NATURE AND ITS ROLE IN THE TRANSITION TO A GREEN ECONOMY

A contribution to Rio +20

The Economics of Ecosystems & Biodiversity

EXECUTIVE SUMMARY

The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on drawing attention to the economic benefits of biodiversity. It highlights the cost of biodiversity loss and ecosystem degradation and brings together expertise from ecology, economics and development to support the mainstreaming of biodiversity and ecosystem considerations into decision making at all levels, including the private sector. Website: www.teebweb.org

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There is growing recognition among policy-makers and private sector decision-makers that the current model of economic growth is socially, environmentally and economically unsustainable. This has sparked a renewed focus on the need for the international community to make a committed transition towards a "green" economy in order to ensure a sustainable and desirable future that promotes social equity, poverty eradication and human well-being (UNEP 2011). This focus has been complemented by the increasing appreciation of biodiversity and ecosystem services (MA 2005) and the economic value of nature including its intrinsic value (TEEB 2008, 2010a and b, 2011, 2012a and b). These two threads are closely interrelated as healthy and resilient ecosystems are necessary for long-term socio-economic development and efforts to build a green economy should be based on a sound appreciation of the value and role of nature in this transition. This paper aims to contribute to the Rio+20 agenda by highlighting the role of nature in the transition towards a green economy in the context of sustainable development and poverty eradication.

1. NATURE IN A GREEN ECONOMY

Nature underpins economic growth, human development and well-being. It is instrumental in building today's economic system and represents the core foundation in the transition to a green economy.

Nature and natural capital

Nature is essential to the health and growth of economies, societies and individuals, through the provision of ecosystem services such as the provision of food, raw materials, medicine, and water; regulating the climate; contributing to air and water quantity and quality; and mitigating natural hazards. Nature also offers a wide range of cultural services related to human health, recreation, tourism, scientific knowledge and spiritual and cultural identity. In providing these services to people, nature can be understood as delivering natural assets and hence be seen as "natural capital", existing alongside manufactured, financial, social and human capital (Pearce et al. 1989). While nature is understood to be more than merely "natural capital", it is nonetheless a useful metaphor to communicate the value or benefits of nature to people and the wider economy (MA 2005).

The green economy

UNEP defines a green economy *as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive"* (UNEP 2011). Critically, the green economy concept is more than merely "greening" economic sectors, it is a means of achieving the sustainable development imperatives of:

- Improving human well-being: securing better healthcare, education and job security;
- Increasing social equity: ending persistent poverty and ensuring social, economic and financial inclusion;
- Reducing environmental risks: addressing climate change, ocean acidification, the release of hazardous chemicals and pollutants, and excessive or mismanaged waste; and
- Reducing ecological scarcities: securing access to freshwater, natural resources and improving soil fertility.

In most countries, the transition to a green economy requires changes to existing governance approaches, institutions and markets. This transition will take different paths in different countries, depending, *inter alia*, on a country's domestic context, natural capital and socio-economic priorities.

Nature in the transition to a green economy

Natural capital, together with the other forms of capital, is a key input for a wide range of economic sectors. It is unique in that it provides what are often free, non-polluting, and low carbon inputs to production, such as clean water from ecosystems or pollination services from bees to support agricultural production. It also provides inspiration for innovation, scientific knowledge and ensures the safeguarding of assets (e.g. through flood control).

All sectors are important for the transition to a green economy and the conservation, restoration and sustainable use of natural capital is a key driver in this transition. Actors in economic sectors such as agriculture, fisheries, forestry and water, have a fundamental interest in safeguarding their sector's natural asset base. In addition, the engagement of all economic sectors in the transition to a green economy is of key importance if the productive and regenerative capacity of nature is to be preserved or augmented (UNEP 2011). Understanding the dependence of economic sectors on nature and the opportunities to minimise their impacts on the environment is therefore crucial for a successful transition to a green economy (UNEP 2011, TEEB 2012a).

2. NATURE, WELL-BEING AND DEVELOPMENT

Nature's benefits to people and communities

Human and societal well-being depends on nature. Where natural capital is degraded and lost, there is a risk that communities are undermined and humans suffer. In contrast, efforts to conserve, restore and sustainably use natural capital can improve human well-being, support livelihoods and increase socio-economic and intergenerational equity (TEEB 2011, TEEB 2012b). In South Africa, for example, interventions by the government to restore and improve wetlands have not only provided much needed employment opportunities but have also increased the capacity of the wetlands to provide essential services to the poor, including crop and reed production, water for domestic purposes, and grazing for livestock (TEEB 2011).

