

# The Economics of Nature

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## INTRODUCTION

Over the last 20 years, the Indian economy, driven by a reforms programme that has focused on building industry and infrastructure, has grown at an enviable pace. Progress, however, has come at the expense of the environment; thereby rendering the growth phenomenon an unsustainable one.

In India, and in many other countries, environmental concerns are often regarded as an issue that can be tackled in the future, once growth has borne all of its fruit and poverty is eradicated. By and large, ecosystem degradation is considered a rich country's burden with the developing countries taking the view that scarce resources must first be invested in industry, infrastructure and technology, rather than in environment protection.

This approach needs to be reviewed on two counts. For one, the environment has a large role to play in sustainable growth, which is the avowed objective of all nations and, second, not factoring in the cost of ecological degradation leads to growth figures that are unrealistic and inflated.

We believe that keeping the environment subordinate to overall economic success does not pay in the long run. Likewise, countries in pursuit of sustainable development will find that it is impossible to maintain growth while the environment threatens to collapse.

## ACCOUNTING FOR NATURE

Recent studies have shown that national economies benefit greatly from the ‘ecosystem services’, which nature provides free to society. However, very little money is invested in their conservation. This is largely because the contribution of natural resources and the cost of their degradation lie outside the scope of gross domestic product (GDP) calculations. These are invisible services and hence neither planned, nor accounted for.

It is important that countries consider the economics of nature and make it a part of their annual accounting processes. For, just as public investment in physical infrastructure is needed to support trade and industry, ‘ecological infrastructure’ is necessary for agriculture, human health and livelihoods. No country can achieve sustainable development by focusing on just one of the above. In fact, this will be among the subjects of debate at the eleventh Conference of Parties to the Convention on Biological Diversity (COP-11 CBD) that India will host in October 2012.

How can we reconcile India’s pursuit of economic development with the need to conserve its ‘ecological infrastructure’? The challenge is not as insurmountable as it has been made out to be. We believe that it might simply be a problem of measurement. The Stiglitz-Sen-Fitoussi report on the Measurement of Economic Performance and Social Progress released in 2009 concluded that ‘choices between promoting GDP and protecting the environment may be false choices, once environmental degradation is appropriately included in our measurement of economic performance’.<sup>1</sup>

This leads us to ask: Do we need to change the way we measure our countries’ and businesses’ wealth and performance? Why and how would a so-called ‘Green Accounting’ framework be efficient at addressing both developmental and environmental issues? Before we answer these, we need to understand why ecosystems matter to our economic and social well-being.

## PROTECTING ECOSYSTEMS: WHY IT MATTERS

The quality of ecosystems, all over the world and in India, is in danger. Despite an impressive Protected Areas network<sup>2</sup> covering

approximately 4.80 per cent of the total geographical area of the country,<sup>3</sup> India is today increasingly challenged by the loss of natural areas and related problems of freshwater scarcity, soil erosion, declining water and soil quality, and biodiversity losses.<sup>4</sup> Indian forests are under threat for their natural resources and as land necessary for infrastructure and industrial development. These activities lead to changes in land use patterns, loss of habitat and fragmentation in regions such as the Indian Himalayan Region or the Western Ghats, globally remarkable for their rich biodiversity and uniqueness.<sup>5</sup> In addition, most of the arid, semi-arid and dry sub-humid areas of India are now either subject to desertification or have been identified as drought prone or considered wastelands.<sup>6</sup> Coastal ecosystems are prone to multiple threats from over-exploitation of bio-resources, poorly planned human settlements and heavy pollution, while wetlands are being damaged by uncontrolled silting, weed infestation, discharge of waste effluents and encroachment.<sup>7</sup>

Does all of this really matter to the country's economic well-being? The answer is a definite 'yes'. Ecosystems should not be regarded solely from an aesthetic or recreational perspective but also from an economic standpoint as 'natural capital'. Just as physical capital is made up of manufactured assets and human capital is composed of knowledge and skills, natural capital refers to ecosystems and biodiversity as a stock of natural assets that are capable of producing a sustainable flow. For example, a well-managed forest or fishery is capable of producing a perpetual harvest, year after year. The forest or the fish stock is the natural capital, and the sustainable harvest can be regarded as natural income. In addition to consumable goods such as timber or fish, ecosystems and biodiversity provide many other valuable services that indirectly benefit society. A forest, for instance, provides value in terms of biodiversity and genetic material, groundwater recharge, carbon sequestration, flood control and non-timber forest produce. Wetlands filter human and animal waste and act as a natural buffer to the surrounding environment. Pollination by bees and other insects is essential for the development of fruits and vegetables. To ensure that all 'ecosystem services' continue unabated, it becomes obvious that ecosystems have to be managed in a sustainable way.

