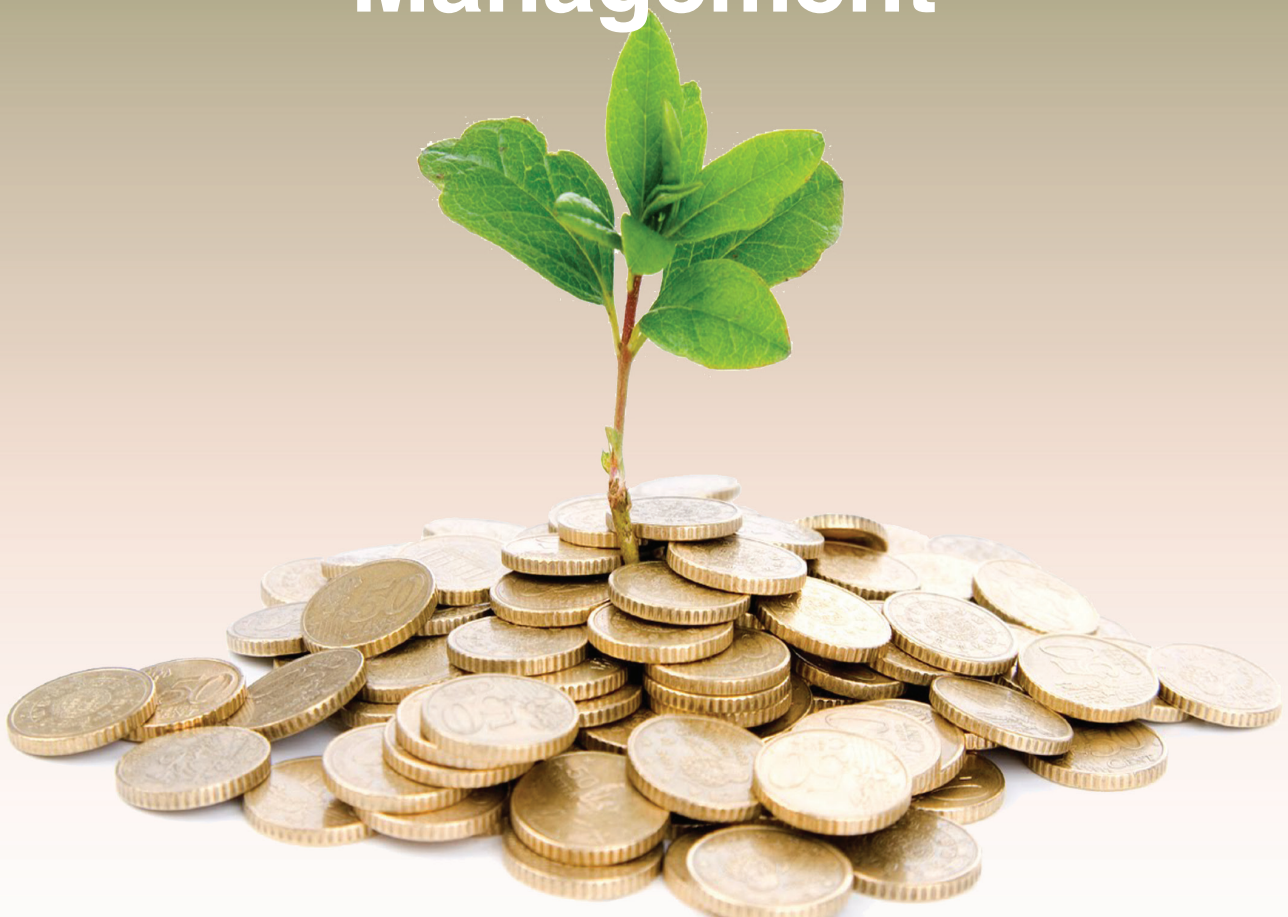
UNEP

INTERNATIONAL ECOSYSTEM MANAGEMENT PROGRAMME (IEMP)

Issues paper for Hi-level Forum on Ecosystem Management and Green Economy

Securing a Green Economy through Ecosystem Management



United Nations Environment Programme

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Summary

This paper has been prepared for the upcoming High-level Forum on Ecosystem Management and Green Economy[1] (18 November 2011, Beijing, China) with the overall aim of contributing to the United Nations Conference on Sustainable Development (UNCSD) taking place in Rio de Janeiro, Brazil in June 2012 (Rio+20).

