UNCCD

UNCCD United Nations Convention to Combat Desertification
THE GLOBAL MECHANISM

2nd Scientific Conference UNCCD

ELD THE ECONOMICS OF LAND DEGRADATION

REAPING THE REWARDS

FINANCING LAND DEGRADATION NEUTRALITY

With an expected 9.5 billion people living on earth by 2050, population pressure, higher consumer expectations and climate change will tax and degrade our natural resource base, especially the land. Land degradation puts the livelihoods of billions of people at risk. It threatens the future sustainability of the entire planet. Land degradation is not a stand-alone issue however. It is closely linked to job creation, food and water security, migration and urbanization, climate change mitigation and adaptation, economic competition and resource conflict. From the local to the global level, efforts to create healthy and resilient landscapes are being increasingly recognized as crucial for economic growth and prosperity. In fact, healthy terrestrial ecosystems can contribute significantly to the delivery of multiple, priority developmental goals.

With an increasing awareness of the potential of land to meet public and private development goals, land is being seen as an ever more attractive investment vehicle. As highlighted by the Second UNCCD Scientific Conference in 2013 , current investments in land management and landscape planning though rarely take into account the costs and benefits of land degradation or sustainable land management (SLM). SLM can be profitable at all scales with more immediate returns at smaller scales, and increasing rates of return for larger scale concerns in the medium to long-term. To realize their full and true value for society and investors alike, land-based investments must become smarter and more effective; integrated and planned at the landscape level.

The vision for financing sustainable development outlined in this brochure seeks to leverage the long-term potential of human, financial, and natural capital to improve the health and productivity of land and soil, and to serve as a catalyst for making progress towards many of the Sustainable Development Goals (SDGs). It makes a compelling case, in particular, that by investing in land degradation neutrality, we can reap significant rewards.

Monique Barbut
UNCCD Executive Secretary

THE RISING COSTS AND RISKS ASSOCIATED WITH "BUSINESS AS USUAL"

As a result of poor management practices and contrary to logic; finance and investment in food production has been one of the main drivers of land degradation by transforming natural ecosystems and favoring short-term profits over long-term sustainability. For all sectors that rely on the land, "business as usual" comes with rising costs and new risks. Risks we cannot afford in the post-2015 world.

Over the past 50 years, advances in agricultural technologies have led to a quantum leap in the production of a limited basket of basic foodstuffs. At the same time, poor land management, fueled by exploitation for short-term economic gains, led to a loss of nearly one-third of the world's arable land, a trend that is continuing at a rate of more than 10 million hectares per year.[1]

Current estimates associated with global land use change between 1997 and 2011 value the loss of ecosystem services within a range of USD 4.3 to 20.2 trillion per year.[2] The global cost of land degradation amounts to nearly USD 66 billion per year.[3] In certain regions, such as Sub-Saharan Africa, the figure can represent as much as 10% of the national Gross Domestic Product (GDP).[4] Given that over 40% of the world's poor depend on degraded lands for essential services, such as food, fuel, raw material, and water purification, restoring productive capacity of the land could lead to significant strides in decreasing economic vulnerability and promoting long-term development.[5]

In addition to the directly tangible value related to the use of land and its resources, land-based ecosystems and their management can have substantial off-site ripple effects.

For one, poor land management and the subsequent scarcity of usable land and its resources can create substantial economic insecurity that could lead to widespread political and even cross-boundary military conflict. Over the past sixty years, at least forty percent of all intrastate conflicts can be associated with natural resources.[6] In 2008 more than 60 food riots occurred worldwide in 30 different countries, 10 of which resulted in multiple deaths.[7] In contrast, good land and natural resource management can provide opportunities for confidence-building measures, serve as models of effective and equitable governance, and advance other peace-building objectives.[8]

The role of land-based ecosystems in natural disaster response is also particularly telling. With increasing climate variability, natural disasters are becoming both more extreme in their nature and more dangerous in their effect. Between 2000 and 2014 alone, nearly USD 2.5 billion of humanitarian aid was used for emergency response and recovery in the agriculture sector.[9] Conversely, healthy land provides effective, resilient protection against flooding, landslides, and erosion. Terrestrial ecosystems also decrease recovery time in soil productivity, thereby ensuring more stable access to resources for the affected population and lowering the vulnerability factor.[10]

Poor investment choices can push up costs for a global society. These are costs which we cannot afford and should not pay in the post-2015 world.