Efforts to conserve, restore and sustainably use natural capital can also increase ecological resilience. Ecological resilience can be understood as the adaptive capacity of an ecosystem to withstand shocks and rebuild itself, or persist on a given developmental trajectory. A resilient ecosystem can continue to provide ecosystem services to local communities under changing environmental conditions, such as climate change, and thus support community viability and livelihoods in the long-term. As such, healthy, functional, resilient ecosystems can be seen as a life insurance policy for many communities.

Nature's contributions to development and prosperity

Healthy and resilient ecosystems may contribute to delivering development goals, especially on poverty eradication. In turn, the degradation and loss of natural capital can undermine development and long-term economic growth and prosperity. Global commitments to improve well-being and eradicate poverty are more difficult to achieve without recognising and taking into account the value of natural capital and its associated benefits.

The role of nature in development has all too often been overlooked and has led to a narrow focus on short-term gains at the expense of long-term prosperity and viability. Private wealth and financial or manufactured capital are systemically prioritised over public welfare and natural capital, which exacerbates the degradation and loss of natural capital (UNEP 2011). However, this is slowly changing. From the local to the global level, efforts to create healthy and resilient ecosystems are helping to deliver development goals.

In the Indian village of Hiware Bazaar, for example, acute water shortages due to vegetation loss were undermining agricultural productivity. The subsequent regeneration of degraded forests and building of earth embankments around hills have helped to conserve rainwater and recharge groundwater. This has increased agricultural production potential by several orders of magnitude and contributed to reducing poverty by 73 per cent in less than a decade (TEEB 2012b).

Likewise, in the Shinyanga Region in central Tanzania, efforts have been made to restore the Nihili woodland by utilizing traditional knowledge. The result has been an increase in the provision of ecosystem services from the woodland (e.g. fuel, fruit, building timber, honey, medicines and fodder) and a reduction in the time needed to collect fuel wood and non-timber forest products by several hours. In addition, the sale of tree products has helped pay for children's schooling and allowed more time for education and productive work, thus creating enabling conditions for development (TEEB 2012b).

Investments in the restoration of ecosystems and the designation of protected areas and associated conservation measures have demonstrated benefits from the local to the global level. Marine protected areas have, for example, been shown to lead to increased fish populations, size and biomass inside reserves, generating positive spillover effects to nearby fishing grounds (Halpern, 2003). In Cambodia, the Ream National Park provides fish breeding grounds and other subsistence goods from mangroves and additional benefits from ecosystem services such as storm protection and erosion control (Emerton et al. 2002). Safeguarding the provision of ecosystem services is important for many local fishing communities, both for livelihoods and food security. It is also of global importance as over three billion people worldwide rely on fish as a significant source of protein (FAO 2009).

At the city, regional and national levels, safeguarding and investing in our natural resources (i.e. working with nature) can address environmental objectives and address ecosystem degradation and loss, foster growth and development and create employment opportunities. Nature in and around cities is often considered as a core element of effective urban planning, investment and management. For example, managing and restoring an upstream watershed can

be a cost effective method for helping with water purification and ensuring its adequate supply, as increasingly demonstrated across all continents (TEEB 2011, TEEB 2012b).

Looking at the benefits of nature from a national perspective can also be important for long-term strategic planning and choosing development pathways. For example, the UK National Ecosystem Assessment explored future implications of different policy scenarios on the provision of various ecosystem services from 2000 to 2060. Those scenarios which involved working with nature resulted in significant gains in ecosystem services and led to the most important long-term economic gains to society (UK NEA 2011).

To fully realise nature's contributions to development and prosperity, the focus needs to be not only on effectively responding to the symptoms (e.g. degradation, loss of ecosystem functions and services) but also to the underlying causes and drivers of the problems (e.g. production methods and consumption levels). Addressing these simultaneously will be essential to achieving lasting results.

Rehabilited mangrove forests in Bali provide storm protection to local communities.

3. THE MULTIPLE BENEFITS OF VALUING NATURE

Working with nature forms a critical part of the transition to a green economy and can deliver multiple benefits that support economic growth and sustainability. In order to take full advantage of these opportunities, there must be a clear understanding of the value of nature and how to reflect this value in public and private decisions in light of the multiple benefits it provides.

