

A Smarter GDP



Factoring **natural capital** into
economic decision-making




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“Gross domestic product, the leading economic measurement, is outdated and misleading...It’s like grading a corporation based on one day’s cash flow and forgetting to depreciate assets and other costs.”

— J. Stiglitz, Nobel prize, economics

The concept of gross domestic product first emerged out of crisis. The world was still mired in the Great Depression and another war was imminent. Governments wanted an annual measure of their economies’ output so that they could manage their wartime planning needs.

If crisis was a trigger to adopt GDP in the 1940s, there is a crisis now that is calling out for a different measure. Our climate is changing, our fisheries are depleted, our soils are degraded, our water supplies are overextended. We now need a measure that goes beyond just the annual output of a country. We need a measure that looks at wealth in its entirety—combining produced, social, human, and, importantly, natural capital.

Both developed and developing countries are looking beyond GDP to help them address today’s challenges. A number of countries are already undertaking natural capital accounting by compiling accounts for water, energy, and minerals to be able to manage them better or to evaluate the trade-offs needed for making different development decisions.

Australia suffers from frequent and more intense droughts. In the 1980s, it decided to take a hard look at how scarce water resources were being used. After debates and experiments over a methodology to compile accounts in the late 1990s, the government began accounting for how much water is used by different sectors—agriculture, industry, and households—and the price these sectors were paying for consuming it. When drought struck again,

this information helped to ensure that the most critical and efficient users got water. Now, Australia has expanded its suite of natural capital accounts to include energy, minerals, land, and environmental protection expenditure.

Mexico is another early adopter of natural capital accounting, starting in the 1990s with a “green GDP.” This adjusted the country’s growth measure for depletion of oil, natural gas, timber, and groundwater while also accounting for the costs of degradation from pollution.

Lack of information results in the overexploitation and deterioration of natural assets. As GDP grows in the short term, natural assets like forests and fisheries may be being depleted and so become unavailable for future generations.

By fully accounting for minerals and energy, fisheries, water, forests, and ecosystems, countries can provide more accurate information to their policy makers. This can lead to better economic decisions about development priorities and investments. There is now a methodology to do this through the recently approved UN Statistical Commission’s System of Environmental and Economic Accounting.

It’s time to step up previously stated commitments to implement natural capital accounting as a way to build a more sustainable world.

CHAPTER 1:

A new balance sheet for a country

Just as private companies look at assets and liabilities on their balance sheets, it is in a country's interests to keep an eye on its assets—and that includes natural capital.

Wealth accounting—the balance sheet for a country—is a measure of all the assets that support human well-being. These include produced capital from manufacturing, human capital including the education of people, social capital including entrepreneurship and innovation, and natural capital. Assets like water, forests, and other ecosystems that provide vital goods and services make up a country's natural capital.

Together with GDP, wealth accounting provides a better indication of prospects for long-term growth. GDP indicates if the economy is growing from one year to the next, while wealth accounts indicate if that growth is sustainable.

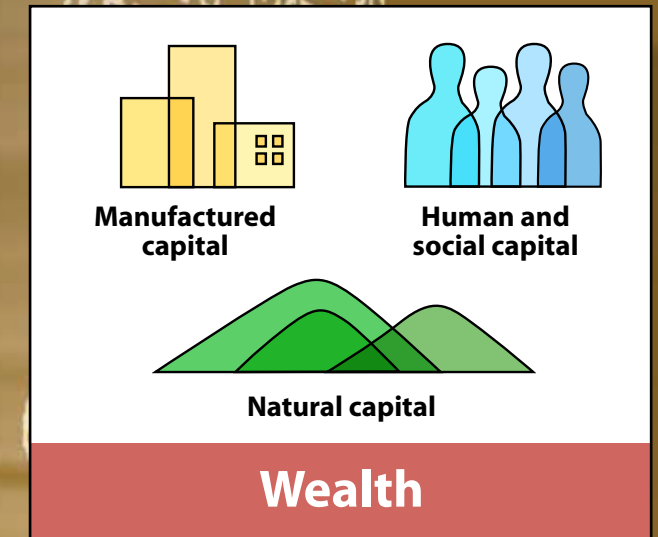
Since the 1950s, most countries have followed the UN System of National Accounts (SNA), which provides an international standard for measuring national income, savings, and some elements of wealth, including

produced capital. All countries measure national income but only a small number compile national balance sheets—or wealth accounts - and even fewer include natural capital.

When countries do not take their natural capital into account, and only rely on GDP, it's like grading a corporation based on one day's cash flow and forgetting to depreciate assets and other costs," said Joseph Stiglitz, winner of the Nobel Prize for Economics.

When a country exploits its minerals or overharvests its forests, it is actually depleting wealth, yet this depletion is not reflected in the GDP. Truly comprehensive wealth accounting would go beyond the SNA to include intangible forms of wealth such as human capital and the benefits flowing from ecosystem services such as pollination and flood protection from mangroves.

To achieve a "smart GDP," countries need to move toward comprehensive wealth accounting. This report focuses on one element of wealth accounting—natural capital accounting—and how countries can make better decisions by using it.



GDP Doesn't Measure...



Wear and tear and depreciation resulting from using produced assets like factories, roads, and bridges.



Loss of natural areas that provide ecosystem services to the economy, like pollination.



Extent to which renewable resources like forests and fisheries are being depleted.



Depletion of minerals and mineral fuels.



Future losses resulting from greenhouse gas emissions – sea level rise, extreme weather, and agricultural losses.



Future economic losses when pollution leads to premature deaths and chronic disease.

What is natural capital?

The usual symbols of progress include gleaming skyscrapers, buzzing factory floors, or well-stocked supermarkets. It is hard to appreciate links between the existence of these and a country's forests, rivers, and land. Natural capital includes, first of all, the resources that we easily recognize and measure such as minerals and energy, timber, agricultural land, fisheries, and water.

Many of nature's vital services are often "invisible" to people. These include air and water filtration, flood protection, carbon storage, pollination for crops, and habitat for fisheries and wildlife. These values are not readily captured in markets, so their contribution to the economy and livelihoods is not recorded. These services are taken for granted and a country does not know what it would cost the economy if these services were lost.

For example, forests are typically recorded in GDP as providing timber. The fact that they sequester carbon is not counted. Other services, like water regulation, are not captured in national accounts as a value of the forest. At best, this is reflected as an agricultural output in a country's GDP.

Why natural capital accounting is important

In 43 countries classified as "low-income," World Bank research has found that natural capital makes up 36 percent of total wealth. Large populations depend on forests, minerals, and soil productivity for their daily existence. As these countries grow and the pressure on land and water increases, their natural resources may be under increasing threat. They are often less able to cope with degradation and loss of ecosystems, a lifeline for many communities.

Countries depend on natural capital in a variety of ways. Globally, more than 250 million people depend on ocean fisheries and aquaculture for livelihoods. In Madagascar, 75 percent of the population depends on terrestrial and coastal ecosystems. Costa Rica uses its watersheds to generate 85 percent of its electricity from hydropower. Botswana's key to economic diversification may lie in nature-based tourism supported by its rich ecosystems.

It's not just developing countries that rely on natural capital. The UK's recent National Ecosystem Assessment, for example, demonstrated how the economy, human health, and well-being depends on ecosystem services that have been rapidly degrading. Similarly, a large share of Australia's tourism industry is dependent on the health and well-being of the Great Barrier Reef.