A new vision is emerging for the post-2015 world. Countries, communities and corporations are now ready to make important commitments that would substantially increase investments in SLM and ecosystem rehabilitation. A good example of this positive trend is the increasing momentum that various forest and landscape restoration initiatives are generating across the globe, including the Bonn Challenge [11], New York Declaration on Forests,[12] Initiative 20x20,[13] or the Action 2020 by the World Business Council for Sustainable Development.[14]

Moving forward, the expected Sustainable Development Goal (SDG) targets on land, particularly under proposed goal 15, aim to progressively improve land and soil productivity and achieve land degradation neutrality are indicative of the urgent need to prioritize investments in order to recover healthy and productive land resources on a global scale.

The kind of investments needed to achieve integrated and sustainable land management have already been proven to be much more cost-effective than the resources needed to mitigate the negative consequences of inaction. (See for instance case study 4 on p. 13)

In monetary terms, restoring just 12% of degraded agricultural land could boost smallholder's incomes by USD 35-40 billion per year and feed 200 million people per year within 15 years. It can also increase resilience to water shocks and reduce greenhouse gas emissions by nearly 2 $GtCO_2$-e per year.[17] Estimates by the Economics of Land Degradation (ELD) initiative further suggest that the adoption of SLM policies and practices could deliver up to USD 1.4 trillion in increased crop production. [18]

Box 1 : Land Degradation Neutrality at a Glance

LDN was born out of the United Nations Conference on Sustainable Development (Rio+20) and is based on the critical idea that the cost of action is significantly lower than the cost of inaction. At the heart of the LDN target are Sustainable Land Management (SLM) practices that help to close yield gaps and enhance the resilience of land resources and communities that directly depend on them while avoiding further degradation.

Land Degradation Neutrality can be understood as a state where the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases. This can happen within different scales and ecosystems. It can occur naturally or due to better land management. [16] It is really the combination of avoiding or reducing the rate of land degradation and increasing the rate of recovery

BOX 2: SLM

The ultimate objective of SLM practices, whether conservation agriculture, agro-forestry or integrated livestock management, is to improve livelihoods (e.g. incomes, human health) and sustainably intensify production through the more efficient use of resources. SLM practices are suitable for virtually all land use systems and climate regions, and applicable at both small and large scales.

In order to achieve many of the SDG targets on food, water and energy, our working landscapes need to remain healthy and productive. Investing in SLM can be a low-risk proposition considering the multiple functions of the land and its long-term productive capacity in relation to overall investor portfolios and the universal desire for economic growth and improved livelihoods.

The cost of adopting and scaling up SLM practices varies depending on the specific agro-ecological context, the extent and degree of degradation and the socio-economic conditions and opportunities that drive the use of and the demand for land resources. As a result, there is often a wide range of cost estimates for implementing management practices that improve land and soil productivity. The same principle applies to the cost of restoring or rehabilitating degraded land. It is context-specific and is dependent on a number of factors, primarily the land's current state, desired state and the management practices employed.

Box 3: Cost variability could depend on:

- The type, degree and extent of land degradation, which characterizes the state of biological and/or economic productivity and complexity (e.g. salinization, soil nutrient deficiencies, loss of biological diversity, physical and hydrological transformations) and determines its capacity for and speed of recovery;
- The desired outcomes of restoration, for example, to recover primary productivity and other targeted ecosystem services in agro-ecosystems or to return the land to its natural or semi-natural state, such as woodlands or grasslands, in order to regain a full suite of services over the long term;
- The type of land management practices employed (both initial and ongoing) given the current state (e.g. natural regeneration, agro-forestry, livestock enclosures, direct planting/seeding) and whether these are labor or capital intensive, and dependent on external investment or expertise.

A recent analysis of 363 case studies compiled by World Overview of Conservation Approaches and Technologies (WOCAT) network, presented at the second UNCCD scientific conference, suggests the range for the establishment costs to vary from USD 20 to over USD 4000 per hectare,[19] and for the maintenance costs[20] from USD 22 to USD 286 per hectare per year.[21]

At the high end of the spectrum of costs lie the technologically-intensive measures that involve water-controlling structures, such as the construction of dams, runoff canals and related erosion management structures. However, in half of the cases studied, the cost of ongoing maintenance ran below USD 89 per hectare showing a great potential for relatively low-tech SLM practices with significant co-benefits in return,[22] indicating that financing for scaling up could be feasible even with existing investment pools.