With cutting-edge scientific findings and supporting evidence from policy makers and practitioners, the authors assessed a range of issues centred on how improved ecosystem management could support the greening of economies. From this analysis, it is concluded that:

- The Earth's ecosystems are the natural foundation of human civilization. A robust, healthy and sustainable ecosystem is a prerequisite to secure green economy development.
- Ecosystems have been profoundly degraded over the last 50 years and multiple stressors, including population growth, economic development and climate change, continue unabated. Some key ecological processes have been degraded beyond critical thresholds, which risks leading to a collapse in these ecosystems and their services. This poses a threat to human life, livelihoods and development, and demands urgent action.
- Ecosystem management can halt and reverse the increasing degradation of ecosystems while also providing economic and job opportunities, particularly for developing countries. Hence ecosystem management plays a pivotal role in green economy development.
- Numerous methods and tools are currently available to promote the role of ecosystem management in the transition to a green economy.

Based on these key findings, a series of recommendations have been made to secure political commitment and ensure ecosystem management is given the adequate weight it deserves in the Rio+20 discussions and outcomes, including:

- Need for improved synergies between ecosystem management and green economy in developing Rio+20 policy frameworks;

1 **Ecosystem Management,** "*an integrated process to conserve and improve ecosystem health that sustains ecosystem services for human well-being*" (UNEP 2009)
A **Green Economy** is defined by UNEP as one that results in '*improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'.*

- Request for enhanced capacity, finance, technology and knowledge support to all developing countries;
- Call for building ecological infrastructure in developing countries in particular those in Africa as a prerequisite for enhancing ecosystem management and promoting green economy.

In addition, the authors raised a list of questions aimed at triggering discussion on ecosystem management and its role towards achieving a green economy:

1. Has the role of ecosystem management in the greening of economies been recognized world-wide? If not, what can be done to increase such awareness?
2. How urgent is the need for restoring degraded ecosystems? What are effective means, markets, incentives, regulations, etc. for doing so?
3. Is capacity a constraint for sound management of ecosystems in developing countries? If so, what can be done to speed up the pace of capacity building?
4. In view of the failure of markets to reflect the true value of ecosystem services, what kind of research and actions can be pursued to improve the current economic model?
5. Have discussions to date on Rio+20 focused on the importance of sustainable ecosystem management in the greening of economies? If not, what can be done to ensure it is adequately addressed?
6. What key messages do you want this high-level forum to convey to Rio+20?

This paper includes a short introduction, detailed analysis of the five main issues, conclusions and recommendations. A list of questions for discussion during the Hi-Level Forum has also been provided.

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Acknowledgements:

We are highly appreciative for the financial and in-kind support from The Chinese Academy of Science (CAS) to UNEP-IEMP which led the drafting of this paper.

Introduction

The Earth Summit on sustainable development held in Rio de Janeiro, Brazil in 1992 adopted the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, the Convention to Combat Desertification, the Rio Declaration on Environment and Development, and Agenda 21. As 2012 nears, all eyes are set towards the United Nations Conference on Sustainable Development (UNCSD), commonly referred to as "Rio+20", whose main objectives are to secure renewed political commitment for sustainable development; assess the progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development and address new and emerging challenges. The UN General Assembly has also selected green economy in the context of sustainable development and poverty eradication as one of the two themes of Rio+20, which will provide an alternative development path towards global sustainability by addressing social, economic and environmental issues in a more integrated way.

Given the rising trends of global temperature, hunger, water scarcity, and biodiversity loss, compounded by a global population of 7 billion, which is to hit 9 billion in the next 40 years, Rio+20 is a unique opportunity for decision makers to take stock of our successes and failures in the last 20 years, and to plan intelligently for the next 20 years and beyond.

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Our economy operates on an unsustainable basis as it does not fully account for environmental externalities. We need a transition to an economic system that reflects the environment; one based on ecosystem services. Currently there are severe pressures on the health of our ecosystems and its decline in health and quality of services is occurring at an alarming rate.

Without fully reflecting the value of natural assets and sharing the benefits of ecosystems more equitably, human interaction with them will remain unsustainable and degradation is likely to accelerate, leading to the potential collapse of important ecosystem functions and services. This threatens the security of all sectors of society, regardless of political ideologies, cultures or stages of development. Conserving and managing nature protects the resilience of ecosystems and the valuable benefits they provide society. This is particularly the case for the poorest and most vulnerable people around the world, who strongly depend on natural ecosystems for their livelihoods. Care of ecosystems and the benefits they provide can serve as the underpinning foundation on which a sustainable economic model can be developed.

This issues paper explores how managing and restoring natural capital can help

support the greening of eocnomies. As a contribution to the success of Rio+20, the paper also provides advice to policy makers on how global sustainability can be achieved through promoting ecosystem management.