This leads us to ask: What are ecosystems services?

The term is fairly recent and its origin can be traced to a relatively modern field of research established in the 1960s that studies the linkages between economics and ecological systems. After a long gestation period, a new cross-disciplinary field was eventually named and institutionalised with the establishment of the International Society for Ecological Economics in 1988 and the journal *Ecological Economics*.<sup>8</sup> The key members of this group developed the concept further, highlighting the ties between ecosystems and human well-being.<sup>9</sup> From 2001 to 2005, the concept moved to the mainstream of conservation policy with the Millennium Ecosystem Assessment Project,<sup>10</sup> a study that assessed the global and local consequences of ecosystem change on human well-being. It involved more than 1,360 experts from 95 countries and was funded by the United Nations Programme for the Environment, the Global Environmental Facility and several private foundations and governments. Its key result was alarming—60 per cent of the ecosystem services assessed was being degraded, leading to a major loss of well-being on a global scale for future generations.

Not only will the loss of natural capital and ecosystem services affect society as a whole and impoverish our children, but it is already affecting the poorer populations concentrated in developing countries. In India, for instance, the poorest communities depend on forests for fuel-wood and construction material to earn their livelihood, freshwater for drinking, soil quality for agricultural production, medicinal plants for health care, and so on. Ecosystems provide the basic materials and services necessary for a decent quality of life. These communities are highly vulnerable to climate change and natural hazards due to their lack of mobility and access to substitute resources.<sup>11</sup> Conservation of surrounding ecosystems plays an important role in protecting against natural catastrophes. Conversely, bad ecosystem management and insufficient investment in conservation often leads to a vicious cycle where high rates of poverty increase dependency and pressure on ecosystems for subsistence which, in turn, reduces the services generated by ecosystems and leads to more poverty.<sup>12</sup>

## GREEN ACCOUNTING FOR GOVERNMENTS: A TRUE MEASURE OF WEALTH

### Ending the Economic Invisibility of Nature

From an economic perspective, and in light of the above evidence, preventing ecosystem degradation should be high on governments' agendas, especially in developing countries where reducing poverty is a major priority. Effective poverty reduction involves combating disease, providing education, enabling fair access to employment opportunity and also using natural resources judiciously with regard to their renewability, impact on local environments and value to local populations. Managing improvements in all these areas without a formal framework to quantify any of them in monetary terms may sound absurd; however, that is in fact a reasonable job description for developing country governments. If the saying 'You cannot manage what you do not measure' applies to the management of developing economies, then we have probably defined the greatest challenge for developing country governments—how to measure national wealth in order to grow it in a sustainable manner. This is a prerequisite for framing policies which direct investment into areas that provide the best return on investment while avoiding the pitfalls of economic trajectories that expose them to unacceptable or terminal risk.

To invest in environmental conservation, policymakers must first be able to measure and then value the contribution of ecological capital. For that, there is a need to redefine the concept of wealth for a nation.

Much recent work on 'inclusive wealth' measurement says that wealth should include not just a measure of manufactured and financial assets (physical capital), but also natural capital (oil, other minerals, forests, freshwater resources, cropland, fisheries, etc.), human capital (knowledge and skills) and social capital (institutional and legal infrastructure, political maturity, social harmony, etc.). Sustainable growth can then be defined as that which increases per capita national wealth, defined in this 'inclusive' or holistic manner.

To measure their ecological wealth, countries must practice what we term 'green accounting'. This consists of modelling and pricing the non-marketed services of environmental assets, as well as valuing future environmental liabilities arising from our actions. For any accounting period, the overall valuation exercise arrives at a revised value of net assets, and the year-on-year difference is the true measure of national savings, or 'genuine savings'. Yet, to date, depreciation of natural capital is not reflected in the popular macroeconomic aggregates used by policymakers or discussed in the press. Losses of fish, forests, freshwater and air quality have little or no visibility at all in accounting systems. The lack of natural capital accounting can dangerously accentuate a bad track record of conservation and cause severe loss of public wealth, while escaping public notice.

