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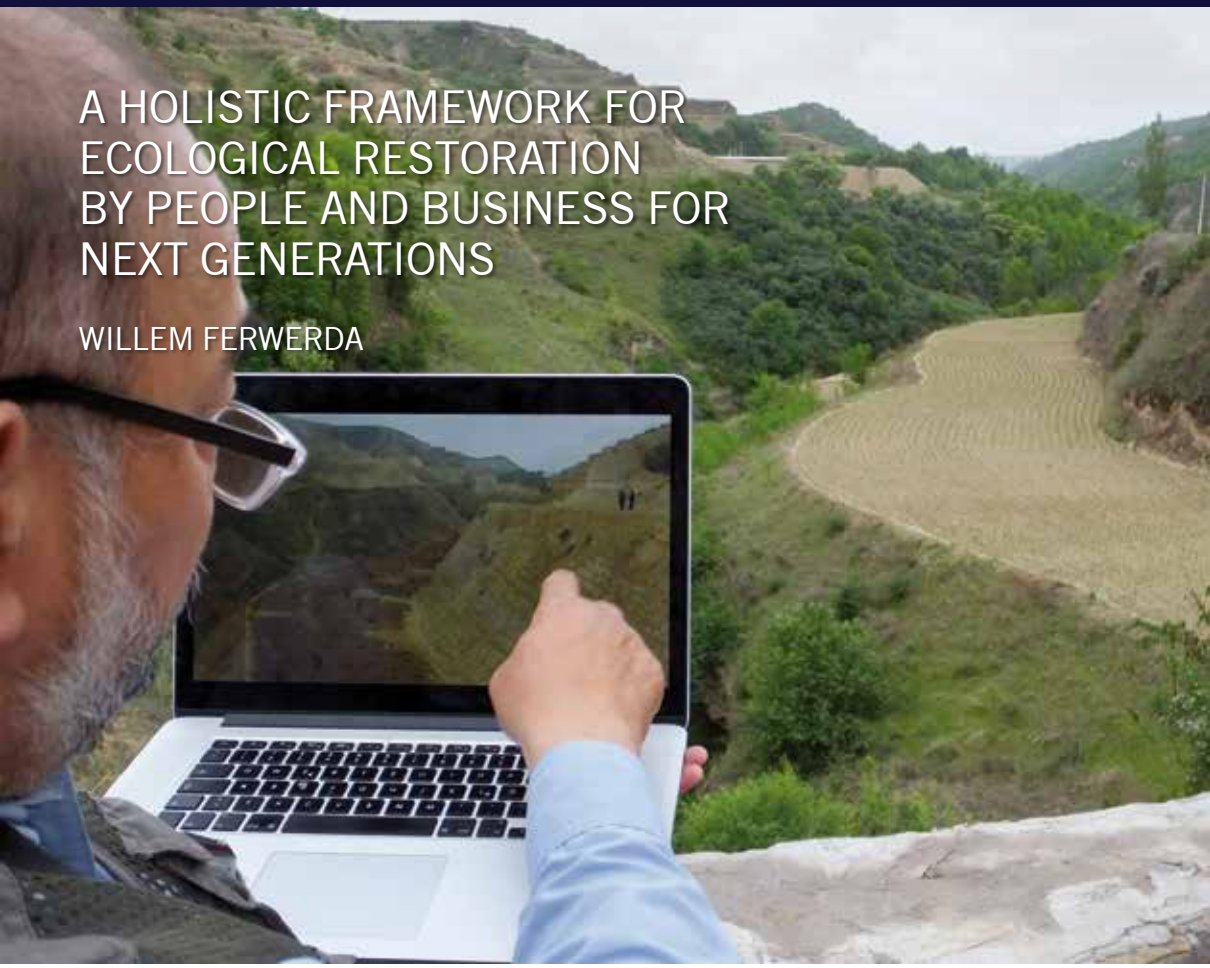
4 RETURNS, 3 ZONES, 20 YEARS



A HOLISTIC FRAMEWORK FOR ECOLOGICAL RESTORATION BY PEOPLE AND BUSINESS FOR NEXT GENERATIONS

WILLEM FERWERDA

IUCN CEM

RSM ERASMUS UNIVERSITY

4 returns, 3 zones, 20 years: A Holistic Framework for Ecological Restoration by People and Business for Next Generations

Completely revised second edition with contributions from Dominique Noome

WILLEM FERWERDA

4 returns, 3 zones, 20 years presents a holistic and practical business framework that uses a common language, and – based on science, technology and social stakeholder management tools- aims to establish Ecosystem Restoration Partnerships between people living on the land, companies, investors, governments and business schools, to restore degraded ecosystems that gives multiple returns, while teaching practical lessons and reaching international restoration targets.

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“We are drowning in information, while starving for wisdom. The world henceforth will be run by synthesisers, people able to put together the right information at the right time, think critically about it, and make important choices wisely.”

E.O. Wilson – winner of the Pulitzer Prize, author, and professor ecology at Harvard University.

Restoration of the Loess Plateau (before in 1995, and after 2009) in Shaanxi province, Northwest China. The ecological and economic transformation of this area demonstrates what can be achieved if different stakeholder groups work together
(PHOTO CREDIT: KOSIMA LIU).

Ecological restoration benefits people and business: Return of inspiration and return of social, natural and financial capital through creation of restoration partnerships. A successful entrepreneur of tree nurseries near Xianyang, China (above), and a farmer and rural entrepreneur in Andalusia, Spain (below).

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FOREWORD

In our pursuit of wealth and desire to see immediate economic returns, humanity has left behind a trail of degraded ecosystems. Today, as we approach the limits of our planet's productive capacities, we are beginning to fully understand not just the finite nature of the Earth's resources, but the value they bring to economic development and livelihoods.

It is estimated that ecosystems--ranging from marshes and coral reefs to tropical forests and soils--provide vital services worth between US $21 trillion to US $72 trillion each year.

Wetlands alone provide services of nearly US $7 trillion annually. Forested wetlands treat more wastewater per unit of energy, and have up to 22 times higher cost-benefit ratios, than traditional sand filtration in treatment plants. Pollinating services provided by bees and other insects are boosting agricultural production to the tune of at least US $153 billion annually.

The good news is that it is not too late to act. Maintaining and managing intact ecosystems should be our key priority. However, with more than 60 per cent already degraded by human activities, ecosystem restoration is just as important.

United Nations Environment Programme (UNEP) studies have shown that well-planned, science-based, community-supported programmes can recover 25 to 44 per cent of the original services while benefiting the organisms and habitats of ecosystems.

This, of course, means the entire global community working together, and as such I am pleased to see initiatives such as this publication by Willem Ferwerda, and his associated Commonland initiative. Mr. Ferwerda envisions a systemic approach to forging local partnerships for ecosystem restoration. He provides tools for making a compelling business case for investing in restoring ecological infrastructure and expanding, rather than squandering, the planet's natural capital.

Through such initiatives, we can ensure the healthy, functioning ecosystems vital to humanity's sustainable development aspirations.

Achim Steiner

Under-Secretary-General United Nations and Executive Director of the United Nations Environment Programme (Nairobi)

August 2015

UNEP
United Nations Environment Programme

PREFACE

Over the past 20 years I've been researching and documenting the world, seeking to understand how natural ecosystems function and why human activities degrade them. What I have learned is that the air, water, food and energy on which we depend have all been processed by living systems on the Earth. We depend on microbiological and other forms of life to generate, filter, constantly renew and naturally regulate the atmosphere, the hydrologic cycle, and natural fertility in the soil. My research shows that the Earth's natural systems have historically been degraded (and continue to degrade) because humanity has mistakenly valued production and consumption of goods and services more highly than the natural ecological function of the Earth. I have also seen that there is no biophysical reason why these systems must be degraded. And that it is possible to restore them to ecological health through purposeful and enlightened human effort.

The work of supporting the natural resilience of the Earth to restore ecological function is the most important task for everyone alive today. Given the complexity and scale of what needs to be done, it is clear that new structures of management and implementation of ecological restoration at scale are needed. Currently humanity faces fundamental challenges from pushing against the Earth's planetary boundaries. Biodiversity loss, food insecurity, desertification, human induced climate changes, chemical pollution and economic crisis all threaten our lives, families, communities, nations and civilization. We do not have decades or generations to ponder these issues: we must process this information and act now. Having the courage and the determination to face these daunting tasks is of vital importance.

With the '4 returns, 3 zones, 20 years' approach presented in this paper, a collaborative effort is created to envision a comprehensive and integrated way in which humanity can bring to bear its best awareness, management, capital and technical capacity to ensure human survival and sustainability by restoring fundamental ecological functionality to degraded landscapes on a planetary scale. This effort is urgently needed to stimulate and catalyse the monumental efforts that are required to show that humanity can act as a species on a planetary scale. There is a role for every human being in this the 'great work' of our time. I'm happy to dedicate my life to this effort and I encourage all who understand this and can contribute to do so immediately.

John Dennis Liu

Documentary maker Visiting Fellow, Netherlands Institute of Ecology (NIOO) Royal Netherlands Academy of Arts and Sciences (KNAW)

Director, Environmental Education Media Project (Beijing, China)
Ambassador Commonland

SUMMARY

"There are no economies without ecosystems, but there are ecosystems without economies..." **The Economics of Ecosystems and Biodiversity (TEEB) Report, European Communities (2008)**

Our economies are based on production methods and consumption patterns that generate jobs and wealth, while simultaneously degrading and destroying the ecosystems that form the very basis of this wealth creation.

Scientists have shown that maximisation of Return on Investment (ROI) per hectare leads to ecosystem degradation.

Healthy ecosystems are at the heart of a sound and sustainable economy. Restoring damaged ecosystems is therefore essential to reversing the depletion of our primary asset and keeping ecosystems functioning for future generations. But while restorative efforts are currently undertaken by NGOs, local farmers and government organisations, these efforts must be scaled up urgently. A wider global initiative is required to mobilise and engage the expertise and resources of the full business community.

Ecosystems form the basis of all wealth creation. Ecosystem services flow from natural capital and are an investor's primary asset. According to the United Nations Environmental Programme (UNEP), ecosystem services are worth over US $21–72 trillion annually – comparable to the World Gross National Income of US $58 trillion in 2008. Ecosystems provide societies with soil fertility, food, water, shelter, carbon sequestration, goods and services, medicines, stability, pleasure, knowledge and leisure.

Around 2 billion hectares are degraded. Today, 60 per cent of the services provided by ecosystems are threatened. Economic activities aimed at achieving short-term wealth are destroying ecosystems worldwide and thus economies' primary asset. Restoring damaged ecosystems is essential if we are to secure the livelihoods of future generations. The United Nations Environmental Programme (UNEP), the UN Convention to Combat Desertification (UNCCD) and the World Resources Institute (WRI) estimate that there are 2 billion hectares of severely degraded land suitable for rehabilitation through forest and landscape restoration. Of that, 1.5 billion hectares are suited to mosaic landscape restoration, in which forests and trees are combined with other land uses, including agroforestry, and smallholder agriculture.

Current efforts to scale-up restoration are not succeeding. While several NGOs and farming and governmental organisations are working hard on ecosystem restoration, their efforts are currently not collaborative. Business, farming and ecological interests are generally not well aligned or integrated. In spite of international intentions such as those of the ministerial Bonn Challenge on forest landscape restoration, efforts to restore damaged ecosystems continue to fall short of stated goals. The situation has arisen in which we know what needs to be done, but do not have the structure in place to implement it.

Only a collaborative effort between stakeholders will achieve restoration goals. We know from experience of the immense power of the business sector as a driver of new partnerships and schemes. We also understand that it is possible to anticipate an ROI in any given area's ecosystems as long as the project duration is long enough. A scenario in which business and investors enter partnerships with farmers and land users, science and other stakeholders thus holds the promise of effectively restoring degraded ecosystem functions to a state in which they can support a balanced socio-economy based on ecological functions. Or in other words: a maximisation of multiple returns per hectare leads to the ecological restoration.

To realise such collaborative efforts, an orchestrator is needed to actively compose collaborative partnerships between all stakeholders to restore a location: local people, science, business, investors and governments. These Ecosystem Restoration Partnerships have the explicit goal of restoring the land in co-operation with local people, farmers and investors and companies with the support of local authorities in a way that conforms with international established guidelines, such as the Bonn Challenge, Action 2020 and the Sustainable Development Goals.

Such local Ecosystem Restoration Partnerships could be an association or co-operation of farmers, land owners and land users, using expert knowledge from entrepreneurs and companies, and financed by investments based on a common landscape vision of long-term restoration. To facilitate the creation of these partnerships and formulate a common vision, many barriers have to be tackled, such as overcoming silos, avoiding the use of jargon, and showing how it works. Also needed is a universal and systemic approach that shows clearly how to restore ecosystems, and uses a language that everyone understands. This approach should also give a horizon that is long enough to realise restoration, but still holds promise for investors.

Degraded ecosystems will produce four losses: in biodiversity, social value, economic activities and in their meaningfulness to people. The approach introduced by 4 returns, 3 zones, 20 years offers incentives for farmers, land users, companies and investors that will give 4 returns: a return of inspiration (joy, awareness, purpose, meaning, innovation), return of social capital (employment and engagement), return of natural capital (biodiversity, resilience, ecosystem functionality), and return of financial capital (investment). To restore degraded landscapes a zoning approach is needed. Dividing it into three zones makes it clear to all stakeholders: a natural zone (restoring biodiversity, hydrology and topsoil); an eco-agro mix zone (restoring ecology with productive species); and an economic zone (agriculture and real estate). Using this business model based on collaborative management and new connections with local implementing partners, combined with business-driven solutions and resources, the significant scaling-up of current projects and the restoring of millions of hectares of degraded landscapes and seascapes is aided. A key success factor is a sense of purpose about the future when dealing with stakeholders; this can be realised by making use of Theory U methodology. The learning circle of Ecosystem Restoration Partnerships, business schools will be involved in such a way that ecology will be part of a new skill set for new generations of business leaders and business developers.

1 INTRODUCTION

"Hope is definitely not the same thing as optimism. It is not the conviction that something will turn out well, but the certainty that something makes sense, regardless of how it turns out." **Vaclav Havel**

This paper is about hope and the potential for humans to address one of the most challenging issues of today: the degradation of natural ecosystems and the depletion of agro-systems, together called mosaic landscapes. Indeed, greater awareness and understanding is growing among strategic decision makers in government, business, science, and civil society that the current global economic turmoil is rooted in unsustainable production and consumption practices combined with an increasing and more demanding population.

Just as we now recognise that our activities are a major cause of the environmental problems associated with the age, we also have a key role in positing the solutions necessary to reverse the damage done. Insights and personal experiences from specialists and local people in ecology, agriculture, economics, sociology, business, governance and finance have all contributed to this paper.

A. PLANETARY BOUNDARIES

"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist." **Kenneth Boulding**

According to scientists at the Stockholm Resilience Centre[1], mankind is rapidly approaching the boundaries of the nine productive ecological capacities of the planet. Recently, scientists concluded that the safe threshold of four of these nine planetary boundaries have been crossed as a result of human activity[2]. These four are: climate change, loss of biosphere integrity (meaning loss of biodiversity and species extinction), land-system change and an overload in the phosphorus and nitrogen biogeochemical cycles. This concept provides us with a physical and biological basis for understanding how the world's global environmental threats interconnect. Figure 1 shows the relationship between the environmental ceiling of each of the nine planetary boundaries, as well as the 11 dimensions of human wellbeing as identified on the governments' priorities at the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012 (Rio+20).

The continuing degradation and loss of ecosystems has an alarmingly detrimental effect on our well-being. Reduced security of food and water, depletion of soil fertility, reduced access to energy and its efficient utilisation, a decline in biodiversity, and the increased occurrence of extreme weather events (drought, floods, hurricanes) are just a few of the

1 Rockström et al., 2009, Planetary boundaries: Exploring the safe operating space for humanity

2 Steffen et al., 2015, Planetary boundaries: Guiding human development on a changing planet

detrimental consequences. A recent example is the 2014 water shortage in Sao Paulo as a result of deforestation in the Amazon[3].

Nobel Prize-winning atmospheric chemist Paul Crutzen, in his book *'The Anthropocene[4]'*, describes society as having entered a new geological period in which many important processes are dominated by human influence. His arguments include[5]:

- In the last 150 years, humankind has exhausted 40 per cent of the known oil reserves that took several hundred million years to generate;
- two billion hectares, a land mass equivalent to China and the United States combined, have been degraded or destroyed[6];
- More than 50 per cent of the Earth's land surface has been transformed by direct human action, with significant consequences for biodiversity, nutrient cycling, soil structure, soil biology, and climate[7];
- More nitrogen is now synthetically fixed in the manufacture of fertilizers and through using fossil fuel combustion than is fixed naturally in all terrestrial ecosystems;
- More than half of all accessible freshwater is appropriated for human purposes, and underground water resources are being rapidly depleted in many areas.

Many international studies have detailed the urgency of the environmental crisis facing mankind, including the *Global Biodiversity Outlook*[8], the 2005 Millennium Ecosystem Assessment[9], the 2012 *Global Energy Assessment*[10] and UNCCD[11] as well as studies from a resources perspective[12].

> *"Any progress achieved in addressing the goals of poverty and hunger eradication, improved health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded."*
> **UN Millennium Ecosystem Assessment (1,300 scientists in 2005)**

International policymakers increasingly understand the importance of the topic and many policies now include the ecosystem degradation issue. Many of the seventeen UN Sustainable Development Goals are connected to ecosystems, most explicitly Goal 15: *'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and*

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3 São Paulo running out of water as rain-making Amazon vanishes, 2014, http://af.reuters.com/article/commoditiesNews /idAFL6N0SI6G020141024?sp=true

4 Crutzen, 2006, The Anthropocene.

5 IGBP, 2004, Executive Summary: Global Change and the Earth System.

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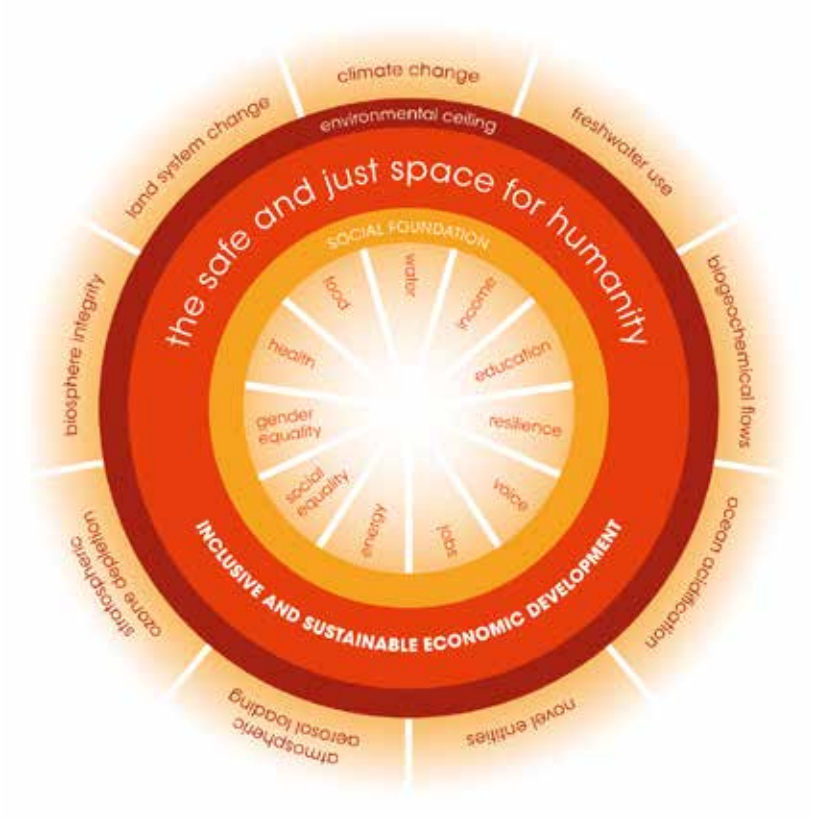
11 United Nations Convention to Combat Desertification, 2014, The land in numbers: livelihoods at a tipping point.

12 McKinsey Global Institute, 2011, Resource Revolution: Meeting the world's energy, materials, food, and water needs.

halt biodiversity loss'[13]. Initiatives like the World Business Council for Sustainable Development (cluster on Ecosystems & Landscape Management), The Economics of Ecosystems and Biodiversity (TEEB, 2008), The Economics of Land Degradation, Leaders for Nature (since 2005) and the Natural Capital Declaration[14] (2014), and the increased attention for the topic at the World Economic Forum in 2015, all of which require a strong involvement of business, show that attitudes are changing.

The conclusion we can draw from this is: given the interconnectedness of global environmental issues, one issue cannot be resolved without at least some understanding of how it interacts with the other issues.

FIG. 1. *Adaptation of the nine planetary boundaries*[15] *in relation to a safe and just space for humanity*[16]



13 UN, 2014, Open Working Group proposal for Sustainable Development Goals

14 Mulder et al., 2014, The NCD Road Map: Implementing the four commitments of the Natural Capital Declaration

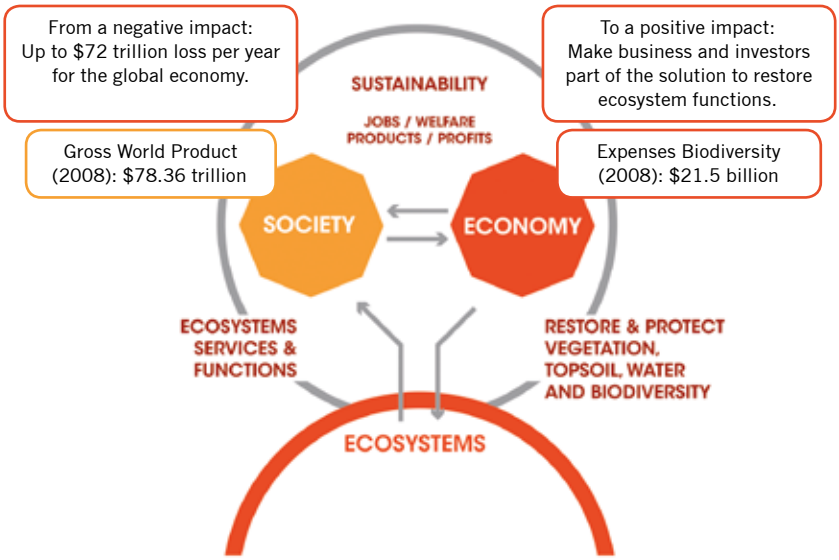
15 Rockström et al., 2009, Planetary boundaries: Exploring the safe operating space for humanity.