Main issues

1. Ecosystems are the natural foundation for economic activity and human well-being. A robust, healthy and sustainable ecosystem is a prerequisite for the development of a green economy.

Economic activity and human well-being depend on the Earth's ecosystems and the services these ecosystems provide such as food, fresh water, climate and flood regulation, and recreational and aesthetic enjoyment. The Millennium Ecosystem Assessment (MA), launched in 2005, set out the relationship between ecosystem services and human well-being. This was further elaborated in The Economics of Ecosystems and Biodiversity (TEEB) series of studies, highlighting the "structure-function-service-benefit" relationship between nature and human well-being (Figure 1).

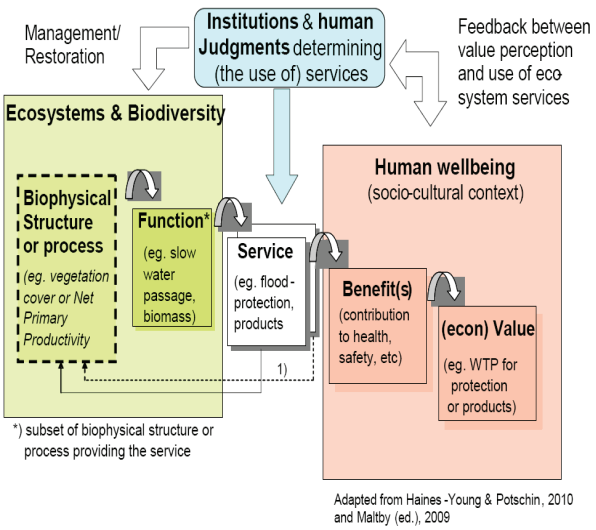

Figure 1: The pathway from ecosystem structure and processes to human well-being

The "function" of biodiversity and ecosystems needs to be distinguished from the underlying biophysical structure "in the sense that the functions represent the *potential* that ecosystems have to deliver a service which in turn depends on ecological structure and processes" (Kumar 2010). For instance, a forest (structure) has the potential to sequester carbon (function) which helps regulating

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the climate (service). Likewise, a coral reef (structure) leads to the production of fish (process) needed to maintain a viable fish population (function) which can be harvested to provide food (service). In order to facilitate the discussion on ecosystem services the MA distinguishes between *provisioning services* such as food, water or timber; *regulating services* such as flood and disease regulation; *cultural services* including recreational and spiritual services; and *supporting services* such as soil formation and nutrient cycling. In reality, most ecosystems deliver a variety of services and benefits to humans. Food, for example, provides nutrition but also pleasure and cultural identity (Kumar 2010).

At a more fundamental level, healthy ecosystems represent the foundation of economic activity and a prerequisite for achieving a green economic transition
(UNEP 2010)

These ecosystem services, especially those supporting food, timber and fisheries production, contribute significantly to global employment and economic activity, particularly in developing countries.[2] For instance, it is estimated that more than one billion people are employed in the agriculture sector[3] with another 30 million people deriving income from fishing and fishing related activities. Moreover, approximately 95 per cent of the employment in the fisheries sector is located in developing countries.

At a more fundamental level, healthy ecosystems represent the foundation of economic activity and a prerequisite for achieving a green economic transition (UNEP 2010). Given this, it is essential that the economic value of these services are recognized, demonstrated and captured in the accounts and decision-making of governments, the private sector and consumers.

2. Nonetheless, ecosystems have been profoundly degraded over the last 50 years and pressure on them continues unabated. This is unsustainable and threatens livelihoods and economic development.

The MA found that in the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth. The degradation of ecosystems imposes risks and threats to human life, livelihoods and economic development. For instance, in some regions dryland areas have been degraded into deserts, and in others, lakes and coral reefs have become “dead zones” which are no longer able to sustain aquatic species.

2 Millennium Ecosystem Assessment – A Synthesis, 2005, p. 49.
3 International Labour Organization, 2011, Global Employment Trends 2011, p. 20.

Although the degradation of ecosystem services constitutes a clear loss of a country's natural capital, under the predominant approach to national accounting only the extraction and processing of these resources is typically reflected in GDP. The erosion of the underlying asset, or the effect of this loss on future economic well-being, is ignored. This failure to account for the loss of natural capital can lead to inaccurate measurements of a country's balance sheet. For example, the MA found that countries like Ecuador, Ethiopia, Kazakhstan or Trinidad and Tobago, which had a positive growth in net savings in 2001, actually experienced a loss in net savings when depletion of natural resources (energy and forests) and estimated damages from carbon emissions were factored into the accounts (MA 2005).