This should not come as a surprise since national accounts, as we know them, were designed to keep track of war-time economic activity. After the end of World War II, the Marshall Plan for post-war construction in Europe spawned the development of the first *Standardised System of National Accounts*, published in 1952.<sup>13</sup> The following year, the UN published a revised version for global use known as the 1953 SNA.<sup>14</sup> Used by the World Bank, this framework is the most commonly used accounting convention that brings coherence to hundreds of mainly economic statistics available in many countries. Given the circumstances, the framework was necessarily 'industrial' in its essence. There was no space in it for niceties such as environmental degradation and socio-demographic developments. Almost exclusively its focus was on the economic factors of production and consumption.

The System of National Accounting (SNA) uses GDP as a key measure of a country's progress, an emphasis which has been accentuated by decades of reinforcement through the advisory approach and aid policies of the International Monetary Fund (IMF) and the World Bank. Virtually all economic policy analysis and policymaking today is oriented directly or indirectly towards maximising GDP growth. In theory, GDP is a measure of the 'value added' by an economy in a particular year, that is, the value of all outputs after deducting the value of all inputs. This would

seem a very simple way to keep track of economic progress but, in practice, GDP has proved to be a limited and sometimes arbitrary measure. Whereas the Balance Sheet and Profit and Loss accounts of a company show not just income but also net profit and the change in net asset value over an accounting period, GDP takes no account of changes in the value of a nation's assets—be they natural assets (i.e., forests, freshwater, sub-soil minerals, etc.) or human assets (health, education and skills of the population). At present, national accounts only cover the actual value of ecosystem services if they are incorporated into product prices or when the services are lost and the cost of alternatives becomes apparent. When their market price is zero, services are in fact invisible and can be appropriated for provision or degraded without record. It may be argued that 'intangible' national assets such as legal and institutional infrastructure, law and order and communal harmony, which are all aspects of social capital contributing to quality of life and human well-being, are an excusable omission from national accounting. This is because there is considerable recognition of these assets in the minds of voting citizens, and hence considerable policy focus at national and provincial levels. However, not to record the depletion of natural assets, which are so essential to well-being but not understood as such, cannot be anything other than a recipe for impoverishment.

Consider, for example, a catastrophe such as the combined earthquake, tsunami and nuclear disaster that ravaged Japan in March 2011. The ensuing reconstruction of destroyed housing, roads and bridges would show up as an increase in GDP and therefore as national income. And indeed, Japan's central bank and the World Bank announced at the end of March that GDP growth was likely to contract by 1 per cent in 2011, register 2.9 per cent growth in 2012 due to reconstruction efforts and recover completely five years from now.<sup>15</sup> The problem here is that this official 'GDP growth' masks a significant increase in poverty—as evidenced by the loss of livelihoods and human lives, hardship and suffering of the displaced poor, including the long-term costs of livestock losses and standing crops, rich topsoil, precious marine and terrestrial ecosystems and freshwater quality. If this is all properly and holistically accounted

for, it would be a large deduction from national wealth. The root cause of such a fundamental misunderstanding of economic reality is, of course, the economic invisibility of nature. Much of what nature provides is in the form of public goods—available to all, not transacted through markets, not priced and, thus mistakenly, not valued as they ought to be.

This rationale is not limited to catastrophic events and specific situations, but should in fact be applied by every country in their business-as-usual approach to measuring national wealth. India's high GDP growth, which reached more than 8 per cent in 2010, is regarded as a very positive trend for the country's well-being and a good indicator that India will increasingly be able to lift its poor population out of desolation. However, the argument is flawed because along with a steady increase in GDP, India has also seen a sharp drop in its ecosystem services. And by leaving this out, it is ignoring the value of the fundamental 'ecological infrastructure' necessary for agriculture, human health and livelihoods. Yet, in the current system of national accounts, the destruction of forest services, for instance, will show up as GDP growth from more logging! These free services therefore need to be measured, valued and added to existing measures such as GDP to provide more inclusive aggregates to guide policymakers, businesses and consumers; assess the efficiency of conservation policies and measure the country's progress. These new indicators need to be effective and efficient in budgetary and public debates and thus need to be computed and published along the same fiscal year deadlines as conventional indicators.<sup>16</sup>

