectives, through activities such as REDD++ and Ecosystem-Based Adaptation. Quantifying the value of ecosystem service co-benefits is critical for successfully promoting co-benefits. A major global partnership to support implementation of natural wealth accounting—quantifying incomes from natural capital and the asset value of natural capital itself—is necessary if countries are to develop sustainably, especially while coping with climate change.

Overcoming the Obstacles to Natural Capital and Ecosystem Accounting

Environmental accounting has only been partially implemented, and mainly in OECD countries including both high-income and some middle-income countries. The policy advantages of accounts for energy and water use, the emission of pollutants have led to their adoption in a number of OECD countries (see Annex 1). Only 16 countries compile asset accounts for natural capital, mostly for oil, gas and minerals (see World Bank 2010 for review). But there has been relatively little long-term support for implementation of green accounting in developing countries, arguably where green accounts are most needed – resource-dependent economies where faulty economic treatment of environmental changes is likely to be associated with large-scale misallocation of national resources. At the global level, MDG 7 on environmental

[4] There is a very crude estimate value for one regulating service, forest watershed services.

sustainability has been a serious challenge since there were no agreed indicators and subsequently no real tangible or monitorable targets.

Few countries have fully integrated natural capital in analysis of economic growth. There have been numerous pilot environmental accounting projects and case studies, mostly independent, one-off country programs, but many of these efforts failed to lead to institutionalization of environmental accounting, especially in developing countries. Obstacles are many and varied but perhaps the most important obstacle is the failure to demonstrate *at scale* the practical benefits of natural capital accounting to policy-makers (see World Bank and Earth Institute, 2006 for review). A secondary, but significant, obstacle, particularly in developing countries, is the lack of internationally agreed methodologies for valuation of ecosystem services. Many developing countries have been particularly keen to show the economic value of ecosystem services and the cost of degradation. But without international standards for valuation, the green accounts lack credibility with ministries and national statistical agencies, and they are not mainstreamed into the decision-making process.

There is a need to *demonstrate at scale*, across a significant number of both developed and developing countries both the feasibility of monetary ecosystem accounting and the policy relevance. There is also a need to establish a Global Partnership that will provide an international forum for developing the technical work and its policy applications, and promoting it among a wide range of stakeholders including government policymakers, parliamentarians, NGOs and civil society, etc.

Program Goal and Objectives

The overall goal of WAVES is to promote sustainable development worldwide through the implementation of comprehensive wealth accounting that focuses on the value of natural capital and integration of 'green accounting' in more conventional development planning analysis.

To achieve this goal there are four specific objectives

1. Implementation of natural capital accounting, focusing on ecosystem services, at the national or sub-national level in 6-10 developing and developed countries to demonstrate at scale the feasibility of integrating natural capital in the national economic accounting framework. Ecosystem accounting will be carried out by both developed and developing countries, so that natural capital accounting becomes, like the national income accounts, something that all countries do.

2. Incorporating natural capital accounts in policy analysis and development planning that links natural capital and economic growth. The objective will be to incorporate these values in more conventional analysis for development finance decision-making, developing the evidence base to demonstrate at scale the usefulness of ecosystem accounting for policy and economic management.

3. Inputs into the development of internationally accepted, standardized guidelines for the implementation of ecosystem accounting. The objective will be to work with the

4. Establishing a Partnership to promote widespread adoption of natural capital accounting beyond the pilot countries by communicating the results to, and working with, a wide range of stakeholders including government policymakers, parliamentarians, international organizations, NGOs and civil society, academics, and others. This will also be achieved by leveraging additional resources once success has been demonstrated in the first phase of this study.

Program Activities

The following activities will be undertaken to achieve each of the program objectives.

Component 1. Implement ecosystem accounting at the national or sub-national level in several developing and developed countries.

1. Construct ecosystem and comprehensive wealth accounts

The World Bank will support implementation of natural capital accounting with a focus on ecosystem services in a group of 6-10 developing countries. In order to achieve a demonstration effect rapidly, the World Bank will give priority to countries that have already initiated this work to some degree, and have a reasonable amount of data available for ecosystem accounts. The first round of countries includes Botswana, Colombia, Costa Rica, India, Madagascar, and the Philippines. The second round of countries may include Namibia, Mexico, Vietnam and Uganda.[5]

WAVES will also include developed countries that will carry out their own work on ecosystem accounting. Countries that have expressed interest in joining include Australia, Japan, Norway, and the United Kingdom. These countries will fund their own work and will contribute through the Partnership to establish a 'critical mass' of country experiences.