Like other forms of capital, natural capital requires investment, maintenance, and good management if it is to fully contribute to increasing output and prosperity. Natural capital accounting is a tool that can help measure the full extent of a country's natural assets. When faced with critical decisions like whether to build a road through a forest or clear mangroves to build a port, countries need data on the value of the services provided by the

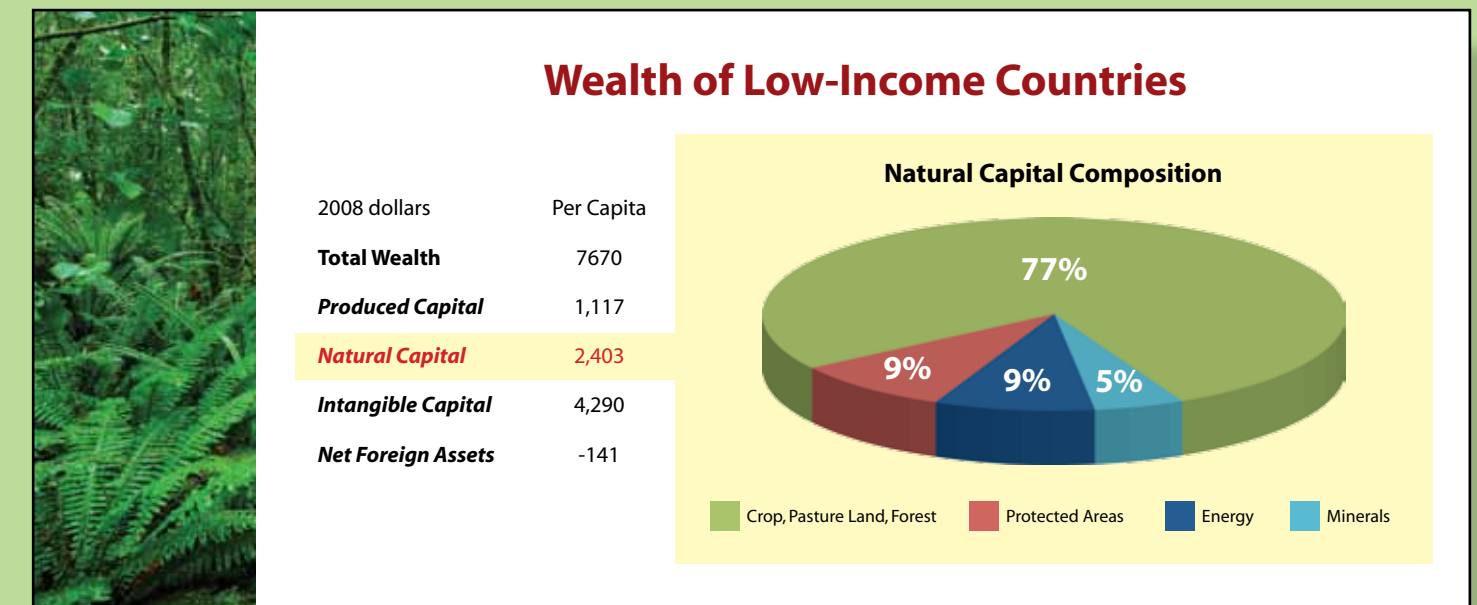
forest and the mangroves that will potentially be lost in this process of conversion. These figures need to be comparable to the economic data related to infrastructure development. This enables more informed decision making that is rooted in understanding the trade-offs around natural resource management.

Natural capital accounting enables countries to measure who benefits and who bears the cost of ecosystem changes. It can serve an important function in developing approaches that target the poorest communities.

Take, for example, Zanzibar. A large part of Zanzibar's GDP is generated by tourism. The Earth Institute and the Pew Foundation helped conduct a detailed natural capital accounting exercise to understand Zanzibar's coastal wealth. These accounts showed that budget tourism was

bringing greater economic benefits to local communities than high-end tourism did. As a result of this analysis, the government of Zanzibar can steer policies for the maximum benefit of local communities, including jobs.

By overlooking ecosystem services, development decisions are inefficient. For example, over one-third of the world's population lives in coastal areas and so is at risk from storms and extreme events like hurricanes and typhoons. In some areas, ecosystems such as mangrove forests provide protection against these natural hazards. Yet, decisions about coastal land use have not always taken this important service into account. The example of mangrove forests in Thailand shows how coastal storm protection from mangrove forests can outweigh the private benefit of conversion to fish/shrimp ponds.



Making an informed decision about mangroves

The December 2004 tsunami was a wake-up call to several Indian Ocean nations. Over the past 20 years, these countries have replaced the most effective barrier to ocean forces—mangroves—with shrimp farms, tourist resorts, and urban sprawl. One of the reasons is that mangroves are undervalued in economic calculations, making it easier for governments to divert them to other uses.

Edward Barbier, an environmental economist, did a calculation to estimate the true value of mangroves by putting a price tag on some “indirect services” like their role in coastal protection, as breeding habitat, and their ability to store carbon.

He considered a scenario in where in Thailand, policy makers were faced with the following decision: to convert mangrove forests for shrimp farming or to leave them intact. The decision may seem simple on the surface: accounting for marketed goods (coastal communities’ harvesting of various wood and non-wood

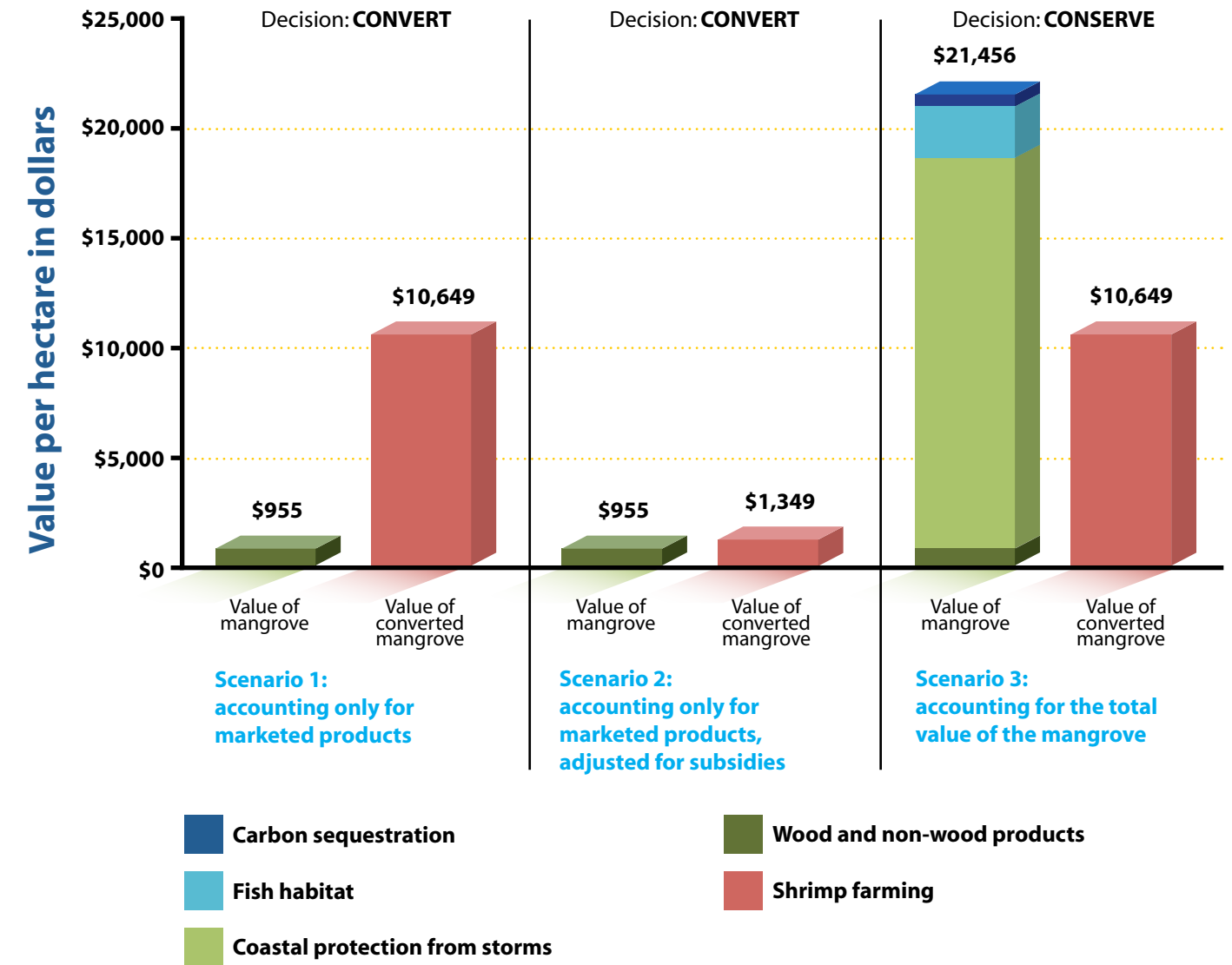
products) values mangroves at \$955 per hectare—a paltry sum in comparison to the potential \$10,949 per hectare from farming shrimp.

He then considered the mangroves’ natural “barrier” service. If mangroves were cleared for shrimp farming, this service would be lost. Adding in the role of mangroves in coastal protection, their value rises to \$18,641 per hectare, far greater than the benefit from shrimp farming.

This information facilitates the decision not to convert. If the mangroves’ ability to store carbon as well as their role as a nursery and breeding habitat for offshore fisheries are considered, the value further increases to as much as \$21,456 per hectare. Unfortunately, by relying on conventional economics, significant tracts of mangroves in the upper Gulf of Thailand have been removed to make way for shrimp farms and for coastal and industrial development.



Mangroves in Thailand - convert or conserve?