Tabel 1: Overview: Establishment and maintenance cost of SLM

Cost range (363 case studies)	Establishment USD/ha	Maintenance USD ha/yr
High end	4000	286
Median	470	89
Low	20	22

Box 4: SLM and opportunity cost

There are two important dimensions to the cost of SLM though: one is its implementation in terms of initial and ongoing expenditure (e.g. planting and maintenance), the other being the opportunity cost (i.e. short-term trade-offs) of revenue foregone as a consequence of introducing these practices. To overcome investment barriers, credit programmes or restricted but subsidized input programmes are generally considered appropriate. However, as the transition from industrial agricultural practices to SLM practices may involve lower productivity and marketability of produce in the short term, especially for smallholder agricultural producers, there may be an opportunity cost for the adopter. To overcome the opportunity costs, a broader range of instruments backed by public sector support may be required. Activities might include: upfront payments for environmental services to be delivered in the long term through adoption or measures to increase the returns to income during the transition through marketing improvements or development of alternative income sources.[23]

Table 2: Examples of establishment and maintenance cost of SLM interventions across regions

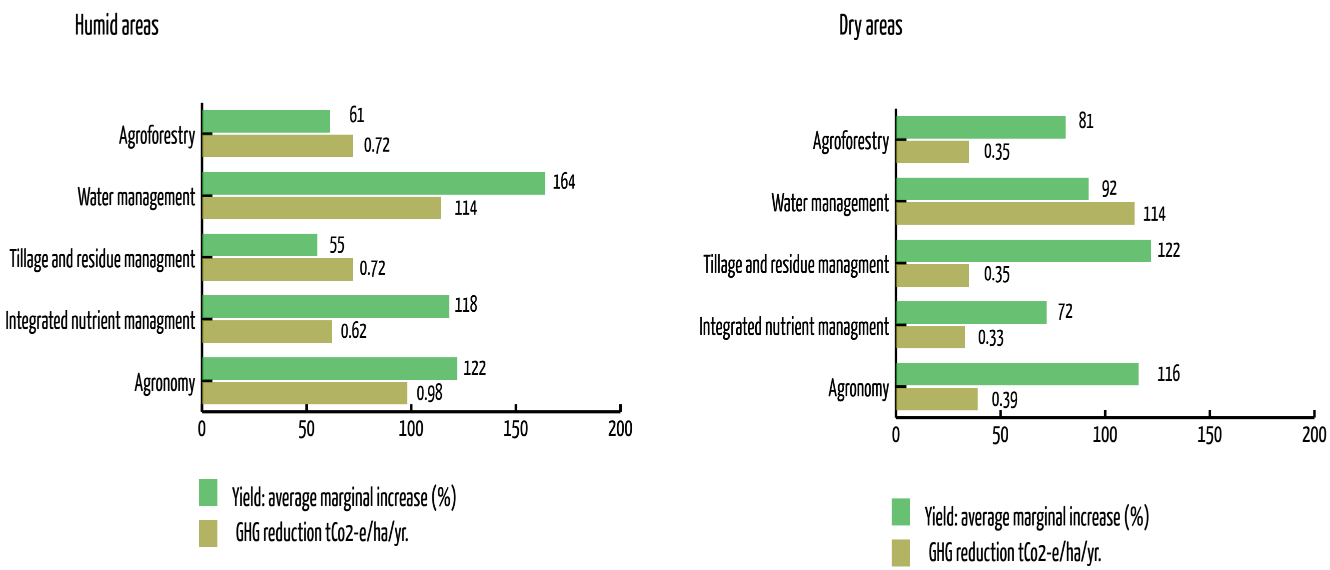
Technology Oprions	Case Study	Establishment cost USD/ha	Average maintenance costs USD/ha/year
Improved Cropland Management Using various SLM practices	Reduced tillage of almonds and olives, **Spain** [24]	0	-97
	No-till with controlled traffic, **Australia**[25]	5	111
	Zai, **Burkina Faso**[26]	12	30
	Soil-protective minimal technology of the tillage and sowing, **Kazakhstan**[27]	90	90
	Intensive agroforestry system (high input, grass barriers, contour ridging), **Colombia**[28]	1285	145
	Roof rainwater harvesting system, **Botswana**[29]	2012.5	12.5
Improved pasture and grazing management Using various SLM practices	Controlled grazing in deciduous woods as an alternative to grazing on rangeland, **Italy**[30]	100	75
	Rotational grazing, **South Africa**[31]	105	27
Restoration of degraded land Using various SLM practices	Farmer Managed Natural Regeneration, **Niger** [32]	6	4
	Restoration of degraded rangeland , **South Africa**	230	32[33]
	Rehabilitation of degraded lands, **Ethiopia**[34]	420	101.30
	Woven wood fences, **Turkey**[35]	1350	110
	Afforestation for rehabilitation of degraded irrigated croplands **Uzbekistan** (Agroforestry)[36]	3547.10	278