## In Search of a New Toolbox

The creators of GDP were aware of its limitations. In his Nobel Memorial Lecture in 1984, Richard Stone started by stating, 'The three pillars on which analysis of society ought to rest are studies of economic, socio-demographic and environmental phenomenon.' He then went on to say that his work had focused mostly on economic accounting and that he had not been able to spend much time on environmental accounting, even though he realised that 'environmental issues, such as pollution, land use and



non-renewable resources offer plenty of scope for accounting'. Similarly, it has long been known that even a fully articulated set of national accounts may not necessarily translate into a fool-proof measure of well-being. As Simon Kuznets, another pioneer of national accounting said, 'The welfare of a nation can scarcely be inferred from a measure of national accounts.'<sup>17</sup> In short, the creators of GDP thought of it as a work-in-progress and recognised the limitations of their approach. Unfortunately, 60 years on, the world has continued to focus much of its energy on maximising an incomplete and out-of-date paradigm.

There have been attempts to overcome the intrinsic limitations of the SNA and GDP. In 1993, the first international handbook on environmental accounting was released in the form of the System of Environmental and Economic Accounting (SEEA). However, it had limited impact as it did not recognise the need for asset accounts in physical units, nor did it acknowledge the concept of ecosystems. In 2003, the new manual on environmentally adjusted accounting provided an alternative approach across a sample of over a hundred countries. However, this framework remains insufficient for developing countries as a policy tool, as it still values natural assets primarily as resource inputs into production. It would not, for example, take into account the environmental values of forests which, for their flood prevention, rainwater storage and drought prevention benefits alone, are worth significantly more than their accounted timber or carbon values. These shortcomings might be addressed in the SEEA 2012/2013 revision, which will devote a specific volume to ecosystems and valuation issues. A few countries and the European Environment Agency have already tested elements for ecosystem accounting expenditures, natural assets (subsoil, water and forest), pollution or other material flow accounts.<sup>18</sup>

Of course, there is no easy way forward. The problem with GDP is not so much conceptual but has more to do with the way in which national accounts were standardised in the post-War years. The methodological, computational and data requirements for correctly valuing ecosystem degradation would have been considered too high in the pre-computer era. Even today, this remains a difficult field of work. Given the huge complexity of biodiversity and ecosystem

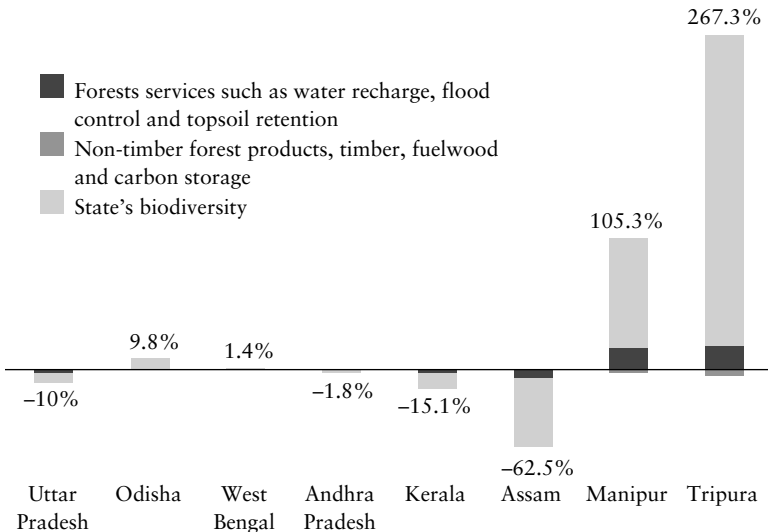
functioning, the multiplicity of its benefits for human well-being and the complicated linkages between the two, it is difficult to develop a common set of indicators and methodologies.