16 Kate Raworth, 2012. A Safe and Just Space for Humanity. Oxfam Discussion Paper.

B. RETHINKING OUR RELATIONSHIP WITH NATURE

Solving the ecological crisis requires more than just technical innovation. It requires the integration of the knowledge and experiences of stakeholder groups that have established a clear vision of a sustainable future, in which economic activity operates within the functional boundaries and capabilities of the planet. It requires us to rethink our relationship with nature and the basic essentials it provides: food, water, topsoil, energy and air, not to mention the planet's enormous variety of species (biodiversity) or, more comprehensively, the biosphere as a holistic structure (closed system). In sociological terms, it requires us to re-establish our relationship with nature and human culture such that it is healthy and sustainable for both planet and people. In this context, the debate over the concept of the 'societal relationship to nature' unveils interesting insights into the relationship between modern society and nature that are often missing in mainstream debates[17].

FIG. 2. *Rethinking sustainability; we need a shift from a linear understanding of finance and business activity to one that is holistic, systemic and cyclical.*



Much of the Earth's degraded land is the result of modern (intensive, industrial) agriculture, with biodiversity and ecosystems functioning at levels comparable to heavily urbanised and industrial areas. Despite this, a wealth of recent knowledge and experience strongly indicates that it is still well within our collective ability to recover the functional health of degraded and unproductive ecosystems. What is needed is a better understanding of how people and economies depend on nature, and to find a balance in the trade-off between short-term protection and long-term solutions[18].

17 Berghoefer et al., 2010, Many eyes on nature: diverse perspectives in the Cape Horn Biosphere Reserve and their relevance for conservation.

18 Dalerum, 2014, Identifying the role of conservation biology for solving the environmental crisis.

C. SUSTAINABILITY: FROM TRIPLE P TO PLANETARY RESILIENCE

How does the now general accepted 'Planetary Boundaries theory' fit into the present sustainability model of Triple P (Planet, People, Profit)?

The traditional view of sustainability is one that gives equal emphasis to three key stakeholders: people, profit and planet (collectively known as the Triple P or Triple Bottom Line) or society, economy and ecosystems. The Triple P philosophy has encouraged the idea that reducing your impact is sufficient. Although many companies increase their efforts in Corporate Social Responsibility (CSR), biodiversity and ecosystems are usually not an integrated part of CSR but viewed as something separate, so any changes made have been minor, while major degradation of the planet continues.

Good initiatives abound in direct investment projects and through the introduction of environmentally (and socially) friendly production processes, including those that embrace new certification schemes and introduce participatory processes with all relevant stakeholders. This has resulted in many certification initiatives based on supply chains, such as the Forest Stewardship Council, Marine Stewardship Council, Sustainable Trade Initiative (IDH), the soy and palm oil roundtables, UTZ Certified, Rainforest Alliance and ISO 26000. Almost all of these schemes are related to commodities for the international market, including coffee, cocoa, soy, palm oil and timber, in which the consumer pays a premium. The focus here is on reducing environmental impacts, which is important but not in itself sufficient to properly protect the Earth's ecosystems.

The conclusion must therefore be that the present Triple P model does not work in advancing the preservation of ecosystems. We need to adopt a new approach in which ecosystems form the fundament of our planetary resilience (see Figure 2). We need to go from 'Triple P' to 'Planetary Resilience' and understand that Ecosystems are Economics. New business models have to move beyond certification and Environmental Impact Assessment (EIA). The private sector must find a way to go beyond impact reduction; if we take from ecosystems, we need to give back in order to keep them functioning for next generations.

Figure 2 shows that sustaining ecosystems and restoring and conserving biodiversity — an approach that has so far been underutilised and underfunded — is the key to sustaining our economy. This should form the core business of companies and governments. The logical conclusion is that sustainable companies should not only work on lowering their unsustainable impacts, but also on scaling up their positive impacts by 'giving back' to nature – through ecological restoration in partnership with those stakeholders who live in these ecosystems: farmers, local land users and finally the growing urban community, who now represent more than 50 per cent of all people on the planet. It is time to scale-up efforts with positive meaningful actions, and put into action business plans that work with nature instead of against it.

FIG. 3. *Malawi: ecosystem degradation in Kasungu National Park; an abandoned tobacco field discovered during a patrol. Encroachment and tobacco farming lead to deforestation, localised loss of biodiversity and topsoil cover that takes decades to recover.* (PHOTO CREDITS: DOMINIQUE NOOME)

FIG. 4. *India (Tamil Nadu): ecosystem degradation in the Gundar river basin, caused by the removal of vegetation cover by deforestation and overgrazing in the last 50 years. This has resulted in water scarcity, topsoil loss, biodiversity loss, migration and decrease of agricultural productivity.*

D. CREATING A RESTORATION INDUSTRY – SCALING UP BY BREAKING DOWN SILOS

Scaling-up means that we have to work together, and understand the complexity of ecological and socio-economic drivers. But first we need to remove the barriers between various stakeholder groups that prevent essential knowledge-sharing and collaboration. Breaking down institutional silos and designing and implementing restoration projects and programmes that are effective, efficient, and engaging will enable businesses and investors to cost-effectively scale-up efforts to restore ecosystems through collaboration with scientists and practitioners, and via partnerships with countries and communities. Projects such as the Chinese Loess Plateau Watershed Rehabilitation Project and those from the Foundation for Ecological Security in India and Regreening Niger provide practical examples of how this can be achieved. But it takes time and trust. Governments, companies and other stakeholders who are interested in long-term, intergenerational projects are needed instead of short-term, lacklustre activities that achieve no real impact in terms of sustainability[19].

BOX 1 CHINESE LOESS PLATEAU WATERSHED REHABILITATION PROJECT

The Loess Plateau Watershed Rehabilitation Project was conducted by The World Bank's International Development Association. It started in 1995. With a total budget of approximately US $500 million applied over 3.5 million hectares or 35,000 km² (equivalent to the size of Belgium), the investment per unit area for the Loess Plateau Project was just under US $143 per hectare. The outcome provided many useful lessons. Sediment flow into the Yellow River was reduced by more than 53 million tons just during the 10-year life of the project, and continues afterwards. A network of small dams stores water for use by towns and farmers when rainfall is low, and reduces the risk of flooding. Replanting the vegetation and bans on grazing increased the perennial vegetation cover from 17 per cent to 34 per cent. Local food supply increased. More than 2.5 million people in four of China's poorest provinces; Shanxi, Shaanxi and Gansu, and the Inner Mongolia Autonomous Region were lifted out of poverty, reducing the rate of poverty from 59 per cent to 27 per cent. Farmer incomes rose from around US $70 per year per person to around US $200. In addition, the project produced substantial benefits downstream as a result of reduced sedimentation, and globally through carbon sequestration. The project's principles have been adopted and replicated widely throughout China. It is estimated that as many as 20 million people in China have benefited from the replication of this approach. The ultimate aim is to restore the whole of the degraded Loess plateau, which is the approximate size of France.

19 Van Andel & Aronson, 2012, Restoration Ecology: The New Frontier

FIG. 5. *China: restored hills of the Loess Plateau with trees of* Robinia pseudoacacia *near Yan'an. The restoration has resulted in an increase of apple cultivation (front).*

> *"We will launch major projects to restore the ecosystem, and increase our capacity for producing eco-friendly products. A sound ecological environment is the foundation for the sustainable development of humanity and society."* **Xi Jingping, President of China (2014)**[20]

In order to achieve significant results when scaling-up 'ecosystem restoration' projects and programmes, and in order to develop a restoration industry, we need to take into account the following enabling factors:

- **Agreement on the definition of 'ecosystem restoration'** – various definitions of the term exist and are used by scientists and NGOs (see Box 2). We should strive for one concise, shared, one-page definition that is understandable;
- **Long-term vision and commitment** – for many governments and donor agencies, restoration and conservation projects generally only last five years. This expectation is short sighted and one of the main reasons why many projects do not generate adequate or expected results. Too little attention is paid to long-term (more than 20 years) concerns for profits and sustainability in the private sector, and in current programmes at business schools. The ambition should be to stimulate intergenerational sustainable profit models (with a 20-40 year timeframe);
- **Simplicity and practicality** – most stakeholders work within their own silos and develop complex methodologies and frameworks that have little or no practical application, thereby creating frustration among stakeholders and a lack of progress in the field. Our ambition is to encourage the use of simple and effective guidelines and criteria, and to encourage people to find commonly shared, inspiring and practical

20 Xi Jingping. (2014) The Governance of China, Foreign Language Press.

solutions. An appropriate stakeholder approach endorsed by a range of institutions and businesses is also needed. Success can only be guaranteed if we develop solutions together;

- **A common language** – experts, farmers, businesses and governments speak different languages. We need to develop a common language and recruit story tellers to promote it worldwide;
- **Developing solutions in partnerships** – if we do not work together we will not be able to restore the vast number of degraded landscapes. We need to actively create new and surprising partnerships between all stakeholders and connect these directly to hectares.

E. COMMON GOAL: THE BONN CHALLENGE

The best way of developing such a mechanism, one which enables business and other stakeholders to come out of their silos and work together, is to identify common goals that are clear, attractive and take into account the complex context. A common goal of the world community should be:

To restore millions of hectares: to upscale ecosystem restoration projects with the aim of restoring millions of hectares within 20 years, and to build upon other initiatives to create jobs, alleviate poverty, enhance food security and biodiversity, absorb carbon from the atmosphere, build social security and halt economic migration.

To achieve this shared goal we need to:

- **bring different interests together** – those of companies and investors, with research institutions, business schools, civil society organisations, local governments, and farmers;
- **create an active broker mechanism** – a simple mechanism (team) that acts as a driver and endorser and is replicable in other regions. It will use international standards and criteria through the scientific networks (universities, IUCN[21] specialised institutions, and others);
- **use a holistic (or systemic) approach** – attract people in the business community, NGOs and scientists who are committed to a mission that envisions a new way of achieving socio-economic and ecological sustainability based on systems thinking[22];
- **use all available technology** – gather together specific and most advanced technologies and knowledge to put together documented protocols for ecosystem restoration and sustainable agriculture; **educate future business leaders** – create a direct relationship between business schools and restoration projects to influence new generations of business leaders. In this way we ensure that economic and

21 International Union for the Conservation of Nature, www.iucn.org.

22 "Systems thinking is the process of understanding how things influence one another within a whole. In nature, systems thinking examples include ecosystems in which various elements such as air, water, movement, plants, and animals (including humans) work together to survive or perish. In organisations, systems consist of people, structures, and processes that work together to make an organisation healthy or unhealthy. Systems Thinking has been defined as an approach to problem solving, by viewing 'problems' as parts of an overall system, rather than reacting to specific parts, outcomes or events and potentially contributing to further development of unintended consequences." Peter Senge, 1990, The Fifth Disclipine.

business activities protect and restore the good health of ecosystems and that business models are built to make restoration a viable business and investment proposition;

- **be complementary to existing efforts** – many global commitments and targets on ecosystem restoration have been agreed, including the Aichi Biodiversity Target 1523 to restore 15 per cent of degraded ecosystems by 2020, and the UN Framework Convention on Climate Change (UNFCCC) which agreed to slow, halt, and reverse forest loss and related emissions in developing countries.[24]

Promises have already been made. At the UN Conference on Sustainable Development (Rio+20) in June 2012, the UN Convention to Combat Desertification (UNCCD) shepherded the latest commitment to ecosystem restoration whereby countries will strive to achieve a land degradation neutral world (The Future We Want[25]). And the year before, the Bonn Challenge[26], a core commitment to restore 150 million hectares of lost forests and degraded lands worldwide by 2020 was launched at a ministerial conference in Bonn in September 2011. It's clear that the time for making things more complex is over. This broker mechanism should not be about controlling complexity, but about distributing complexity among partners. It should be practical and replicable. And it has to actively search for business cases.

23 Convention on Biological Diversity, 2010, Aichi Biodiversity Targets.

24 UNFCCC Conference Of the Parties, Cancún, Mexico 2010.

25 UN Conference on Sustainable Development: Rio+20, 2012, Rio de Janeiro, Brazil.

26 Secretariat of IUCN, 2011, Bonn Challenge.

2 ECOSYSTEMS ARE ECONOMICS

"A business that makes nothing but money is a poor business."
Henry Ford

Business Relevance: Healthy ecosystems form the basis of a sound and sustainable economy. They are the natural capital upon which the well-being of all societies and businesses exist. Integrated reporting takes the value of ecosystems into account. Corporate dependencies and impacts on ecosystems and biodiversity should be measured and valued as an integral part of management practice and reporting. This will highlight the unsustainability and hidden cost of industries and practices that degrade ecosystems [e.g. water use in the mining industry]. TEEB (The Economics of Ecosystems and Biodiversity) estimates the cost of this loss to be between US $21 - 72 trillion per year, and Costanza et al.[27] estimate that on a yearly basis US $4.3 - 20.2 trillion have been lost due to the conversion of ecosystems.

Questions for business schools: Do we prepare our students to understand the relationship between economics and ecology? Is TEEB part of our curriculum? Are we aware that photosynthesis and biodiversity forms the basis of our economy?

Ecosystem restoration is not just a philanthropic endeavour, but also a core economic issue. With this publication we anticipate an increasingly larger group of participants from the business, finance, scientific and civil society spheres to come together, paving the way for the designing and implementation of practical solutions. Working with nature will not only strengthen the long-term technical and strategic functioning of businesses overall, but boost the morale and passion of employees for the work with which they are tasked.

A. ECOSYSTEM SERVICES

Ecosystem services are based on the functionality of ecosystems and form the basis of all wealth creation. Restoring ecosystem functions is thus an economic activity. Among scientists and policy makers, the four types of ecosystem services first mentioned by the Millennium Ecosystem Assessment in 2005 are well known:

- **provisioning services:** food (including seafood and game), crops, wild foods, spices; water; pharmaceuticals, bio-chemicals, and industrial products and energy (hydropower, biomass fuels);
- **regulating services:** carbon sequestration and climate regulation; waste decomposition and detoxification; purification of water and air; crop pollination; pest and disease control;
- **supporting services:** nutrient dispersal and cycling; seed dispersal; primary production; infrastructure and housing;

27 Constanza et al., 2014, Changes in the global value of ecosystem services

- **cultural services:** cultural, intellectual and spiritual inspiration; recreational experiences (including ecotourism); scientific discovery.

As an illustration: the tsunami that hit the coasts of South East Asia in December 2004 taught us how important intact mangrove forests are to have protected people and the coast against the mega waves. UNEP provides a good overview of the importance of mangroves to people in their 2014 Call to Action[28]. It makes no sense to degrade and destroy your primary asset in an effort to make money in the short-term. Logically speaking, one would do everything possible to either save or conserve the asset's value (at the very least) or improve or enhance its condition, subsequent worth and continued productivity (which would be the ideal). To provide an analogy, one would assume a factory owner would frown upon the suggestion that sacrificing production equipment for the sake of the product being produced was a sound business decision. But this is precisely what happens in our current management of ecosystems and landscapes: natural capital stocks are being sacrificed for the sake of what they produce (flows).

B. ENVIRONMENTAL ECONOMICS

> *"The degradation of ecosystems costs the global economy between US $21–72 trillion per year ...Ecosystem decline cannot be considered in isolation from other trends. Business risks and opportunities associated with biodiversity and ecosystem services are growing."*
> **The Economics of Ecosystems and Biodiversity in Business (TEEB and Enterprises)**[29]

There is an emerging consensus that all is not well with today's market-centric economic model. Although it has delivered wealth over the last half century and pulled millions of people out of poverty, it is recession-prone, leaves too many unemployed, creates ecological scarcities and environmental risks, and widens the gap between the rich and the poor. Around US $1 trillion a year in perverse subsidies and barriers to entry for alternative products maintains the illusion of business-as-usual while obscuring the associated environmental and societal costs. The result is the broken system of social inequity, environmental degradation, and political manipulation that marks today's corporations. Scharmer and Kaufer describe this as the three 'divides'; the ecological divide, the social divide and the spiritual-cultural divide.[30]

As early as the 1950s, questions were asked about the sustainability of the demands made by humanity on natural resources. In the 1960s this issue was brought to the fore by Rachel Carson's book *Silent Spring*, drawing attention to the detrimental effect of the insecticide DDT on the environment, and ultimately resulting in its ban. In addition to the obvious economic consequences on a multi-billion dollar agrochemical industry, it increased academic thinking about the economy of pollution. The notion of the economics of 'spaceship earth' was explored by Boulding[31] in 1966, developing the idea of the earth as a closed system with limited resources:

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28 UNEP, 2014, The Importance of Mangroves to People: A Call to Action.

29 TEEB, 2012, The Economics of Ecosystems and Biodiversity in Business and Enterprise.

30 Schermer & Kaufer, 2013, Leading from the emerging future: from ego-system to ecosystem economies

31 Boulding, K, 1966, The economics of the coming spaceship Earth.

"The closed earth of the future requires economic principles which are somewhat different from those of the open earth of the past. For the sake of picturesqueness, I am tempted to call the open economy the 'cowboy economy,' the cowboy being symbolic of the illimitable plains and also associated with reckless, exploitative, romantic, and violent behaviour, which is characteristic of open societies. The closed economy of the future might similarly be called the 'spaceman' economy, in which the earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy." **Kenneth Boulding**

Interestingly, despite being written almost 50 years ago, the concept of 'spaceship earth' is still relevant today. In economic terms, this requires us to shift from a linear understanding of finance and business activity to one that is cyclical (feedback loops) in principle and operation, and based on a solid understanding of how natural systems work. It is imperative that we restore the mutually beneficial relationship between mankind and nature. Indeed, the concept of a circular economy – an industrial system that is restorative or regenerative by intention and design (Ellen McArthur Foundation[32]) – is receiving more and more worldwide attention. For example, in 2009 a national law came into effect in China called the Law for the Promotion of the Circular Economy[33]. The European Parliament recently adopted a communication stating the need to work towards a circular economy[34], and the concept received a lot of high-level attention at the World Economic Forum in Davos in 2015.

In 2013, a report[35] commissioned by The Economics of Ecosystems and Biodiversity (TEEB)[36] summarised the total 'unpriced natural capital' (e.g. clean water and air) consumed by the world's largest industrial sectors. The primary production and processing industries were estimated to have used a total value of US $7.3 trillion in unpriced natural capital in 2009, equalling 13 per cent of global economic output in that year. One of the most striking conclusions of the report was that none of the world's top industrial sectors (e.g. coal mining, wheat farming, cattle ranching and farming) would be profitable if they would pay for their environmental impact.

32 Ellen MacArthur foundation: http://www.ellenmacarthurfoundation.org.

33 Mathews & Tan, 2011, Progress toward a circular economy in China: The drivers (and inhibitors) of eco-industrial initiative.

34 EU Commission Communication, 2014, Towards a circular economy: A zero waste programme for Europe.

35 Trucost, 2013, Natural capital at risk: the top 100 externalities of business.

36 Sukhdev, Wittmer and Miller, 2014, The Economics of Ecosystems and Biodiversity (TEEB): Challenges and Responses.

C. COSTS OF ECOSYSTEM DEGRADATION TO SOCIETY

"Awareness of environmental risks has moved to the forefront of global consciousness during the past 25 years. However, this awareness has not translated into comprehensive action to address the problem of land degradation, which poses a serious threat to long-term food security. This inaction is primarily the result of limited knowledge of the costs related to land degradation and of insufficient institutional support." – **Mkonya et al., International Food Policy Research Institute**[37]

Among most scientists, and increasingly among members of the business community, it is widely accepted that healthy ecosystems form the basis of a sound and sustainable economy. TEEB provides important insights into the relationship between ecosystem degradation and its costs to global society and businesses. Corporate dependencies and impacts on ecosystems should be measured and valued as integral part of management practice and reporting. The costs are huge, although many figures mentioned are estimates. TEEB estimates this loss to be between US $21 - 72 trillion per year, and Costanza et al.[38] estimate that on a yearly basis US $4.3 - 20.2 trillion have been lost due to the conversion of ecosystems. To compare: in 2012 the Gross World Product was approximately US $84.97 trillion. TEEB Study Leader, Pavan Sukhdev, provides a nuanced analysis in *Corporation 2020* about how corporations need to align their aims with society, becoming viable communities, institutes and financial, human and natural capital 'factories'. It concludes that the restoration and conservation of ecosystems is no longer an issue to be tackled solely by NGOs and other charitable organisations or by donor-funded development projects (Public Private Partnerships).

It would be beneficial to integrate the figures of TEEB with the studies under the Economics of Land Degradation (ELD) initiative. This initiative intends to produce a global study on the economic benefits of land and land-based ecosystems by highlighting the value of sustainable land management and providing a global approach for the analysis of the economics of land degradation. It aims to make the economics of land degradation an integral part of policy strategies and decision-making by increasing the political and public awareness of the costs and benefits of land and land-based ecosystems. Together with the TEEB study, this could establish a genuinely holistic view of the issues at stake.