As stressed above, all of humanity depends on ecosystem services and even wealthy populations are vulnerable to the consequences of ecosystem degradation in a globalised world – both directly, if fisheries are depleted, for instance, and indirectly due to the cross-boundary character of environmental degradation. Poor households in rural areas, however, bear a disproportionate burden given their dependence on ecosystems for their livelihoods. Indeed, the failure to address the ongoing degradation of ecosystems directly threatens the realization of the Millennium Development Goals (MDGs) and the natural foundation of a green economy.

3. Ecosystem management plays a critical role in halting and reversing this ongoing degradation. It can also provide economic and job opportunities, particularly for developing countries.

Ecosystem Management, "an integrated process to conserve and improve ecosystem health that sustains ecosystem services for human well-being" (UNEP 2009), places particular emphasis on integrating human needs with conservation practice, and recognizes the inter-connectivity between ecological, social-cultural, economic and institutional structures in developing solutions. The approach is increasingly being used by many developing countries and has been written into international agreements[4].

China has a long history of ecosystem management which can be tracked back to 2070-1600 B.C. of its first dynasty Xia. Xia issued perhaps the first law of ecosystem management in the world, which says —In spring, mountains and

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(MA 2005).

4 E.g. The Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem 2001.

forests must be banned from logging for trees to grow; in summer rivers and lakes must be banned from fishing for propagation of fishes and turtles (禹禁：春三月，山林不登斧，以成树木之长；夏三月，川泽不入网罟，以成鱼鳖之长。。。).

This spirit of nature conservation as such has been largely inherited by the Chinese, albeit with periods of unwise management of ecosystems and periods of greater focus on restoration and managementafter the lessons learnt over time The case of **Grain for Green Programme** in Loess Plateau of China illustrates this process.

the Yellow River receives a high content of sand entrained in the water leading to siltation of the river channels and reservoirs, which moreover, raises river beds and increases the risk of flooding. For this reason, controlling soil erosion of the Loess Plateau has been a national priority since the turn of last century.

Loess Plateau is located in the middle reaches of Yellow River, encompassing 287 counties in seven provinces. It is the largest area of loess in the world, covering more than 600,000 km2, accounting for 6.6% of China's land area, with 8.5% of the Chinese population. The fragility of the loess ecosystem is characterized by its arid climate, with only 64.1mm of average annual precipitation, which is compounded by high population density of 168 person/km2 and intensive cultivation on the slope land. This intensive cultivation has led to severe soil erosion, with an average erosion rate 5,000-10,000 t/km2/year. As a result, the Yellow River receives a high content of sand entrained in the water leading to siltation of the river channels and reservoirs, which moreover, raises river beds and increases the risk of flooding. For this reason, controlling soil erosion of the Loess Plateau has been a national priority since the turn of last century.

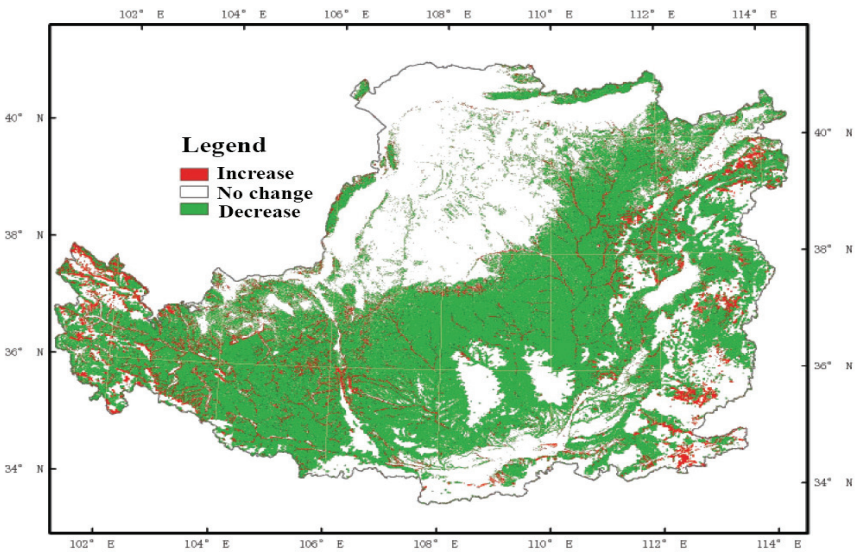

Figure 2. The change of soil erosion during 2000-2008 in the Loess Plateau region