Identifying priority ecosystems

There is a large range of ecosystems and ecosystem services that eventually need to be accounted for, and it is not possible to cover all at once. To make rapid progress and demonstrate the usefulness of ecosystem accounting, priorities for ecosystem accounting must be established. Each country will determine its priority ecosystems—considering the importance to a country's development and vulnerability to current development trends, but also the need for robust techniques for valuation, availability of data, and ability to scale up values from local case studies to national level. Countries will be encouraged to choose priority ecosystems through an extensive consultation process as well as through adding value to their previous work.

Building national or sub-national accounts

The context for ecosystem accounting is the concept of the comprehensive wealth approach to sustainable development described earlier. The objective is to develop country-specific

[5] These are are countries that have expressed interest in joining the partnership and will be considered in future work.

natural capital accounts, both the value of services and of the assets providing those services. Ecosystem accounts will be based on the SEEA to the extent possible, as well as emerging developments in environmental accounting. Following the general guidelines of the SEEA, ecosystem accounts consist of the following components:

- Monetary value of ecosystem services produced annually, and the cost of degradation of services:
  - For Provisioning and Tourism Services market prices or 'near market' prices can be used. In order to integrate ecosystem values with the national accounts, the valuation approach must be consistent with the national accounts, which are based on market prices[6]. Income in the national accounting sense is called 'value-added,' and when one speaks of a sector's contribution to GDP, it refers to that sector's value added. Value-added is calculated as gross revenue (the value of output) minus the cost of intermediate inputs (goods and services) used for production.[7]
  - For Regulating services, a number of techniques will be used, insofar as they are consistent with the concept of valuation used in the national income accounts, that is, marginal value;
- Distribution of benefits from ecosystem services and the burden of degradation-depletion costs among different stakeholders, information that is critical for sustainable management of ecosystems. Recovery of resource rents or payment schemes for ecosystem services are a part of this. The national accounting framework for such disaggregation is the social accounting matrix;
- Value of associated ecosystem assets and Comprehensive wealth, Adjusted Net Saving and Adjusted Net National Income. We will start in each country with the wealth accounts estimated by the World Bank, and replace these estimates with figures derived from country-specific data.

The power of the national accounting approach is to provide an economy-wide picture of the value of ecosystem services. There are many challenges to incorporating natural capital in a national accounting framework, due to the unique characteristics of natural capital. Many case studies of ecosystem services have been done, but there remain many gaps where services are not covered. In some cases, these gaps can be filled by scaling out or borrowing values from other studies. But the value of many ecosystem services is highly site-specific, which makes gap filling and scaling out a potentially complex undertaking. To address this, country implementation teams will be encouraged to seek and use values from local or sub-national case studies for ecosystem services, and identify reasonable methods for scaling up local value to fill data gaps. Technical advice will also be provided to draw on meta-data analyses, and ecosystem models such as InVESTfrom the Natural Capital project, ARIES or local models to do this.

[6] In contrast to the measurement of economic welfare.

[7] Value-added consists of three components a) Compensation of employees—wages & salaries plus benefits and in-kind payments, b) Gross operating surplus or Mixed income—a residual income that remains after paying for all other production costs, which consists of the earnings of the self-employed; the 'surplus' to cover the cost of fixed capital & depreciation; and resource rent that may occur when natural resources are the basis for economic activity; c) taxes on production such as royalties on mining, or other levies designed specifically to capture rent.

Spatial characteristics
While scaling up, the ecosystem accounts are likely to be most useful if they preserve the spatial characteristics of ecosystem services. For example, at the national level, it is important for a Ministry of Finance to know the aggregate value that forests contribute to the national economy, and the extent to which performance of other sectors (agriculture, energy, municipal water supply, tourism) depends on forest ecosystem services. But it is also important for the forestry sector to be able to set priorities among different forest areas or uses of specific forests based on the relative values of each forest area within the country. In establishing PES schemes, it is useful to know how the value of ecosystem services may vary across different forest areas or different end users. For this level of decision-making, site-specific values are needed.

In the preparation stage of the project, a country planning study will review the availability and quality of environmental and economic data, and determine how data gaps will be filled. This is described in greater detail in the work plan for the Study (Annex 2).