Valuing nature and the tools to do so

There is a strong case for valuing nature in both physical and economic terms more systematically than at present. Historically, the lack of understanding of the importance of nature and the value of its contributions to society and the economy, has led to the degradation of nature and undermined the services it provides. However, there is a growing appreciation of the importance of biodiversity and ecosystem services (see e.g. MA 2005) and the economic value of nature (see e.g. TEEB 2008, 2010a and b, 2011, 2012a and b). The identification, assessment, and demonstration of the value of ecosystem services can improve decision-making by helping to identify win-win opportunities and trade-offs, where policy and business objectives can be met most cost effectively and where there are multiple co-benefits. This information is also increasingly translated into policy responses. For instance, demonstrating the value of water purification services has led to improved forest management policies, the value of carbon sequestration to peatland restoration, and the value of climate change adaptation to floodplain conservation.

Looking into the economics of ecosystems and biodiversity does not necessarily imply responses relying solely on payments for ecosystem services (PES) or other market-based instruments which are currently receiving much attention. There is a variety of other approaches such as regulation, spatial planning and public-private partnerships, which can provide effective mechanisms to achieve multiple policy objectives including biodiversity conservation and job creation.

There is currently a real opportunity for a renaissance in decision-making, one that better takes into account nature, its intrinsic values, the wide range of public goods and services it provides, as well as private and collective benefits and values which are both market- and non-market based. There are a number of approaches to highlight the values derived from nature, ranging from ecosystem service indicators, to maps demonstrating the flows of ecosystem benefits to communities, and the application of monetary valuation techniques. Each approach has strengths and limitations and decision-makers may typically rely on a mix of qualitative, quantitative, and monetary assessments.

Value for money and meeting multiple objectives

Investments in nature today can save money and promote economic growth in the long term and must therefore be seen as an integral part of the transition to and the foundation of a green economy. In the current context of austerity, it is worth taking a careful look at the role of nature and the benefits it provides as these can offer economic savings and opportunities for investments with real social and economic returns. Furthermore, sustainably using and managing natural capital can also support well-being, improve livelihoods and create added value for both the public and private sectors.

Investments in nature can, in many cases, be significantly more cost-effective than investments in other forms of capital or engineered solutions for delivering certain services or pursuing specific policy objectives, especially if the wider range of co-benefits delivered are factored into the equation. For instance, investments in protected areas have led to benefits in a number of countries, including increased visitor spending in protected areas in Finland, low cost water supply to the city of Dunedin in New Zealand, and avoided soil erosion and improved water supply for farmers in Venezuela (TEEB 2011, TEEB 2012b). Restoration has also been found to be a cost effective solution. For example, the restoration of mangroves helped with flood and storm defences in Vietnam, the restoration of peatlands in Germany with carbon storage, and management and restoration of watershed ecosystems increased clean water provision to New York and avoided potentially significant price rises (TEEB 2011).

Ensuring the maintenance of healthy and resilient ecosystems can contribute to meeting multiple policy objectives simultaneously. For example, a payment for ecosystem services scheme launched in Mexico is an example of a tool that addresses multiple objectives - poverty, water security, deforestation and climate change. Water charges are earmarked to support community engagement in forest management, which has resulted in conservation and hydrological service benefits, including aquifer recharge, and to reduced deforestation rates and avoided greenhouse gas emissions (TEEB 2011, Muñoz et al. 2010).

4. CHALLENGES AND COMMITMENTS

Key challenges

The world population is expected to increase to 9 billion by 2050, life expectancy to continue to increase as will the share of the world's population living in urban areas. The global economy is also expected to grow significantly, possibly tripling by 2050 (OECD 2012). While this provides benefits to an expanding middle class and may contribute to poverty alleviation, there are a number of significant risks associated with these trends that may undermine and roll back the gains. The rising level of consumption and production will put increasing stress on the planet's resources and ecosystems, accelerating the historic trends of pollution and the depletion of natural capital. As many ecosystems and landscapes continue to be used unsustainably and our natural capital stocks and flows are further reduced, societal challenges associated with the loss of benefits from nature will rise, likely surpassing critical ecological thresholds or "tipping points". It is clear that humanity is consuming more than the regenerative capacity of the planet can supply, and that there is a need for a fundamental change in the level of response if major collapses are to be avoided (Club of Rome 2012).