Source: Based on E. B. Barbier, “Ecosystem Services and Wealth Accounting,” in UNU-IHDP and UNEP, *Inclusive Wealth Report 2012* (Cambridge University Press, 2012). All figures in 2000 US dollars.

Measuring natural capital

The idea of accounting for clean air, clean water, forests, and other ecosystems has been around at least since the Earth Summit in Rio in 1992. One of the reasons it did not gain traction was the lack of widely agreed methods for putting monetary values on these services. Consequently, most of the efforts by countries were experimental. Lack of political will to implement accounts on the ground has also hampered progress.

In February 2012, the UN Statistical Commission approved the System of Environmental and Economic Accounts (SEEA) as an international statistical standard like the System of National Accounts (SNA). This was a fundamental leap forward for natural capital accounting. Now, natural capital accounting can be implemented at scale.

The SEEA standards cover material natural resources like minerals and timber, as well as accounts for environmental protection expenditures, taxes, and subsidies.

SEEA does not aim to replace or change the most commonly used measure, GDP—it fits alongside the current SNA as a set of “satellite accounts.” Countries then develop accounts that target their key policy concerns—say, water accounts in Botswana, fisheries accounts in the Philippines, and land accounts for the contributions of forests in Costa Rica.

This system relies on basic environmental statistics on water, energy, forest, and pollutants. Some of these are already being collected by relevant departments in governments around the world. By implementing SEEA guidelines, governments can add value to individual components, using them to inform policies, evaluate trade-offs between different policies, and assess their impacts across domains of the economy, the environment, and society.

When natural capital is mainstreamed into economic accounts, it can inform analysis and development decisions. It is this link that makes SEEA an effective tool to engage ministries of finance and planning.

The SEEA framework has been endorsed by the UN Statistical Commission, which is a body of heads of statistical offices

from all countries and international organizations like Eurostat, the IMF, OECD, UN, and the World Bank. Over time, countries are expected to implement statistical standards using SEEA, as they have done with the SNA.

The methodology for ecosystem accounting is still experimental—more work is needed to determine how best to assign values to all aspects of ecosystem services. Work is under way to refine this for the second phase of the SEEA.

SEEA provides guidance to countries for compiling:

- **Asset accounts:** Stocks and changes in stocks of natural resources such as land, forest, water, fish, soils, minerals, and energy in physical and monetary terms
- **Physical flow accounts:** For the use of energy, water, other materials, air and water emissions by economic sectors
- **Monetary accounts:** Environment taxes and subsidies, environment protection expenditure, and resource management expenditure

Nature's services

Ecosystems are dynamic systems in which living organisms, like plants, animals, and micro-organisms, interact with the non-living environment. They range from the relatively undisturbed, natural forests to systems intensively managed and modified by humans, such as agricultural land and urban areas.

The UN's Millennium Ecosystem Assessment (MA) established a new way of thinking about and monitoring the state of the environment and its relationship to the economy. They called this “ecosystem services,” the benefits people obtain from ecosystems. The MA classified these values into four areas:

- **Provisioning services** such as food, water, timber, and fiber
- **Regulating services**, providing natural protection against flood, drought, degradation, and disease
- **Cultural services**, including recreational, aesthetic, and spiritual benefits
- **Supporting services** such as soil formation, photosynthesis, and nutrient cycling.

Source: Millennium Ecosystem Assessment, 2005



Monetary valuation for ecosystem accounting

Ecosystem services have different kinds of values for people:

Direct use value: Individuals directly use an ecosystem service, for example by extracting resources from the ecosystem (such as food, timber) or from nonconsumptive use, for example for recreation. A wilderness area, for instance, provides direct use value to visitors who hike, kayak, and enjoy the scenery.

Indirect use value: Individuals benefit from ecosystem services supported by a resource rather than directly using it. Lower organisms on the aquatic food chain, for example, provide indirect use values to fishers who catch the fish that eat these organisms. Indirect use value is generated by both global life-support functions (such as climate regulation) and local life support functions (such as water regulation, soil retention, nutrient cycling, pollination).

Option value: People value having the option to use a resource in the future even if they are not using it in the present. For ecosystems, the option value describes the value placed on maintaining ecosystems for possible future uses, some of which may not yet be known (there may be plants with unknown medicinal uses, for example).

Non-use value: This is derived from the fact that the natural environment is maintained, including both the value individuals attach to the existence of the ecosystem resource as well as its availability to others (in current as well as future generations).

The further we move from direct use value toward indirect use value, option value, and non-use value, the more difficult it becomes to measure values. At one end of the spectrum we have goods such as timber, which is traded on the market and whose value can be directly observed. Measuring indirect use values (for example, the value of water regulation) can be challenging. It is often done by conducting surveys or observing other markets that can give proxy values. This challenge applies even more to option values. It is challenging to measure non-use values, since this can only be done through survey-based methods, which raise even greater issues of reliability and robustness.

Environmental economists are developing measures for the value of ecosystem services—these vary in terms of reliability and also the extent to which their results fit into the framework of the national accounts. SEEA phase 2 aims to resolve issues around ecosystem valuation.

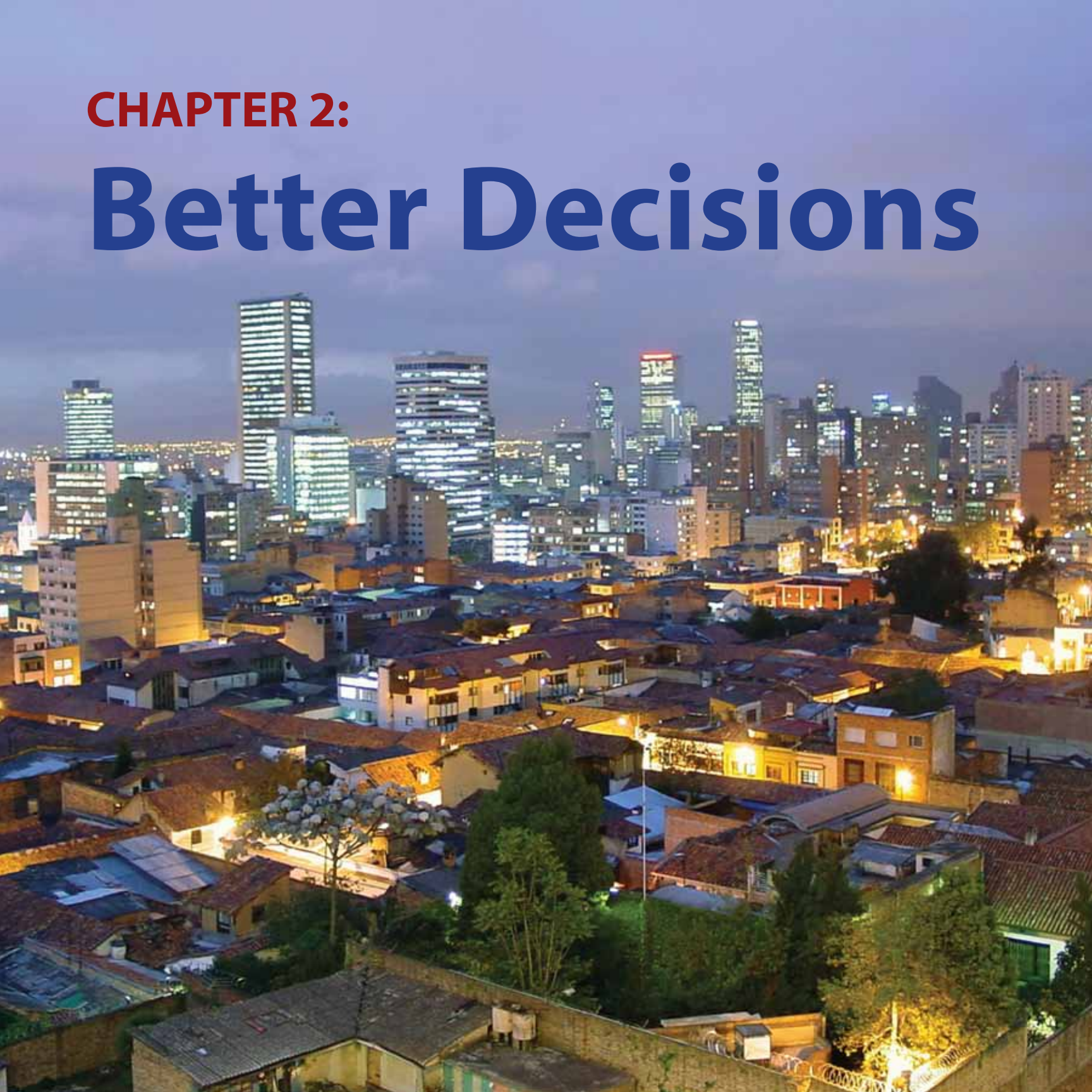


Natural capital accounting can be a powerful tool for policy makers grappling with trade-offs in a growing economy. While work is progressing on a methodology for ecosystem valuation, there is an internationally approved method to value some elements of natural capital, like forests, minerals, and water.