2. Establish an institutional structure in each country to guide ecosystem accounting
In order to guide the implementation of ecosystem accounting, some institutional structure needs to be established including

- A lead agency in government that is in a position to champion ecosystem and wealth accounting in the country.

- A national advisory organization (Project Steering Committee, Forum, or Advisory Committee) that will provide overall guidance to the work in each country, comprised of the key government agencies involved with ecosystem accounting, both data provides and data users

3. Build support capacity for ecosystem accounting in partner countries
It is necessary to build understanding of natural capital accounting among a broad range of stakeholders in order to generate the support necessary to ensure that this work continues after the project is finished. This will be done through a series of public workshops, which focus on non-technical aspects of ecosystem accounting. In addition, while some countries have considerable local capacity, other countries may require technical training of the government staff for implementing natural capital accounting. Technical training will be provided over the course of the project.

Component 2. Incorporate natural capital accounting in policy analysis and development planning

1. *Identify potential policy applications for natural capital accounting and incorporate accounts into country policy applications*

The integration of policy analysis with compilation of the ecosystem accounts is essential to ensure that the accounts lead to improved decision-making by a wide range of stakeholders including government, the private sector, and civil society. It is important to identify the country-specific policy processes that the ecosystem accounts will feed into from the beginning, to make sure that the accounts fit the need of the analytical tools and processes.

In coordination with work done by the Technical Experts Group (see Component 3), country teams will demonstrate the use of wealth and natural capital accounting for analysis in the partner country, review analytical tools and suggest revisions in order to better take natural capital into account. Applications for policy analysis and planning in each country include both macroeconomic issues and sector-specific natural resource management (some of the policy applications are described in Annex 1, a more detailed discussion of policy applications can be found in Lange, 2003 and *Ecological Economics* 2006).

Examples include:

- At the macroeconomic level, analysis that targets national development plans and strategies, such as the Green Economy initiative. Where these is sufficient demand and capacity, countries may consider incorporating natural capital in macroeconomic models such as CGE models extended for water, energy, pollution, or other ecosystem services.
- At the sectoral level detailed statistics and indicators can support sectoral Master Plans (environment, forestry, tourism, biodiversity, etc.) and Strategies, Action Plans, Watershed or River Basin Management, Coastal Zone Management, and so on.

2. *Build support and local capacity for analysis in partner countries*

Building broad support for natural capital accounting will largely depend on demonstrating its policy usefulness. Thus, in addition to technical presentations, public workshops will be held to discuss the results and applications to decision-making at national, sectoral and other relevant levels. Early consultation about results will ensure that the data provided are useful to policy-makers, and will help identify important modifications of the approach that can be undertaken during the rest of the project. In some countries, there is considerable local capacity for analysis, but in other countries, technical training may be needed. This will be done through a series of technical training over the course of the project.

Component 3. Develop standardized guidelines for the implementation of ecosystem accounting that can be implemented globally.

1. *A Technical Experts Group will be established* to guide development and implementation of methodologies for ecosystem accounting, accounting and ensure cohesion, consistency and scalability among the country studies.

Past efforts to implement monetary environmental accounting failed in part because of the lack of clear guidelines for valuation. While there have been many fragmented efforts to value ecosystem accounts by academics, NGOs and others, there has been no high-level overarching group of experts to establish methodology for monetary accounting. The London Group and the UNCEEA, made up of statistical experts, do not have the expertise for environmental valuation.

To demonstrate ecosystem accounting at scale, WAVES must ensure cohesion and consistency in valuation methodology across the different countries. The only way to achieve this is to establish a high level Technical Experts Group of experts in environmental economics, natural sciences, and national accounting. The Technical Experts Group will include World Bank staff and technical experts from academic institutions, UN agencies, and other relevant institutions. Some of the specific issues to be addressed include:

- Representing in the accounting approach certain challenging characteristics of ecosystems, for example, their public goods' nature (national and global), thresholds and irreversibilities, and treatment of transboundary ecosystems;
- Review the possible use in accounting frameworks of values from financial payment mechanisms set-up for ecosystem services such as Payments for Environmental Services and biodiversity offsets.
- Assessment and ranking of 'readiness' for incorporation in an accounting framework of the full range of ecosystem services in terms of the current state of scientific knowledge about underlying ecological processes that deliver the services, the scalability of local case studies, and global availability and robustness of data.
- Development of analytical tools that demonstrate the policy use of natural capital accounting, such as growth accounting models revised to incorporate natural capital. These models may be adopted for country-level work, if there is demand and capacity in the country, but also for more broad adoption by the other countries, the World Bank, and other international agencies which regularly do such analysis.