Healthy and resilient land ecosystems contribute to delivering development goals. From the local to the global level, efforts to create healthy and resilient land related ecosystems are helping to deliver economic growth and prosperity. Investments in the rehabilitation and restoration of ecosystems or the associated conservation measures have the ability to deliver multiple benefits for food and water security, climate change mitigation, poverty eradication and human well-being, particularly when using a landscape approach.

Food Security: The demand for agricultural products is expected to rise in the following decades, requiring up to 70% increase in world food production in 2050 when compared to levels in 2005. To make matters worse, agricultural production, including access to food, in many African countries and regions is projected to be severely affected by climate variability and change that could lead up to 50% reduction in crop yields for rain-fed agricultural crops by 2020.[37] To counteract this trend, sustainable, resource-conserving, and low-external input techniques have been successfully employed to significantly improve yields. In what may be the most systematic study of the potential of such techniques to date, Pretty et al. (2006)[38] compared the impacts of 286 recent sustainable agriculture projects in 57 developing countries covering over 37 million hectares. They found that such interventions increased productivity on 12.6 million farms, with an average crop increase of 79%, with a potential of 128% for projects in East Africa. *See also case studies no. 1/4/8/10/11*

Climate Change mitigation:[39] Rehabilitation of degraded land or better land management using SLM practices can help mitigate climate change by either reducing Green House Gas (GHG) emissions or by sequestering CO_2 from the atmosphere in the soil and biomass. The rehabilitation of degraded landscapes for instance could sequester up to four tCo_2-eq/ha/yr.[40] while application of improved SLM techniques reduces or stops soil erosion, thus converting carbon losses into gains. To a large extent, land use changes needed to generate climate change mitigation are the same as those that improve agricultural productivity and increase system resilience, at least in the long run (see Figure 1). *See also case studies no. 1/9/11*

Figure 1: Compound benefits of SLM practices[41]



Water security: Improved land management and the rehabilitation of degraded landscapes also increases water storage and infiltration, reducing loss through runoff and leading to greater water availability in the soil. Actions to improve water resources management also bring considerable economic gains. An investment in the amount of USD 15–30 billion into improved water management in developing countries can have direct annual returns in the range of USD 60 billion. Every USD 1 invested in watershed protection can save anywhere from USD 7.5 to nearly USD 200 in costs for new water treatment and filtration facilities.[42] Heavy upfront investment is not vital. Small changes in the existing technology or equipment, such as low-cost buckets and drip lines, or changes in the current practices, such as ground water recharge and adopting alternative water harvesting systems, have been shown to improve the livelihoods of the poorest of farmers and substantially increase productivity gains.[43] *See also case studies no. 3/6/9*

Disaster mitigation and risk prevention: Restoring degraded ecosystems and land resources can also be an important tool to improve the quality of life in both urban and rural areas and protect people against natural disasters.[44] The sustainable management of land and watersheds for example are part and parcel of resilient ecosystems that reduce the risks of droughts and floods. In many cases investing in natural solutions can even offer cost-efficient ways to mitigate the impacts of natural disasters when compared to input- and cost-intensive solutions.[45] Initiatives in soil and water conservation implemented in various disaster-prone regions in Africa have demonstrated a yield in benefits ranging from USD 2.3 to USD 13.2 for every dollar invested.[46] Beyond the monetary cost-benefit ratio, these preventative measures also deliver long-term development gains well beyond the immediate humanitarian assistance. *See also case studies no. 5/6/9/12*