Commitments that respond to the challenges

Growing recognition of the urgent need for action to halt the degradation and loss of natural capital, avoid societal losses and safeguard future possibilities for sustainable growth and well-being has led to a wide range of international commitments, including the three Rio Conventions - the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD).

The following areas of action highlight the increased recognition of the links between nature and the green economy:

- The reform of environmentally harmful subsidies, which has been identified by many governments as a priority for addressing the loss of biodiversity, the impacts of climate change, as well as making funds available for the transition to a green economy. Calls for subsidy reform have been highlighted under the Strategic Plan for Biodiversity 2011-2020 as well as in some of the recent G20 statements (CBD 2010, Lehmann et al. 2011, UNEP 2011, ten Brink et al 2012).
- The integration of the value of ecosystem services into natural capital and integrated environmental and economy accounts (SEEA) to ensure an improved and linked evidence base nature and the economy. The SEEA was initiated by the United Nations Statistical Commission, linked to the UN System of National Accounts (SNA) and called for under the Strategic Plan for Biodiversity 2011-2020. The World Bank-led WAVES project and the recent Gaborone Declaration by 10 African Nations (Gaborone Declaration 2012) in support for green accounting are two important commitments to progress.
- Mainstreaming conservation, restoration and sustainable use of ecosystems and biodiversity as part of wider objectives, strategies and plans for sustainable development, including national development plans, poverty alleviation strategies and green economy strategies. This has been called for under the Strategic Plan for Biodiversity 2011-2020.
- The benefits of pro-active investment in restoring degraded ecosystems, including Target 15 of the Strategic Plan for Biodiversity 2011-2020, calls for ecosystem-based adaptation under the UNFCCC and commitments to addressing desertification and land degradation in drylands under the UNCCD.
- The need to further scientific knowledge and know-how, and improve communications and cooperation across the science-policy interface has been recognised in the recent establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), which aims to reinforce the use of science in policy making that affects or is affected by the status of biodiversity and ecosystems.
- The engagement of the business community in solutions – whether improving accounting to include resource input dependency, risks and potential liabilities, commitments to carbon neutrality and no-net loss of biodiversity, codes of conduct and commitments to reporting, and research activities (TEEB 2012a). Emerging developments include corporate sustainability reporting and accounting, such as Puma's Environmental Profit and Loss Account, and the Natural Capital Declaration of the financial sector (Puma 2011, Natural Capital Declaration 2012).

The on-going global financial crisis should not slow down the transition to a green economy. On the contrary, the crisis should act as a catalyst to implement the above-listed commitments in order to achieve significant cost savings over time, exploit untapped opportunities to create jobs and growth, and finally help society make the transition towards ecologically sustainable growth and more broadly, a sustainable and desirable future.

5. ACHIEVING THE TRANSITION TO A GREEN ECONOMY

While different countries may opt for transition paths towards a green economy tailored to their national circumstances, adopting a wide range of coherent and coordinated measures will be an integral part of successful transitions. The mix and emphasis of these measures will differ from one country to another. In most cases, a balanced approach will include both supply and demand measures, thereby greening the economy with production- and consumption-focused measures. As set out above, this approach should build on a sound appreciation of the value and role of nature which will provide a core foundation for the development of a future green economy. If the transition is managed well, it will not only result in environmental sustainability but will produce a paradigm shift to sufficiency, adequacy, equity, responsibility and mutual respect within and across peoples, socio-economic classes and generations.

Building blocks for a green economy

Over the years, a wealth of experience has been accumulated across countries on policies, approaches and measures to reduce or avoid environmental damage, to restore degraded ecosystems and conserve those that are intact and healthy. These measures have been a mix of traditional, business-as-usual approaches to:

- Minimise losses and avoid inappropriate trade-offs through the use of impact assessments, product life cycle assessments, project selection and evaluation criteria; and
- Invest in environmental infrastructure to comply with legislation and regulation, such as water supply and waste water infrastructure to meet water quality standards, waste infrastructure and air pollution control measures to meet emission and air quality standards.