2. Contribute guidelines for ecosystem accounting to the revised Handbook for the System of Environmental and Economic Accounting

International statistical standards, such as the System of National Accounts, are established by the UN Statistical Commission, which is comprised of national statistical offices and international agencies. The UN Statistical Commission has established a high-level group, the United Nations Committee of Experts for Environmental Accounting (UNCEEA), and a technical group, the London Group to prepare guidelines and methodologies for the SEEA. Part of the current revision process for the SEEA includes a new section on ecosystem accounting, which will include both physical measures and valuation.

Guidelines for ecosystem accounting will be accepted by the international community when they are part of the SEEA, the official statistical guidelines. The World Bank has a long history of participation in the development of environmental accounting methodology as a member of the London Group, and the UNCEEA. The World Bank is currently participating

in the SEEA revision process, and is committed to making a substantial contribution to the development of guidelines for ecosystem accounting, drawing on lessons learned from implementing ecosystem accounting in partner countries.

Component 4. Promote adoption of ecosystem and natural capital accounting beyond the WAVES' partner countries

1. *Establish a broad platform in the Global Partnership for*
    - sharing experiences among countries and training,
    - communication and dissemination of results from country case studies,
    - outreach to other countries working on environmental accounting, and to organizations who may be important in promoting adoption of ecosystem accounting. There is also strong interest in this issue from GLOBE International – the global legislators organization, which is planning a related initiative to target political leadership for integrating natural capital values into economic decision-making. GLOBE International will be invited to explore the scope for including a Parliamentary track in the design of WAVES' outreach activities.

2. *Participate in international forums* that promote natural capital accounting, such as the UNEP's Green Economy Initiative

3. *Conduct a review of developed and developing country experiences* with environmental accounting to understand the obstacles to and opportunities for promoting environmental accounting

Program Outputs and Outcomes

The program is expected to produce outcomes and outputs that support the program's objectives.

Component 1. Implementation of ecosystem accounting at the national or sub-national level in several developing and developed countries.
Outcomes for each country include:

- accounts for priority ecosystems as identified by each country that systematically integrate the value of ecosystem goods and services with national income accounts.
- macroeconomic indicators to monitor economic progress that include natural capital such as Comprehensive wealth, Adjusted Net Saving and Adjusted Net National Income.
- Improved capacity in partner countries to construct and utilize environmental accounts effectively.

Global outcomes include:

- Demonstration at scale of the feasibility of ecosystem accounting
- The experience with ecosystem accounting in each country will contribute to the development of methodology that can be widely implemented (see Component 3)

Component 2. Natural capital accounting incorporated in Policy and Development Planning Analysis
Outcomes for each country include:

- Policy analysis and planning in each country that links natural capital and growth as well as sector specific issues related natural resource management.
- Analytical tools that revise planning and policy analysis in order to better take natural capital into account
- Improved capacity in partner countries to use environmental accounts effectively in economic analysis and policy dialogue.

Global outcomes include:

- A compelling body of evidence demonstrating the link between wealth, natural capital and growth that will promote wider adoption of natural capital accounting
- Proven analytical tools that revise national and sectoral development planning and policy analysis in order to better take natural capital into account
- Strengthened capacity for the World Bank, other multilateral development banks and other international agencies to support mainstreaming by including natural capital in analytical work that supports countries such as the Country Economic Memoranda (CEMs), Country Strategic Partnerships (CSPs), Country Assistance Strategies (CASs) and Poverty Reduction Strategies (PRSPs), as well as the work led by UNEP on a "Green Economy".

Component 3. Development of internationally accepted, standardized guidelines for the implementation of ecosystem accounting.
Outcomes include:

- Methodologies for ecosystem accounting that have been tested at the country level and can be applied to other regions and countries
- Substantial input to the Handbook for the System of Environmental and Economic Accounting (SEEA), Volume 2 on ecosystem accounting

Component 4. Partnership to promote adoption of ecosystem and natural capital accounting beyond the partner countries
Outcomes include:

- A platform for
    - communication and dissemination of results from country case studies,
    - outreach to other organizations outside the partnership who may be important in promoting adoption of ecosystem accounting, such as parliamentarians
    - sharing experiences among countries and training
    - developing methodologies
- A report on lessons learned for country experiences with environmental accounting and recommendations about how to overcome obstacles to implementation

Implementation

The program will last for 5 years, undertaken in two major phases. The first year constitutes a Preparation Phase with objectives and outcomes described in Annex 2. Key components include

establishing the Partnership and carrying out feasibility and planning studies in partner countries to develop multi-year workplans for the implementation of natural capital accounting.