Poverty Reduction: Sustainable land management and the subsequent greening of agricultural production reduce poverty, diversify incomes and create new employment opportunities. On average, the contribution of agriculture to raising incomes is estimated to be at least 2.5 times higher than that of non-agriculture sectors in developing countries. In addition, green agriculture directs a greater share of total farming input expenditures towards the purchase of locally-sourced inputs, thereby catalyzing the potential for a local multiplier effect. Overall, green agricultural practices tend to require more labor inputs than conventional farming, creating jobs in rural areas and a higher return on labor inputs, which in turn reduces the pressure of rural migration to overcrowded cities.[47] *See also case studies no. 2/4/5/8/10/11*

Map 1: Unlocking the benefits of sustainable land management[48]

CASE STUDY 1 Land rehabilitation and sustainable land management for Climate Change mitigation, Kenya[49], Germany,[50] Brazil[51]

BENEFITS:

Kenya Agricultural Carbon Project: 40,000 smallholders in western Kenya adopted a variety of sustainable agriculture practices including soil conservation and forestry. In 2014 the project achieved a reduction of 24,788 metric tons of carbon dioxide, which is equivalent to emissions from 5,164 vehicles in a year and farmers' yields increase by up to 15-20%.

Mecklenburg- Vorpommern, Germany: 30,000 hectares of peatland were restored over the period 2000 to 2008, leading to emission savings of up to 300,000 t CO_2-equivalent at an avoidance cost of CO_2 8 to 12 EUR/t CO_2.

Sao Paulo, Brazil: Natural forest will be restored on approximately 5,576 ha of land around four reservoirs created by hydroelectric plants. This is expected to sequester 0.67 Mt CO_2 -e by 2012 and 1.66 Mt CO_2-e by 2017 along with increasing critical habitats and creating vital wildlife corridors, connecting the newly forested lands with existing conservation.

CASE STUDY 3 Working for Water, cost benefit analysis of sustainable watershed restoration and management, (cost benefit analysis), South Africa[53]

RESULTS:

Costs to rehabilitate catchments range from EUR 200 to EUR 700 per hectare while benefits may reach a 40 year NPV of EUR 47,000 per hectare (using the benefit transfer approach and a 1% discount rate).

CASE STUDY 5 Shinyanga Soil Conservation Programme (HASHI), Tanzania [55]

BENEFITS:

Reinstatement of the ngitili system on more than 350,000 hectares of degraded woodlands

Ecosystem restoration process that enhanced livelihoods and created a vital safety net during dry seasons and droughts.

The total monthly value of benefits is estimated at USD 14 per person, considerably more than the national monthly average consumption level per person of USD 8.50 in rural areas.

CASE STUDY 6 Sustainable management and conservation of land resources for ecosystem services New Zealand[56], Venezuela[57], U.S.A. [58], Finland[59]