Starting from 1999, the Chinese government launched a national "Grain for Green Program" for restoring cropland to forest (or grassland). The Loess Plateau was a priority area for the program, which includes transforming sloping farmlands into terraces, vegetation rehabilitation, enclosing hills and banning grazing, building dams to trap silt, enhancing basic and high quality farmlands, planting commercial forests and fruit trees, as well as growing fodder and fostering related industries. The program has achieved remarkable ecological and economic benefits: regional evapotranspiration has decreased by 6.2% and surface water runoff by 13.6% ; over 153 million tons per year of soil has been retained; and there has been a positive impact on carbon sequestration, with 69.21 TgC in soil, and 23.76 TgC in rehabilitated vegetation (Table 1). Food production rose 18% between 2000 and 2008, achieved through the increase of per-unit food production against decline of total cropland area. Meanwhile, the Loess Plateau's economic situation has greatly improved. Per capita income in rural areas increased from RMB1000/year in 1998 to more than RMB 3000/year in 2007. As the Program advances, the rural economy has improved with the growing secondary and tertiary industries, which has not only created new jobs for rural labour force, but also diversified sources of household income.

4. Rio+20 – an opportunity to promote ecosystem management for green economy development

As "Rio+20" will be focusing on, *inter alia*, green economy in the context of sustainable development and poverty alleviation, it provides a unique opportunity to highlight how ecosystem management can support the greening of economies.

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*' (UNEP 2011). It is a vehicle for delivering sustainable development, including poverty eradication. Ecosystem management has been highlighted in this paper given its critical role in restoring and securing the natural foundation for greening economies. The way in which ecosystems management is related to the underlying concept of a green economy is listed in Table 1.

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Green Economy Key issues to address	Relevance to Ecosystem Management	What can Ecosystem Management do?	Examples
Valuation and investments in Natural Capital	✓✓✓	When developing a valuation scheme for ecosystem services and making investments. The current state of ecosystems and availability of its services will affect valuation.	Environmentally adjusted water tariff in Heredia, Costa Rica. The town of Heredia is implementing a Payment for Ecosystem Services (PES) system that taxes the water users in order to pay farmers in the watershed to undertake improved conservation measures for the potable water supply. The PES charge had doubled from 1.90 colones per cubic meter of water in the year 2000 to 3.80 colones per cubic meter in 2007, which was still less than 2.5% of the total water bill.[5]
Poverty Alleviation	✓✓✓	Community based initiatives to restore ecosystems have a direct correlation to improved socio-economic standing of the community.	In South Africa, the ecosystem restoration programme "Working for Water" combined control of invasive alien species with rural economic and social development. The project treated 3,387 ha of land and created 91 person years of employment. Contracting costs up to 2001 were R 2.7 million, with an estimated total cost of R 4.9 million (including project management costs and all other transaction costs). The action prevented losses of between 1.1 and 1.6 million m^3 of water annually.[6]
Create jobs and social equity	✓✓✓	Provides the natural capital for job creation and enhances social equity by providing provisioning services to the populace.	The protection and management of the environment is one of the pillars of Rwanda's Vision 2020, the "country of a thousand hills" has undertaken many initiatives to protect ecosystems for income generation and job creation. Several of these projects are already beginning to reap environmental, economic, and employment benefits.[7]
Promote renewable energy and low carbon technologies	✓✓	Ecosystems provide the raw material for renewable energy like biomass.	India has a total installed capacity of bio energy generation till 2007 from solid biomass and waste to energy of about 1227 MW against a potential of 25,700 MW.[8] This huge potential in renewable energy is directly related to ecosystems.

5 Pagiola S, Platais G. Payment for Environmental Services: From Theory to Practice. Washington, D.C.: The World Bank, 2007

6 TEEB. The Economics of Ecosystems and Biodiversity Report for Business – Executive Summary. European Commission: Brussels, Belgium, 2010.

Resource and energy efficiency	✓✓	The EM approach ensures resource availability and efficiency.	Community forestry has contributed to restoring forest resources in Nepal. Forests account for almost 40 per cent of the land in the country. Although this area was decreasing at an annual rate of 1.9 per cent during the 1990s, this decline was reversed, leading to an annual increase of 1.35 per cent over the period 2000 to 2005[7].
Sustainable urban living	✓✓	Urban ecology promotes sustainable urban living.	The ecosystem services approach has been used in Finland, for better planning and conservation of urban green spaces. This is important because the ecosystem health in urban areas is important to maintain a high quality of life including public health[9]
Climate change	✓✓✓	Ecosystem-based adaptation (EBA) and REDD+	The Plan Vivo model of community based Payments for Ecosystem Services (PES) has helped communities mitigate and adapt to climate change in Mexico[10]