In chapter 2, we will see how some countries are already measuring natural capital or compiling accounts to answer key policy questions. The private sector too is stepping up and building a critical mass of companies and financial institutions interested in accounting for natural capital.

CHAPTER 2:

Better Decisions



Natural capital accounting is a tool for policy makers that is being used for informed decision making in developing and developed countries.

Some 24 countries now regularly compile at least one account (see map). Developing countries like Mexico, Colombia, the Philippines, and South Africa are compiling accounts ranging from energy and water to how minerals and timber contribute to national economic growth. Uptake in Europe is strongly influenced by EU regulations mandating certain accounts.

The Strategic Plan for Biodiversity 2011–2020, agreed at the Convention on Biological Diversity meeting

at Nagoya, Japan, in 2010, provides a clear target on Natural capital accounting. It recommends that by 2020, biodiversity values are to be integrated into national and local development and poverty reduction strategies and incorporated into national accounting and reporting systems. The United Kingdom has established a Natural Capital Committee to advise the government on integrating the value of natural capital into their national accounts.

Across all countries, the most widely implemented accounts are flow accounts for energy, air emissions, and water. Asset accounts focus on minerals, oil and gas, forests, and land. Among developing countries, Mexico stands out with the most extensive, regular implementation of natural capital accounts.

Connecting accounts and key policy issues

Issues faced by policy makers	How natural capital accounting can help
How to increase the contribution of coastal ecosystems to the economy	Ecosystem accounts can help determine how the management of coastal ecosystems can be improved and who will benefit
How to plan hydropower development	Land and water accounts can help assess the value of competing land uses
How much finance to provide for protected areas	Land accounts can help determine the full value of protected areas by adding up the potential contribution from tourism, climate regulation, and water supply provision
How to manage tourism and biodiversity hotspots	Location-specific tourism accounts can help determine the contribution of nature to tourism to ensure long-term sustainability

At the macroeconomic level, ministers of finance need to know whether or not their development strategies are laying the basis for long-term economic growth. For example, in a mineral-rich country like Botswana, these accounts help answer questions like: What is the extent of resource rents being generated and can these be increased? Can resource rents be invested in other assets, providing the basis for sustainable growth?

Without natural capital accounting, governments are underestimating the true contribution of their natural resource sectors. The Millennium Ecosystem Assessment found that in a number of countries, the timber value of forests accounted for less than a third of total economic value of all forest ecosystems. This is because information on the value of non-market goods and services, particularly environmental services provided by forests, is often missing. For this reason, Spain is devoting significant effort and resources to forest and land accounts for the economically important region of Andalusia. This information will help the government manage the area better and design a tourism policy for Andalusia that is not at odds with sustainability of the region. Land accounts are helping Australia design a



management strategy that balances trade-offs between ecotourism, agriculture, and ecosystem services like flood protection and groundwater recharge. Nearly 50 countries are now also doing water accounts. These accounts provide detailed information on the use and price of water that helps governments decide how to allocate water most efficiently. Currently, statistics on the magnitude of water abstractions are often estimated rather than based on reliable data. Classifications of

water users are rarely disaggregated in this way. Australia, Mexico, and the Netherlands are pioneers in this area.

It is often the poorest communities who bear the brunt of degraded ecosystems. Natural capital accounting can provide a tool to assess who benefits and who bears the cost of ecosystem changes, helping governments

gauge whether growth is inclusive. An analysis of where the rents go, for example, from mining or tourism can help guide policies.

Global commons—like fisheries—are degrading in part because there has been no effort to estimate what they are worth. Better data can show how poor management can lead to lost rents—especially to developing economies.

Business getting on board

Leading global financial institutions like RaboBank, Standard Chartered, and National Australia Bank have committed to voluntarily integrating natural capital accounting into their products and services. They, along with other CEOs and financial institutions, have endorsed the Natural Capital Declaration (NCD), which commits them to integrating natural capital considerations into private sector reporting, accounting, and decision making.

Unlike governments, who have a standard methodology to measure natural assets provided by the SEEA, financial institutions and companies do not yet have an internationally agreed framework to adequately report or account for natural capital. The NCD signatories, together with the International Integrated Reporting Committee, will work to build standardized methods of reporting.

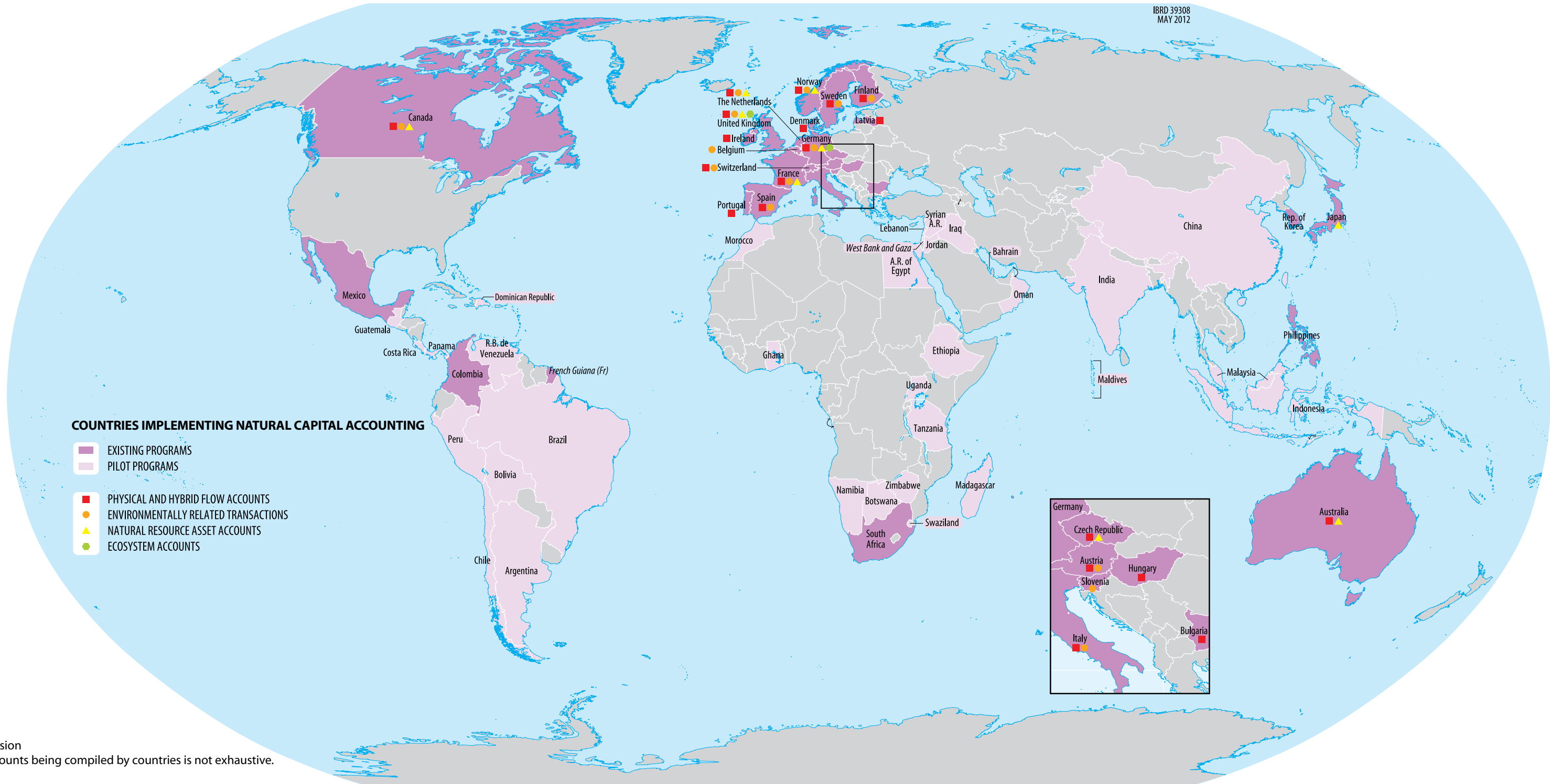
Another initiative called the TEEB (The Economics of Ecosystems and Biodiversity) for Business Coalition has been convened by the Institute of Chartered Accountants in England and Wales.