They have also included, albeit less often, more active ecosystem management approaches, such as:

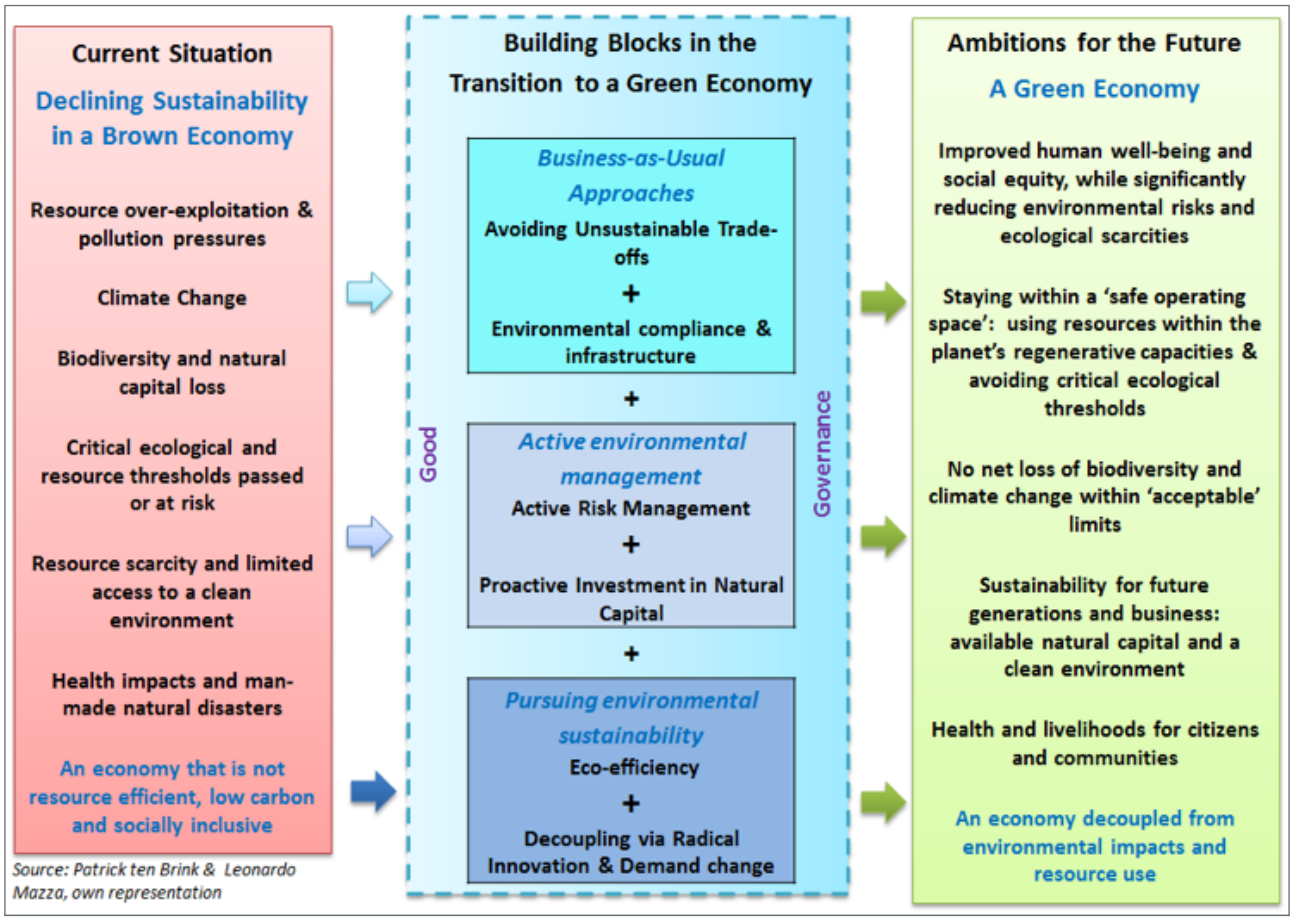
- Proactive approaches to risk management that build on a wider appreciation of risks, such as risk mapping for flood control and taxonomy research for invasive species (e.g. the moth threat to Mexico's key economic and cultural icon the "Nopal" cactus); and
- Investment in natural capital via restoration, conservation and improved management practices, including through the development of networks of protected areas (e.g. the EU's Natura 2000 network), the restoration of peatlands for carbon storage and other co-benefits (e.g. Mecklenburg-Vorpommern in Germany), the restoration of flood plains (e.g. Belgium's Scheldt estuary) or afforestation for flood control (e.g. China's Sloping Land Conversion Programme) (TEEB 2011, TEEB 2012b).