7 UNEP. Toward a Green Economy – Pathways to Sustainable Development and Poverty Eradication. Accessed online Sept. 28, 2011: http://www.unep.org/greeneconomy/

8 P. Venkateswara Rao, Saroj S. Baral, Ranjan Dey, Srikanth Mutnuri, Biogas generation potential by anaerobic digestion for sustainable energy development in India, Renewable and Sustainable Energy Reviews, Volume 14, Issue 7, September 2010, Pages 2086-2094, ISSN 1364-0321, 10.1016/j.rser.2010.03.031 (http://www.sciencedirect.com/science/article/pii/S1364032110000936)

9 Niemelä J, Saarela SR, Söderman T, et al. 2010. Using the ecosystem services approach for better planning and conservation of urban green spaces: a Finland case study. Biodiversity and Conservation, 19(11): 3225-3243

10 Plan Vivo, Project Fact Sheet - Scolel Té Plan Vivo Project. Accessed online October 8, 2011 at http://www.planvivo.org/wp-content/uploads/Scolel_Te_factsheet.pdf

5. There are already ecological infrastructures, mechanisms, good practices, methods and tools in place to promote the role of ecosystem management for green economy development

5.1. Building ecological infrastructure and developing mechanisms

Developing countries share common challenges related to ecosystem management, including capacity, knowledge and information constraints. Therefore, there is a need for these countries to learn from each other. The UNEP International Ecosystem Management Partnership (IEMP) provides such an opportunity.

Monitoring the state of the Earth's ecosystems, understanding the ecological processes and predicting ecosystem functions are essential for sound ecosystem management. This requires integrated cross-displinary networks such as the Chinese Ecosystem Research Network (CERN). Considering the global importance of ecosystem management, there is also the need for establishing an intergovernmental body to improve the science-policy interface such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Developing countries share common challenges related to ecosystem management, including capacity, knowledge and information constraints. Therefore, there is a need for these countries to learn from each other. The UNEP International Ecosystem Management Partnership (IEMP) provides such an opportunity.

The Chinese Ecosystem Research Network (CERN) was established in 1988 by the Chinese Academy of Sciences. Over the past 20 years, CERN has become a coordinated, comprehensive and sustained scientific and technological facility that undertakes monitoring, research, demonstration, capacity building, data sharing and policy support. As a predominant member of the Global Terrestrial Observing System (GTOS) and International Long-Term Ecological Research (ILTER), CERN and its research sites have become an important national and international ecological infrastructure. It is the largest national ecological research network in the world with 40 field stations located in major ecosystem types across China, five sub-centers, and a synthesis center, and over 2000 scientists, technicians and graduate students engaged in its activities. The long-term scientific research has helped the nation address such issues as agriculture and food security, ecosystem restoration, disaster reduction and natural resources management.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES): Over the past decade there has been growing international recognition about the need to improve the interface between the science and policy of biodiversity and ecosystem services. This recognition ultimately led to the current process for creating an Intergovernmental Science-Policy Platform

on Biodiversity and Ecosystem Services (IPBES), which aims at strengthening the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development. As requested by governments, IPBES should perform regular and timely assessments of knowledge on biodiversity and ecosystem services and their inter-linkages. These assessments must be scientifically credible, independent and peer-reviewed, and must identify uncertainties. It should support policy formulation and implementation by identifying policy-relevant tools and methodologies. IPBES will prioritize key capacity-building needs to improve the science policy interface at appropriate levels and then provide and call for financial and other support for the highest-priority needs related directly to its activities.

The International Ecosystem Management Partnership (IEMP) is defined by its co-sponsoring organizations the United Nations Environment Programme (UNEP) and the Chinese Academy of Sciences (CAS), as the *"China-based International Programme focusing on science and policy interface on issues of ecosystem management in all developing countries."* It is the first UNEP initiative of this kind in the South and for the South. This definition is supported by its core mandate of synthesising science findings for decision-making on ecosystem management and three subsequent inter-related initiatives:

- Monitoring and Capacity Building,
- Integrated Knowledge Management, and
- Science for Policy.