For example, the report, *TEEB for Business* recommends seven steps[39] for companies to better account for the value of natural capital. With this insight businesses understand the need for their involvement in ecosystem restoration. The next question is how to make this more attractive to ensure they act on this information. An initiative such as the Ecosystem

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37 International Food Policy Research Institute: www.ifpri.org; Mkonya et al., 2011, Economics of land degradation. The costs of action versus inaction.

38 Costanza et al., 2014, Changes in the global value of ecosystem services.

39 These seven steps are: 1. Identify the impacts and dependencies of your business on Biodiversity and Ecosystem Services (BES); 2. Assess the business risks and opportunities associated with these impacts and dependencies; 3. Develop 'BES' information systems, set SMART targets, measure and value performance, and report your results; 4. Take action to avoid, minimise and mitigate BES risks, including in-kind compensation ('offsets') where appropriate; 5. Grasp emerging BES business opportunities, such as cost-efficiencies, new products and new markets; 6. Integrate business strategy and actions on BES with wider corporate social responsibility initiatives; 7. Engage with business peers and stakeholders in government, NGOs and civil society to improve BES guidance and policy (www.teebweb.org).

Marketplace[40] conveys the ongoing story of ecosystem service pioneers and, importantly, provides businesses with information services that are required for building an integrated economy, incorporating and accounting for the values of ecosystems and their services.

FIG. 6. *Uncontrolled grazing like here in Southern India is an important cause of landscape degradation in many drylands.*

40 Ecosystem Market Place: www.ecosystemmarketplace.com.

3 RESTORING ECOSYSTEM FUNCTIONS IS RESTORING OUR ECONOMY

"The nation that destroys its soils destroys itself." – **Franklin Delano Roosevelt**[41]

Business Relevance: Business needs to adapt a systems thinking approach and the long-term focus – 20 years – to invest in the new restoration industry that will restore the economy. There are 1.5 billion hectares of degraded land worldwide suitable for restoration projects; once restored, 150 million hectares would generate more than US $80 billion for the world's economy and close the climate change 'emissions gap' by between 11-17 per cent. The full engagement of business is urgently needed to scale-up and accelerate such ecosystem restoration. The business community has many of the essential capabilities required, such as a hands-on approach, the ability to mobilise local communities and the resources to finance on-the-ground projects. A wider global initiative, consortium, or mechanism to engage business is urgently needed: Ecosystem Restoration Partnerships.

Questions for business schools: Is your education ready for the restoration industry? Do you teach the system approach or other holistic leadership models?

Some companies have understood that investing in environmental sustainability is highly profitable in the medium and long-term due to lower costs and higher revenues[42]. Many have pursued actions on the basis of corporate social responsibility and environmental impact reduction strategies.

A. OPPORTUNITIES FOR RESTORATION

As a contribution to the Global Partnership of Forest and Landscape Restoration, the World Resources Institute (WRI) partnered with the University of Maryland and the IUCN to map opportunities for forest and landscape restoration – where candidates for restoration can be found, and their significance. The WRI calculated that 2 billion hectares have been degraded or destroyed, as shown in WRI's Atlas of Forest and Landscape Restoration Opportunities[43] (Figure. 7).

Recently, the PBL-Netherlands Environmental Assessment Agency[44] established a project[45] to map large-scale ecosystem degradation in conjunction with World Soil

41 Letter to all State Governors on a Uniform Soil Conservation Law, 26 February 1937.

42 Nidumolu et al., 2009, Why Sustainability Is Now the Key Driver of Innovation.

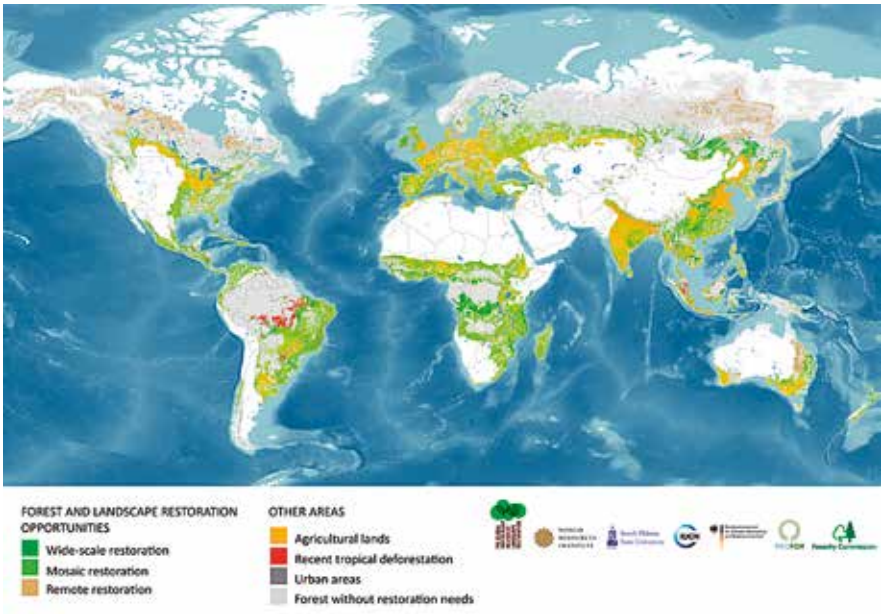
43 World Resources Institute, 2014, Atlas of Forest and Landscape Restoration Opportunities.

44 PBL-Netherlands Environmental Assessment Agency: http://www.pbl.nl/en.

45 Mantel et al., 2014, Modelling of soil degradation and its impact on ecosystem services globally.

Information-ISRIC, Wageningen University Research, Potsdam Institute, University of Utrecht, and WRI. Two global, high resolution maps are in development, one on historical degradation, and one on ongoing degradation. The maps will enable the production of a preliminary calculation of the resulting loss of a number of basic ecosystem goods and services. This project aims to include degradation processes and restoration options in PBL's global environmental assessments in the near future. These include the Global Biodiversity Outlook of the CBD and the Global Environmental Outlook of UNEP.

FIG. 7. *Forest and Landscape Restoration Opportunities* (SOURCE: WORLD RESOURCES INSTITUTE)



Countries have accumulated a wealth of experience on policies, approaches and measures to reduce or avoid environmental damage, to restore degraded ecosystems and conserve those that are intact and healthy. A good overview was given by TEEB's *Green Economy Contribution to RIO+20*[46].

Additional examples have been documented in the powerful presentations and documentaries from the Chinese American documentary maker and scientific story teller John Liu[47]. These examples show that we can restore vast areas of degraded lands to a state of relative health. They contain a message of hope and create an awareness that 'yes we can' (see Figure 8 from India). The restoration of natural capital forms an essential part of the Rio+ 20 *The Future We Want* document and the indicators of UNEP's Greening the Economy. Other examples of forest landscape restoration can be found at the Global Partnership on Forest and Landscape Restoration[48].

46 Ten Brink P. et al., 2012, Nature and its Role in the Transition to a Green Economy. Executive Summary.

47 John Liu, Director Environmental Education Media Project (EEMP): www.eempc.org

48 Global Partnership of Forest and Landscape Restoration: www.ideastransformlandscapes.org

FIG. 8. *Before and after in Rajasthan (Left) and Moya Kheda (Right), in India. Collective efforts of local communities have restored grazing lands, reduced desertification and improved rainwater penetration. Vegetation and animal diversity and water availability have increased. Grass production increased from 1.1 tonne/ ha to 2 tonnes / ha in Rajasthan, while the area under Rabi crop doubled in Moya Kheda.* (PHOTO CREDITS: FOUNDATION FOR ECOLOGICAL SECURITY, INDIA)

February 2004

September 2002

July 2009

September 2009

August 2014

November 2014

B. ONE INTERNATIONAL DEFINITION

A challenge hampering the task of restoration stems from the existence of different scientific views and perspectives on landscape and ecosystem restoration. These dominate the scientific debate and often slow the action on the ground and the ecosystem concept is in debate[49]. Most definitions concern restoration[50], rehabilitation[51] and reclamation[52] (Box 2). The variety of definitions is the result of decades of scientific debate. However, we need to work towards a universal language that everyone understands.

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49 Murcia et al., 2014, A critique of the 'novel ecosystem' concept.

50 Society for Ecological Restoration, 2004, SER International Primer on Ecological Restoration.

51 Food and Agriculture Organisation of the United Nations, 2005a, Habitat rehabilitation for inland fisheries.

52 Lamb & Gilmour, 2003, Rehabilitation and Restoration of Degraded Forests (IUCN & WWF publication).

BOX 2 DEFINITIONS OF ECOSYSTEM OR LANDSCAPE RESTORATION FROM LITERATURE

Different views on landscape and ecosystems restoration exist. Internationally accepted criteria, and a common definition will motivate businesses to become partners in restoration.

The definitions presented here are sufficiently broad to allow for a variety of responses to ecosystem degradation across a wide spectrum of contexts. Ecological restoration refers to activities for returning an ecosystem to its pre-disturbance condition, insofar as is possible, and also to rehabilitation, protection and recovery of biodiversity, ecosystem functioning, and other indicators of ecosystem health and ecological integrity.

"Ecological restoration is the process of assisting the recovery of an ecosystem that has been damaged, degraded or destroyed." (SOCIETY OF ECOLOGICAL RESTORATION, 2004).

The objective of ecological rehabilitation is to re-establish the productivity and some, but not necessarily all, plant and animal species thought to be originally present at a site. (For ecological or economic reasons the new habitat might also include species not originally present at the site). In time, the protective function and many of the ecological services of the original habitat may be re-established.* (FAO 2005).

The concept of landscape restoration tackles the broader range of issues and needs via a landscape-scale approach, "a planned process that aims to regain ecological integrity and enhance human well-being in deforested or degraded landscapes." (WWF INTERNATIONAL 2007).

Land restoration: reversing land degradation processes by applying soil amendments to enhance land resilience and restoring soil functions and ecosystem services (UNCCD, 2012).

Regeneration is often viewed as the growth or re-emergence of the native species in a place after it has been destroyed or degraded, resulting from the protection of an area from biotic interference. Regeneration may come about naturally or result from human intervention (CIFOR WEBSITES).

Reclamation aims to recover productivity (but little of the original biodiversity) at a degraded site. In time, the protective function and many of the original ecological services may be re-established. Reclamation is often done with exotic species but may also involve native species.* (WWF/IUCN 2000) N.B. Reclamation is also used for creating new land from the sea, the polders (WF).

Recovery of a habitat is linked to the ecological succession of a site; that is returning naturally to the state in which it had been before being degraded or destroyed, without any intervention from humans (CIFOR WEBSITES).

* While restoration-related definitions often focus on 'original' habitat cover, it may be more appropriate in the future to focus on restoring resilient natural habitats, for example through paying attention to connectivity and dispersal, rather than assuming that all 'original' species will persist under changed conditions. From this point of view, 'potential' would be substituted for 'original' in the above definitions.

C. DIFFERENT LANDSCAPES, DIFFERENT APPROACHES

Landscapes are often seen as sets of overlapping ecological, social and economic networks within a specific area. This makes landscapes an ideal unit for planning and decision-making, as it allows for the integration of various sector plans and programs in one single spatial context. Each landscape calls for its own kind of restoration. Our strategy is to take the resilience of ecosystem functions as the starting point of the definition. The restoration of ecosystem functions will increase biomass, biodiversity and the accumulation of organic matter. It will increase ecosystem services such as pollination, retention of water, soil fertility and health. In such a way restored landscapes will be created where an increase of biodiversity and vegetation cover will go hand in hand with newly developed agricultural lands.

FIG. 9. *Different landscapes, different approaches. Each landscape calls for its own kind of restoration. Over time all kind of 'land use zones' were formed, often resulting in overgrazing and degradation, like here in the Andes of the Quilotoa region, Ecuador.*

Within those mosaic landscapes, ecological, sustainable agricultural and economic zones will co-exist in an ecological balance, because they are based on sustaining the natural resilience of the ecosystem. And although many people will use the terms 'ecosystems' and 'landscapes' interchangeably, the most complete definition of 'landscape restoration' comes from IUCN[53]:

53 IUCN, 2013, The Global Partnership on Forest Landscape Restoration (GPFLR)

"Turn barren or degraded areas of land into healthy, fertile, working landscapes where local communities, ecosystems and other stakeholders can cohabit, sustainably." **IUCN**

FIG. 10. *El Salvador (Suchitoto): deforestation, unsustainable grazing and burning degraded the forest ecosystem functionality and productivity.*

Interesting steps are being taken in Rwanda, El Salvador (see Fig. 10) and Ethiopia. The leaders of those countries increasingly understand that restoring ecosystem functions equally restores the economy.

"The most meaningful indicator for the health of the land, and the long-term wealth of a nation, is whether soil is being formed or lost. If soil is being lost, so too is the economic and ecological foundation on which production and conservation are based." **Christine Jones[54], Australian soil scientist**

54 Jones, 2006, Creating topsoil

D. CREATING A RESTORATION INDUSTRY

"There is no more strategic issue for a company, or any organisation, than its ultimate purpose. For those who think business exists to make a profit, I suggest they think again. Business makes a profit to exist. Surely it must exist for some higher, nobler purpose than that."
Ray Anderson, CEO and founder of Interface, The Corporation

Although there are enormous opportunities for increasing food, biodiversity, water security and the accumulation of biomass in the top soil by recovering lost functionality in production landscapes, not one global initiative or consortium has succeeded in involving the business sector in the large-scale restoration of degraded lands and biodiversity. This is particularly serious, given the urgent need to scale-up and accelerate ecosystem restoration[55] and the relationship with alleviating poverty in many developing countries. We urgently need the power of the private sector to scale-up.

The challenge is how to convince companies to step up. Reasons to act include:

1. It is ethical; companies recognise that they have to take this responsibility;
2. It is about self interest and being prepared, as governments will sooner or later introduce legislation; and
3. It addresses the enormous challenges of sustaining business operations (supply chain, new markets, reputation, social stability, engagement, positioning, jobs and new market developments[56]).

Until now, the business community as a whole has not been particularly active in restoring landscapes or re-greening the planet. Although some individual companies may contribute to carbon compensation schemes (REDD+[57]) or support individual restoration projects, a wider global initiative, consortium, or mechanism to engage business is urgently needed. The business community has many of the essential capabilities required, such as a hands-on approach, the ability to mobilise local communities and the resources to finance on-the-ground projects. The need for business involvement is underlined by the call to action of the World Conference on Ecological Restoration by SER (2011, Merida, Mexico, and reinforced in 2013 at the same conference in Madison USA and in Manchester in 2015), and the 2011 The State of the World's Land and Water Resources for Food and Agriculture[58].

The questions is how to scale-up existing successes and catalyse the full engagement of the business community? An excellent signal was given at the ministerial conference in 2011 in Bonn, Germany. The Bonn Challenge aims to restore 150 million hectares of degraded land with associated national plans of and actions such as Plant a Pledge[59].

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55 UNEP, 2010, Dead planet, living planet: Biodiversity and ecosystem restoration for sustainable development.

56 Nidumolu et al., 2009, Why Sustainability Is Now the Key Driver of Innovation.

57 UN: Reducing Emissions from Deforestation and Forest Degradation. REDD+ includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. http://www.un-redd.org.

58 Food and Agriculture Organisation of the UN, 2011, The State of the World's Land and Water Resources.

59 Plant a Pledge: www.plantapledge.com.

The IUCN's analysis, announced at Rio+20, shows that once restored, 150 million hectares would generate more than US $80 billion for national and global economies and close the climate change 'emissions gap' by between 11-17 per cent. For example, mean costs of restoration for 'other forests' are US $2,390 per hectare. For the restoration of 200 million hectares, the sum needed is US $478 billion or about € 450 billion over 20 years. That's approximately € 2.25 billion a year. As is shown by De Groot[60] et al. (2013): the business case for conservation is difficult to find despite the fact that ecological restoration has a potential high benefit: cost ratio. Their sensitivity analyses showed that even in a worst-case scenario (i.e., discount rate of 8 per cent, 100 per cent of the maximum cost, and a restoration benefit of 30 per cent of the total economic value), investing in restoration still breaks even or provides a financial profit (in total economic value) in six ecosystem types.

TABLE 1. *Estimated returns from ecosystem restoration*
(THE ECONOMY OF ECOSYSTEMS AND BIODIVERSITY, TEEB, 2009)

Returns from Ecosystems Restoration

Estimates of costs and benefits of restoration projects in different biomes

Biome / Ecosystem	Typical Cost of restoration (high scenario)	Estimated annual benefits from restoration (avg. scenario)	Net present value of benefits over 40 years	Internal rate of return	Benefit / cost ratio
	US$/ ha	US$/ ha	US$/ ha	%	Ratio
Coral reefs	542,500	129,200	1,166,000	7%	2,8
Coastal	232,700	73,900	935,400	11%	4,4
Mangroves	2,880	4,290	86,900	40%	26,4
Inland wetlands	33,000	14,200	171,300	12%	5,4
Lakes / rivers	4,000	3,800	69,700	27%	15,5
Tropical forests	3,450	7,000	148,700	50%	37,3
Other forests	2,390	1,620	26,300	20%	10,3
Woodland / shrubland	990	1,571	32,180	42%	28,4
Grasslands	260	1,010	22,600	79%	75,1

Some companies are already involved in the restoration of ecosystems. For example mining companies such as Rio Tinto and Holcim, as well as some energy companies (coal mining), have experience in restoring lands which they were responsible for degrading. Guidelines would be developed by NGOs and companies.

To convince business and investors to be part of a restoration industry, a scalable model should be attractive and:

- be universal; based on a common language and definitions that everyone understands;
- respect local peoples' ambitions, and have a deeper understanding of their inner purpose and how they are connected to the landscape in which they live;
- connected to training centres and being part of business schools' curricula to educate new generations of managers in systemic thinking;
- be science-based, financially sustainable, and make use of all existing technical tools and developments.

60 Groot, De, 2013, Benefits of Investing in Ecosystem Restoration.

4 A TOOLBOX OF PROMISING SOLUTIONS

Business Relevance: There are already a number of successful projects worldwide. A scalable model for a successful ecosystem restoration project should be attractive to business and be set up for all stakeholders: (1) based on a universal language, (2) considerate of the local peoples' needs, ambitions and connections to the land, (3) connected to business schools' curricula to embed systemic thinking and 'grounded' understanding in young management, (4) based on science, (5) financially sustainable and (6) implemented with a mix of social tools (Theory U, Presencing), and technical tools (such as permaculture, water management and dune stabilisation). Innovative products, processes and even new markets may emerge from these projects, in addition to restoration of natural capital and alleviation of poverty.

Questions for business schools: What can you contribute to complete the toolbox? What promising new solutions can you bring? Is there a demand for system thinking ventures? Have you experienced Theory U stakeholder management in business settings and connected to food and environmental issues?

Experiences from many on-going or completed projects have already created a toolbox. This illustrates what we could achieve in new joint projects; we benefit from existing experiences and lessons learned. Tools include several promising technical solutions with social- and stakeholder-management tools that are equally, or even more, important in order to achieve success in restoration.

> *"Ecological restoration is a 'growth industry' and the work of the future: since we humans have degraded so much of the planet, we have almost endless opportunities to return ecosystems to health. While nature left alone will begin to regain its balance, oftentimes thoughtful, direct actions can jumpstart the restoration process. We find little more rewarding than playing a role in restoring ecosystems, whether in the form of reviving habitats, monitoring wildlife species or even reintroducing extirpated keystone species. Bringing order, health, and steady prosperity to local communities represents an important parallel to restoring ecosystems: we see restoration as a broad concept that blurs the divisions between human and nature in reinstating a more thoughtful relationship between the two."* **Vision Tompkins Conservation**[61]

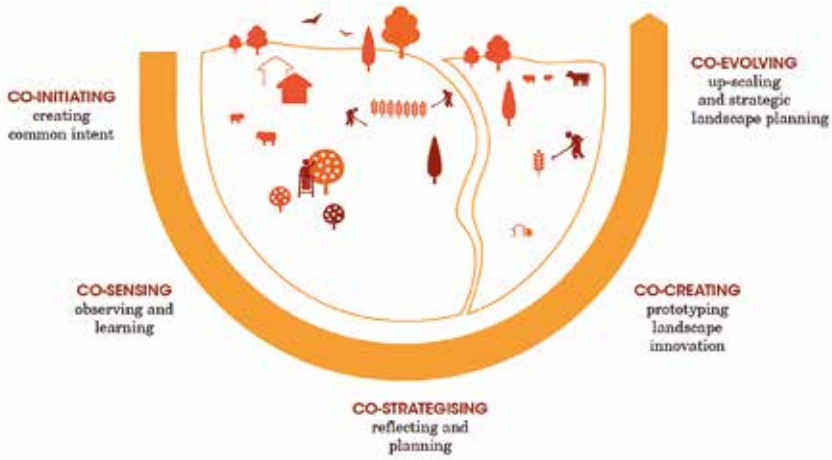
A. SOCIAL TOOLS

Social participatory skills are an important prerequisite in order to achieve success in restoration. Many lessons can be learned from foresters, farmers, development

61 Tompkins Conservation (2013). Tompkins Conservation. www.tompkinsconservation.org.

organisations and conservationists. Economic drivers are a key to success, but are not the only ones. In addition, the structure of stakeholders must be sensible. However, further and deeper insights are required to address the need for purpose. In addition to the technical, financial and stakeholder tools, we need to address our own inner path of leadership to restore ecosystems. Insights into synchronicity, as formulated by Jaworski[62], should be taught and understood in business schools and in rural areas where farmers strive to survive. Living Lands, a non-profit organisation for conserving and restoring living landscapes integrates the 'U' methodology, trans-disciplinary research and ecosystem approach. This methodology for leading profound change is expanded and deepened in Theory U[63] and 'Presencing'[64]. The approach provides opportunities for all stakeholders -by moving through the 'U' process – to engage in reflection on the social-ecological system and inner reflection in order to identify and create viable community-based responses (Figure 11). Theory U proposes that the quality of the results that we create in any kind of social stakeholders system is a function of the quality of awareness, attention, or consciousness from participants in the system.