Management of the Partnership

The overall management of the global partnership in the World Bank (the Secretariat) will be the responsibility of the Environment Department, in which the Trust Fund Manager (Task Team Leader, TTL) will carry out this function in close coordination with partners in the World Bank and partners external to the World Bank.

The Secretariat will be composed of the TTL and designated World Bank staff from the Environment Department and Regional VPs. The main functions of the Secretariat are:

(a) supervising and executing the components of WAVES
(b) preparing the overall work plan for WAVES and preparing consolidated reports
(c) financial management and reporting to ensure alignment of funded activities with guidelines and administrative agreements;
(d) monitoring of program performance and results to ensure overall quality control, and reporting results;
(e) communications and outreach (to donors, partners and others);
(f) organizing meetings of the Steering committee, Partnership Forum and other meetings with donors, regional/country representatives, and others as needed.

A Multi Donor Trust Fund (MDTF) will be established and will comprise one funding stream to which all donors contribute. Management responsibilities for the MDTF will be with the Secretariat, which will channel funds for partnership activities.

The World Bank will closely coordinate WAVES with related activities of UNEP and UNDP (e.g. UNEP's GEF Project for Ecosystem Services (ProEcoServ) and the Green Growth Initiative, and the joint UNDP-UNEP Poverty-Environment Initiative).

In addition to the Secretariat, there are three important governance bodies: a Steering Committee, a Policy and Technical Experts Committee and a Partnership Forum.

Steering Committee

A Steering Committee will provide strategic direction for the overall initiative and will consist of the Director of the Environment Department, World Bank; one member from each donor agency; the Director of Division of Environmental Policy Implementation, UNEP; the Director of the Energy and Environment Group, UNDP; one member from each WAVES-supported pilot country; one member from the UNCEEA and the WAVES WB TTL as ex-officio member. The Steering Committee will meet twice annually, either around other planned events or virtually to keep costs at a minimum. It will endorse the annual work plan and budget of WAVES submitted by the secretariat.

Policy and Technical Experts Committee

Policy and Technical Experts Committee will provide policy-directed science to develop methodology and policy applications for ecosystem accounting. The Committee will be

comprised of acknowledged experts in the fields of natural sciences, environmental economics, accounting, and policy, to be co-chaired by the WAVES TTL and UNEP's ProEcoServ TTL. The Committee will coordinate its work with the UN Committee of Experts on Environmental and Economic Accounting, which is developing the international guidelines and statistical standards for environmental accounting. The Committee will provide technical expertise and advice to the Secretariat, Steering Committee, Partnership Forum and pilot countries.

Partnership Forum
A Partnership Forum will be open to all organizations that participate and learn from WAVES. A forum meeting will be held once a year to exchange experiences and ideas, get broader input into WAVES, build a community of practice, and provide a platform for promoting environmental accounting.

Pilot countries
In each pilot country, a Country Coordinator will work with Bank staff in the country office in overseeing the implementation of WAVES by teams of specialists from government agencies and their partner institutions (research agencies, NGOs), eliciting guidance from a national steering committee that is chaired by the lead government agency. The Country Coordinator will also serve as focal point to coordinate interactions among the specialists/advisors from the *Policy and Technical Experts Committee* and providing updates to the *WAVES Secretaria*t. Work in each developing partner country will be carried out by a country team consisting of one or more members from the World Bank core team, one or more persons from the region, the country advisory organization (to be determined during the feasibility and planning stage), with the assistance of STCs for in-country work.

Countries may explore options for coordinating with related initiatives, such as Payments of Environmental Services schemes, country TEEB initiatives, the Interim REDD+ Partnership or programs supporting ecosystem-based adaptation.