5.2. Recognizing and demonstrating value

Once the underlying biophysical characteristics of an ecosystem are understood, translating this scientific understanding into values can improve the decision-making of governments, businesses and consumers. One of the failures of our prevailing political and economic systems is that the value of biodiversity and ecosystems is often either entirely ignored or poorly understood. The TEEB studies recommend a pragmatic, tiered approach to valuation in analyzing problems and developing policy responses. In some cases, it may be sufficient to simply recognize the value of ecosystems and biodiversity to ensure their sustainability. For instance, protected areas such as national parks have historically been established in response to a collective heritage or patrimony without the need to place a monetary value on the "services" provided. In such cases, economic valuation may even be counterproductive if it is inconsistent with cultural norms

IPBES will prioritize key capacity-building needs to improve the science policy interface at appropriate levels and then provide and call for financial and other support for the highest-priority needs related directly to its activities.

or fails to reflect the full range of values (TEEB 2010). In other cases, it may be necessary to demonstrate the value of ecosystems and biodiversity in economic terms to ensure balanced and informed decision-making. This is particularly true when policymakers and businesses make decisions impacting ecosystems based on a cost and benefit calculation. A failure to demonstrate ecosystem values in such cases can easily lead to perverse policy and business decisions. For instance, when considering the conversion of wetlands for agricultural or industrial use a policymaker would not have the full picture if the value of the wetland in terms of water filtration and flood control services is ignored (see Box 1).

In addition to assisting in cost-benefit analysis, the demonstration of economic value can be an important tool for achieving more efficient use of natural resources, highlighting the costs of achieving environmental targets, and identifying more efficient means of delivering ecosystem services (TEEB 2010). As such, valuation can assist policymakers in addressing trade-offs rationally.

In addition to assisting in cost-benefit analysis, the demonstration of economic value can be an important tool for achieving more efficient use of natural resources, highlighting the costs of achieving environmental targets, and identifying more efficient means of delivering ecosystem services

(TEEB 2010).

BOX 1: NAKIVUBO SWAMP

The results of a valuation exercise for the city of Kampala, Uganda, showed that the nearby Nakivubo Swamp provided an economic value of between US$1 million and US$1.75 million a year in wastewater purification and nutrient retention services. Researchers concluded that the services provided by the Swamp created a much cheaper means of treating Kampala's wastewater than the expansion and maintenance of new wastewater facilities. Moreover, public funds were simply not available to replicate the natural ecosystem services provided by the swamp (TEEB 2010). Despite these findings, policy makers have been slow to protect the area and the wetland's ability to remove nutrients and pollutants has been greatly reduced over the past decade. However, in 2008, the Kampala Sanitation Programme proposed a new plan to reduce the pollutant load by expanding existing sewage treatment facilities in Kampala and to rehabilitate and increase the Nakivubo wetland area to re-establish its original ecosystem services.

5.3 Capturing the value through markets

PES: innovative response policy

In some cases, the value of an ecosystem service can be reflected through markets. The most common way to do this is through payments for ecosystem services (PES) schemes, which typically promote the conservation of natural resources by offering incentives to landowners in exchange for securing the ecosystem service. There are many types of PES schemes that focus on specific ecosystem services, but due to their commercial scale, four main schemes stand out: carbon sequestration, watershed protection, biodiversity protection, and landscape beauty (Wunder 2005):

1. Carbon sequestration: The principal PES scheme for carbon sequestration is REDD, or REDD+ (Reducing Emissions from Deforestation and Forest Degradation). The aim is to utilize funding from developed countries to reduce deforestation in developing countries. The 'plus' denotes important additional actions that can be taken on by Parties including conservation of forests, enhancement of carbon stocks and sustainable management of forests. Early success with REDD+ has been demonstrated clearly by Brazil which reduced deforestation rates by 67% in 2009 and 2010, consequently reducing global emissions by nearly 1 billion tons.
2. Watershed protection: PES schemes focused on direct watershed protection allow participants to pay upstream landowners for best practice land use which limits deforestation and land degradation to reduce risks, such as floods and soil erosion, while maintaining aquifer quality.

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6. Conclusions and recommendations

This paper has assessed a range of issues focused on how improved ecosystem management could help secure development of a Green Economy anddeliver sustainable development. From the analysis, it can be concluded that:

- The Earth's ecosystems are the natural foundation of human civilization. A robust, healthy and sustainable ecosystem is a prerequisite to secure green economy development
- Ecosystems have been profoundly degraded over the last 50 years and pressure on them continues unabated. Some of the key ecological processes have exceeded their thresholds, which may lead to the collapse of some vulnerable ecosystems. This poses threats to human life, livelihoods and economic development and demands urgent action.
- Concrete evidence shows that ecosystem management can halt and reverse this increasing degradation of ecosystems. It can also provide economic development and job opportunities, particularly for developing countries.
- There is clear evidence that many key issues of green economy development can be addressed by ecosystem management. Hence it plays a pivotal role in green economy development.
- There are already numerous ecological research networks, mechanisms, good practices, methods and tools in place to promote the role of ecosystem management for green economy development.