FIG. 11. *Theory U: Collective awareness, strategic approach and collective action.*
(SOURCE: THE PRESENCING INSTITUTE (MIT) AND LIVING LANDS).



Since it emerged in 2006, Theory U has come to be understood in three primary ways: first as a framework; second, as a method for leading profound change; and third, as a way of being – connecting to the more authentic or higher aspects of our self. Theory U enables stakeholders in a landscape to see their own blind spots and pay attention in a way that allows them to open their minds, their hearts and their efforts. This systemic opening constitutes a shift in awareness that allows all to learn and recognise the shared future. This includes putting the onus of underlying social problems on an individual, community and institutional level while changing behaviour to better reflect the values of inclusion, fairness and opportunity.

62 Jaworski, J., 2011, Synchronicity: The inner path of leadership.

63 Scharmer and Kaufer, 2013, Leading From the Emerging Future: From Ego-system to Eco-system Economies.

64 Senge et al., 2004, Presence: An Exploration of Profound Change in People, Organisations, and Society.

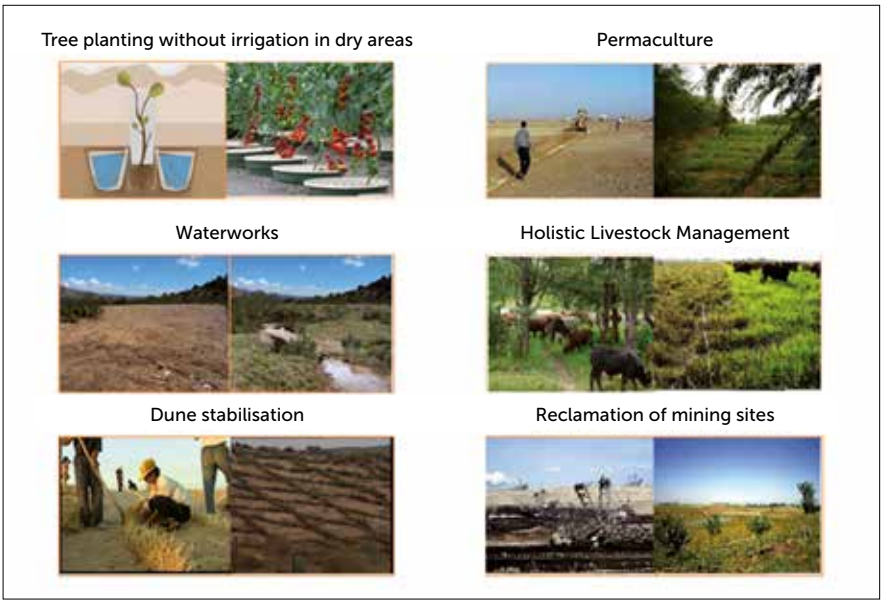
"Restoration is needed for society to sustain, for government to deliver and for business to keep their products." **Dieter van den Broeck, director Living Lands, South Africa**

B. TECHNICAL TOOLS

A range of inspirational examples demonstrates that it is technically possible to re-green eroded areas (Figure 12). Once stakeholders understand how to combine greening with successful economic activities, a business case will emerge. Mostly these small-scale projects are science-based and make use of participatory approaches.

Examples with good results are the African Re-greening Initiative[65] led by Chris Reij (Free University Amsterdam and World Resources Institute) and the mangrove restoration projects of Wetlands International[66] in West Africa and Indonesia. Low-tech solutions are creating biomass in dry degraded lands through permaculture techniques, as Geoff Lawton (Permaculture Research Institute, Australia[67]) shows in eroded desert land in Jordan[68]. Based on what he learned from wild herds of large grazers, Allen Savory[69] developed restoration methods with a holistic livestock methodology for ecosystems in the United States.

FIG. 12. *Proven restoration technologies exist*



65 Africa Regreening Initiative: www.africa-regreening.blogspot.com

66 Wetlands International: http://www.wetlands.org.

67 Permaculture Research Institute, Australia: www.permacultureglobal.com.

68 Green Gold Documentary: www.youtube.com/watch?v=sohI6vnWZmk.

69 Savory Institute, USA: www.savoryinstitute.com.

Other examples of these techniques include water storage systems such as the 'waterboxx'[70] and 'cocoon' to plant trees without irrigation, a cost-effective and efficient device for dry areas; Biochar[71] which converts agricultural waste into a soil enhancer that can sequester carbon, boost food security by adding mycorrhizal fungi[72], waterworks and alluvial fans to increase water absorption and retention into the soil. The result is enhanced yields with greater economic profit. There are plenty more of these low-tech innovative ideas available. Many of them are in the process of being scientifically tested and analysed, but the results so far are promising. They are often the result of citizens' initiatives, an entrepreneur's inspiration or result from an individual or collective sense of responsibility. They are indicators of local common sense and our ability to restore what once was lost, in an attempt to regain lives and livelihoods.

Contour trenching, developed by the late Peter Westerveld[73] in Kenya, can sometimes be used in dry degraded areas to capture rainwater flowing downwards above ground. The trenches collect destructive above-ground water flows so they no longer erode away the fertile top soil and any remaining vegetation.

Another very effective method is for local people and conservation organisations to purchase land and water to create, restore or conserve intact natural ecosystems. The World Land Trust, UK[74] in co-operation with IUCN NL, has extensive experience and a wide and reliable network of local implementation partners.

C. EXAMPLES OF COMBINING TECHNICAL AND SOCIAL TOOLS

The most successful restoration projects are those that combine social, technical and entrepreneurial expertise. In Egypt, the Sekem Company led by the Abouleish family is re-greening the desert using a holistic regenerative agriculture[75] In Brazil, Leontino Balbo Jr. is the director of the Balbo Group and head of Native[76], a Brazilian sugar cane company that has been taking innovative action to achieve complete sustainability for nearly 30 years. Through the Green Cane Project, Native produced a methodology for growing sugar cane that halted soil erosion and increased biodiversity and top-soil fertility without using chemicals. The company studied the ecosystem and applied what they learned. The first thing they changed was people's opinions about agriculture. In agribusiness, minds are often set on maximum profitability, with the farm viewed merely as a means of production. Native wanted to set the focus on sustainability hand-in-hand with profitability, and for people to see farming as a way of life. A real cultural shift was achieved. Restants of cane burning was eliminated. Native spent five years working to develop the first Brazilian green cane harvesting machine. There are a lot of good technical handbooks on restoration. A good overview of technical tools are given by the working paper 'A guide to the Restoration Opportunities Assessment Methodology (IUCN, WRI, 2014). It is expected that the Código Forestal – the new forestry law in Brazil –

70 Cocoon developed by the Land Life Company and waterboxx by Groasis are specialised in developing tree planting devices without irrigation: www.landlifecompany.com and www.groasis.com.

71 International Biochar Initiative (2014) www.biochar-international.org.

72 Quoreshi, 2008, The use of mycorrhizal biotechnology in restoration of disturbed ecosystem.

73 Westerveld Trust: http://westerveld.squarespace.com

74 World Land Trust: www.worldlandtrust.org

75 Sekem, Egypt: www.sekem.com

76 Native, Brazil: www.nativealimentos.com.br

that came into force in 2012, will have a positive impact on the 5 million landowners to restore degraded private lands.

FIG. 13. *South Africa, Baviaanskloof: Gullies and degraded land caused by overgrazing by goats and cattle.*

The work conducted by the South African organisation Living Lands[77] through PRESENCE (Participatory Restoration of Ecosystem Services & Natural Capital in the Eastern Cape) in the Baviaanskloof, South Africa, resulted in a large amount of information about ecosystem services, water, vegetation and land use, erosion, socio-economic data, and so forth. Based on this information, and managed by Living Lands, several co-operating organisations began implementing restoration measures. These included replanting nearly 1,000 hectares of the indigenous Spekboom *(Portulacaria afra)* on the overgrazed hill slopes, supported by a governmental programme, and the restoration of the water system in conjunction with the South African National Biodiversity Institute[78]. The measures were taken to retain the rainwater for longer, raise the groundwater table, and restore vanished wetlands. However, Living Lands differs from many implementing organisations, as its vision is to create local collaborations and stakeholder ownership (stewardship) of a living landscape for sustainable water catchments. The organisation sees living landscapes as those with a healthy ecosystem that are home to ecological, agricultural, social systems and a green economy, and which are managed to function sustainably. These landscapes will produce more socio-ecologically resilient systems that are better adapted to climate change and provide greater water and food security.

77 Living Lands, South Africa: www.livinglandscapes.co.za

78 SANBI: http://www.sanbi.org/

Activities from other organisations include the international Desire project co-ordinated by Wageningen University, which provides examples of sustainable land management and the greening of dry eroded lands[79].

Under the leadership of former businessman Doug Tompkins and his wife Kris, 2 million hectares of land in Argentina and Chile have been conserved and restored by their organisation Tompkins Conservation. Degraded agricultural lands have been restored and biodiversity increased.

FIG 14. *Argentina: Laguna Blanca. Agro-ecology farm of formerly degraded agricultural lands with restored ecosystem functions achieved by maintaining and connecting the remaining indigenous forests, and by actively restoring the soil, leading to an increase in biodiversity.* (PHOTO CREDIT: TOMPKINS CONSERVATION)

More than 40 years ago Paolo Lugari started restoration initiatives in Las Gaviotas, situated in the Llanos, the eastern plains of Colombia. Centro Las Gaviotas[80] created new forest cover (starting with pines), agriculture, and increased topsoil and biodiversity in a way previously thought impossible because of the poor soils and lack of canopy. Lugari inspired people with his holistic and ecological vision to create shade and compost through a closed canopy, increase of the ground water table, and creating productive land through regenerative agriculture.

In the heavily degraded Middle East region a traditional approach is gaining increasing attention in Jordan: the 'Al-Hima' land management system. This is a historical system of land management in the Arab region that encourages the sustainable, shared use of common resources amongst relevant communities. According to a study of the ELD, the

79 Schwilch et al., 2012, Desire for Greener Land. Options for Sustainable Land Management in Drylands.

80 Centro Las Gaviotas, Colombia: www.centrolasgaviotas.org.

Economics of Land Degradation[81] to benefits of large-scale rangeland restoration from the Hima system were found to outweigh the management and implementation costs at a discount rate of 8 per cent.

FIG. 15. *Indonesia: mangrove restoration in Banten Bay Offset Project.*
(PHOTO: SANDER CARPAY, WETLANDS INTERNATIONAL).

Not only dry lands have great opportunities for restoration; millions of hectares of degraded mangroves, wetlands and reefs representing a threat to human well-being, biodiversity, agriculture and a sustainable economy can be restored. Wetlands International is investigating ecosystem-based approaches to resilience for nature and people as a unifying concept. Flooding disasters, such as hurricane Katrina in the USA in 2005, showed us that healthy ecosystems can function as buffers and greatly reduce the risks.

Again, a systems approach is essential here: disaster risk reduction cannot only be achieved by working at the local community or household level when flooding is caused by deforestation or mining upstream, for example. New concepts, mechanisms and tools to bring them together are needed at the ecosystem level and business level.

81 Myint, M.M., & Westerberg, V. (2014). An economic valuation of a large-scale rangeland restoration project through the Hima system in Jordan. Economics of Land Degradation. Bonn.

FIG. 16. *India: people in Tamil Nadu have drawn maps to show how the restored water tanks and watersheds in their county are connected to agriculture and forestry and restore the landscape. With support of the Dahn Foundation, Madurai.*

5 THE PATH TO POSITIVE IMPACT: A NEW ROLE FOR BUSINESSES AND BUSINESS SCHOOLS

"The Corporation 2020 is the firm of the future. It produces positive benefits for society as a whole, rather than just its shareholders. It encourages positive social interactions among workers, management, customers, neighbours, and other stakeholders. It is a responsible steward of natural resources. It invests in the productivity of its workers through training and education. It strives to produce a surplus of all types of capital – financial, natural, human – it is thus a 'capital factory.' We believe that the firm of the future can be best characterised with four terms – goal alignment, community, institute, and capital factory." **Corporation 2020**[82]

Business Relevance: There is a disconnect between the curricula of most business schools and the growing agreement that business and management have an important impact in establishing a 'restoration industry.' By incorporating ecology, multi-stakeholder approaches and knowledge of technical developments into their curricula, in addition to training in how to be part of Ecosystem Restoration Partnerships, business schools will educate future business leaders who understand the crucial importance of systemic thinking in their decision-making. Meanwhile organisations such as the WBCSD, the World Resources Institute and the IUCN have developed tools and training that assist businesses and their staff and management to evaluate their impact and dependence on ecosystems and ecosystems services, and determine risks and opportunities in their current operations.

Questions for business schools: Are future business leaders part of the ecosystem restoration industry? What kind of educational programmes would you consider to be part of the restoration industry? Would you consider starting a new educational centre on ecology and economy, restoration and degradation?

A. FIRST STEPS TO INVOLVING BUSINESS

There is an increasing demand for producers and consumers to understand and reduce their ecological footprints throughout the entire value chain. TEEB studies of business cases about ecosystem restoration and biodiversity conservation should thus form part of the agenda and curricula in business schools. There are already many good examples of this. The idea of a restoration industry is not new. In his bestseller *The Ecology of*

82 Corporation 2020: www.corp2020.com

Commerce, a declaration of sustainability[83], author Paul Hawken stated in 1993: 'If this book has one main purpose, it is to imagine and describe the ways business can act that are restorative to society and the environment.' In 2002, author Storm Cunningham contributed to the restoration industry idea with his book *The Restoration Economy*[84] chronicling the previously undocumented trillion-dollar global industry that is revitalising natural and man-made environments. Storm Cunningham explores the rapid rise of restorative development, details how the information age is catalysing the transition from development to restoration, and demonstrates how restoration is 'greening' residential, commercial, and public construction.

Organisations such as the World Business Council for Sustainable Development[85] (WBCSD), the World Resources Institute and the IUCN have developed a Corporate Ecosystem Services Review[86] and a Guide to Corporate Ecosystem Valuation[87]. These tools assist businesses in evaluating their impact and dependency on ecosystems, and determining the risks and opportunities of their current operations. Mainstream valuation tools should use a common language and be practical and inspiring and more user friendly. Despite a wide array of methods and frameworks, none of the present valuation tools are easy to use by the business community. Often they are complex; presented in a manner and using language that is not immediately relevant to decision-making in the private sector.

Some valuation frameworks help businesses to understand and identify the 'material' or tangible risks and benefits of ecosystem services. However, while the Corporate Ecosystem Valuation can be seen as an important step forward, it still does not provide sufficient incentives for companies to restore natural capital, and therewith agricultural systems that in the long run rely on ecosystem functionality. The Business Ecosystems Training (BET) of the WBCSD was designed to improve the understanding of managers and employees across business functions about their company's direct and indirect impact and dependence on ecosystems and ecosystem services. This type of training, as well as the continued existence of externalities[88], must then provide impetus for implementing and financing ecosystem restoration initiatives. A global standard for the assessment and valuation of landscapes is urgently needed so the private sector can assimilate restoration activities into their decision-making frameworks. A promising development is that the WBCSD, together with its member companies and in partnership with the Stockholm Resilience Centre and the World Resources Institute, gave priority to Ecosystems in Action 2020[89], a platform that sets the agenda for business action for sustainability to 2020 and beyond.

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83 Paul Hawken. The Ecology of Commerce, a declaration of sustainability. 1993. Harper Business

84 Storm Cunningham. The Restoration Economy. 2002. Berret-Koehler Publishers.

85 World Business Council for Sustainable Development, 2014, www.wbcsd.org/work-program/ecosystems.aspx

86 Hanson et al., 2008, The corporate ecosystem services review: guidelines for identifying business risks and opportunities arising from ecosystem change

87 Hanson et al., 2012, The Corporate Ecosystem Services Review: Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change. Version 2.0

88 A consequence of an economic activity that is experienced by unrelated third parties. An externality can be either positive or negative.

89 Action 2020 of the World Business Council on Sustainable Development: http://action2020.org

BOX 3 ACTION 2020 FROM THE WORLD BUSINESS COUNCIL ON SUSTAINABLE DEVELOPMENT – TARGETS

Action 2020 (WBCSD) Targets on Ecosystems[90]
Reduce loss of ecosystems and restore degraded ones. By 2020, reduce the loss of natural ecosystems and restore degraded ones so that biodiversity and ecosystem services are maintained:

- Rate of forest loss is at least halved and, where possible, brought close to zero (relative to the average 2000-2010 rate)
- Rate of wetland loss is at least halved and, where possible, brought close to zero (relative to the average 2000-2010 rate)
- 10% of coastal and marine areas are conserved
- 15% of degraded forests as of 2010 are pledged to, or are under restoration
- 15% of degraded wetlands as of 2014 are pledged to, or are under restoration
- 15% of degraded coral reefs are pledged to, or are under restoration
- Restore at least 12 million hectares per year of degraded lands.

Corporation-level analysis of their impact on ecosystems requires quantification, both monetary and non-monetary, based on agreed methodologies that are general enough to be applied at a global scale, yet specific and flexible enough to allow for adaptation to local circumstances. These will only be effective if published as a disclosure item in corporations' financial statements. Regulators such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) are already working to establish standards that are credible and consistent internationally and it is hoped will contribute to scaling-up ecosystem restoration initiatives. There is definitely a need for accountants with knowledge of ecology.

B. A NEW MISSION FOR BUSINESS SCHOOLS: INTEGRATING ECOLOGY AND SYSTEM THINKING

It is also crucial to encourage business schools to integrate and emphasise the importance of 'natural capital' in their curricula. A disconnect exists between the educational curricula promoted by business schools and the growing recognition among government bodies, and within academic circles, regarding the importance of healthy ecosystems for the survival of the planet. Learning about the restoration of degraded ecosystems is not currently considered relevant for future business managers.

Business schools should embrace new ways of thinking and acting that involve promoting sustainable business models, thereby making themselves an example of best practice for a new and visionary generation of business leaders. Teaching a new generation of business leaders how to establish a 'restoration industry' is no longer a CSR or charity issue: it has become an economic issue. Only a handful of business schools are active in this field. For example, Yale University offers a master's programme that combines

90 Action 2020 Priority Areas; Ecosystems: http://action2020.org/priority-areas/ecosystems.

environmental studies with the study of management. Students use the resources of Yale School of Management and Yale School of Forestry & Environmental Studies. They earn two degrees: a Master of Business Administration and Master of Environmental Management. Upon graduation, they join a collegial network of alumni of the programme working in business and the environment[91].

Case studies that show how businesses implement and finance, ecosystem restoration projects are valuable resources. They show how we can achieve the restoration of ecosystems in practical terms. The onus is on business biodiversity networks such as Leaders for Nature, UN Global Compact and the World Business Council on Sustainable Development, to find new ways of teaching ecosystem science alongside business.

FIG. 17. *Educating the next generation of business leaders at business schools by teaching ecology at MBA level is an important step in creating a Restoration Industry Sector* (PHOTO: ROTTERDAM SCHOOL OF MANAGEMENT, ERASMUS UNIVERSITY).

Students should strive to become leaders who incorporate ecology, multi-stakeholder work and an understanding of technical developments in their work, and thus can facilitate a restoration industry and set benchmarks. By including learning how to be part of Ecosystem Restoration Partnerships as part of the curriculum in business schools, future business leaders will understand the crucial importance of systemic thinking and ecology in future decision-making. In this way business schools can be helpful in 1) creating a new generation of business developers needed to develop business plans within the Ecosystem Restoration Partnerships, and 2) educating a new generation of CEOs that understand the importance of ecology in their decision-making processes.

91 Yale School of Forestry and Environmental Studies: http://environment.yale.edu/academics/degrees /joint/mba

6 CLOSING THE GAP BETWEEN BUSINESS AND ECOSYSTEM RESTORATION

"Ecological restoration is a 'growth industry' and the work of the future: since we humans have degraded so much of the planet, we have almost endless opportunities to return ecosystems to health."
Doug Tompkins, Founder of Esprit, North Face, and Tompkins Conservation

Business Relevance: Ecosystem restoration is a 'growth industry' that is just beginning to show its future value. Business involvement is growing, including such initiatives as the Beverage Industry Environmental Roundtable (BIER). Guiding Principles on Ecosystems (BIER has 23 members from the tea, coffee, spirits and wine categories, with over US $260 billion in combined annual revenue, over 2,100 facilities in 170 countries and more than 5,600 distinct brands). 'B Corporations' make a Declaration of Interdependence, acknowledging all stakeholders of business (including ecosystems). But there are barriers between business and ecosystem restoration that must be removed. The key is to establish a common framework for creating Ecosystem Restoration Partnerships. Trusted orchestrators are needed to bring together local communities, NGOs, farmers, businesses, business schools, ecologists, economists and policymakers and help drive long term commitment from all parties who will be part of the Partnerships.

Questions for business schools: What elements can your education programme contribute to train trusted orchestrators and business developers? What do you need to do to make your school a B Corporation? Do you have examples of companies and alumni that can participate in closing the gap?

Businesses are now actively seeking ways in which they can make positive contributions to combat the cause of environmental degradation. There is also evidence that they are deepening their understanding and awareness of ecosystem impacts and dependencies.

There are many mechanisms the private sector can make use of to contribute to ecosystem restoration. These include numerous successful projects available for scaling-up. In addition, a large body of knowledge on how to achieve ecosystem restoration has been accumulated. Despite the possibility of gaps in our existing knowledge, implementation of large-scale restoration is the obvious next step and further learning must come from 'doing'.