But difficult is not impossible. New technologies and tools such as observation satellites, ground-positioning systems and on-site real-time monitoring can help tackle the data collection challenges. Furthermore, along with the development of the ecosystem services approach, many ecological economists have participated in the development of monetary valuation methods of these services.<sup>19</sup> In 1997, ecological economist Costanza and his team released their often-cited estimate of \$33 trillion as the US dollar value of the world's ecosystem services.<sup>20</sup> This study strongly contributed to the mainstreaming of these methods. More recently, on an international scale, a multi-phase research effort called The Economics of Ecosystems and Biodiversity (TEEB) hosted by the United Nations Programme for the Environment was showcased during the 10th Conference of Parties to the CBD at Nagoya, Japan, in October 2010. For TEEB, a scenario analysis on the 50-year impact of 'business-as-usual' concluded that if we continued with business as usual, by 2050 we would have lost land area from wild nature roughly the size of Australia, or 7.5 million square kilometers. The opportunity cost from not preserving this biodiversity, in terms of ecosystem service losses, would amount to as much as 7 per cent of global GDP on the horizon of 2050. The natural capital being lost every year was estimated to be between €1.3 and 3.1 trillion, roughly \$2–4.5 trillion.<sup>21</sup>

Although methodologies have to be scrupulously discussed and carefully chosen while valuing ecosystems, it is the first necessary step towards creating 'Green Accounts' and ultimately implementing a 'Green GDP' that would better reflect a country's wealth and well-being. An example of the Green Accounting methodology being applied in India was published under the Green Accounting for Indian States Project (GAISP), launched in 2004. It incorporated the value of carbon storage and other ecological services of forests, freshwater quality, biodiversity, pastures and cropland. All key findings have emphasised this point: that the cost of ecosystem degradation through soil and water quality losses and deforestation

is dramatically high. For instance, Indian forests facilitate ground-water recharge, prevent agricultural soil nutrient loss and avoid flood damage. Consequently the depletion of these services in 2003 led to a loss equivalent to 1.10 per cent of India's GDP.<sup>22</sup> The data can also be calculated by sector and by state and the results are astounding. For instance, water quality in Uttar Pradesh's rivers has declined to such an extent that restoring it would alone take off about 17.5 per cent from the state's GDP (2003 data).<sup>23</sup> These figures should suffice to convince Indian policymakers that investing in environmentally sustainable policies must go hand in hand with their development goals. The Supreme Court of India used the GAISP analysis in 2006 to draw up a scale of compensatory payments for converting different types of forested land to other uses. This policy now generates public funding dedicated to improving India's forest cover.

**Figure 1**  
**Monetary gains (or losses) in some unaccounted benefits of forests, as percentages of states' GDP in 2002–03. These have resulted from changes in forest cover due to mismanagement or good conservation**



Source: Green Accounting for Indian States Project, GIST, 2004–08

Discussions on how to take the ‘Green Accounting for Governments’ agenda forward are now taking place in a concerted manner at the international scale. At the 10th Conference of Parties to the CBD at Nagoya, Japan, in October 2010, World Bank President Robert Zoellick made a surprising and bold announcement—countries had to undertake a project to measure and report their ‘Natural Capital’ as an addendum to their national accounts. As a result, in March 2011, a group of international experts convened by the World Bank in Washington compared their ideas and expertise, and agreed to move forward to achieve this goal with a group of ‘first mover’ nations. India has also announced plans to incorporate Natural Capital into its national accounts by 2015 and has since launched a national TEEB India study to help do so.

## GREEN ACCOUNTING FOR BUSINESS: NEW RISKS, NEW OPPORTUNITIES

### Measuring the Negative Externalities of Business

Green accounting at the national level is a necessary step towards a profound change in the way states will navigate the environmental crisis. However, governments have limited control over the heart of today’s economy: the production process. Supply chains are indeed controlled by businesses; therefore they must change the way they measure and manage their impacts on ecosystems and biodiversity, while understanding that it is in the interest of the long-term sustainability of their activity.