The Coalition is working closely with the HRH Prince of Wales' Accounting for Sustainability Project, IUCN, and WWF-UK with the goal of expand the concept of corporate "performance" to include the environmental impacts of companies.

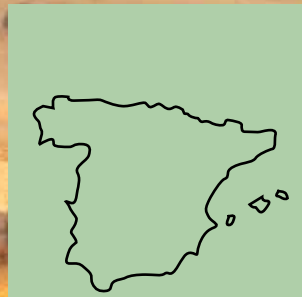
Some companies are leading. The sports company PUMA is among the first in the world to do Environmental Profit and Loss Account. Its 2010 accounts showed the environmental impact for some key areas of PUMA's supply chain—water use, land use, air pollution, and waste.

CEOs of leading corporations like ASDA and Unilever have signed on to a Natural Capital Leadership Compact—a call for action by leaders of global companies convened by the University of Cambridge Programme for Sustainability Leadership. These companies pledge that they will operate within the limits of natural systems, identify and address the "un-costed" impacts on people and the environment (externalities), enable consumers to make better informed choices, and develop rigorous and realistic targets and plans.





Source: UN Statistics Commission
Note: The information on accounts being compiled by countries is not exhaustive.



SPAIN

Managing Andalusia's rich resources

A tool for policy makers

Here are some examples of how countries are already exploring natural capital accounting and are using it in their decision making.

- In the Philippines, environmental accounts for heavily degraded Manila Bay motivated the Supreme Court in 2008 to mandate a massive cleanup to avoid the impacts of illness expected to cost \$7 million, reduce fish export losses resulting from algal blooms (worth \$29 million), and protect mangroves whose direct benefits reached \$150 million in the early 2000s. The Philippines also used environmental accounts to establish entry fees for some of its national parks, resulting in doubling of income from these fees.
- The Norwegian Ministry of Finance has integrated its energy and air emission accounts into the macroeconomic model used for policy planning. This helps the country decouple economic growth and energy consumption. While Norway's gross national income grew by 50 percent between 2000 and 2010, its greenhouse gas emissions remained steady at 54 million tons of CO₂ equivalent since 2000.
- The Netherlands uses natural capital accounts to monitor its economic growth in relation to the environmental impact of that growth. The accounts monitor changes in GDP along with changes in national energy and materials use as well as trends in emissions. This helps the Netherlands reduce environmental degradation even as the economy grows. GHG emissions have been declining since 2005, making the 20 percent EU emission reduction target by 2020 attainable.

Policy question: How to manage the global biodiversity hotspot region of Andalusia?

Context: Traditionally, Andalusia's ecosystems were managed for timber, cork, hunting, and livestock grazing. As pressures on the forest grew, policy makers realized the ecosystems were worth much more. The region provides ecosystem services—public and private recreation, forest produce, carbon storage, and biodiversity—whose values are not readily observable in markets.

The challenge was how to develop the area while making sure that it continued to provide the other ecosystem services in the long run, including drawing millions of tourists annually.

Four years ago, the government decided to spend \$9 million on building a detailed set of land accounts related to its forests and the complex system that they support. While most of it follows the SEEA methodology, they are pushing to develop their own ecosystem accounts.

Purpose of the accounts:

Evaluating trade-offs for development: When building roads or bridges, these accounts show which parts of the forests store more carbon and are worth preserving or how much compensation is to be paid to local residents for commercial revenue lost as a result of the road.

Public buy-in for millions spent on fire protection in the region: The accounts map fire expenditures and help in determining whether the money is being spent on the forest with the greatest value. This helps in communicating and justifying the public expenditure on protection against forest fires.

Setting entry prices for tourists: One part of the land accounts involves using the Simulated Exchange Value tool, which determines the amount of money tourists would be willing to pay to visit a particular area of Andalusia.



AUSTRALIA

Protecting the Great Barrier Reef

Policy question: How to protect the Great Barrier Reef from threats upstream?

Context: The Great Barrier Reef (GBR) Marine Park is a globally significant World Heritage site with one of the most diverse and healthy reef ecosystems in the world. It is of great economic as well as heritage value, generating around AU\$2,257 million from tourism a year (2006–07). Despite this, it is threatened by declining water quality due to catchment runoff, loss of coastal habitat from development, fishing impacts, and climate change.

While the coral reef itself has been subject to careful management, many of the threats to this valuable ecosystem originate outside the GBR, especially from land use practices around the rivers that drain into the reef. Land management practices in agriculture (such as tillage methods and volume of fertilizer applied) have a particularly strong impact on the levels of nutrient and sediment runoff.

To help manage the GBR for long-term protection and sustainable use, the Great Barrier Reef Land Account was constructed. The GBR Land Account provides detailed environmental, economic, and social information for each of the five natural resource management regions of the GBR catchment. This work was so important that it fed into developing the SEEA’s Central Framework.

Purpose of the accounts:

Monitor activities that impact the reef: The accounts identify major sources of nutrient and soil runoff, as well as the land value, crop value, and employment.

Calculates the economic cost of constraining these activities: The data help to compensate farmers for not using farming practices that affect the reef downstream.

Accounts provide environmental, economic, and social information for each of the five natural resource management regions of the GBR catchment.

Current emissions discharged to the Great Barrier Reef lagoon 2010

	Total suspended solids	Total nitrogen	Total phosphorus	PS11 herbicides
Natural Resource Mgmt Region	tons/yr	tons/yr	tons/yr	kg/yr
Cape York	2,388	2,998	1,516	n/a
Wet Tropics	1,350	4,400	2,037	10,054
Burdekin	4,738	2,446	2,555	4,911
Mackay-Whitsundays	1,542	912	2,172	10,019
Fitzroy	4,109	1,672	4,142	2,269
Mary Burnett	3,076	1,463	3,092	990
Total Great Barrier Reef region	17,213	13,891	15,514	28,243



MEXICO

Experience with water accounts

Mexico was among the first developing countries to compile water accounts following the SEEA guidelines.

Agriculture there consumes 77 percent of inland water resources. The growing demand for water in cities often competes with agriculture and environmental water requirements for rivers. The volume of water allocated through a permit system in several watersheds is larger than the total renewable flow. The result is that several aquifers are overexploited—extraction is greater than recharge.

The National Institute of Statistics and Geography and the National Water Commission of Mexico have worked together to compile preliminary water accounts that are useful for monitoring the changes occurring through the years. They are able to calculate the productivity of water for some of the main activities that use inland water resources

—agriculture, drinking water, thermoelectricity, and industry. The productivity is calculated as the ratio of value added per cubic meter of water abstracted.

Working closely with the UN Statistical Division, the process has helped consolidate data that existed with different agencies and ministries within the government. This information helps the government design programs to promote more efficient use of water, such as the establishment of water markets.

There is better information on water-related emissions too—the volume of untreated wastewater, for example, helps derive other indicators on the health of the water systems. Work remains to be done on translating these into indicators for use by policy makers.

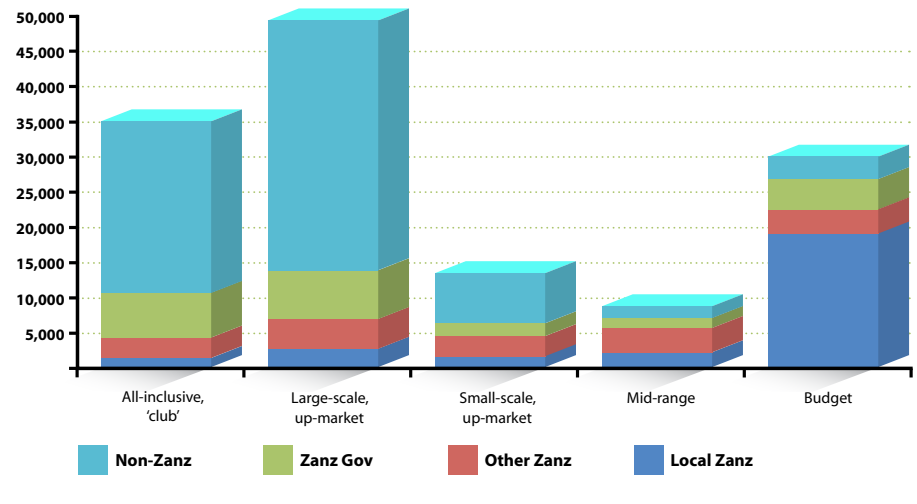


ZANZIBAR

Accounting as a tool to promote inclusive development



Income from types of tourism, Zanzibar, 2007 (\$ '000s)



Zanzibar's coastal and marine ecosystems contribute 30 percent of its GDP through tourism, fisheries, and seaweed farming, yet the ecosystem is seriously degraded. With fish stocks already depleted and seaweed prices low in global markets, tourism is the best chance for growth and already generates a significant proportion of the country's

income. But only 20 percent of this accrues to the local communities who steward the resource.