A. ROLE FOR BUSINESS

Not only has the value of businesses' contributions to ecosystem restoration been established, but the various ways in which businesses can contribute have been broken down and defined. In its RIO+ report on Land Degradation, the UNCCD outlined the following roles for the private sector[92]:

- Engage in investments that increase efficiency in land use and the resilience of related ecosystems functions and services, and reduce or mitigate risks.
- Invest in research and development into sustainable land use management.
- Establish and implement public-private partnerships that also ensure social inclusiveness.
- Support the development of information-sharing mechanisms, especially at the local level, with a focus on sustainable land use management and related goods and services.
- Within the framework of corporate responsibility, the private sector could also be engaged in reporting at national and international levels on their actions toward the achievement of halting degradation and on best practices, lessons learned and management models that they find useful for attaining such targets.

Several interesting examples of business involvement exist, including the Danone Livelihoods Fund, initiated by Danone in 2011. The Fund[93] is a completely autonomous entity that since February 2012 has incorporated four other investors who adhere to its approach: Schneider Electric, CDC Climat, Credit Agricole and La Poste Group. The Livelihoods Fund concentrates on the restoration of natural ecosystems (mangrove replanting, reforestation), agroforestry and rural energy (improved stoves project for reducing the use of firewood).

> *"Danone's food business is closely linked to nature's cycles. Protecting natural springs and producing milk in sustainable conditions have been key concerns of our business units for years. When we opted to put nature at the heart of our strategy, we adopted an ambitious target: reducing our carbon footprint by 30 per cent from 2008 to 2012. Livelihoods is a new step forward, with carbon offset projects that associate restoration of natural resources and food security – two concerns at the heart of Danone's corporate mission."*
> **Myriam Cohen-Welgryn, General Director of Danone Nature.**

Business involvement in restoration is growing. Members of the beverage industry, such as Heineken and Coca Cola are involved in restoring water catchment areas as part of bringing down their water footprint. The Beverage Industry Environmental Roundtable (BIER) is made up of 23 leading global beverage companies representing the beer, bottled water, carbonated soft drinks, juice, tea, coffee, spirits and wine categories, with over US $260 billion in combined annual revenue, over 2,100 facilities in 170 countries and more than 5,600 distinct brands. In 2014 the members of BIER decided to invest in protection of ecosystems and biodiversity through human and financial capital[94] and presented the Beverage Industry Environmental Roundtable Guiding Principles on Ecosystems.

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92 Adapted from UNCCD (2012). Zero Net Land Degradation

93 Danone Communities: http://www.danonecommunities.com/en/danone-communities

94 Beverage Industry Environmental Roundtable: http://www.bieroundtable.com/#!eco-system-services/cv7a

"By going beyond biodiversity conservation and promoting restoration of natural ecosystems, these Principles demonstrate the leadership of the Beverage Industry Environmental Roundtable" **Peter Bakker, President, World Business Council for Sustainable Development**

Engineering companies such as Arcadis are increasingly involved in restoration activities. Some companies are fully dedicated to ecosystem restoration, like Biohabitats[95] in the USA. Surprisingly the agro-business is lagging behind. Unilever, Nestlé and Cargill are progressing in taking measures that stimulates sustainable agriculture in their plantations. Interestingly, there is a co-operation between Syngenta and UNCCD on the topic of education and learning, for example a joint project to establish a Soil Leadership Academy[96].

Stakeholder thinking is slowly becoming more integrated in companies. An important next step is the development of B Corporations[97]. They are certified by the nonprofit B Lab[98] to meet rigorous standards of social and environmental performance, accountability, and transparency. They have signed the Declaration of Interdependence (Box 4), a holistic view of how companies should contribute to the benefit of everything on the planet. Restoration companies should all become B Corporations, because restoration is based on a deep understanding of interdependence. Today, there is a growing community of more than 1,000 certified B Corporations from 33 countries and over 60 industries working together toward one unifying goal: to redefine success in business.

BOX 4 THE DECLARATION OF INTERDEPENDENCE OF B LAB IS BASED ON A HOLISTIC APPROACH.

DECLARATION OF INTERDEPENDENCE OF B CORPORATIONS

We envision a global economy that uses business as a force of good. This economy is comprised of a new type of corporation – the B Corporation – which is purpose-driven, and creates benefit for all stakeholders, not just shareholders.

As B Corporations and leaders of this emerging economy we believe:

- That we must be the change we seek in the world.
- That all business ought to be conducted as if people and place mattered.
- That, through their products, practices, and profits, businesses should aspire to do no harm and benefit all.

To do so, requires that we act with the understanding that we are each dependent upon one another and thus responsible for each other and future generations.

95 Biohabitats Ltd: http://www.biohabitats.com

96 Syngenta and UNCCD build partnership for a Soil Leadership Academy, 2014, http://www.syngenta.com/ global/corporate/en/news -center/news-releases/Pages/140410.aspx

97 B Corporation: http://www.bcorporation.net

98 The non-profit behind B Corps: http://www.bcorporation.net/what-are-b-corps/the-non-profit-behind-b-corps

B. REMOVING OBSTACLES THAT PREVENT PRODUCTIVE PARTNERSHIPS FROM DEVELOPING

Although motivation and awareness within the private sector are increasing — many companies have begun to include no-net-loss into their consideration of issues related to this area — the net-positive-impact action on ecosystems remains scarce, despite the steady influx of new project initiatives to re-green the planet and restore natural capital.

> *"Now Is the Time for Action to Preserve Our Precious Ecosystems."*
> **Paul Polman, CEO Unilever (Lima, 2014)**

This lack of engagement is largely due to the significant barriers that exist between businesses and those organisations and communities involved in ecological initiatives. These barriers range from a lack of networking between groups, to differences in the use of language and a lack of trust. Clearly, to achieve greater involvement from the private sector requires us to remove the barriers that exist between local communities, NGOs, farmers, businesses, business schools, ecologists, economists and policymakers. At the same time, new alliances must be forged based on common understandings of what can and must be done. In other words, private sector involvement depends on:

- intersectoral and inter-institutional collaboration that necessitates the breakdown of institutional silos;
- the development of an easy-to-use global standard ecosystem-service valuation tool that is backed by science;
- an outline for international and widely accepted guidelines, tools and technologies for ecosystem restoration that include a means of reintroducing sustainable agricultural practices;
- a 'wiki' database or clearing house of ecosystem- and landscape-restoration projects that can provide models for replication and scaling-up implementation;
- implementation of a smart and simple broker mechanism that engages companies in major restoration projects, and which is regionally replicable and endorsed by leaders in the field, ensuring it represents best practice and can be highly effective in its role of connecting people, communities and organisations;
- a commitment from all participating companies, scientists, governments, NGOs and local communities to a long-term approach and perspective on this undertaking.

C. THE NEED FOR A TRUSTED ORCHESTRATOR

Establishing an inter-institutional framework or mechanism is needed in order to build the necessary trust and connections (missing link) between the business community and stakeholders; civil society organisations, governments, and educational institutions among others. Basing the framework on ecological science is imperative in order to break down these barriers to connection and realise productive collaboration on major projects. The partnerships created as a result of this framework would hold immense promise for ecosystem restoration; the costs and benefits would be distributed proportionately (i.e. equitably and justly) and take into account long-term time goals. Serious attention would need to be given to the recommendations of TEEB and following up the goals of Action 2020.
Companies could expect to benefit from these partnerships (ROI) in a number of ways, such as developing new technical tools and insights into sustainable decision-making;

experience of working with different sectors; the development of new networks; and positive brand and reputation effects including internal brand building among employees who are aware that their organisation is playing a meaningful role in the current environmental crisis. The Business Engagement Strategy[99] and Operational Guidelines for Private Sector Engagement[100] of IUCN are important references in this matter, but unfortunately too theoretical and not read by decision-makers in companies.

D. AVOIDING LAND GRABBING AND GREEN WASHING

It is not necessarily a problem when wealthy companies invest in ecosystem restoration to create new agricultural lands in poor countries for commercial use. But when local people are evicted from the land or less food is grown as a result, that's a very big problem indeed. This process is called 'land grabbing'. Recent data indicates that at least 80 million hectares of land deals have been identified as land grabs since 2001[101]:

> *"Massive investment in agriculture is desperately needed to help fix the broken food system. Private sector investment can play a vital role in delivering inclusive economic growth, environmental sustainability and poverty reduction. However, in order to do so, it must be adequately regulated and should adhere to some key principles, such as focusing on local food markets, working with producer organisations and respecting the rights of small-scale producers, workers and communities".*
> **Erinch Sahan and Monique Mikhail, Oxfam**

Ecosystem Restoration Partnerships, formed with businesses, should be aware of the potential dangers of land grabbing. Through their co-operation with farmers, landowners, land users and local organisations, as well as their use of accepted international restoration guidelines, Ecosystem Restoration Partnerships should be able to avoid these practices. Moreover, they must be aware of greenwashing, which is used to promote the perception that a company's aims and policies are environmentally friendly. Whether it is to increase profits or gain political support, green washing may be used to manipulate popular opinion to support otherwise questionable aims. Working in long-term partnerships with businesses can curtail these unethical activities. Only lengthy commitments of several years will deter companies from taking part in green washing or land grabbing activities.

99 IUCN, 2012, IUCN Business Engagement Strategy

100 IUCN, 2009, Operational Guidelines for Private Sector Engagement

101 Oxfam, 2012, Private investment in agriculture: why it's essential and what's needed

7 CREATING ECOSYSTEM RESTORATION PARTNERSHIPS

"We must break down the silos if we are to advance the cause of ecological restoration. Creating Ecosystem Restoration Partnerships on the land with business will both facilitate the sharing of knowledge and complementary expertise but also enable business to become a major driver of ecological restoration." **the author**

Business Relevance: Business has an extremely important role in driving ecosystem restoration. For successful ecosystem business development however, personal and institutional silos must be broken down. This is crucial to the creation of an Ecosystem Restoration Partnership, in which a wide variety of stakeholders participate. These partnerships make use of existing experiences and know-how to optimise the value of the land and to mitigate risks. The ultimate goal of Ecosystem Restoration Partnerships worldwide is to scale-up the restoration of degraded lands by creating business opportunities through partnerships with farmers, land owners, conservation organisations, companies and investors.

Questions for business schools: How can you communicate Ecosystem Restoration Partnerships to your core partners? Would you be part of it? Can you imagine where and what your role might be?

Unfortunately, it's not widely known that maximising ROI per hectare over mere decades leads to almost worldwide degradation, including loss of biodiversity and topsoil, water scarcity, and loss of security. Scientists and visionary leaders conclude that our economy has led to what we may call the 'degradation industry'. This approach initially yielded a lot of profit, but is now a severe threat to human well-being, the global economy, trade, and society. But of all these serious issues, the greatest damage of degradation is that it causes a loss of self-reflection and inner purpose. Many people remain locked in their own silos and are disconnected from nature; they do not see the connection between food security and their own well-being. However if we break down the silos, we advance the real case for ecological restoration. Creating new partnerships with businesses will facilitate the sharing of knowledge and complementary expertise. On a deeper level, it will enable businesses to become moral leaders based on a long-term purpose. Investors and companies that embrace this inner purpose will be the major drivers of ecological restoration. The ambition formulated in this paper, calls for an international mechanism for ensuring the productive involvement of the private sector in ecological restoration efforts.

A. THE IMPORTANCE OF CREATING ECOSYSTEM RESTORATION PARTNERSHIPS

By design, ecosystem business development is flexible enough to adapt to different circumstances around the world, and scaled-up to meet the demands of the largest initiatives. In its approach and operations it will draw on best-practice examples of other successful mechanisms for creating inter-institutional collaboration, with contributions from the private sector.

For example: the business network Leaders for Nature[102] IUCN NL founded this network in the Netherlands in 2005 to propagate relationships between business and biodiversity. It is now being rolled out in several other countries including India. Thanks to the efforts of this network in 2011, 11 multinationals[103] signed a Memorandum of Understanding agreeing to work together on the restoration and sustainable management of ecosystems for the next 20 years.

The creation of Ecosystem Restoration Partnerships (ERP) are actively needed for scaling-up such an approach. ERPs should be neutral and independent organisations that bring together existing networks of businesses and business schools, scientific institutions, governments and local development partners. They should be empowered, endorsed and financed by committed private-sector institutions as well as business schools and student communities. And they should have access to investment vehicles.

B. CRITICAL SUCCESS FACTORS OF ECOSYSTEM RESTORATION PARTNERSHIPS

Ecosystem restoration projects will be funded through a variety of finance and incentive mechanisms, including a social investment fund that may pay off its interest in the form of quantities of carbon sequestered, real estate, groundwater recharged, or through increases in agricultural production. What does such an Ecosystem Restoration Partnership look like, and what are the critical success factors?

An Ecosystem Restoration Partnership is usually formed by a group of landowners or farmers who are committed to the restoration of their land or ecosystem and have a common vision. Most such partnerships are farmers' associations or co-operations. Members of the partnership are open to new methods of land use and have a systemic or holistic understanding of the land and why it is degraded. Often they do not have access to capital or knowledge, and do not speak the languages of other disciplines of expertise such as agriculture, forestry, ecology, finance and social sciences. Critical success factors of Ecosystem Restoration Partnerships are:

- **Focus:** restoring hectares of degraded landscape and seascape based on ecosystem science.
- **Endorsement:** from ecosystem scientific institutions, civil-society organisations and government.

102 Leaders for Nature: www.leadersfornature.com

103 Agreement was signed on 13 December 2011 by the Dutch offices of ABN AMRO, AkzoNobel, ARCADIS, Cofely Nederland NV (part of GDF Suez), DHV, DSM, InterfaceFLOR, KLM, Nutreco, Philips and PwC

- **Connection to companies, government and implementing partners:** through business networks, business schools and implementing partners (NGOs, government, landowners and farmers).
- **Business cases:** agriculture, food, water, carbon sequestration, biofuels, mining based on ethics and responsibility.
- **Delivered Results:**
  - Number restoration projects (= number of hectares).
  - Number involved business schools and educational projects.
  - Number investors and companies involved.
  - Number ecosystem services coming back as part of the whole.
  - Number increase of local agricultural production, other investments and local income.
- **Long-term commitment:** one generation, which is 20 years (e.g. could be divided in 4 x 5 year periods).
- **Organisation:** smart management mechanism supported by the partners.
- **Income model:** start-up investment, after 3 years there should be an agreed up per cent return from projects.
- **Replicable:** model regionally replicable.

C. STAKEHOLDERS

The ultimate goal of Ecosystem Restoration Partnerships worldwide is to scale up the restoration of degraded lands by creating business opportunities through partnerships with farmers, land owners, conservation organisations, companies and investors. It means that a very good understanding and trusted relationship between the stakeholders is needed and that the intervener or orchestrator is deeply committed.

> *"The success of an intervention depends on the interior condition of the intervener."* **William O'Brien, former CEO of the Hanover Insurance Company**

The following groups of stakeholders form an integral part of an Ecosystem Restoration Partnership and business development (see Figure 17):

A. Farmers, local land users and local stakeholder networks on the land: Local stakeholders are farmer associations, local entrepreneurs and civil-society organisations working on ecosystem restoration and conservation – the people who live on the land. Farmers benefit most of landscape restoration and thus are considered the key stakeholder (Figure 18). They can best operate through learning networks, in which all relevant stakeholders can connect and search for new modes of collaboration and ways of creating synergies around a common objective. Such a learning network is in the process of creation under the umbrella of new alliances such as the Global Partnership on Forest Landscape Restoration (GPFLR), Landscapes for People, Food and Nature Initiative[104], the Alliance for Climate Smart Agriculture[105] and others. This learning network will likely operate through a 'blended approach' of face-to-face meetings, and the use of social media and other web-based learning support tools (e.g. e-learning modules). In such a learning network, a diverse range of projects and initiatives are brought together via a collective platform.

104 Landscapes for People, Food and Nature: http://peoplefoodandnature.org/

105 FAO: Climate Smart Agriculture: http://www.fao.org/climate-smart-agriculture/en/

The real investment is in people and communities, and in activities to restore biodiversity and ecosystem functioning for food and water security, sustainable livelihoods and climate-change mitigation and occasionally adaptation. Ecosystem Restoration Partnerships should make use of existing local networks of farmers and rural cooperatives, in addition to local civil-society organisations, development organisations as well as conservation organisations such as IUCN, WWF, the Society of Ecological Restoration, and the World Land Trust. Besides creating large-scale restoration business projects, the work of the Partnerships should be complemented with Vocational Training Centres for Ecological Restoration, with the help of companies. The business case is essential to assist local communities to overcome the difficulties of their first few years in which they may have less income.

B. **Science:** As developed and endorsed by recognised international institutions and bodies, such as the CGIAR Consortium[106], notably the Centre for International Forestry Research[107], FAO, Society for Ecological Restoration, universities and soil experts, as well as the scientific IUCN Commissions.

C. **Business Network:** Starting with the World Business Council for Sustainable Development (WBCSD), Leaders for Nature, UN Global Compact and corporate alliances, such as BIER.

D. **Business schools:** Since training and education is a critical success factor for long-term private sector involvement, it is important to include business schools as part of these Partnerships. The work of business schools should be linked to training centres to develop sustainable development competences for students of all levels; further, curricula of business school programmes should include focus on curriculum-focused questions as: What would a Corporation in look like in 2020? How will Corporations be involved in restoration? What kind of business developers and business plans are needed?

E. **Investors:** Create a track record of participating family companies and social entrepreneurs who understand the importance of long-term vision and investment (20 years), and whose companies will play a part in this vision. Multilateral and bilateral institutional investors may be invited to join, such as the World Bank, Global Environment Facility, regional development banks and Development Finance Institutions. The final goal is to get involvement of institutional investors such as pension funds on board. A good overview of financing strategies for landscapes is found in *Financing Strategies for Integrated Landscape Investment.*[108]

F. **Governments:** There are an increasing number of positive and visionary initiatives of various scales taking place in the world's nations. Several countries, including China, El Salvador, Burkina Faso, Niger and Rwanda have confirmed their commitment to restore millions of hectares of degraded land[109]. In 2014 the government of Ethiopia made one of the most significant pledges: The country set a target to restore 15 million hectares of degraded and deforested land – one-sixth of the country's total land area – to productivity by 2025[110]. Likewise, new legislation in Mexico, Argentina,

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106 CGIAR Partnership: http://www.cgiar.org/

107 Centre for International Forestry Research: www.cifor.org

108 Seth Shames, Margot Hill Clavies and Gabrielle Kissinger. 2014. Financing Strategies for Integrated Landscape Investment. EcoAgriculture Partners

109 In 2011 Rwanda announced the Forest Landscape Restoration Initiative to reverse degradation of soil, water, land, and forest resources by 2035, and to use ecosystem restoration as a way to create jobs.

110 In September 2014 Ethiopia announced this in New York at the UN Climate Summit. http://www.wri.org/blog/2014/10/ethiopia-commits-restore-one-sixth-its-land.

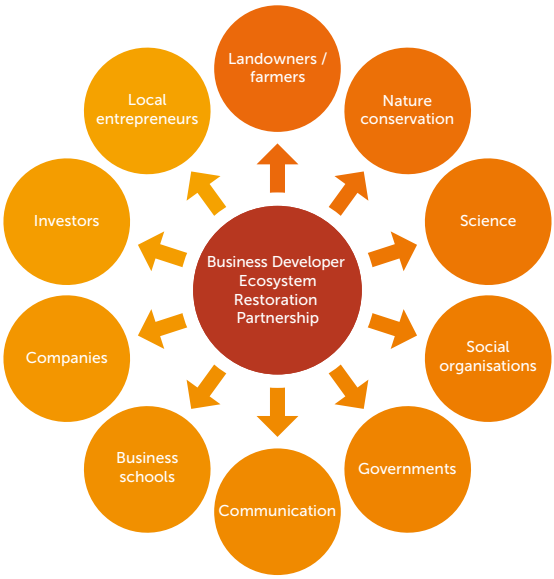
and Colombia aims to promote sustainable development, reduce climate change and alleviate poverty. However enormous challenges for governments still lie ahead in countries like Spain, Greece and the region of the Middle East.

G. **Media and knowledge transfer:** Communication and learning through practical examples, case studies and news, which will reside on the web and be disseminated through the media.

FIG 18. *Ecuador, Guamote: Farmers selling native products (potato and mashua,* Tropaeolum tuberosum) *at the market. Farmers benefit most from landscape restoration and thus are considered the key stakeholder.*

An overview of the stakeholders and the role of the Ecosystem Restoration Partnership and business developer is shown in Figure 19.

FIG. 19. *An Ecosystem Restoration Partnership and Business Development. A business developer acts as dealmaker within an Ecosystem Restoration Partnership to make the best available combinations of stakeholders for implementing large-scale restoration projects based on a business proposition. An additional advantage is that business schools will learn to work with new sustainability approaches through the projects elaborated by this venture.*



8 A PRACTICAL HOLISTIC FRAMEWORK: 4 RETURNS, 3 ZONES, 20 YEARS APPROACH

"If you want to build a ship, don't drum up people together to collect wood and don't assign them tasks and work but rather teach them to long for the endless immensity of the sea." **Antoine de Saint-Exupéry**

Business Relevance: Degradation of ecosystems leads to four losses: 1) job loss, 2) economic loss, 3) the loss of fertile soils and biodiversity, and 4) the loss of purpose, meaningfulness or joy. Successful Ecosystem Restoration Partnerships are based on 4 returns: Inspirational Capital, Social Capital, Natural Capital, and Financial Capital. Three (landscaping) zones are part of the restoration of an ecosystem: a Natural Zone, a Combined Zone, and an Economic Zone are part of this mosaic landscape. Ecosystem Restoration Partnerships require a long timeframe, combined with the flexibility to constantly develop creative solutions to combat complex stakeholder challenges. Hence 4 returns, 3 zones, 20 year – a practical and replicable approach for restoring ecosystems and developing sustainable business.