A study by Trucost for the United Nations Principles for Responsible Investment (UNPRI) estimated that the negative environmental externalities (or third-party costs to society) of the 3,000 largest public companies were close to \$2.15 trillion in 2008.<sup>24</sup> Externalities accounted for 7 per cent of their turnover and one-third of their profits. This can often make the difference between profit and loss, but since these were externalities, they were not accounted for. The main externalities were greenhouse gas (GHG) emissions and water extraction, followed by air pollution, which directly impacts health. These are all very significant numbers, but the reality is that nobody

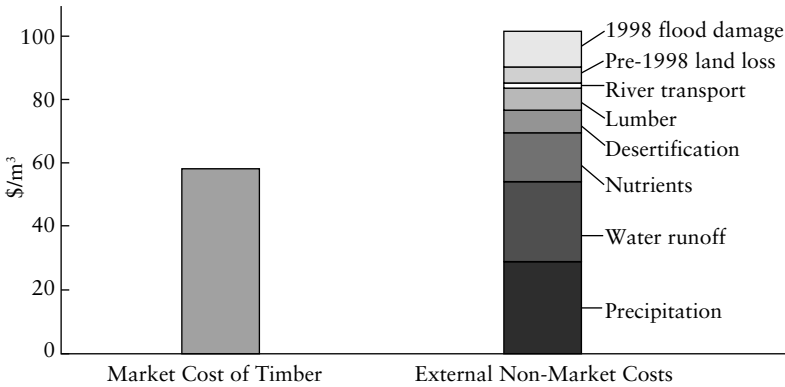
looks at them because nobody accounts for them. We keep writing the GDP accounts of society and publishing annual corporate results, but these externalities are rarely accounted for.

Therefore, we need to have two transformations to make people aware of the true costs of externalities. First, we have to measure the value of these externalities because if we do not measure them we are never going to manage them. Second, we have to look inside corporations themselves. The old ways of doing business are probably not likely to survive. Change will happen. The question is how sharp, unsettling and expensive to society and to corporations will the transition be. Yet, companies contribute positive externalities such as the creation of human capital through employing and training staff, generation of social capital through their corporate social responsibility (CSR) and research and development (R&D) initiatives. However, the need to measure and account for their impact on natural capital has now become a necessity, since tackling the ecological crisis must not remain the preserve of governments.

Different case studies illustrate the importance of ecosystem stewardship for the long-term sustainability of a business activity. Measurement and green accounting are the keys to acknowledging this unavoidable reality. Between 1959 and 1981, China logged 75 million hectares, 92 per cent of which were natural rather than plantation forests, mainly to satisfy the demand for timber in the construction sector.<sup>25</sup> The resulting loss of ecosystem services such as watershed protection and soil conservation resulted in devastating droughts in 1997 in the Yellow River basin and flash floods in 1998 in the Yangtze River basin. The loss of ecosystem services (climate regulation, timber and fuel supply, agriculture productivity, water regulation, nutrient cycling, soil conservation and flood prevention) due to deforestation in China over the period was estimated at \$12 billion per year. Thus, the 'true' marginal cost of timber production in China may have been almost three times greater than the prevailing market price.<sup>26</sup> Had these values been recorded in the construction sector since 1959, it is likely that such a rapid rate of deforestation would not have been considered a sustainable strategy for businesses in the construction sector. The

logging bans and harvest reduction implemented by the Chinese governments from 1998 onwards to try and halt the catastrophe led to the displacement of many loggers and forest employees—a difficult social situation that could have been avoided.

**Figure 2**  
**Impact of the Chinese Construction and Materials Sector on Forests, 1950–98**



Source: Mark Trevitt (Trucost) for TEEB

The economic value of forest ecosystem services that may have been lost as a result of logging to supply timber to the construction and materials sector in China over the period 1950–98, is likely to be substantial if expressed in the same terms as timber prices (\$/m<sup>3</sup>). These are rough estimates of the ecosystem ‘externalities’ associated with logging which are not reflected in market prices. Forest policy can be an effective means of ‘internalising’ these values.

Unsustainable economic behaviour and a failure to account for the impact on ecosystems and biodiversity can have even more far-reaching consequences. The desiccation of the Aral Sea in Central Asia from an overuse of scarce water resources is a striking example of how badly informed trade-offs can lead to the loss of entire ecosystems and industries. In the days of the Soviet Union, it was believed that ‘a cubic meter of river water used for irrigation would be more economically beneficial than the same volume delivered to the Aral Sea’.<sup>27</sup> Starting in 1956, the diversion of water from the