The challenge Zanzibar faces, like many other developing countries, is how to increase the participation and benefits from tourism flowing to local communities. Conventional wisdom is to set targets

for tourism arrivals without taking social and environmental impacts into consideration.

The government of Zanzibar undertook coastal management accounts. The analysis showed that budget and small-scale tourism mostly benefits local communities, while the benefits from "club" and large-scale tourism mostly accrue to outsiders.

Budget tourists are also more likely to engage in activities that depend on a healthy ecosystem, like diving and snorkeling, creating incentives for sustainable management. This information enables the government to develop policies around tourism geared for the maximum benefit to local communities.

Fisheries wealth accounts reveal a lost opportunity

Ocean fisheries and aquaculture support close to 250 million livelihoods around the world and produce seafood worth nearly \$190 billion per year. But overfishing and other impacts on global fisheries are taking a heavy toll. Almost 85 percent of the world's ocean fisheries are fully exploited, overexploited, or depleted, resulting in large economic losses and serious threats to the livelihoods of the poor.

The World Bank teamed up with the University of British Columbia's Fisheries Center to fill the gap for the wealth of marine fisheries, based on recently developed methodologies. The purpose was to provide a first estimate of wealth accounts for global marine fisheries—what it is now and what it could be under better management.

The accounts show that under current management, no region is getting close to the potential economic benefits their fisheries could generate. A majority of countries in Africa, Europe, and North America are currently operating at

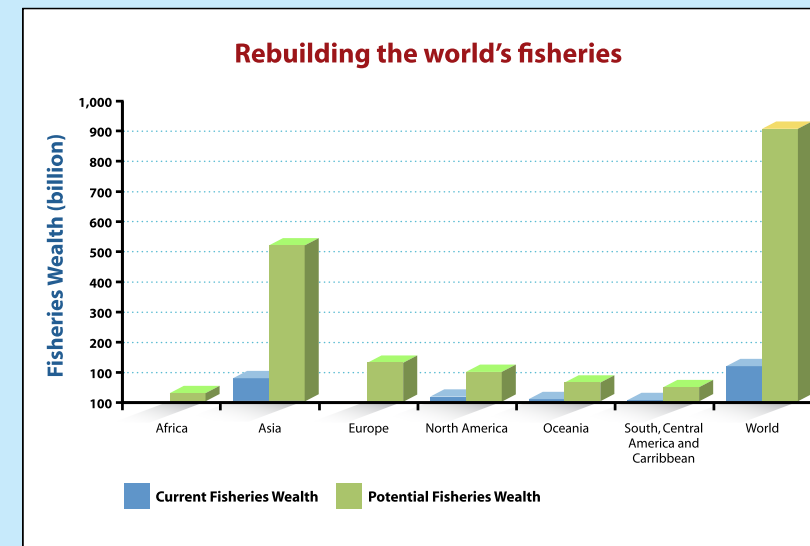
a loss with negative resource rents—that is, in most fisheries, it costs more to catch fish (taking subsidies into account) than the product is sold for.

This makes a strong case for rebuilding the world's fisheries by defining clear access rights, removing harmful subsidies, and cooperatively managing shared fish stocks. This can result in potentially enormous economic gains: global fisheries wealth is estimated to increase from \$120 billion to \$900 billion, with the potential for the greatest gains in Asia.

While fisheries may be a small contributor of total wealth on the global scale, this resource stock is

particularly important for small Island developing states (SIDS). When fisheries are rebuilt and sustainably managed, SIDS across all regions benefit with substantially higher levels of wealth, tripling in value from \$15 billion to \$68 billion; in

Oceania, rebuilt fisheries stock would account for a potential 52 percent of total wealth.



CHAPTER 3:

A Partnership for Progress

Growing demand

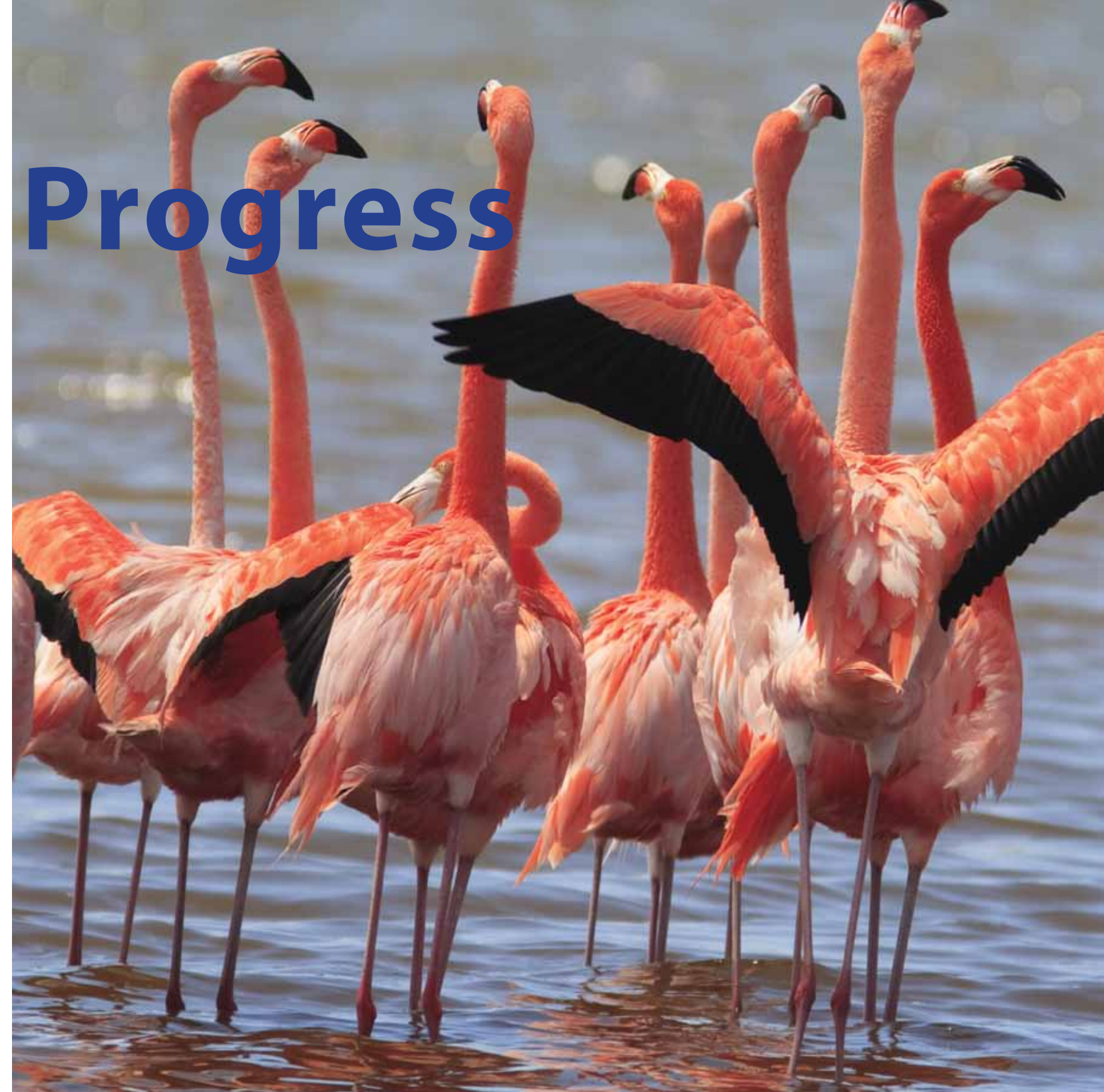
Botswana's diamonds have been the mainstay of its economic growth for decades. Now the country in southern Africa is looking to diversify its economy. Can its unique natural ecosystems provide a new stream of revenue and growth?

At the same time, biodiversity-rich Madagascar wants to know how to finance more than 60,000 square kilometers of protected areas. And the Philippines, worried that its marine ecosystems may be threatened by climate change, wants to know the exact contribution that fisheries make to its economy so it can improve overall management

These developing economies are looking for information that can help them make these kinds of critical decisions. Countries want to go beyond the single GDP number and focus in on sectors like water, forests, energy, and minerals to understand the dynamics of their economies better. Some natural resource-rich countries are starting to factor natural capital into their national accounts to fully reflect the contribution of these assets to their economy.