Questions for business schools: How would you explain the 4 returns framework to investors and companies? Would the 4 returns framework be useful to other business disciplines? What does the word 'holistic' mean to you as business? Which zone would give you a maximum ROI? How to measure return of inspiration?

Creating Ecosystem Restoration Partnerships means the need for trust and connection between all stakeholders investing in large-scale ecosystem restoration. A shared understanding or language is needed, and an approach that creates engagement, controls complexity, and keeps key partners inspired to harvest the results of their investments over the long period of time required for landscapes to recover. With a long term, multiple returns approach a missing link in the majority of ecosystem restoration projects can be created: long-lasting partnerships between local people and organisations that include the involvement of investors and companies.

These partnerships make use of existing experiences and know-how to optimise the value of the land and to mitigate risks. Long-lasting partnerships mean a common long-term vision, having an eye for each other's interests, and the cohesion between several goals and returns. The return on investment (ROI) that investors and companies can expect from Ecosystem Restoration Partnerships depends on the nature of the partnership, the duration of the project and the local ecosystem. Potential ROIs for companies or investors include an increase in agricultural output; carbon credits and new market development; a marked increase in local products and jobs; the development of sustainable resourcing; being part of a new business-to-business peer group with new business opportunities; becoming a front runner in new emerging issues (biofuels, loans, local agro development,

water, biodiversity offsetting, no net loss); better meeting the demands of consumers/ clients; enhancing the company's level of corporate social responsibility and ethics with positive implications for its brand and reputation; and an increase in innovation potential.

The hereunder described 4 returns framework is systemic: seeing ecosystems or landscapes from a systems perspective (not as a production unit for one sole crop or product), as well as from a long-term (intergenerational) viewpoint. To make this happen, we have to ensure that everyone understands the present situation (by describing the situation in widely understood terminology/language) and the proposed ways in which the situation can be remedied (Ferwerda, 2015[111]).

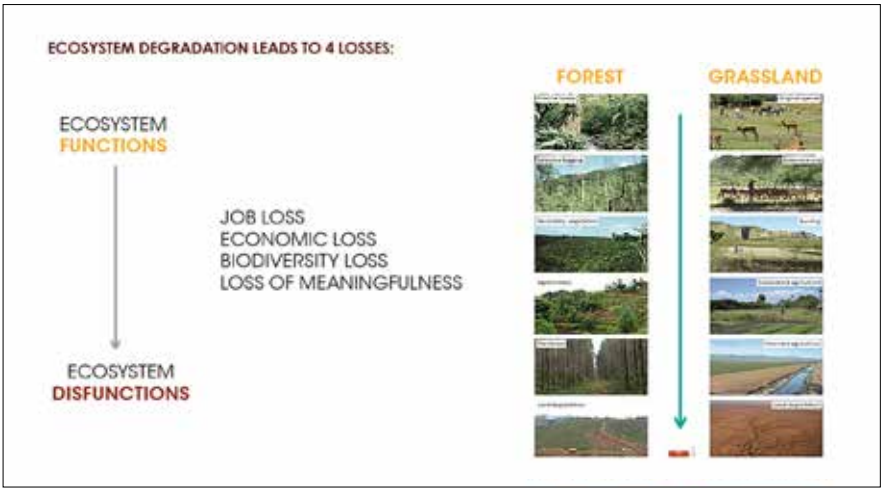
A. DEGRADATION OF ECOSYSTEMS LEADS TO FOUR LOSSES, RESTORATION DELIVERS 4 RETURNS

Maximisation of ROI per hectare leads to ecosystem degradation over time. This basically creates four areas of loss:

- job loss;
- economic loss;
- the loss of fertile soils and biodiversity; and
- the loss of purpose, meaningfulness and joy.

These losses increase over time if functional ecosystems that are providing ecosystem services degrade to dysfunctional ecosystems that cease to provide these services (Figure 20).

FIG. 20. *Four losses per hectare as the result of ecosystem degradation*
(PHOTO CREDIT: BEN TEN BRINK, NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY)



111 Ferwerda, W. H. (2015) 4 returns, 3 zones, 20 years: a systemic and practical approach to scale up landscape restoration by businesses and investors to create a restoration industry. In: Chabay, I., Frick, C.M. and J.F. Helgeson (Eds.): Land Restoration: Reclaiming Landscapes for a Sustainable Future. 560 p. Elseviers Science.

Successful restoration partnerships should be based on maximisation of 4 returns per hectare:

- **Inspirational capital:** people engagement, innovation, awareness and passion
- **Social capital:** jobs, income, security, social cohesion
- **Natural capital:** fertile soils, hydrology, biodiversity, biomass and carbon storage
- **Financial capital:** financial performance (increases in e.g. agriculture, timber, water production based on ecological science), demonstrable corporate social responsibility

TABLE 2. *Maximising 4 returns per hectare.*

4 returns	Different entities	Values measured
Return of inspiration	▶ Meaningfulness, spiritual/ holistic awareness, Gross National Happiness, re-sacralise nature ▶ Local culture wisdom & outreach ▶ Landscape leaders, commitment to local ownership, less corruption ▶ Understanding meaning of long-term commitment for companies, investors ▶ Time for inner reflection, worship	▶ % of stakeholder group/ yr/ ha: # local cultural, social, religion events ▶ # 'defining moments' of people involved ▶ % of stakeholder group/ yr/ ha ▶ % of stakeholder group/ yr/ ha committed; % -/- corruption benchmark ▶ % responding to long term commitment ▶ • # volunteers # inspirational sessions ▶ • % of free time to rest and think
Return of social capital	▶ Jobs ▶ Security ▶ Local social cohesion ▶ Education & social services ▶ Healthcare	▶ # of new jobs / project / municipality / ha ▶ # various savings / yr / project ▶ # social ventures / yr / project ▶ # schools, trainings, services / project ▶ # medical posts, doctors
Return of natural capital	▶ Biodiversity ▶ Invasive species ▶ Vegetation cover ▶ Top soil ▶ Water	▶ # of native species / yr / ha ▶ % decrease/ yr / ha ▶ % coverage / yr / ha; % cloud formation ▶ mm layer / yr/ ha; % microbes; % C / ha ▶ % humidity; # stream flow (m3 / yr / ha)
Return of financial capital	▶ Agriculture, carbon, timber ▶ Leisure, hunting, bush harvesting ▶ Real estate & other incomes ▶ Water ▶ Decrease erosion, increase topsoil	▶ Yield / yr / ha ▶ Yield / yr / ha ▶ Value / yr / ha ▶ Production m3 / ha/ yr ▶ Decrease costs input chemicals / ha / yr

It means that each restoration project of an Ecosystem Restoration Partnership should deliver 4 returns per hectare, instead of striving towards maximisation of ROI. For each return the deliverables should be clearly indicated, measurable and monitored over time.

B. THREE LANDSCAPING ZONES

However, to deliver 4 returns in ecosystems, every activity of Ecosystem Restoration Partnerships should include a well mapped integrated zoning approach: three landscaping zones are defined that in the end will produce these results:

A Natural Zone for restoring the landscape's ecological foundation and biodiversity. In this zone there will be, in the end, rich biodiversity; soil for ecosystem services; carbon sequestration; forest products; and opportunities for leisure and hunting.

Combined or Eco Agro Mix Zone for restoring the topsoil and delivering low economic productivity. In this zone there will be, -in the end-, partially restored biodiversity; soil recovery, carbon sequestration and timber supply by agroforestry; fruit trees; water supplies; and opportunities for leisure.

Economic Zone designed for delivering high economic productivity. In this zone there will be, in the end, productive zones for sustainable agriculture and dedicated zones for real estate and infrastructure.

The restoration of such interconnected zones as parts of one plan creates landscapes in which an increase of biodiversity and vegetation cover will go hand in hand with newly developed agricultural lands. Within those mosaic landscapes, ecological sustainable agricultural and economic zones will co-exist in an ecological balance.

Ecosystem Restoration Partnerships require a long timeframe, combined with the flexibility to constantly develop creative solutions to combat complex stakeholder challenges. Restoration should be based on integrating purpose into the business model for ecosystem-restoration partnerships. The approach is tailor made for each location but with the underlying focus on optimisation of 4 returns per hectare (Figure 21).

FIG. 21. *Three landscape zones (Left to right: Natural Zone, Combined Zone, Economic Zone)*

NATURAL ZONE

Investment
- Restoring vegetation
- Planting native trees and clearing invasive species
- Natural restoration
- Limited maintenance

Return
- CO2 capture, water, soil
- Restored biodiversity
- Forestry, hunting
- Tourism

COMBINED ZONE

Investment
- Restoring landscape
- Planting usable trees
- Restoring perennial vegetation and soil
- Limited maintenance

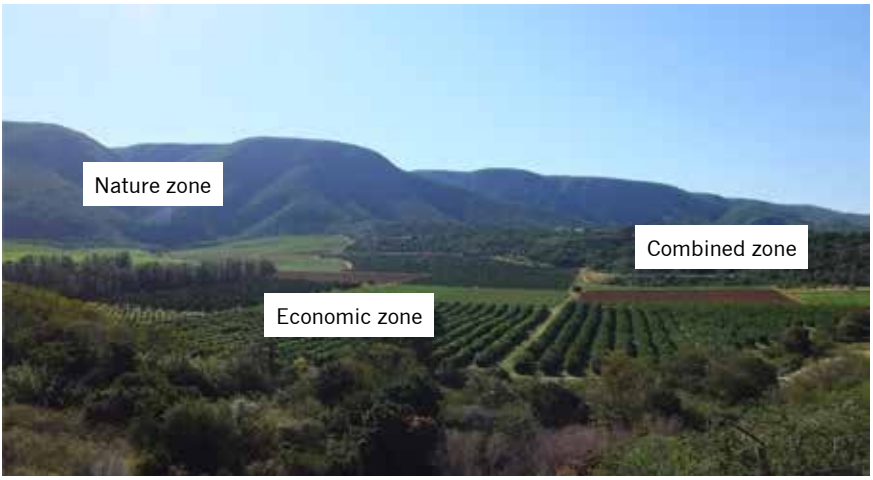
Return
- CO2 capture, water, soil
- Partially restored biodiversity
- Agroforestry, fruit trees, timber
- Tourism

ECONOMIC ZONE

Investment
- Sustainable agriculture, forestry, aquaculture
- Real estate and infrastructure fitting in landscape
- Ventures with positive impact on landscape

Return
- CO2 capture, water, soil
- Crops and products
- New businesses, new collaborations
- Economic development

FIG. 22. *A landscape in Eastern Cape (South Africa) where a three-zone model is shown.*



C. STAKEHOLDER MANAGEMENT BASED ON THE THEORY U

Ecosystem Restoration Partnerships will only be successful if stakeholders collectively take accountability and understand that we have created a negative by-product of economic success: degraded landscapes. Meeting these challenges requires updating our economic logic and operating system from an obsolete 'ego-system' focused entirely on the well-being of the self to an eco-system awareness that emphasises the well-being of the whole. Thus it is of crucial importance to have local landscape leaders. Local people should benefit first by active participation, based on land use and tenure, throughout the project cycle. The approach will acknowledge that people adopt many strategies to secure their livelihoods and that many actors are involved. Clear understanding of the dynamic nature of livelihoods and what influences them is needed. Participation should be built on the strengths of people and focus on new opportunities, rather than focusing on problems and needs, and refer to the ability to sense and bring into the present one's highest future potential as an individual and as a group. Projects should promote micro-macro links; they should examine the influence of policies and institutions on livelihood options, and highlight the need to inform policies with insights from the local level, and with the priorities of those living in poverty. Creating partnerships comprising both the public and private sector should be encouraged.

Fig. 23: The result of a using the 4 returns, 3 zones, 20 years approach and Theory U at landscape level with a farmers' community in Andalusia, Spain.

A theoretical perspective and a practical social technology to change people and groups can be found in Theory U (See Figure 11). Theory U offers a set of principles and practices for collectively creating the future that stakeholders want to emerge, following the movements of co-initiating, co-sensing, co-inspiring, co-creating, and co-evolving. Theory U has been successfully implemented in several projects, leading to new and long-lasting local stakeholder partnerships. In Spain this has led to the creation of a new farmers' association (Figure 23). These partnerships can develop into restoration companies that can actively restore degraded ecosystems giving 4 returns. Similar approaches are being promoted by the Future Earth programme[112].

112 Future Earth is the global research platform providing the knowledge and support to accelerate our transformations to a sustainable world (www.futureearth.info).

D. LONG-TERM PARTNERSHIPS

Institutional investors are not yet investing in restoration projects. They see the following barriers: (a) unfamiliarity with restoration as a business opportunity; (b) lack of clarity about the risks; (c) the long-term nature of restoration; (d) lack of clarity regarding the exit strategy. The time frame of Return on Investment for business and investors is usually two to three years. Investors also want to have the possibility to easily end their participation when they are experiencing difficulties. Most of the financial returns, however, are long term. The same applies for other returns; it takes time, for example, for biodiversity to recover or to notice positive changes in local society. Donor-sponsored projects often have the same short-term commitment. Owing to the short running time of projects, partners are urged to spend much of their precious time on reporting from the outset. For these reasons Ecosystem Restoration Partnerships should take at minimum 20 years (one generation), or at least secure a four stage (4x5 years) commitment. While institutional investors like pension funds are not likely to commit, the game changers in a new restoration industry should come from family-owned companies and impact investors. They can build up a track record and prepare the ground for institutional investors.

> *"The 4 returns framework is to build bridges between farmers and local landowners, investors, companies and governments. That is our way to restore living and productive landscapes. It is not an easy way, but we believe that this approach is the best way to achieve long-term land restoration successes for people and nature."*

9 SCALING-UP: IDENTIFYING THE BUSINESS CASE

"We have a choice to make during our brief visit to this beautiful blue and green living planet: to hurt it or to help it." **Ray Anderson – Founder and Chairman of Interface, Inc.**

Business Relevance: Companies like Unilever, Coca Cola, Nestlé, Heineken and Mars are now entering into restoration activities due to the link of the land to their core business model. This 'proximity to the land' factor forms an opportunity for other stakeholders. It means that companies in agriculture, mining, and water are more open to taking part in restoration activities than those in other sectors. Scaling-up means that entrepreneurial 4 returns Business Developers are needed to identify existing and promising 'ready to scale-up' restoration projects (with a multi-criteria investment tool). At the same time they need to keep track of a group of potential investors and companies, organise investments, monitor progress and communicate about the project(s).

Questions for business schools: What are the key skills of a 4 returns business developer? What are the key elements of a 4 returns business development education? What should be the minimum required percentage of investments in restoration over 5, 10 and 20 years?

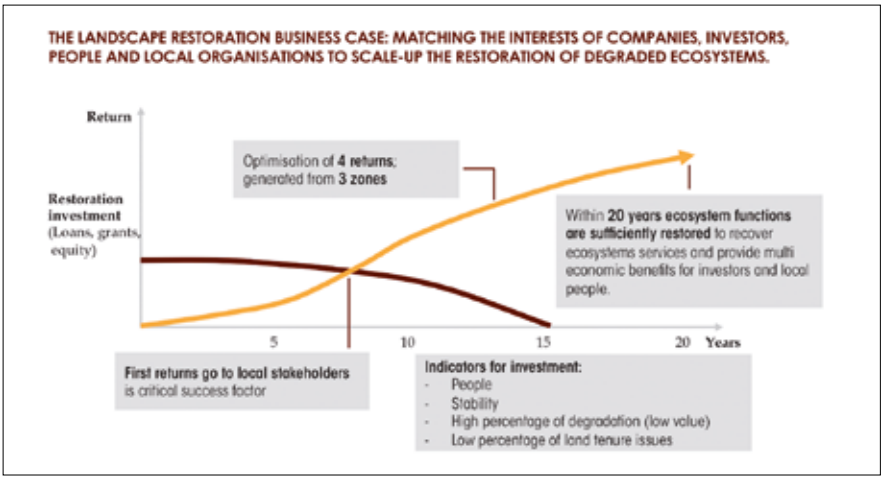
Good projects are scarce in a world where money and people are looking for purpose. The aim of the 4 returns framework is to accelerate the transition process from a Degradation Industry to a Restoration Industry. To find the best examples of existing projects that can be scaled-up, there is a need to understand the local context, as well as the language of business and investors. Furthermore, many other entities are working in this field. Examples include conservation REDD+ projects, restoration projects with government support like Working for Ecosystems in the Eastern Cape, South Africa or the positive developments in China, El Salvador and Rwanda, where governments have decided to put restoration higher on the agenda as part of social and environmental security. The recently formed Global Alliance on Climate Smart Agriculture (2014) of CGIAR and World Bank will also contribute significantly. Meanwhile some business approaches based on holistic livestock management already exist, for example projects initiated by the Allan Savory Institute in Australia (harvesting invasive species and bringing native species back through rotation cattle grazing) and in grasslands in the US and Southern Africa, as well as projects initiated in Australia by Sustainable Land Management Partners113. Companies like Unilever, Coca Cola, Nestlé, Heineken and Mars are now entering into restoration activities due to the link of the land to their core business model. This 'proximity to the land' factor forms an opportunity for other stakeholders. It means that companies in agriculture, mining, and water are more open to taking part in restoration activities than in other sectors. However, it

113 Sustainable Land Management Partners: http://slmpartners.com

also forms a threat as they are operating on a balance between maximisation of profit (short term) and optimisation of commodity security in the long run, which is of course about establishing long-term landscape restoration and biodiversity-conservation activities. Scaling-up means that 4 returns Business Developers are needed to identify existing and promising 'ready to scale-up' restoration projects, while keeping track of a group of potential investors and companies. This work should be based on a systemic approach, avoiding the problem of maximisation of ROI per hectare. To overcome the obstacles we have seen previously, we therefore need systemic business development, with the following goal: ecological restoration is based on maximisation of 4 returns per hectare--inspirational, social, natural and financial.

What should these 4 returns Business Developers look like? They need to have a background in business and the know-how to make business cases. Besides being entrepreneurial, with the know-how to set up companies, they should have excellent stakeholder management and communication skills. And they should love nature and be committed to learning fundamental knowledge about ecologies and systems.

FIG. 24. *The 4 returns restoration business case: matching the interests of companies, investors, people and local organisations to scale-up the restoration of degraded ecosystems.*



A. IDENTIFICATION OF THE BUSINESS CASE FOR AN ECOSYSTEM RESTORATION PARTNERSHIP

The question of whether an ecosystem or landscape, along with its stakeholders, qualifies for an Ecosystem Restoration Partnership is answered through careful selection based on a multi-criteria assessment tool (Box 5). Spin diagrams per project provide an overview of the restoration readiness of an area and stakeholders as well as investment potential. Four different phases are essential to create an Ecosystem Restoration Partnership:

BOX 5 KEY ELEMENTS OF THE MULTI-CRITERIA BUSINESS CASE FOR ECOSYSTEM RESTORATION PARTNERSHIPS

Selection Criteria: Four different phases are essential to create an Ecosystem Restoration Partnership:

1. **Identifying the business case for an Ecosystem Restoration Partnership**
   Key elements of the business case (ROI over 20 years) include the following:
   - A leading stance on critical emerging issues: creating jobs, biofuels, sustainable agriculture, loans, local agro development, water, biodiversity offsetting, real estate, value of the land, no net loss, etc.
   - New market development
   - Sustainable resourcing
   - Risks assessment and opportunities
   - Business-to-business peer group; new business opportunities with peers
   - Carbon sequestration
   - Meeting the demands of consumers/clients
   - Enhanced corporate social responsibility
   - Ethics, future leadership in stakeholder management
   - Potential for stronger marketing, reputation and good will
   - Increased innovation potential
   - An enhanced horizon scanning and awareness of new and forthcoming, governmental policies

2. **Identifying the right site**
   - Site selection criteria for local partners and companies
   - Site location; type of ecosystem and mosaic landscape, number of hectares
   - Land tenure: local interests/conflicts/stability
   - Ecological restoration potential in relation to agriculture, water, carbon, jobs
   - Existence of local implementing organisations
   - Costs benefits, risks, duration (20 years)
   - Guaranties assessment: banks, development banks, investors
   - Return on investment: fair share between local people and investors, other parties, funders
   - Application of Criteria Ecosystem Restoration (IUCN Ecosystem Approach).
   - Partnership agreement of 20 years, or 4 x 5 years
   - Decide: go/no go

3. **Identifying the right tools**
   Toolbox:
   - Participatory approach and Theory U on the site, and vocational training centres
   - Alternative local incomes
   - Ecosystem survey done
   - Addressing local governance issues and legal issues
   - Deciphering which mix of technical tools are possible, such as livestock management, analogue/agroforestry, fencing, trenching, water works, alluvial fans, Cocoon/Waterboxx, permaculture, adding native mycorrhizae, microbiome treatments, cultural and psychological people tools
   - Establishing a finance and investment portfolio

4. **Ecosystem business development**
   How can you proceed?
   - Start by building local presence and work with local business developers
   - Identify the different potential business cases within the partnership
   - Create stakeholder commitment within the partnership and prepare stakeholders for changes in ecosystem use
   - Build upon existing belief systems to ensure sustainable long-term management strategies for farmers, and potential new local ventures
   - Support, problem solving and learning during 20 years of partnership
   - Formation of project management team on field site and create local development companies
   - Signing Principles of Cooperation for 20 years with investor companies and local organisations to create restoration companies and ventures that can receive investment capital
   - Guidance of criteria and guidance monitoring process
   - Updating knowledge with new scientific findings
   - Maintaining a project database through partners
   - Engaging in the requisite problem solving and learning curve required for this undertaking
   - Knowledge management in place
   - Enabling participation in business school (MBA) education of the various partners

B. THE TRANSITION FROM A DEGRADATION INDUSTRY TO A RESTORATION INDUSTRY

Convincing institutional investors is a critical element of creating a restoration industry. A first step is to accommodate impact investors and family run or owned businesses as they are the change makers. Investment Funds based on the 4 returns approach should be established. The ambition is to create a pipeline of promising projects with business models based on the 4 returns assessment tool. This pipeline will form the basis of an investment fund. As soon as projects are selected and presented, the investors are asked to participate. In order to build a track record, funding is sought from investors with family capital and company capital. In the long run institutional funders are asked to participate as a track record is built. They will invest in the operational restoration companies; in the projects; or in a landscape restoration business plan, as defined by the development company. Visionary community leaders, innovative entrepreneurs, family offices, impact investors and wealthy individuals can be seen the change makers to establish a restoration industry.