Resources, Budget and Milestones

The development of the analytical paper will be carried out by a core team of Glenn-Marie Lange (TTL, ENV) and Marian delos Angeles (ENB). In addition, we will draw on a broader group from regions and country offices including Kirk Hamilton (DEC), Richard Damania and Gunnars Platais (LAC), David Sislen (LAC-Colombia), Jean-Christophe Carret (AFR-Madagascar), Martin Fodor (AFR-Uganda), Mani Muthukumara (SAR-India), Herbert Acquay (SAR), Ernesto Triana (SAR), Josefo Tuyor (EAP-Philippines), Maya Gabriela Q. Villaluz (EAP-Philippines), Marea Hatziolos (EAP), Christophe Crepin (EAP)

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The project will last for 5 years, undertaken in two phases with the bulk of the work undertaken in the first 3 years with a budget of $15 million.

The first phase of the project has been fully funded by UK ($765,000). Commitments for the second phase have been received from Japan, Norway, the UK and Australia and other partners have expressed strong interest in contributing.

Milestones
The 1-year Preparation Phase is outlined in Annex 2. There are several important milestones for this project:

- *October 2010*: launch the Partnership at the Biodiversity COP in Nagoya, Japan (accomplished)
- *January 2011:* Internal, WB-wide and external review of the Concept Note (accomplished)
- *March 2011:* First Partners Meeting (accomplished)
- *December 2011:* Completion of Feasibility Studies and Work Plans for Pilot Countries and Approval for funding by the Secretariat
- *May 2012*: based on the initial results, propose an international program of action on Ecosystem Valuation and Accounting at the 'Rio + 20' Earth Summit, the 2012 UN Conference on Sustainable Development
- *Dec 2012:* Completion of SEEA Volume 2: Methodology for Valuing Ecosystems Services
- *2013-2014: C*ountry fora on results, policy recommendations, and statistical development initiatives
- *2015*: Dissemination of Final Results and Recommendations on a way forward for an Environmental Sustainability Goal (including suggested targets and monitorable indicators) at the 2015 Millennium Development Goals Summit Review.

October 2010: launch the Partnership at the Biodiversity COP in Nagoya, Japan.

May 2012: based on the initial results of the Partnership, propose an international program of action on Ecosystem Valuation and Accounting at the 'Rio + 20' Earth Summit, the 2012 UN Conference on Sustainable Development.

2015: Disseminate the Final Results and Recommendations on a way forward for an Environmental Sustainability Goal (including possible targets and monitorable indicators) at the 2015 Millennium Development Goals Summit Review.

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Annex 1: How environmental accounts contribute to better policy

Environmental accounts are critical for managers and policy makers at all levels of governance. At the macroeconomic level, Ministries of Finance need to know whether their development strategy is laying the basis for long-term economic growth or not. In countries dependent on extraction of high-value minerals or other natural resources, whether a developed or a developing country, development can only be economically sustainable if revenue from natural resource extraction is transformed into alternative assets. With environmental accounts, countries can monitor this process, providing a sound basis for policy interventions consistent with sustainable development at each stage. Environmental accounts provide the basis for answering questions such as:

- How much resource rent is being generated, and would different policies increase rent?
- How much resource rent is recovered through taxes and non-tax instruments?
- How much of the recovered rent is invested in other assets, providing the basis for sustainable long-term growth?

In developing countries, the stated objective of the widely adopted PRSPs (Poverty Reduction Strategy Programs) is to promote *sustainable* economic growth and poverty reduction. However, PRSPs use GDP as a primary macroeconomic indicator in their monitoring framework; consequently, policy makers receive information about only half of the objective, short-term economic growth, but not sustainability of that growth. The long-term cost of soil erosion, for example, is enormous in many countries and may undermine any short-term gains in GDP. Environmental accounts adjust some of the conventional macroeconomic indicators to measure sustainability of economic growth, such as Adjusted Net Savings or changes in Comprehensive Wealth.

Ministries of Finance often make budgetary allocations based on information from national accounts that underestimates the true contribution to the economy from the environment and natural resource sectors, resulting in misguided government policies and poor investment decisions. Information about the value of non-market goods and services, particularly environmental services provided to other sectors such as agriculture and tourism, is often missing. The *Millennium Ecosystem Assessment* reports, for example, that in a number of countries the timber value of forests accounted for less than a third of the total economic value of forest ecosystems. Environmental accounts include the value of all ecosystem goods and services, providing the information necessary to support (i) better allocations from the current budget to support management of environment and natural resource sectors, (ii) better guidance to business about most efficient private sector investments, and (iii) better infrastructure investment decisions that reflect all the potential gains from sustainable management of environment and natural resource sectors.