Increasingly, ministries of environment and planning want data that can help them negotiate for budgetary resources from finance ministries. By showing the contribution of natural capital to national income, they can effectively build a case for increased budget allocations and investment. Ministries of finance want to use macroeconomic indicators like adjusted net savings in addition to GDP to provide them with a different lens on economic growth.

With the recent approval of the UN Statistical Commission's System for Environmental and Economic Accounts, there is now a method to account for material natural resources like minerals, timber, and fisheries. Challenges remain on the implementation side, and many countries are now reaching out to the international community for assistance to help understand natural capital accounting better.



Shifting perceptions

For years, countries have been concerned that measuring and reporting natural resource depletion and degradation might affect their economic performance. Increasingly, governments are recognizing that natural capital accounting is a tool for better decision making. Its links to improved policy is gradually becoming more explicit.

However, the reality for many countries is that even national accounts pose a challenge. GDP is a culmination of thousands of data points from multiple areas of the economy. Collecting reliable data requires effective institutions as well as trained economists and statisticians. Countries that struggle with national accounts want to be sure they have the support and resources to undertake natural capital accounting effectively.

Where once there was little experience to draw upon, a global community of practice is gradually building up to design training programs for the implementation of SEEA—similar to those that exist for the SNA.

The WAVES partnership

To support countries with the move to natural capital accounting, the World Bank initiated a partnership called WAVES—Wealth Accounting and the Valuation of Ecosystem Services—which includes several UN agencies, national governments, NGOs, and academic and other institutions.

WAVES works as a global partnership. It includes developing countries—Botswana, Colombia, Costa Rica, Madagascar, and the Philippines - all working



Perceived challenges around natural capital accounting	How WAVES can help
Need a standardized methodology	<p>Implement the recently approved UN Statistical Commission's SEEA methodology on material accounts</p> <p>Work with the UN to develop a globally recognized methodology</p>
How country policy issues can be addressed through natural capital accounting	Demonstrate policy links and work with national governments to identify policy priorities
Need support for countries to compile data	Provide technical and financial support to countries to build capacity
Need proof that natural capital accounting works effectively	Compile evidence from across countries already doing this

to establish natural capital accounts. It also includes developed countries like Australia, Canada, Denmark, France, Japan, Norway, Spain, and the United Kingdom that are already exploring natural capital accounting and have valuable lessons. UN agencies—UNEP, UNDP, and the UN Statistical Commission—are helping to implement environmental accounting in countries and review scientific evidence and methods. The WAVES partnership is currently supported by founding donor-partners to the Multi-Donor Trust Fund, including Japan, the United Kingdom, Norway, and France.

The first priority of WAVES is to implement the SEEA and use the methods that are internationally recognized. The second is to help develop an agreed methodology for measuring ecosystem services. Some countries are ahead of the learning curve and are interested in

sharing lessons—for example, Australia, a veteran in water accounts, has offered to guide Botswana.

All partners share a common vision of a world where valuing the environment leads to better decisions for development. The partnership will nurture a community that shares experiences and expertise and raises awareness of the importance of natural capital accounting in moving toward more inclusive, green growth.

WAVES objectives

The WAVES partnership design is based on the experience and feedback from countries that have been experimenting with natural capital accounting for over 20 years. Their experience helped refine the SEEA

methodology while highlighting areas where interventions could help countries the most. Key objectives include:

Demonstrating policy links: In WAVES partner countries, the primary aim is to link policy with natural capital accounts. In every country, work begins with identifying the most pressing policy questions and relevant sectors. National Steering Committees are critical to ensuring that these accounts are used to support better, strategic decision making.

Compiling a body of evidence: A WAVES Policy and Technical Experts Committee leverages knowledge and experiences from all partners. The committee is compiling a body of evidence about the policy uses of natural capital accounts.

Communicating what works: WAVES has a strong communications component that aims to promote natural capital accounting globally. The partnership will develop training materials, support a Web-based knowledge portal, and engage in the global dialogue about environmental accounting.

Working on the next set of methodologies for SEEA: The SEEA's "central framework" approved in 2012 covers certain components of natural capital. The UN Statistical Commission has agreed to a process toward development of similar standards for ecosystems and other natural assets. The WAVES partnership will play a key role in developing the monetary component of the accounts and will ensure that this work feeds into the next phase of SEEA.

Capacity building and training: WAVES provides intensive technical support to its implementing partners and is developing a knowledge portal to facilitate training and knowledge sharing between countries.



Moving toward a methodology for measuring ecosystem services

The WAVES Policy and Technical Experts Committee (PTEC) is an important component of the WAVES partnership and is made up of specialists in economics, natural sciences, accounting, and policy from institutions and countries across the world.

Some of its goals:

- Develop an internationally agreed methodology for ecosystem accounting, particularly monetary accounts, so that it can be incorporated in the next phase of SEEA.
- Provide technical support, training, and quality control for natural capital accounting in WAVES partner countries based on SEEA's Central Framework.
- Compile a body of evidence that shows how natural capital accounting can be used for better decision making.

To achieve these goals, the committee will commission technical papers and organize workshops to develop standard methods and will test them out jointly with partner countries.

Together with the UN Committee of Experts on Environmental Accounting, the WAVES PTEC will support development of materials for implementation of the SEEA. This could include online training courses, a diagnostic tool for SEEA assessment comparable to diagnostics available for the System of National Accounts.

For this work, the PTEC will reach out to private sector groups working in parallel on standardized measures for corporate accounting, regional networks of environmental economists like Environment for Development, the South Asian Network for Development and Environmental Economics, and think tanks like the International Institute for Environment and Development.

WAVES road map

Countries have many different reasons for undertaking natural capital accounting and a range of policy applications. This highlights the need for a road map to assist countries wanting to undertake natural capital accounting. WAVES has designed a step-by-step process for implementation:

Build political will: In many countries, a decree, executive order, or law mandating natural capital accounting may be necessary to ensure continuity over the long term. WAVES helps countries design and develop strategies for building political buy-in.

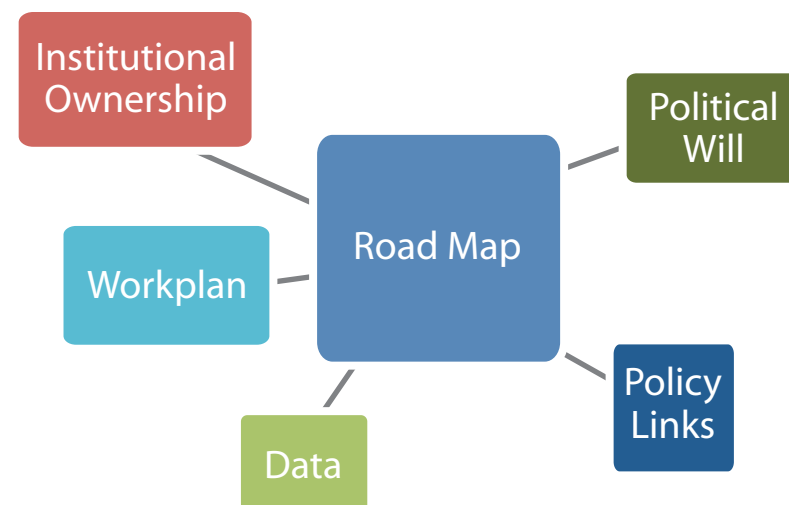
Build institutional ownership: Partner countries begin by establishing an institutional structure with strong commitments from the national government and clear lines of responsibility across government departments. Experience has shown that this effort is most successful if led by a user of the information with a broad mandate—for example, ministries of planning, environment, or finance. A lead agency as a champion is key to building support across government. The WAVES partnership works closely with the agency responsible for compiling national income accounts.

Assess policy entry points: Implementation is most successful when focused on critical natural resource issues and key policy entry points for a given country. When natural capital accounting can be shown to make a difference for development policy over a relatively short time frame, the effort is likely to be sustained. National development plans and annual budget discussions can help identify key policy entry points. For example, if a country has identified hydropower as a way to meet energy needs, then to implement this efficiently,

it could consider building water and land accounts to help assess the trade-offs involved.

Design a work plan: Having identified the key policy entry points, a country can begin charting an implementation plan. It is not necessary to compile all natural capital accounts at once. Countries can start with those that are most policy relevant and technically feasible. A country may choose to start with forest accounts that only account for timber and non-timber goods (where there is international agreement on methodology) and later compile accounts for the ecosystem services provided by forests like carbon sequestration, water, and sediment control.