Measuring the progress of the 4 returns is very important; progress serves as a means of justifying the interventions to the local stakeholders, investors, etc. In addition to the monitoring conducted by independent entities to safeguard the investors' interests, on-site monitoring would also be beneficial. The use of drones may become increasingly important, as well as the use of local restoration training centres.

C. HOW DOES IT WORK?

The strength of a 4 returns language should be shown in documents and communicated in projects; it connects (the actors in) a specific project to a wider local network, investors, companies and international partners. At this moment the concept of 4 returns, 3 zones, 20 years is being tested and implemented in degraded areas in South Africa, Spain and Australia.

ORCHESTRATING ECOSYSTEM RESTORATION PARTNERSHIPS

To catalyse the creation of Ecosystem Restoration Partnerships, an orchestrating party is needed that is science based, entrepreneurial, has access to companies and investors and experts and can build trust and confidence towards local people and organisations. It should be an independent organisation that works as a social enterprise to create as much value as possible for everyone based on restoration of ecosystem functioning, based on a systemic mission, and with a practical goal of establishing the four principles of return. As such, it should aim to help facilitate the mobilisation and redirection of investment funds and business participation by acting as an orchestrator between businesses (investors and individuals), governments, NGOs, communities, farmers and local civil society organisations (CSOs) working in the field of restoration and conservation.

COMMONLAND

Commonland is aiming for a role as orchestrator and active in landscape restoration. It was founded in 2013 with support from the COmON Foundation, the IUCN Commission on Ecosystem Management and Rotterdam School of Management, Erasmus University. Commonland operates out of an international network and has access to proven restoration technologies, international support from partners in business, finance, NGOs, science, governments and multilateral institutes. Its approach is in line with international agreements such as the Bonn Challenge and UN Conventions, and it is connected to relevant programmes of mission partners such as World Business Council on Sustainable Development (WBCSD), Wageningen University and the Economics of Land Degradation initiative. Commonland believes that landscape restoration represents large untapped opportunities for sustainable economic development. To demonstrate this potential, the organisation develops landscape restoration projects that are based on business cases. Commonland actively involves investors, companies and entrepreneurs in long-term restoration partnerships. Long-term commitment is important, as it takes approximately 20 years, or one generation, to restore a landscape. Its activities are built upon decennia of experience and offer one critical element: building a bridge between the current restoration community – the stakeholders on the land – and the investors and business community. The team uses a multidisciplinary approach and an easy to understand language to connect and engage with all different stakeholders.

> *We must break down the silos if we are to advance the cause of ecological restoration. Creating new partnerships with business will both facilitate the sharing of knowledge and complementary expertise but also enable business to become a major driver of ecological restoration.*
> **Commonland**

Commonland consists of a foundation, a fund and development companies. The foundation develops the network and the restoration approach. To build on existing strengths, they partner with existing initiatives in the landscapes to be restored. The 4 returns development companies develop the landscape restoration projects. An important element is the alignment of the interests of the different stakeholders in the field, such as landowners, businesses, governments, and so on. Sustainable business cases that contribute to restoration are being developed together with all stakeholders, taking all interests into account. The fund co-invests in the landscape restoration projects and the business activities that contribute to restoration.

Together, Commonland and the 4 returns Development Company form a Social Enterprise: an organisation that applies commercial strategies to maximise improvements in human and environmental well being, rather than maximising profits for external shareholders. Social enterprises aim to offer reasonable benefits to their investors, with the idea that in doing so they will ultimately further their capacity to realise their social and environmental goals. Commonland acts in a transparent and open manner concerning its structure, activities and agreements.

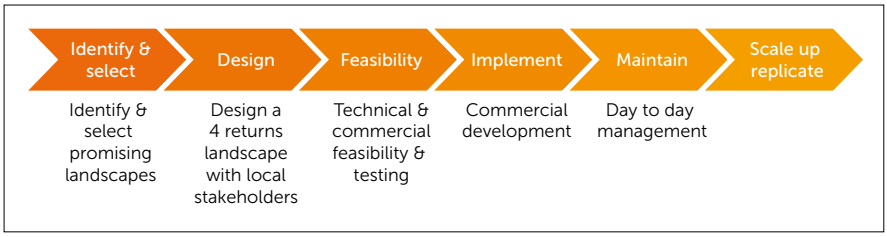
HOW DOES IT WORK?

Commonland aims to actively create Ecosystem Restoration Partnerships (ERP). It brings together stakeholders to scale-up existing small scale potentials. It is a small organisation, with a team of professionals operating in a wider network of associates. The team has connections to the worlds of business investors and agriculture and ecology; team members speak the language of business, and also the language of ecologists, farmers and local people. Their orchestrating can only be successful if Commonland, as a new brand, operates in a way that is complementary to other organisations, is endorsed by international experts, NGOs and scientists and supported by business schools, private companies and foundations.

Scaling-up ecosystem restoration involves the following steps/activities, to be coordinated by a business developer:

- **Selecting 4 returns projects:** identifying and selecting existing small-scale restoration initiatives, with potential to be scaled-up according to the 4 returns approach, based on a stage gate approach (Figure 25) and a set of criteria (Box 6 and Figure 24)
- **Bottom-up stakeholder engagement process:** development of the business model for each selected project based on cooperation with all partners, using inspirational stakeholders principles (Theory U, see Figure 11), and based on long-lasting commitment (of 20 years or more) from all parties
- **4 returns Development Company:** actively creating an Ecosystem Restoration Partnership by matching companies, investors, people and local organisations and developing these as Operational Restoration Companies, based on 4 returns
- **Organising Financial Investment:** establishing an Investment Fund that invests in those Operational Restoration Companies
- **Monitoring progress and communicating:** visually documenting and communicating projects and connecting (the actors in) a specific project to a wider local network and international partners

FIG. 25. *Stage gate approach from 'restoration ready' to 'investor ready' projects.*



LANDSCAPE EXAMPLE: SOUTH AFRICA

> *"If this works, I wont' be a goat farmer anymore, I will be a lavender and nut farmer. That makes so much more sense."* **Farmer René van Rensberg in Baviaanskloof, South Africa**

Context
The project focuses on the Baviaanskloof, Kouga and Kromme catchments, with a combined surface of 550,000 hectares. Because of its rich biodiversity, the Baviaanskloof gained World Heritage status in 2004. Together, these three catchments supply 70 per cent of the current water supplies to Port Elizabeth. The potential for the city to grow economically is constrained by limited energy and water supplies. Port Elizabeth has recently (2009-10) come out of one of the most severe droughts in living memory, during which it experienced a significant water crisis. Irrigation farmers in the associated Algoa region suffered a 40 per cent cut in their water entitlements during this drought. In contrast to many other stressed catchments in South Africa, this region has already reached the point where demand for water outstrips supply[114].

The purpose of the pilot project is to create a multi-stakeholder platform and unlock commitments for a long-term restoration partnership that will produce several returns:

- Return of inspiration to act: personal leadership
- Return of social capital: a learning organisation for collective decision-making and good governance
- Return of human capital: human well-being
- Return of natural capital: good practices on living landscapes
- Return on investment: decrease of cost, reducing of risk, increase of organisational resilience and sustainability, strengthen networks and relationships, improve services delivery, improved democracy

To attain this purpose, the project comprises five work streams, each of which supports the overall goal. The work streams are closely interlinked:

- Build a collective platform for ecosystem restoration in the Baviaans-Kouga-Kromme catchment area
- Build business models/transition models for restoration partnerships

114 Department of Water Affairs, South Africa, 2011, Annual report of the department of water affairs, 2010 - 2011

- Develop leadership capacity within the participants in the project
- Strengthen bottom up collective action on the landscape
- Develop young entrepreneurs in the local communities

FIG. 26: *Angora Goats in the Baviaanskloof (South Africa) are the cause of much overgrazing*

Organisation
The Commonland Foundation has set up a development company, The 4 returns Development Company, in South Africa. This company manages this project as an independent player in close collaboration with the local partner organisation Living Lands[115]. The organisations have set up a core team to manage the project. This core team will mobilise a group of participants in the project (local stakeholders as well as global experts and innovators), who are identified as critical stakeholders in the co-creation of solutions.

Business case
In this area the business case is based on reduced water costs and risks as well as increased agricultural productivity (e.g. high value crops). Furthermore, the project can create employment opportunities (in particular for off-season labourers) in restoration efforts (planting indigenous trees, eliminating alien species and creating alluvial fans) for the next 20-30 years.

As a starting point, three main activities can be identified:

- Making the transition from small livestock farming to sustainable high-value alternatives
- Improved water management through the creation of alluvial fans
- Reforestation with Spekboom (Elephant Food bush, Portulacaria afra)

Current partners include the South African Ministry of Environment, Insurance company

115 Living Lands: http://livinglands.co.za/

Santam, the local bottling company of a large soft drink manufacturer and the German Development Cooperation GIZ.

FIG. 27. *Visualisation of the landscape potential after restoration with photographs and videos is part of the stakeholder-engagement process to actively involve farmers in participation in restoration activities (Photo credit: Four Returns Development Company, South Africa)*

PROJECT EXAMPLE: SPAIN

Context

> *"We require the specialized labor of men and women that work in the fields, because it is them who provide us with our food staples. We must recognize and honor the work of rural people. The quality of our future depends on their good work and on our collective ability to maintain a proper balance with the surrounding natural ecosystems."* **Paco Casero, farmer, Spain (retired president of Asociación Ecovalia for organic farmers)**

The Altiplano de Vélez site, situated in the Spanish provinces Almeria and Granada, covers about 500,000 hectares of land at an altitude of between 700 and 2,045 metres above sea level. It consists mainly of high altitude steppe *(altiplano)* with karstic (limestone) massifs and includes a variety of ecosystems representative of Mediterranean forest and maquis. The climate is semi-arid to arid and the amount of precipitation has declined progressively over the past decades.

The Segura and Gualdaquivir Rivers run through the area, which contains three nature reserves. The local economy is based on farming and agriculture, mainly rain-fed almonds, cereal, and Segureño sheep and subsidies from the Common Agricultural Policy

of the European Union. The soil is of mediocre quality and there is a lot of erosion due to over-tilling and over-grazing.

Unemployment is high in the area; between 40 and 60 per cent of the population is unemployed. Many people are leaving the area, notably the younger generations. The population size has declined about 70 per cent between 1950 and 2000, leading to a decrease in commercial activities and services and a 'graying' population with an extremely high percentage of people in higher age groups. The economic crisis that hit in 2008 only exacerbated the situation.

FIG. 28. *Rainfed almonds in the Altiplano de Vélez, Andalusia, Spain*

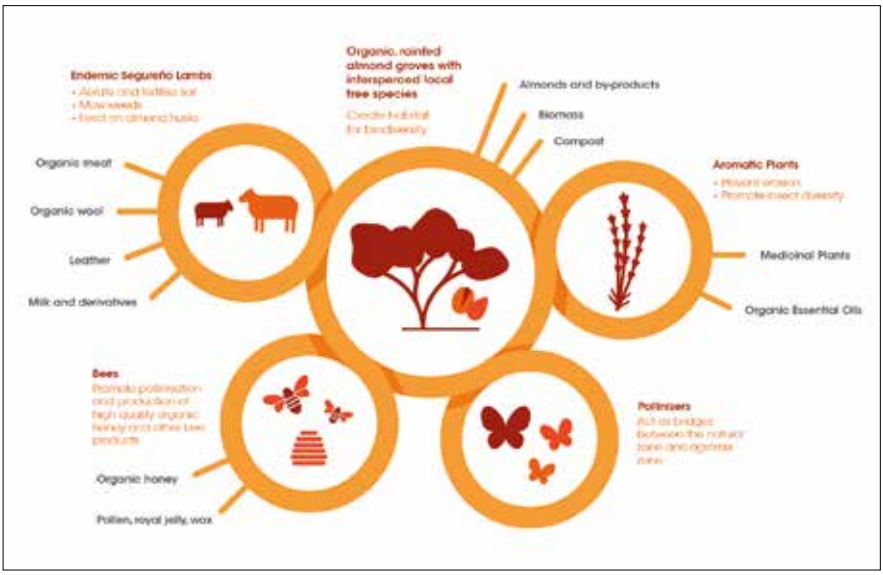
Organisation
Local frontrunners have taken the initiative to organise themselves under an Association (Asociación AlVelAl) that embraces the 4 returns approach and will serve as an umbrella organisation to create a unified, coordinated bottom-up strategy for planning and implementation of restoration initiatives. Commonland will be a partner in the process, which will be driven by local leaders. The Association started with at least 200 members (individuals and organisations) and it is likely to grow quickly.

Business case
In this area the business case is based on restoring the water table and soil quality as well as empowering local people by enabling them to create a high-end brand of local, organic products.

There is potential for a successful three zone approach with different activities per zone. Commonland supports development and upscaling of local businesses in:

- Organic almond production
- Integrated agroforestry including almond, lamb, aromatics, bee products, etc. (See Figure 25)
- Rural tourism (restoration protected areas)

FIG. 29. *Integrated productive Ecosystem for Large Scale Restoration Based on Business Cases in Spain.*



10 CONCLUSION

There is good news amidst the constant flow of distressing messages concerning environmental crises: we can restore ecosystems. The technology exists, the science is available and the financial resources are ready to be uncapped. Initiatives such as the Chinese Loess Plateau Watershed Rehabilitation Project that was started by the World Bank and Chinese government in 1995, provides a practical example that it is possible to restore millions of hectares. Increasingly governments are convinced that this is the way forward, as demonstrated by policy changes in Rwanda, Ethiopia, and after natural disasters such as mangrove reforestation after the tsunami in South East Asia (2004), and the water management restoration after Hurricane Katrina in the USA (2005).

But evidence based on business cases is the only way forward to involve institutional investors and companies. This evidence should be obtained by working in large scale degraded landscapes of more than 100,000 hectares by identifying the business cases in forestry, agriculture, livestock, leisure, carbon, water, and local industries within the context of Ecosystem Restoration Partnerships with local farmers, landowners and other stakeholders. Business developers, impact investors, and local stakeholder managers, are critical success factors to build evidence and thus turn an ecosystem restoration partnership into investable business opportunities. The *4 returns, 3 zones, 20 years* approach has proven to be an excellent framework for all stakeholders, providing a common ground from which to work together and achieve the long term goals of a 4 returns landscape development business plan.

Time and trust are required in order to produce these results. What is needed are governments, impact investors, companies and other stakeholders who are interested in long-term, intergenerational projects instead of short-term, lacklustre activities that achieve no real impact in terms of sustainability. By widely adopting 4 returns the inspirational, but currently disconnected relationship between humans and nature can be re-established and we can transform the Degradation Industry into a Restoration Industry. The recently founded Commonland Foundation (4 returns from landscape restoration) is working with its partners to realise the scaling-up of these projects based on the 4 returns approach. As inspiration is the door opener to involve all stakeholders including investors and businessmen, we should start with the heart. From the Tragedy of the Commons, it is time to work on The Promise of the Commons.

> *"What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another."*
> **Chris Maser, author[116], 2001**

116 Maser, C., (2001) Forest primeval: The natural history of an ancient forest. Oregon State University Press, Oregon.

ABOUT THE AUTHOR

Willem Ferwerda studied biology, tropical plant ecology and agriculture, and environmental science in the Netherlands (University of Amsterdam) and Colombia (Universidad Nacional, Bogotá).

Between 2000-2012 Ferwerda served as executive director of IUCN Netherlands. He expanded the membership and built the most influential national IUCN office, while creating the Ecosystem Grants Programme, a fund that financed 1,500 local conservation projects in 40 tropical countries. In 2005 he founded Leaders for Nature, an international business network on biodiversity and ecosystems, now active in India and Brazil as well as the Netherlands. In 2006 Ferwerda convened 80 business leaders from multinationals such as Shell, Rabobank, DSM, Unilever, KLM and many others, to sign an open letter to the Dutch government, which led to the Dutch governmental Taskforce on Biodiversity and Natural Resources. His efforts led to the realisation in 2010 of an agreement around ecosystems and biodiversity between VNO-NCW (Confederation of Netherlands Industry and Employers) and 35 nature organisations, resulting in the platform on Biodiversity, Ecosystems and Economy.

Ferwerda is Executive director of Commonland, and board member and advisor of some institutions related to ecology and economy. He is Executive Fellow Business and Ecosystems at the Centre for Eco-Transformation, Rotterdam School of Management, Erasmus University and Special Advisor to the IUCN Commission on Ecosystem Management.

LIST OF ABBREVIATIONS

CIFOR	Centre for International Forestry Research
CoP	Conference of Parties of a UN Convention
CSR	Corporate Social Responsibility
EEMP	Environmental Education Media Project
EIA	Environmental Impact Assessment
ERP	Ecosystem Restoration Partnership
FAO	Food and Agriculture Organisation
FSC	Forest Stewardship Council
GIZ	German International Cooperation
GPFLR	Global Partnership on Forest Landscape Restoration
HIVOS	International development organisation guided by humanist values
ICRAF	International Centre for Research in Agroforestry / World Agroforestry Centre
IUCN	International Union for Conservation of Nature
IUCN CEM	Commission on Ecosystem Management, one of the scientific bodies of IUCN
LPFN	Landscapes for People, Food and Nature Initiative
MA	Millennium Ecosystem Assessment
MDGs	Millennium Development Goals
MIT	Massachusetts Institute of Technology
NPV	Net Present Value
PES	Payment for Ecosystem Services
PRESENCING	A blend of the words 'presence" and 'sensing," refers to the ability to sense and bring into the present one's highest future potential – as an individual and as a group. With Theory U, presencing offers a new theoretical perspective and a practical social technology to change people and groups.
REDD	Reducing Emissions from Deforestation and Forest Degradation
ROI	Return on Investment
RSM	Rotterdam School of Management, Erasmus University
SDGs	Sustainable Development Goals
SER	Society for Ecological Restoration
TEEB	The Economics of Ecosystems and Biodiversity
UNCBD	United Nations Convention on Biological Diversity
UNCCC	United Nations Convention on Climate Change
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
WBCSD	World Business Council for Sustainable Development
WLT	World Land Trust
WRI	World Resources Institute
WUR	Wageningen University and Research Centre
WWF	World Wide Fund for Nature

GLOSSARY

A general glossary of terms applied within the fields of landscape restoration, sustainable agriculture and forestry, business development and ecology.

Action 2020: Action programme of the World Business Council on Sustainable Development to 2020 and beyond. Ecosystems are one of the nine priority actions within Action 2020 (SOURCE: WWW.ACTION2020.ORG).

Agro Forestry: An integrated approach of using the interactive benefits from combining trees and shrubs with crops. It combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy, and sustainable land-use systems (SOURCE: WWW.FAO.ORG).

Afforestation: Planting of new forests on lands which, historically, have not contained forests. (SOURCE: IPCC, 2000).

Alien/Exotic species: Animals, plants or other organisms that are not native to the particular ecosystem in which they are found.

Analogue Forestry: A system of planned, managed forests, primarily deployed in tropical or subtropical areas. The forests are designed to mimic the function and ecology of the pre-existing climax vegetation for the area, and are also designed to provide economic benefits (SOURCE: WWW.ANALOGUEFORESTRY.ORG).

Asset Management Company: A company that manages investments made out of the pooled funds of investors in line with the investment objectives.

Biodiversity: Derived from biological diversity. It means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (SOURCE: UN CONVENTION ON BIOLOGICAL DIVERSITY, WWW.CBD.INT).

Bonn Challenge: A global movement launched on September 2, 2011 at a ministerial conference in Bonn to restore 150 million hectares of degraded and deforested land by 2020. The Bonn Challenge calls on countries and other actors to accomplish this as a way to meet several existing international developments, such as the Convention on Biological Diversity Target 15, the REDD+ agreement of the United Nations Framework Convention on Climate Change, and the Millennium Development Goals (SOURCE: WWW.BONNCHALLENGE.ORG).

Business Case: Captures the core financial elements of a venture, project or task. A positive business case is assumed, when the case adds value for an end-user in such a way that the revenue is higher than the costs and that this results in 4 returns for the company/ entrepreneur or the investors behind.

Business Model: A business model describes the rationale of how an organisation creates, delivers, and captures value (BASED ON: KAPLAN, 2012).

Business Plan: A formal statement of a set of business goals, a thorough description of the business in all its aspects, the reasons they are believed attainable, and the plan for reaching those goals.

Capacity Development: The process through which individuals, organisations, and societies obtain, strengthen, and maintain the capabilities to set and achieve their own development objectives over time (SOURCE: WWW.UNDP.ORG).

Carbon Sequestration: The removal of atmospheric carbon dioxide, either through biological processes (for example, photosynthesis in plants and trees) or geological processes (for example, storage of carbon dioxide in underground reservoirs).

Co-creation: The involvement of groups of people in decision-making and value creation through personal engagement.

Collaborative Learning: The collective action and reflection that occurs among different individuals and groups as they work to improve the management of human and environmental interrelations (DERIVED FROM: KEEN ET AL., 2005).