At the sectoral and sub-national levels, this information is useful for Master Plans as well as specific investment decisions. At the sectoral level, environment and natural resource sectors can build more effective cross-ministerial/multi-stakeholder alliances by demonstrating the contribution of, for example, forests to other sectors, such as agriculture, fisheries, tourism and hydroelectric power. This lays the basis for improved forest management at both the national and local levels. For example, a forest ministry considering the award of logging concessions will know how the volume and method of logging will affect water supplies to downstream

cities, production of non-timber forest products that are critical to livelihoods of poor households, and opportunities for agriculture and tourism. Similarly, water ministries will be able to quantify the economic gains and losses from a range of water management decisions because, unlike all other water databases, the water accounts are linked to the national income accounts. Such decisions include: the benefits from water infrastructure investment, the economic gains and losses from reallocation of water among end-users, the social and economic impacts of different pricing policies for water and sanitation services, the benefits from treatment of water and pollution abatement, and the most efficient combination of methods to meet future water needs (infrastructure development, water demand management, pricing, etc.).

Annex 2: Preparation Phase Scope of Work and Timeframe

The first tasks to be initiated will set the stage for rolling out the work of the Partnership. It will focus on the Partnership establishment and the technical preparation to develop a sound analytical and institutional platform for advancing wealth accounting and to develop appropriate tools and methodological approaches that can then be scaled-up in the country pilots.

- **Partnership establishment**. A Partnership will be required to promote and implement the development and piloting of wealth accounting that focuses on the value of natural capital. The output of this component will be agreement on appropriate governance and working structures and an agreed multi-year work plan for the initiative.
- **Establish a system for information dissemination and communication** – a system for sharing information and lessons learned among interested parties will be established at the outset. This will be essential for broad stakeholder consultation on valuation of ecosystems and their services.
- **Assessment of feasibility for ecosystem accounting** in pilot countries. The output of this component will be a series of assessments for 4-10 pilot countries which summarize technical and institutional feasibility of ecosystem accounting, policy applications of the accounts, and provide a multi-year work plan for developing ecosystem accounts and broader wealth accounts.
- **Analysis and methodological development** – various analytical activities will be undertaken during the preparation phase. Some of these will be designed to improve the **evidence base** for global wealth accounting. One study will look at why wealth accounting has not yet been fully adopted – despite a long history of work on this issue. Another study will explore early experience of wealth accounting and its impacts on the sustainability of economic decision-making. Analysis will also be undertaken of the gaps and weaknesses in current understanding of ecosystem valuation and wealth accounting. Appropriate tools and methodological approaches will also be developed. The output of this component will be a set of standardized guidelines for the practical implementation of natural wealth valuation and accounting that can be applied globally.

Country Feasibility and Planning Studies

The preparation will result in a report for each pilot country which summarizes technical and institutional feasibility of ecosystem accounting, lays the groundwork for implementation in the country, and develops the workplan to implement ecosystem accounting in each country.

Implementation in Pilot countries
A Feasibility Team for each pilot country will be set up to carry out the studies, and will consist of one or more members from the World Bank core team (Glenn-Marie Lange, TTL), one or more persons from the region, and STCs for in-country work.

The team will carry out the study through

- extensive interviews and consultations with government and other relevant agencies in the country,
- review of reports, documents and databases relevant to ecosystem accounting,
- workshops to inform and engage a broad range of stakeholders about the project

Outcomes:

1. A lead agency in government to champion ecosystem accounting is identified. This agency should preferably have broad coordinating responsibilities in government, like the Ministry of Environment in Colombia or the National Economic and Development Agency in the Philippines, since ecosystem accounting often cuts across the responsibilities of individual line ministries. The lead agency should also have authority in government, rather than, for example, a research institution or NGO.

2. A preliminary proposal for a national advisory organization that will provide overall guidance to the work in each country, addressing structure, membership and role of the organization is prepared.

