

## Executive Summary

### Role of Natural Capital Data, Accounting and Evidence to Inform Biodiversity Policies in Developing Countries<sup>1</sup>

#### Biodiversity and Ecosystem Services

Biodiversity is a key to the integrity and functioning of terrestrial and marine ecosystems, which in turn provide critical services to the economy and society that are embedded in nature. A large body of work involving field experiments, site studies, aerial surveys complemented by mathematical modelling has found that a number of diversity indicators (e.g., covering soil and species diversity) are strongly related to ecosystem productivity.

Both biodiversity and ecosystem services have been declining in several countries and within global commons, resulting in losses that affect the wellbeing of many, especially those most dependent on these assets. Resource dependent communities, including women and poor people in low-income countries are particularly vulnerable and disproportionately affected by the loss of biodiversity and ecosystem services.

The [2020 Living Planet Index](#) reported a 68 percent average decline in birds, amphibians, mammals, fish, and reptiles since 1970; one-third of the world's terrestrial, and two-thirds of its marine, protected areas are under threat from human impact.

The major direct drivers of the losses are industrial fishing; commercial and illegal logging leading to forest degradation and/or deforestation; land use change; extensive agriculture (e.g., overgrazing and shifting farming); intensive agriculture (e.g. land conversion due to commodity supply chains); soil and water pollution; and the activities of extractive industries (e.g., mining). The indirect factors behind these are increase in population, loss of indigenous knowledge for managing nature, migration and urbanisation and expanding trade, which does not account for the externalities from the export of land- and marine-intensive products. Underlying these drivers is the way economic activities are organized and supported by governments and private decision makers. These lead to under-pricing of natural capital that imposes high social costs not captured in national system of accounts or firms' balance sheets. For example, agricultural, fishery and energy subsidies exert increased pressure on ecosystems. The fact that many of these systems are part of global commons but are controlled by national jurisdictions or not controlled at all means they tend to be over-exploited. The failure to reflect externalities and the hidden social and environmental costs associated with many resource-intensive activities in the prices paid for the final products accelerates over-exploitation of nature.

The losses of biodiversity and degradation of ecosystems matter because they impact on the ecosystem services that provide essential benefits to people (e.g. food, clean air and water) and diminish opportunities for long-term growth and sustainable development. Declines in services include: pollination; soil quality; flood and erosion control; disease control; regulation of freshwater flow and quality in watersheds and wetlands; regulation of air quality, climate and ocean acidification; and regulation of extreme events among others. When certain thresholds are exceeded, loss of

---

<sup>1</sup> Prepared by Anil Markandya. The findings, interpretations, and conclusions expressed in this summary do not necessarily reflect the views of the World Bank, the Executive Directors of the World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work.

biodiversity and ecosystem services could reach tipping points that trigger large and irreversible feedbacks that severely disrupt provision of essential services to people and economies.

### **Natural Capital Accounting and Analysis**

To facilitate mainstreaming of nature and biodiversity into economic systems, the contributions of nature could be quantified in monetary terms through the concept of renewable natural capital. Natural capital accounting is often used to value natural assets in terms of the goods and services that nature provides to economies. Estimates of such capital indicate that in *per capita* terms it has declined in low-income countries during the past quarter century. Furthermore, while per capita renewable natural capital has increased by 4 percent “blue natural capital” (fishery and mangroves) has declined globally by half over the same period, mainly because of a collapse in the value of fishery.

While past and present policies have resulted in significant losses of natural capital, recent studies have shown that ambitious programs, with the right policies, such as removing harmful subsidies can avoid further losses and even recover some of the past losses. The targets for such a program are set out in the Kunming-Montreal Global Biodiversity Framework (GBF), an outcome of the 2022 United Nations Biodiversity Conference. Furthermore, a major role in selecting the right policies and implementing them effectively in the right places to meet the targets of the GBF depends a lot on availability of data such as that provided through the UN System of Environmental Economic Accounts – Ecosystem Accounting (SEEA EA) framework. This Natural Capital Accounting System links the information on the extent and condition of different ecosystems to the services they provide and to the values of those services.

The role of NCA is in providing information to undertake an evaluation of policies and investments related to the different targets. The increased benefits of meeting the GBF targets which result in an increase in ecosystem services can only be measured if data on the baseline services and the associated changes extent and conditions are available. These benefits determine priorities of where action should take place to meet the targets and in designing measures that yield the greatest net benefits. Data on ecosystem condition are also important in determining sustainable use rates for renewable resources and in setting regulations on harvesting and trade. In addition, data on biodiversity indicators is the basis for biodiversity credits and other markets, which attempt to derive tradable biodiversity ‘units’ based on these indicators. The ecosystem condition accounts provide important information for this purpose.

### **Policies and Incentives for Conserving Biodiversity**

A range of policies will have to be implemented to achieve the GBF’s 2030 targets. These include regulatory measures, investments in conservation and restoration of degraded land and marine areas, use of economic and fiscal instruments for different sectors of the economy, and incentives and strategic choices at the economy-wide and sectoral level. There will also be a need to mobilize more funds to implement these measures.