Commons: The Commons derives from the traditional English legal term of 'common land'. While 'common land' might have been owned collectively, by a legal entity, the Crown or a single person it was subject to different forms of regulated usage, such as grazing of livestock, hunting, lopping of foliage or collecting resins. In distinction, the term Commons in modern economic theory has come to refer to the cultural and natural resources accessible to all members of a society, such as air, water, and a habitable earth (SOURCE: WIKIPEDIA).

Deforestation: Clearance or clearing is the removal of a forest or stand of trees where the land is thereafter converted to a non-forest use (SOURCE: DICTIONARY OF FORESTRY).

(Land) Degradation: The reduction in the capacity of the land to provide ecosystem goods and services and assure its functions over a period of time for the beneficiaries of these goods and services (SOURCE: WWW.FAO.ORG).

Degradation industry: Industrial processes that accelerate the degradation of landscapes through delivering maximisation of financial returns per hectare (SOURCE: FERWERDA, RSM, IUCN CEM, 2015).

Eco-agriculture: The protection of wild species and conservation of habitat while increasing agricultural production and farmer incomes (SOURCE: WWW.ECOAGRICULTURE.ORG).

Ecosystem: An ecosystem is a community of living organisms (plants, animals and microbes) in conjunction with the non-living components of their environment (things like air, water and mineral soil), interacting as a system. These biotic and abiotic components are regarded as linked together through nutrient cycles and energy flows. As ecosystems are defined by the network of interactions among organisms and between organisms and their environment they can be of any size but usually encompass specific limited spaces.

Ecosystem Functions: The physical, chemical, and biological processes or attributes that contribute to the self-maintenance of the ecosystem; in other words, what the ecosystem does. Some examples of ecosystem functions are wildlife habitat, carbon cycling, or trapping nutrients (SOURCE: WWW.ECOSYSTEMVALUATION.ORG).

Ecosystem Services: The beneficial outcomes, for the natural environment, or for people, that result from ecosystem functions. Some examples of ecosystem services are support of the food chain, harvesting of animals or plants, clean water, or scenic views. In order for an ecosystem to provide services to humans, some interaction with, or at least some appreciation by, humans is required (SOURCE: WWW.ECOSYSTEMVALUATION.ORG).

Enabling Restoration Company: A company that facilitates the process of the large scale 4 returns restoration industry. This could be a restoration-tech, finance, knowledge, training, research & innovation focused company.

Entrepreneurship: A skill set of being able to identifying and starting a business venture, sourcing and organising the required resources and taking both the risks and rewards associated with the venture (SOURCE: WIKIPEDIA).

4 returns: Commonland's vision is that sustainable restoration of degraded landscapes, applied over a time frame of one generation (20 years) generates 4 returns:

- Return of inspiration: a positive future outlook, sense of place, gross national happiness.
- Return of social capital: jobs and business activity, education and social services, security.
- Return of natural capital: biodiversity, vegetation cover, water harvesting, healthy topsoil, decreased erosion, carbon absorption.
- Return of financial capital: financial benefits derived from the business activities conducive to landscape restoration, e.g. sustainable agriculture and forestry, real estate investment, tourism and leisure and sustainable industrial development.

4 returns Development Company: A landscape development company developing, jointly with local stakeholders, a three zones masterplan for the landscape and an investment strategy for implementing the landscape masterplan with a 4 returns approach. A Development Company is established by Commonland.

Investor: in general an individual or organisation which allocates capital with the expectation of the return on investment. Different types of investors:

- Institutional (pension funds, insurance companies)
- Development finance institutions
- Private equity and venture capital funds
- Professional private investors (family offices, including typical impact investors)
- Retail investors

Investor Ready: Investor ready applies to the status of a (landscape restoration) business case and means that such business case, described in a business plan, is expected to meet the lending and/or investment criteria of banks, professional investors or investment funds.

Investor Ready Venture: The venture has a capable entrepreneur, with a core team, a validated business plan (first revenue proven), partners to launch, scale or exit, 4 returns indicators defined and a term sheet towards investors. (SOURCE: COMMONLAND).

Invasive Species: Invasive species are animals, plants or other organisms not natural to, and harmful to the ecosystem in which they are found. Invasive species can increase in population due to a lack of natural enemies in the new habitat.

Land Tenure: The name given, particularly in common law systems, to the legal construction in which land is owned by an individual, who is said to 'hold' the land.

Landscape: Geographical construct that includes not only the biophysical components of an area but also social, political, psychological and other components of that system (FARINA, 2006, IN: SAYER ET AL. 2007).

Landscape Approach: Managing complex landscapes in an integrated process, incorporating all the different land uses and the needs of the inhabitants within those landscapes in a single management process (SOURCE: WWW.CIFOR.ORG).

Landscape Leadership: Refers to leadership as a capacity, within a spatial context. Landscape leaders are able to influence spatial decision making, negotiate and facilitate the restoration process of degraded landscapes, and motivate and connect landscape stakeholders to establish sustainable initiatives at landscape level.

Landscape Restoration According to three sources of expertise: 1) Turning degraded areas of land into healthy, fertile, working landscapes where local communities, ecosystems and other stakeholders can sustainably cohabit (Source: www.iucn.org); 2) Re-establishing the presumed structure, productivity and species diversity that was originally present at a site that has been degraded, damaged or destroyed. In time, the ecological processes and functions of the restored habitat will closely match those of the original habitat (Source: FAO 2005); 3) The process of assisting the recovery of the ecosystems within a landscape that have been degraded, damaged, or destroyed (ADAPTED FROM THE SOCIETY FOR ECOLOGICAL RESTORATION, WWW.SER.ORG).

Landscape entrepreneur/venture: A (local) entrepreneur or company that operates in a landscape. All landscape entrepreneurs operating within a landscape enable the realisation of the 4 returns business cases of that landscape. Therefore landscape entrepreneurs collaborate with each other within the landscape and with the Development Company of the landscape to create 4 returns returns (SOURCE: COMMONLAND).

Landscape Restoration Plan: A master plan for a landscape based on three zones where the combined impact of viable businesses or ventures in those three zones, jointly with other types of interventions within that landscape, leads to a healthy restoration of the landscape as a whole, with the 4 returns as a measurable result.

Landscape Restoration Partnership: A partnership between (representatives of) the main stakeholders at the landscape level, who have developed a common understanding and vision regarding the sustainable restoration of the landscape.

Livelihood: Comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living (SOURCE: CHAMBERS AND CONWAY, 1992).

Millennium Development Goals: The eight Millennium Development Goals (MDG) set by the United Nations – which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education – form a blueprint agreed to by all the world's countries and all the world's leading development institutions. They have galvinised unprecedented efforts to meet the needs of the world's poorest populations. See also Sustainable Development Goals (SOURCE: UN.ORG).

Millennium Ecosystem Assessment: The objective of the UN Millennium Ecosystem Assessment, initiated in 2001 and completed in 2005/2006, was to assess the consequences of ecosystem change for human well-being, and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The findings of the more than 1,360 experts involved worldwide, contained in five technical volumes and six synthesis reports, provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems (SOURCE: WWW.MILLENNIUMASSESSMENT.ORG/EN/INDEX.HTML).

Monoculture: The agricultural practice of producing or growing one single crop over a large area. It is widely used in modern industrial agriculture and its implementation has allowed for large harvests from minimal labour. However, monocultures can lead to accelerated spread of diseases, as a uniform crop is more susceptible to pathogens. 'Crop monoculture' is the practice of growing the same crop year after year (SOURCE: SHIPTON, 1977).

Mosaic landscape: Multifunctional landscapes consisting of different components which together form a patchwork. This concept reflects the complexity and dynamics as well as the uniqueness of each landscape. A mosaic landscape is similar to the three zones approach of Commonland (SOURCE: MCCRACKEN ET AL., 2008).

Multi-stakeholder Process: A cooperative arrangement between a variety of actors that jointly engage in a process of dialogue and action to solve a specific problem (SOURCE: VAN DER MOLEN AND STEL, 2010).

Mycorrhizae: A symbiotic (generally mutualistic, but occasionally weakly pathogenic) association between a fungus and the roots of a vascular plant. In a mycorrhizal association, the fungus colonises the host plant's roots, either intracellularly as in arbuscular mycorrhizal fungi or extracellularly as in ectomycorrhizal fungi. They are an important component of soil life and soil chemistry.

Net Present Value (NPV): In finance, the net present value (NPV) or net present worth (NPW) of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows of the same entity (SOURCE: WIKIPEDIA).

Permaculture: Originally referred to 'permanent agriculture' but expanded to stand a for 'permanent culture,' as it was seen that social aspects were integral to a truly sustainable system as inspired by the Japanese Masanobu Fukuoka's natural farming philosophy. Permaculture now means a branch of ecological design, ecological engineering, and environmental design that develops sustainable architecture and self-maintained agricultural systems modelled from natural ecosystems. The term permaculture (as a systematic method), was first coined by Australians Bill Mollison and David Holmgren in 1978 (SOURCE: WIKIPEDIA).

Planetary Boundaries: The central concept in an Earth system framework proposed by a group of Earth system and environmental scientists led by Johan Rockström from the Stockholm Resilience Centre and Will Steffen from the Australian National University. In 2009, the group proposed a framework of nine 'planetary boundaries', designed to define a safe operating space for humanity for the international community, including governments at all levels, international organisations, civil society, the scientific community and the private sector, as a precondition for sustainable development. The concept was updated in 2015 (SOURCE: WWW.STOCKHOLMRESILIENCE.ORG).

Reclamation: Replacing the natural vegetation with adapted vegetation types (SOURCE: BRADSHAW, 1987).

Red List of Threatened Ecosystems: The IUCN Red List of Threatened Ecosystems compiles information on the state of the world's ecosystems at different geographic scales. Its central objective is to assess the risk of ecosystem collapse (SOURCE: WWW.IUCNREDLISTOFECOSYSTEMS.ORG).

Red List of Threatened Species: The IUCN Red List of Threatened Species has existed since 1963. It is a a list of animals, plants and other organisms that are endangered and identifies their threats. It acts as a barometer of biodiversity (SOURCE: WWW.IUCNREDLIST.ORG).

Reducing Emissions from Deforestation and Forest Degradation (REDD): Is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (SOURCE: WWW.UN-REDD.ORG).

Reforestation: The establishment of trees on land that has been cleared of forest within the relatively recent past (SOURCE: IPCC, 2000).

Regeneration: The act of renewing tree cover by establishing young trees naturally or artificially. Regeneration usually maintains the same forest type and is done promptly after the previous stand or forest was removed (SOURCE: WWW.DICTIONARYOFFORESTRY.ORG/).

Rehabilitation: To re-establish the productivity and some, but not necessarily all, of the plant and animal species thought to be originally present at a site. (For ecological or economic reasons the new habitat might also include species not originally present at the site). In time, the protective function and many of the ecological services of the original habitat may be re-established (SOURCE: GILMOUR ET AL., 2000).

Restoration industry: Industrial processes that contribute to the restoration of degraded landscapes and provides 4 returns per hectare: inspirational, social, natural and financial returns (SOURCE: FERWERDA, RSM, IUCN CEM, 2015).

Return on Investment (ROI): The concept of an investment of some resource yielding a financial benefit to the investor. A high ROI means the investment gains compare favourably to investment cost. As a performance measure, ROI is used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. In purely economic terms, it is one way of considering profits in relation to capital invested (SOURCE: WIKIPEDIA).

Restoration Tools: Set of methods, technologies and overall management approaches to bring back ecological functions of a degraded ecosystem.

Scaling-up: To efficiently increase the socioeconomic impact from a small to a large scale of coverage (SOURCE: WORLD BANK. 2003).

Sustainable Development Goals: The Sustainable Development Goals (SDGs) are a proposed set of targets relating to future international development. They are to replace the Millennium Development Goals once they expire at the end of 2015. The SDGs were first formally discussed at the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012 (Rio+20) (SOURCE: WWW.SUSTAINABLEDEVELOPMENT.UN.ORG).

System approach (also known as a holistic or integrated approach): An approach that takes the whole living system i.e. landscape (including social and ecological components) as a basis into account; and to derive its specific relationships from within this system perspective. Systems theory looks at the set of interconnected components, relationships, behaviours and interactions within systems. Systems theory within the Systems Approach context recognises that organisations i.e. land restoration, financial, health and social fields are systems in themselves and operate as components of broader systems (landscape restoration). Change within a systems context must therefore take into account both the context of and impacts on the system (SOURCE: WWW.CCSA.CA).

Topsoil: The upper, outermost layer of soil, usually the top 5 to 20 cm. It has the highest concentration of organic matter and microorganisms and is where most of the Earth's biological soil activity occurs.

Theory U: Theory U is a multi-stakeholder innovation approach, developed by the Presencing Institute of MIT Harvard. The theory is applied in organisations and teams to foster bottom-up change and leadership. The theory emphasises the importance of awareness, attention and consciousness of the participants in the process. The five core elements are presented in a U curve (SOURCE: WWW.PRESENCING.COM):

- Co-initiating: Build common intent. Stop and listen to others and to what life calls you to do
- Co-sensing: Observe, observe and observe. Go to the places of most potential and listen with your mind and heart wide open
- Co-strategising: Connect to the source of inspiration, go to the place of silence and allow inner knowledge to emerge
- Co-creating: Prototype the new, in living examples, to explore the future by doing
- Co-evolving: Embody the new in ecosystems that facilitate seeing and acting from the whole

The Economics of Ecosystems and Biodiversity (TEEB): A global initiative started in 2008 focused on drawing attention to the economic benefits and impact of biodiversity, including the growing cost of biodiversity loss and ecosystem degradation. TEEB presents an approach that can help decision-makers recognise, demonstrate and capture the values of ecosystem services & biodiversity (SOURCE: TEEBWEB.ORG).

Three Zones Model: Commonland's proposed way of receiving 4 returns is by designing three landscaping zones: a natural zone, an eco-agro mixed zone and an economic zone as developed and used by Commonland (SOURCE: COMMONLAND).

Vegetation cover: A general term for the plant life of a region; it refers to the ground cover provided by plants, and is the most abundant biotic element of the biosphere.

Up-scaling: To efficiently increase the socioeconomic impact from a small to a large scale of coverage (SOURCE: WORLD BANK, 2003).

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FIGURES

FIG. 1. Adaptation of the nine Planetary Boundaries in relation to a safe and just space for humanity.

FIG. 2. Rethinking sustainability; we need a shift from a linear understanding of finance and business activity to one that is holistic, systemic and cyclical.

FIG. 3. Ecosystem degradation in Kasungu National Park (Malawi); an abandoned tobacco field discovered during a patrol. Encroachment and tobacco farming lead to localised loss of biodiversity and topsoil cover that takes decades to recover. (PHOTO: DOMINIQUE NOOME).

FIG. 4. Ecosystem degradation in the Gundar river basin Tamil Nadu (India), caused by the removal of the vegetation cover by deforestation and overgrazing the last 50 years. It resulted in water scarcity, topsoil loss, biodiversity loss, migration and decrease of agricultural productivity.

FIG. 5. China: with Robinia rehabilitated hills of the Loess Plateau near Yan'an. The restoration has resulted in an increase of apple cultivation.

FIG. 6. Uncontrolled grazing like here in Southern India is an important cause of landscape degradation in many drylands.

FIG. 7. Forest and Landscape Restoration Opportunities (SOURCE: WORLD RESOURCES INSTITUTE).

FIG. 8. Before and after in Rajasthan, India. Collective efforts of local communities have restored grazing lands, reduced desertification and improved rainwater penetration. Vegetation diversity has increased and grass production increased from 1.1 tonne/ ha to 2 tonnes / ha, from top to bottom: February 2004, July 2009 and August 2014. (PHOTO CREDITS: FOUNDATION FOR ECOLOGICAL SECURITY).

FIG. 9. Different landscapes, different approaches. Each landscape calls for its own kind of restoration. Over time all kind of 'land use zones' were formed, often resulting in overgrazing and degradation, like here in the Andes of the Quilotoa region, Ecuador.

FIG. 10. El Salvador, Suchitoto: deforestation, unsustainable grazing and burning degraded the forest ecosystem functionality and productivity.

FIG. 11. Theory U: Collective awareness, strategic approach and collective action. (SOURCE: THE PRESENCING INSTITUTE MIT AND LIVING LANDS).

FIG. 12. Many proven restoration technologies exist.

FIG. 13. South Africa, Baviaanskloof: Gullies and degraded land causes by overgrazing of goats and cattle.

FIG 14. Argentina: Laguna Blanca. Agro-ecology farm of former degraded agricultural lands restored by restoring the ecosystem functions, maintaining and connecting the left-over indigenous forests, active soil restoration leading to a biodiversity increase. (PHOTO CREDIT: TOMPKINS CONSERVATION).

FIG. 15. Indonesia: Mangrove restoration in Banten Bay Offset Project. (PHOTO: SANDER CARPAY, WETLANDS INTERNATIONAL).

FIG. 16. India: people in Tamil Nadu have drawn maps to show how the restored water tanks and watersheds in their county are connected to agriculture and forestry and restore the landscape. With support of the Dahn Foundation, Madurai.

F**IG. 17.** Educating a next generation business leaders at business schools by bringing in ecology at MBA level is an important step to create a Restoration Industrial Sector. (PHOTO: ROTTERDAM SCHOOL OF MANAGEMENT, ERASMUS UNIVERSITY).

FIG 18. Ecuador, Guamote: Farmers selling native products (potatoe and mashua, *Tropaeolum tuberosum* at the market. Farmers benefit most from landscape restoration and thus are considered the key stakeholder.

FIG. 19. An Ecosystem Restoration Partnership and Business Development. A business developer acts as dealmaker within an Ecosystem Restoration Partnership to make the best available combinations of stakeholders for implementing large-scale restoration projects based on a business proposition. An additional advantage is that business schools will learn to work with new sustainability models through the projects elaborated by this venture.

FIG. 20. Four losses per hectare as result of ecosystem degradation. (PHOTO CREDIT: BEN TEN BRINK, NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY).

FIG. 21. Three landscape zones. (Left to right: Natural Zone, Combined Zone, Economic Zone).

FIG. 22. A landscape in Eastern Cape (South Africa) where a three zoning model is used.

FIG. 23. The result of a using the 4 returns model and Theory U at landscape level with a farmers community in Andalusia, Spain.

FIG. 24. The 4 returns restoration business case: matching the interests of companies, investors, people and local organisations to scale-up the restoration of degraded ecosystems.

FIG. 25. Stage gate approach from 'restoration ready' to 'investor ready' projects.

FIG. 26: Angora Goats in the Baviaanskloof (South Africa) were the cause of much overgrazing.

FIG. 27. Visualisation of the landscape potential after restoration with photographs and videos is part of the stakeholder-engagement process to actively involve farmers in participation in restoration activities (PHOTO CREDIT: FOUR RETURNS DEVELOPMENT COMPANY, SOUTH AFRICA)

FIG. 28. Altiplano de Vélez, Andalusia, Spain.

FIG. 29. Integrated Productive Ecosystem for Large Scale Restoration based on Business Cases.

TABLE 1. Estimated returns from ecosystem restoration
(THE ECONOMY OF ECOSYSTEMS AND BIODIVERSITY, TEEB, 2009)

TABLE 2. Maximising 4 returns per hectare.

BOX 1 Chinese Loess Plateau Watershed Rehabilitation Project

BOX 2 Definitions of Ecosystem or Landscape Restoration from literature

BOX 3 Action 2020 of the World Business Council on Sustainable Development – targets

BOX 4 The Declaration of Interdependence of B Lab is based on a holistic approach

BOX 5 Key elements of the multi-criteria business case for ecosystem-restoration partnerships

The paper used for this book was granted the FSC label (inside) as well as the EU Ecolabel (cover)

4 returns, 3 zones, 20 years: a holistic framework for ecological restoration by people and business for next generations.

The notion that the current approach of maximisation of Return of Investment (ROI) per hectare leads to degradation of ecosystems, causing loss of biodiversity and topsoil, water scarcity and eventually loss of food, security and productivity, is well understood by experts. Restoring and conserving ecosystems, and preventing their decline has been identified as one of the most important tasks of our time.

Awareness is growing that the connection between healthy ecosystems, food, security, water, climate and economy needs a business approach with a long-term focus in sync with the sense of inner purpose of all involved.

How can we restore those millions of degraded hectares? Multi-stakeholder Ecosystem Restoration Partnerships with local land owners and users, investors, businesses and governments are the answer. They bring together finance, local knowledge, business rationale and science. Long-term partnerships are a requirement for the successful execution of the work that needs to be done. Innovative consortia of frontrunners in the investment world, companies, farmers, foresters, local entrepreneurs and ecologists are already taking the first steps towards the creation of a 'restoration industry'. To further enable this process a common language and framework is needed that all stakeholders understand.

The 4 returns, 3 zones, 20 years methodology, as proposed in this paper, provides a holistic framework to ensure the productive involvement of both the private and public sector in ecological restoration efforts. It creates a general understanding between all stakeholders and builds bridges on ecosystem level. The 4 returns model can serve as a guideline for all working towards creating the restoration industry.

Willem Ferwerda is Executive Fellow Business & Ecosystems at Rotterdam School of Management, Erasmus University (The Netherlands) and Special Advisor Business and Ecosystems at the IUCN Commission on Ecosystem Management (Gland, Switzerland). He is initiator and CEO of Commonland.

Rotterdam School of Management, Erasmus University (RSM)

Mandeville Building T11-56
Burgemeester Oudlaan 50
3062 PA Rotterdam
The Netherlands
Tel. + 31 10 408 1582
Email ecotrans@rsm.nl

WWW.RSM.NL

IUCN Commission on Ecosystem Management

Rue Mauverney 28
1196, Gland
Switzerland
Tel. + 41 22 999 0000
Email cem@iucn.org

WWW.IUCN.ORG

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