3. Data availability and data gaps, both physical and monetary data , for ecosystem accounting and wealth accounting evaluated

   A critical part of the feasibility and planning study is a critical review of all available data in order to identify where progress with ecosystem accounting can be made most rapidly, where the most serious data gaps are, and how they can be overcome. Based on a review of available publications, reports and databases and discussions with country agencies, the feasibility and planning study will provide an assessment of

   Ecosystem data, availability and quality
   - scientific information about ecosystems and their services in the partner country--scope, geographic coverage, etc.
   - information about economic value of ecosystem services in the partner country—scope, geographic coverage, methodologies used (consistency with national accounting), information about distribution of benefits and costs among different stakeholders

   Country Environmental Accounting program, if the country has one

- the coverage, geographic scope, time series, and methodologies used
- 'unofficial environmental accounts such as those compiled by NGOs or academic organizations

National Accounts, published and unpublished data including surveys

- Coverage and quality of data for natural resources and environment, and the sources of data. Coverage issues include, for example, the level of detail (e.g., the number of non-timber forest products), the scope of geographical coverage (e.g., how well is the rural sector covered?), the scope of institutional coverage (e.g., to what extent are estimated, non-market natural resource values included?).
- The availability of data needed for constructing comprehensive wealth accounts (for example, national income disaggregated by factor income, investment, consumption of fixed capital and capital stocks)
- National surveys which could provide data to help with ecosystem valuation
- Where tourism is an important ecosystem service, the coverage and frequency of surveys

4. Priorities for ecosystem valuation and accounting are identified.
   There are a large number of ecosystems and ecosystems services that eventually need to be accounted for. To make rapid progress and demonstrate the usefulness of ecosystem accounting, priorities for ecosystem services must be established. Based on extensive stakeholder analysis, each country partner will determine the priority ecosystems—those where the greatest contribution to policy can be made. The priorities should consider the importance to a country's development and vulnerability to current development trends, but also take into account the need for robust techniques for valuation, availability of data, and ability to scale up values from local case studies to national level.

   In each country, ecosystem accounting will also be closely coordinated with new related initiatives, such as the Interim REDD+ Partnership, various payment for environmental service schemes or programs supporting ecosystem-based adaptation, where early opportunities may exist for linking the accounting closely to such initiatives and provide a strong demonstration effect for a large number of countries.

5. How ecosystem accounting could inform strategy and policy, at the national or sub-national level is described
   The feasibility study should identify how ecosystem valuation and accounting could strengthen or enhance National Development Plans and strategies, PRSPs, sector Master Plans or Sector Strategies (environment, forestry, agriculture, water, biodiversity, tourism, fisheries, etc.), REDD+ initiatives, Integrated Water Resource Management plans, Coastal Zone Management Plans, and others, including regional initiatives in the partner country.

   This assessment will consider how ecosystem accounting may contribute to World Bank analytical work in the partner country, such as CEAs, CASs, CPSs, CEMs, Public

Expenditure Reviews, or the work of other national and international agencies engaged in the country.

6. Preliminary assessment of the capacity of local institutions to participate in the ecosystem valuation and wealth accounting project.

   The feasibility study will evaluate capacity in government and other local organizations, such as universities and NGOs, to carry out ecosystem valuation and integrate this in wealth accounts and policy analysis. Resource and training gaps will be identified.

Outputs

The outputs from the feasibility and planning study include

1. National workshop (if needed) to gain support for the valuation initiative

2. Report that discusses the following components:
   a. Institutional issues
      i. Agency(ies) that will champion ecosystem accounting
      ii. Institutional structures and capacity required for implementing ecosystem accounting in the country
   b. Policy issues
      i. Priorities for ecosystem accounting
      ii. Policy issues that would benefit from information provided at the national and sector levels
   c. Technical feasibility:
      i. data availability, data gaps and plans for filling gaps
      ii. Capacity of local institutions for ecosystem accounting

3. Work-plan for carrying out ecosystem accounting
   A draft work-plan will be prepared by the Feasibility and Planning Team for discussion with government. Revisions coming from the discussion will be incorporated and a final work-plan prepared that contains the following components:
   a. List of key government counterparts including lead agency and national advisory committee
   b. Implementation of ecosystem valuation, wealth accounting and policy analysis:
      i. how data gaps will be filled, including what can be reasonably estimated using 'benefits transfer,' what can be done through ecosystem modeling using existing models, and what requires primary data collection or other methods
      ii. collaboration with other World Bank initiatives such as CEAs, collaboration with other partners who may be engaged in related work in the country including other NGOs such as IIED or WRI, or other initiatives like the UNDP-UNEP Poverty-Environment Initiative, or country projects funded by other donors
   c. Capacity constraints and need for technical assistance for implementation
   d. Plan for communication, outreach and dissemination to stakeholders in the partner country

e. time frame and budget requirements for the work-plan that is linked to the key milestones of the overall partnership, that is
    i. May 2012: preliminary report on ecosystem accounting to the RIO + 20 WCSD
    ii. 2015: report to the Review of the MDGs