Amu Darya and the Syr Darya to the Aral Sea's main tributaries for irrigated cotton cultivation resulted in its shrinking to 10 per cent of its original size by 2007. Economic progress was indeed achieved in the short run. By 1991, cotton—a water intensive crop—accounted for over 65 per cent of Uzbekistan's gross domestic output, consumed 60 per cent of its resources and employed 40 per cent of the country's labour force.<sup>28</sup> However, the unpredicted long-term impacts are today eminently visible. Ecosystems of the Amu Darya delta in Uzbekistan and the Syr Darya delta in Kazakhstan have suffered substantial damage, with almost all wetland areas replaced by sandy deserts and loss of more than half the mammal and bird species. Fisheries collapsed in the mid-1980s leading to the loss of 60,000 jobs. Pollution increased due to the use of pesticides and soil fertility declined. Local peoples' life expectancy decreased from 65 to 61 years.<sup>29</sup> This exemplifies further the pressing need to measure business impacts on ecosystems. Such an approach would allow us to predict, at least partially, the adverse long-term and often irreversible consequences of a business activity on ecosystems.

### Leading the Way

Many businesses have already set up standard environmental indicators that focus on direct inputs such as water and energy, and outputs such as pollutant emission or solid waste. Life cycle assessment techniques and environmental management systems are increasingly popular among companies that have understood the risks associated with bad environmental governance and want to reduce their impacts along the supply chain.<sup>30</sup> Greenhouse gas emissions and mitigation efforts are increasingly being reported. However, there is now a need to innovate and focus on more comprehensive measurement of ecosystems and their associated services, which are currently treated superficially in company reports and often seen as irrelevant to financial reporting. This includes accounting for all components of biodiversity (i.e. genes, species and ecosystems), as well as the dependence of business operations on intangible biological processes such as nutrient cycles, pest control, and the like. If properly incorporated into financial accounts, green

accounting and the use of ecosystem economic valuation techniques can help achieve this goal.

Some companies are aware of the need to manage these new risks related to ecosystem services and have launched innovative initiatives, partly in preparation for future disclosure requirements. For instance, the sport and lifestyle company PUMA and the PPR Group's sustainability initiative, PPR HOME, have published an economic valuation of the environmental impacts caused by GHG emissions and water consumption along the company's value chain.<sup>31</sup> They have identified that raw material production (cotton cultivation, natural rubber production and cattle ranching for leather) accounts for the highest relative impacts and now intend to address the issue in light of this information. Using monetary valuation methods, PUMA's operations and its supply chain are estimated to have an overall environmental impact on GHG emissions and water consumption to the tune of €94.4 million. PUMA's final goal is to develop robust valuation methodologies and approaches and serve as an example to other companies.

## Creating Enabling Conditions for Businesses

It is a matter of debate whether altruistic behaviour by visionary corporate CEOs can ever suffice to change the way business is done. Some will argue—from either a cost savings perspective or from a perspective of product differentiation and catering to more educated consumers, or from the perspective of extending a corporation's social license to operate—that self-interest can achieve change. We argue that endogenous drivers of change have their limitations, and 'a single swallow does not a summer make'. Myopic managers may fail to adopt environmentally sustainable practices if they are risk averse or present-biased, even when there is potential cost savings associated with these measures.<sup>32</sup>

There is a case for accountancy bodies, tax authorities and other arms of government to be proactive in creating incentives for businesses to engage in such initiatives and mainstream green accounting and externality disclosure in all sectors. They can regulate public access to information and make forest or water



footprints disclosure compulsory. Such measures will transform ‘CSR’ from being voluntary ‘corporate social responsibility’ to being an orchestrated and very timely ‘corporate sustainability response’. Indonesia’s Program for Pollution Control, Evaluation and Rating (PROPER) is a good example of how governments can facilitate greater compliance by businesses. PROPER rates factories’ environmental performance against regulatory standards and releases the results publicly. The reputational incentives associated with such public disclosure have ensured high levels of compliance by factories covered under the scheme. In addition, PROPER has also contributed to increased voluntary participation in such compliance rating exercises and disclosures.<sup>33</sup>

## CONCLUSION

The problem of development and the environment is an issue of measurement and we need to start improving our navigational instruments to face the realities of our time. This is true for both governments and corporations. Emerging countries such as India have to take a lead—the government on their policy landscape, and leading corporations on evolving a more responsible, sustainable model for business.

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