Ecosystems have been profoundly degraded over the last 50 years and pressure on them continues unabated. Some of the key ecological processes have exceeded their thresholds, which may lead to the collapse of some vulnerable ecosystems. This poses threats to human life, livelihoods and economic development and demands urgent action.

Based on these conclusions, the authors recommend:

1. Political commitment at the highest level to ensure ecosystem management is adequately reflected in the Rio+20 discussions;
2. Clear linkages are established between ecosystem management and green economy in developing Rio+20 policy frameworks;
3. Adequate financial, technological and information resources are allocated to support ecosystem management, including in national policy-setting and awareness raising, capacity building, planning and practices, particularly in developing countries.
4. Capacity building and ecological infrastructure in developing countries, particularly in Africa, for enhancing ecosystem management and promoting the greening of economies.

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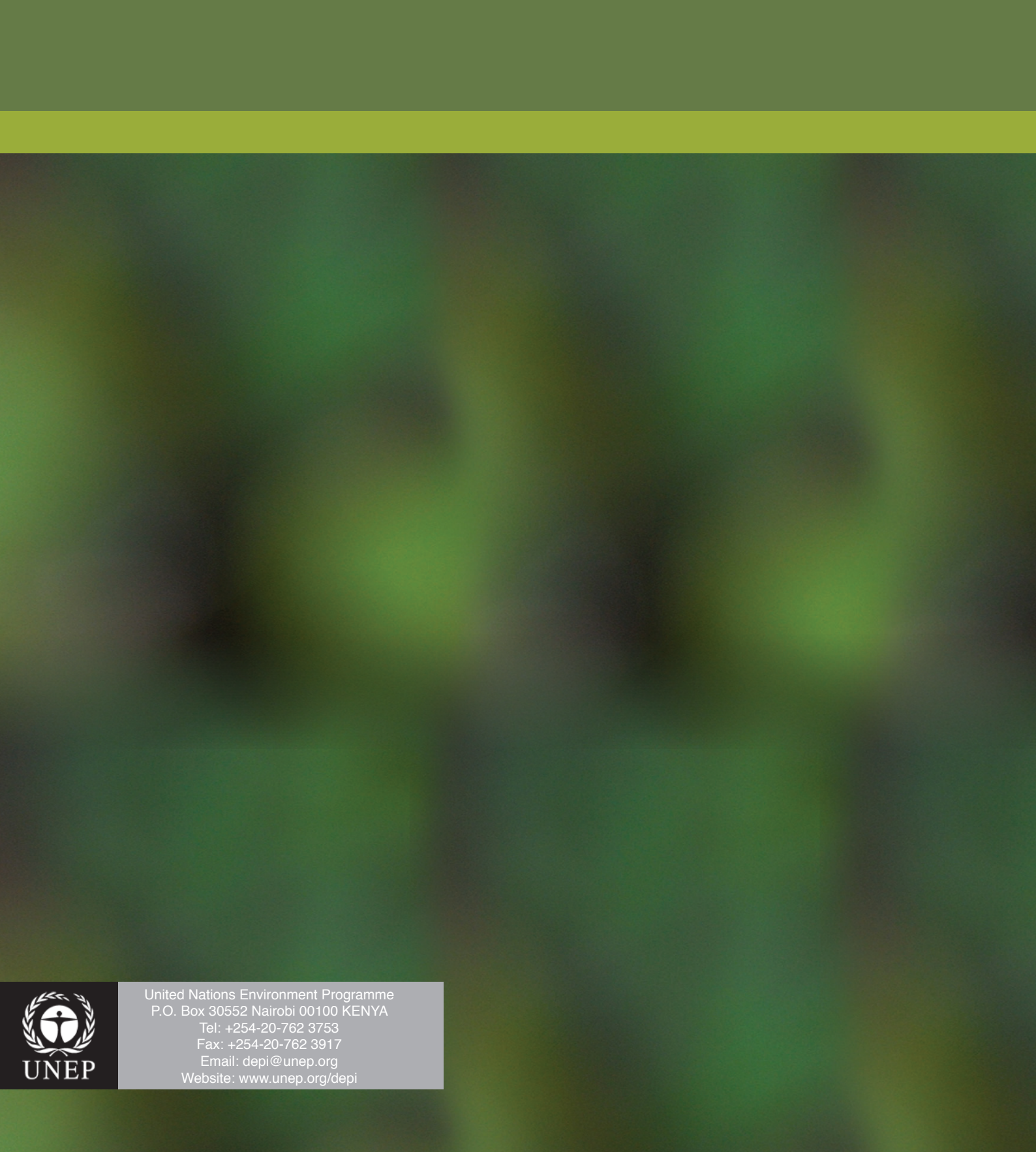

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