A review of recent experience in designing and implementing these measures reveals that there is a critical need for data of the kind that the SEEA EA provides. This information helps in the design of the investments and regulations as well as in monitoring and reporting on their implementation.

Potential for the use of economic instruments is highlighted in studies that show the potential for repurposing subsidies for agriculture and fishery as well as designing schemes of payments for ecosystem services (PES) that draw on the detailed spatial information in the natural capital accounts to ensure effective targeting of ecosystems at risk and mandating of payments to results. New

instruments are also being developed that allow for “habitat banking” on low-yielding lands but with significant potential for conserving biodiversity, which can be made more effective if the data on what is allowed as a substitute for a lost habitat is genuinely equivalent in terms of ecosystem extent and condition. The SEEA EA helps provide that information.

In addition to the sectoral policies considered, governments can also make strategic choices for their development paths so that they reflect the biodiversity objectives. As noted, a significant factor will be to reduce the environmental impacts from agriculture and forest sectors in an effort to boost exports, output and income. For this, countries could follow a strategy to diversify their portfolio of assets such that it makes a shift away from land and marine intensive natural resource asset exploitation towards other forms of capital, such as solar and wind, as well as non-fossil fuel minerals that generate “green jobs” and sustainable growth. Such asset diversification strategies that have not been analyzed widely could include increasing value added from mineral extraction while limiting impacts on biodiversity (e.g. mining in forested areas), particularly in Africa, and substituting the use of fuelwood in rural areas that contributes to deforestation with modern energy sources, especially renewable ones such as wind and solar.

### **Mobilizing Finance for Biodiversity**

There is also an urgent need to mobilize finance to implement many components of the programs. The GBF states that US\$200 billion has to be raised by 2030 to finance the other biodiversity goals. So far, the amounts available are much smaller; an OECD report estimated finance for biodiversity from all sources (private and public) currently at US\$77-87 billion a year, with around 80% coming from public sources. While an increase is needed from both public and private sources to achieve this target, there is a need to mobilize finance from the private sector – given the tightening fiscal space in many developing countries.

On the private finance side, there are a number of new instruments, such as sustainability linked bonds and biodiversity credits. The latter offer an opportunity for a voluntary purchase of biodiversity protection to companies with commitments on corporate social responsibility (CSR) and/or explicitly considering nature and climate risks into their core investment and business strategies. There are issues relating to the metrics used and potential for scaling up the existing schemes, but some advances are being made in this area (e.g., ESG data supported by the World Bank’s Global Program on Sustainability to inform financial market decisions). Some involve linking biodiversity credits to carbon credits. There are also some developments in the REDD+ market that hold promise for its expansion using data from the SEEA EA.

Notwithstanding these developments, the current level of the market for biodiversity credits and REDD+ is relatively small. So far REDD has mobilized about \$1 billion over more than a decade. Efforts for developing high integrity biodiversity credits, including measurement, reporting and verification systems will be key to developing such markets. Increased interest among major financial institutions and businesses towards managing and disclosing nature and climate related financial risks, dependencies and impacts (e.g., TNFD and TCFD) offers promise for attracting private sector finance for nature and biodiversity.

On the public finance side, a number of financial instruments aim to establish proof of concept or a commercial track record of new solutions, which can become either replicable or scalable. Limited grant resources remain the most frequent financial instrument for biodiversity conservation to date. Others that blend public and private finance (“blended finance”), help leverage private financial flows at scale and increase the efficiency of scarce public resources. These include debt conversions or “debt for-climate” and “debt-for-nature swaps” in which there is renewed interest. Such instruments have been tried for some decades with a number of benefits, but also downsides. It has been noted that a debt swap can downgrade a country’s debt rating or creditworthiness. Again, amounts raised so far

are small but there have been some successful swaps recently in Belize, Cabo Verde and the Seychelles.

Instruments involving public and some private sources, such as Green, Social, Sustainability and Sustainability-linked (GSSS) bonds are based on meeting pre-agreed sustainability criteria measured through key performance indicators (KPIs). Examples for issuance of such bonds include Benin, Chile and Mexico. On biodiversity specifically, a landmark example is the Wildlife Conservation Bond or “rhino bond”, issued in March 2022 by the World Bank with GEF support. Data and evidence from programs supported by such bonds will help make the case for them and expand their use. So far, while having considerable potential, GSSS bonds make up just a fraction (about 3 percent of cumulative bonds issued) of the bond market and are extremely small in developing countries. Equity is another instrument under the “blended finance” label that can be used.

In conclusion, meeting the biodiversity targets of the GBF remains a challenge but one for which there is hope if the right policies and programs are implemented. To do this, data and evidence on the potentials and impacts of scalable measures is critical and natural capital accounting and associated policy analysis could play a central role in providing it.