Mainstream into economic policy: The work does not stop at compiling accounts. It is important to use the information generated by these accounts to inform the policy debate. Communicating results among policy makers, the private sector, and civil society, among other stakeholders, helps deepen the impact of these accounts.



WAVES PARTNER COUNTRY: BOTSWANA

Botswana is rich in natural resources. A combination of minerals, energy, protected areas, crop and pastureland, and non-timber forest products make the country's natural capital worth a third of its total wealth. This natural capital already plays a huge role in supporting Botswana's economy—providing food, fuel, shelter, and livelihoods while underpinning key activities, such as diamond mining, which has dominated Botswana's economy for more than 30 years. Botswana has ploughed a significant proportion of its resource rents from mining into building human and manufactured capital. This has helped make Botswana the fourth richest country in Africa.

Critical decision:

Although it is a middle-income country, 21 percent of Botswana's population still lives below the poverty line. Estimates show that diamond reserves will run out in a few decades. Keen to stimulate growth, diversify its economy, and eradicate poverty, Botswana has identified several options for development that include nature-based tourism and expanded mining and agriculture. Policy makers want to know how Botswana can optimize its natural resources while also improving its management and further building social capital.

“Botswana has done really well with diamonds but at current production levels, they are running out. We are looking at whether natural resources, especially ecotourism, can contribute to economic diversification.”

— Ruud Jansen, Poverty Environment Initiative, Botswana



How WAVES is helping:

To meet all three development goals, the government will need to use resources like water and energy sources efficiently, mine sustainably, and invest these resources back into the economy. But the economic information needed to take these steps is incomplete or missing. Botswana's scoping study under the WAVES program seeks to answer such questions as: Is Botswana's economic growth path sustainable in the long term? What is the ideal energy mix, and how should Botswana use its vast coal reserves? How should limited water resources be used? And how can tourism

contribute to long-term growth, diversification, and poverty alleviation?

The government has indicated a strong commitment to the WAVES partnership, and a Botswana WAVES Steering Committee has been established, chaired by the Ministry of Finance and Development Policy. The Committee closely working with the UNDP-UNEP Poverty-Environment Initiative will focus on building accounts on minerals, energy, water and land/tourism, and livelihood. Botswana has a long-standing tradition of economic planning for development and prepares a National Development Plan. The WAVES work plan, running through 2015, is expected to make this planning process reflect the true value of natural resources and its ecosystems.

WAVES PARTNER COUNTRY: MADAGASCAR

Madagascar's biodiversity is undoubtedly its biggest asset. Approximately 90 percent of all plant and animal species found in Madagascar are endemic. The country's protected area network, spanning 6.9 million hectares, attracts up to 130,000 visitors every year. Terrestrial forests and coastal and marine natural resources are already playing a huge role in supporting Madagascar's economy—fisheries contribute 7 percent of GDP and the mining sector is expected to contribute 15 percent of GDP in coming years. Natural capital represents roughly half of Madagascar's wealth. But there is no detailed quantitative analysis of this wealth.

“In Madagascar, it's a question of trade-offs: How can we balance mining, which is a big opportunity, while preserving the livelihoods of rural populations.”

— Leon Rajaobelina, WAVES National Steering Committee

Critical decisions:

In addition to historic pressures like deforestation and overexploitation of marine resources, Madagascar is now seeing the rapid expansion of large-scale mining. The country needs information to manage the trade-offs associated with mining as well as allocating adequate funding for protected areas. The country is highly vulnerable to natural disasters, including cyclones, droughts, and flooding. It is estimated that one-quarter of the population lives in high-risk zones for natural disasters. This is expected to intensify with climate change. To plan well for its future, Madagascar wants to know how to tap protected areas for economic returns, how to distribute mining revenues fairly, and how to protect its natural assets to improve disaster risk reduction.

How WAVES is helping:

Currently, Madagascar's national accounts make almost no reference to natural capital despite its importance to

the economy. Through WAVES, it is identifying the sectors that will help provide the data needed for decisions critical to the country's growth. The first priority was developing macroeconomic indicators like adjusted net savings and adjusted net national income to assess whether Madagascar is building or depleting national wealth. The sectors that were identified for creating detailed accounts included the mining sector, fishing sector, tourism, and water. natural capital accounting is expected to contribute to medium and long-term policy dialogues on resource rent recovery, distribution, and investment in the mining sector.

WAVES PARTNER COUNTRY: THE PHILIPPINES

High growth in the Philippines in the 1980s drew substantially from the country's rich natural resources. This led to the loss of forests, fisheries, and upland soils. Fishing was found to be operating at twice the economically sustainable level and major cities were blighted with high levels of air pollution. While the economy has since diversified through manufacturing and the services sectors, a third of the population that depends on natural resources for livelihoods remains poor. Important steps have been taken to promote community-based natural resource management and initiate user fees for ecosystem services. But these are yet to reach a scale that generates needed impacts on resource conservation, poverty reduction, and government revenue.

Critical decisions:

The country now faces big challenges in pursuing inclusive, high economic growth targets while addressing gaps in governance, high energy costs, and an increasingly degraded environment. It also faces significant risks from natural disasters that are becoming more frequent and intense as a result of climate change. The Philippine Development Plan 2011–16, identifies 10 industries with high potential for generating jobs. Four of these depend on land and coastal ecosystems—mining, agri-business, tourism, and forest-based industries. The

government wants to know how to meet food security targets while ensuring sustainable use of land and water, how to develop mining and tourism while protecting critical ecosystems and sustaining livelihoods, and how to improve management of agriculture and fisheries while also growing rural incomes and increasing the sectors' resilience to climate change risks.

How WAVES is helping:

New political leadership in the Philippines is emphasizing transparent and science-based decision making while pursuing inclusive and sustainable growth. WAVES is working with the government to

generate data that can inform the public dialogue on natural resources use. This has been given a mandate through an executive order and a draft bill on the Philippine Economic, Environmental and Natural Resources Accounts to be led by the National Economic and Development Authority.

Catalytic funding from the WAVES partnership will help bolster efforts by key agencies to compile accounts for minerals, land, water, coastal ecosystems, and tourism to develop better indicators for the economic sectors that use ecosystem services. Economists will work with environmental specialists and social analysts to examine options for attaining economic growth targets in ways that benefit indigenous populations and local communities while sustaining natural capital.

“Natural capital accounting will give us more balanced decision making as we will be able to see the holistic impact of our policies and their impact on the future. While our economic path will not exclude activities like mining or even logging, we can make sure these activities are not just benefitting a few.”

— Margarita R. Songco, Undersecretary, National Economic and Development Authority

In the 20 years since the Earth Summit in 1992, economic growth has lifted 660 million people out of poverty and millions more have seen their incomes rise. There has been significant progress on life expectancy, literacy, and maternal and child health care rates.

Yet we still need to meet the needs of the 2.6 billion people without access to sanitation, the 1.3 billion without access to electricity, the 1 billion who are hungry, and the 900 million people who lack safe, clean drinking water. We must do so in an era of increased uncertainty as we adapt to climate change. And we must do so without sacrificing the environment.

We have learned that to make progress, equal attention must be given to the economic, environmental, and social pillars of sustainable development. Inclusive green growth that takes into account the value of natural capital is the pathway to sustainable development for all.

Now what's needed is a global movement that makes natural capital accounting a reality.

Further Reading

Wealth Accounting and Valuation of Ecosystem Services (WAVES)

www.wavespartnership.org

System of Environmental and Economic Accounts (SEEA)

www.unstats.un.org/unsd/envaccounting/seea.asp

The Economics of Ecosystems and Biodiversity (TEEB)

www.teebweb.org

UNDP-UNEP Poverty-Environment Initiative

www.unpei.org

International Institute for Environment and Development (IIED)

www.iied.org

Globe

www.globeinternational.info

Australian Bureau of Statistics

www.abs.gov.au

UK National Ecosystem Assessment

www.uknea.unep-wcmc.org

Acknowledgments

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WAVES

*Wealth Accounting and
the Valuation of Ecosystem Services*

This report demystifies Natural Capital Accounting. Examples from developed and developing countries illustrate how natural capital accounts on forests, minerals, and water are helping countries make better economic decisions. There is a growing movement to reflect the true value of nature and its services in every country's economic toolkit.

Facilitated by the World Bank, Wealth Accounting and the Valuation of Ecosystem Services is a global partnership that aims to promote sustainable development by ensuring that the national accounts used to measure and plan for economic growth include the value of natural resources.

WAVES

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