Finally, certain measures have focused on pursuing environmental sustainability via:

- Measures for eco-efficiency and wider resource efficiency through water or other resource pricing and wider environmental fiscal reform to incentivise efficient resource use (e.g. fisheries and agricultural subsidy reform in New Zealand or water pricing reform in the Czech Republic) (TEEB 2011); and
- Decoupling the economy from resource use and its negative impacts through more radical innovation and changes in demand, including new clean products and processes building on genetic resources (e.g. pharmaceutical sector and plant based cancer treatment) and biomimicry (e.g. floor tiles and waste, architecture and natural cooling) as well as consumption choice changes through information provision, civil society engagement and the availability of near-zero impact alternatives (TEEB 2011).

These six approaches, presented in the figure below, together with good governance, are key components to a transition to a green economy. The mix and emphasis of measures will differ from one country to another depending on national circumstances and windows of opportunity for progress.

FIGURE 1: **Key components and instruments to enable the transition to a green economy**



Source: Patrick ten Brink & Leonardo Mazza, own representation

Financing the transition to a green economy

The transition to a green economy will require considerable financing. Potential tools to address certain environmental issues and raise funds at the same time include: subsidy reform (which will liberate funds, help overcome technological lock-in and encourage innovation); getting the prices right through the use of market-based instruments for example (to encourage cost recovery and implement the polluter pays and user pays principles); allocating budgets (e.g. by climate and biodiversity proofing funds), and other innovative financing tools (e.g. REDD+ and beyond).

There will also be a need for increased investment from business and a need to increase the effectiveness of development cooperation financing. Ethical investment funds, insurance companies, banks, or indeed rating agencies, have not played a major role in financing nature's role in the transition to the green economy to date. There is, however, a potential for scaling up the contributions from this sector. This will be in part driven by an increased appreciation of nature's contribution to reducing risks relating to increased resource scarcity and from natural hazards exacerbated by climate change (TEEB 2012a) and could be further leveraged through the effective use of financial instruments.

Governance for a green economy

Actions at all governance levels, involving the participation of all relevant stakeholders, are needed for a successful transition to a green economy. A culture of appreciation for the multiple values of nature can support good governance at many levels and take advantage of a range of economic and non-economic valuation approaches. These approaches should cover the range of benefits to society and economy (the ecosystem services) and intrinsic values, and make use of a plurality of tools to demonstrate the importance of nature (TEEB 2010a). Similarly, a culture of evidence-based assessment, aiming to understand the full set of impacts from decisions – who are the winners and losers, what

the spatial impacts are, the time profile of benefits and costs and trade-offs and synergies – is a critical aspect of good governance. The transition to a green economy will need to recognise the roles and responsibilities of all sectors and engage a wide array of stakeholders.

There is a need for, inter alia, public support for research and education, support for networks of excellence, public funding for investments in natural capital, a regulatory framework and its enforcement, access to information and wider public participation, as well as public private partnerships. Progress with the above will require due engagement by business, stimulated and facilitated by appropriate policies, processes and institutions. Due participation, consultation and engagement of civil society, communities, including indigenous populations and citizens, will also be of fundamental importance.

Managing the transition

While the transition to a green economy will lead to many win-wins, it may also mean losses for certain groups, and trade-offs across sectors and over time. These impacts need to be accounted for in transition plans. Managing the transition will thus be critical, as will transparency and communication during the process. Careful transition management can include targeted education and skills training, the provision of early information and the phased introduction of measures taking into account affordability (e.g. as regards moving towards cost recovery in pricing), spatial planning (e.g. zoning fisheries areas), investment in substitute products or services, and in some cases compensation for losses.

Accelerating efforts

It is clear from the current state of the environment, and the magnitude of challenges faced, that the transition to a green economy will not happen with a marginal increase in efforts. More ambitious and accelerated efforts are urgently needed if there is to be a real transition to a green economy that offers improved well-being and social equity, while significantly reducing environmental risks and ecological scarcities. This will require active engagement and collaboration between governments, businesses, communities and citizens. It also requires new ways of thinking about the current state of affairs and our ambitions for the future.

There is a need for systemic solutions to address the systemic problems facing our economies and a need to step up the pace of change. Different countries and different stakeholders can embrace change and lead action in different areas across the building blocks for the transition to a green economy. The Rio+20 Conference offers an important opportunity to commit to working with nature and drive the transition to a truly sustainable future that promotes social equity, poverty eradication and human well-being.

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