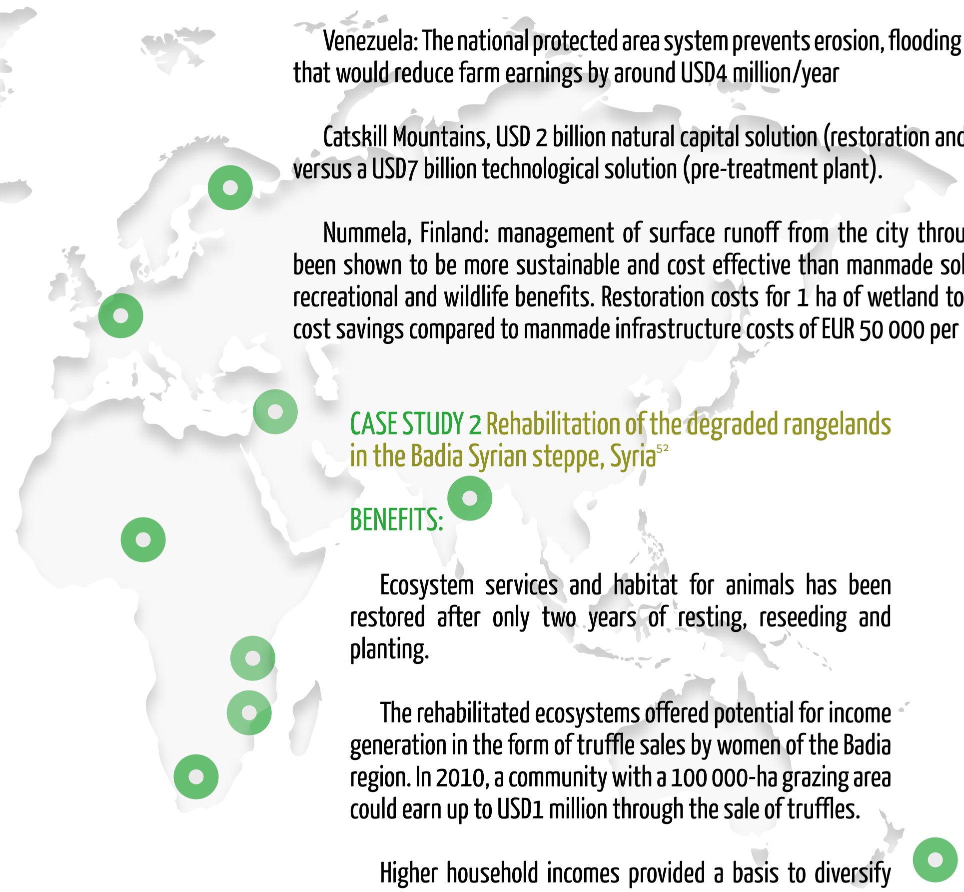
BENEFITS:

New Zealand: The Central Otago conservation area (Te Papanui Catchment) saved the city of Dunedin approximately USD 65 million in water supply costs .

Venezuela: The national protected area system prevents erosion, flooding and water supply fluctuation that would reduce farm earnings by around USD4 million/year

Catskill Mountains, USD 2 billion natural capital solution (restoration and maintenance of watershed) versus a USD7 billion technological solution (pre-treatment plant).

Nummela, Finland: management of surface runoff from the city through wetland restoration has been shown to be more sustainable and cost effective than manmade solutions, as well as providing recreational and wildlife benefits. Restoration costs for 1 ha of wetland totaled EUR 62 000, providing cost savings compared to manmade infrastructure costs of EUR 50 000 per 100 metres



CASE STUDY 2 Rehabilitation of the degraded rangelands in the Badia Syrian steppe, Syria[52]

BENEFITS:

Ecosystem services and habitat for animals has been restored after only two years of resting, reseeding and planting.

The rehabilitated ecosystems offered potential for income generation in the form of truffle sales by women of the Badia region. In 2010, a community with a 100 000-ha grazing area could earn up to USD1 million through the sale of truffles.

Higher household incomes provided a basis to diversify income-earning opportunities for women through literacy classes and training courses in new skills such as first aid, food processing and sewing.

CASE STUDY 4 Land degradation: Cost of action versus cost of inaction (simulation), India and Niger[54]

RESULTS:

India: About 2 % of crop area in India is affected by salinity, which can reduce rice yields by as much as 22 %. The model projected that the cost of desalinization mechanisms such as staggered leaching (using more water to avoid excess salt buildup) was estimated at only 60 % of the costs of inaction, resulting in long term economic savings and increased productivity.

Niger: Soil nutrient depletion, overgrazing, and salinity in irrigated plots are major land degradation problems in Niger, which costs the country approximately 8 % of its GDP in agricultural loses. The model demonstrated that the cost of preventing salinity in irrigated rice is only 10 % of the cost of inaction per hectare, and the cost of preventing overgrazing is just 20 % of the cost of allowing overgrazing to continue.

CASE STUDY 10 Conservation agriculture, comparison of financial profitability over 10 years, Paraguay[63]

BENEFITS :

Net farm income had risen on the Conservation Agriculture farms from under USD 10 000 to over USD 30 000, while on conventional farms net farm income fell and even turned negative.

Agricultural plots with conservation methods showed the following benefits:

Decrease in soil erosion, improvements in soil structure and an increase in organic matter content, crop yields and cropping intensities;

Reduced time between harvesting and sowing crops, allowing more crops to be grown over a 12-month period;

Decreased tractor hours, farm labour, machinery costs, fertilizer, insecticide, fungicide and herbicide;

Reduced economic vulnerability due to higher and more stable yields and diversification into other cash crops.

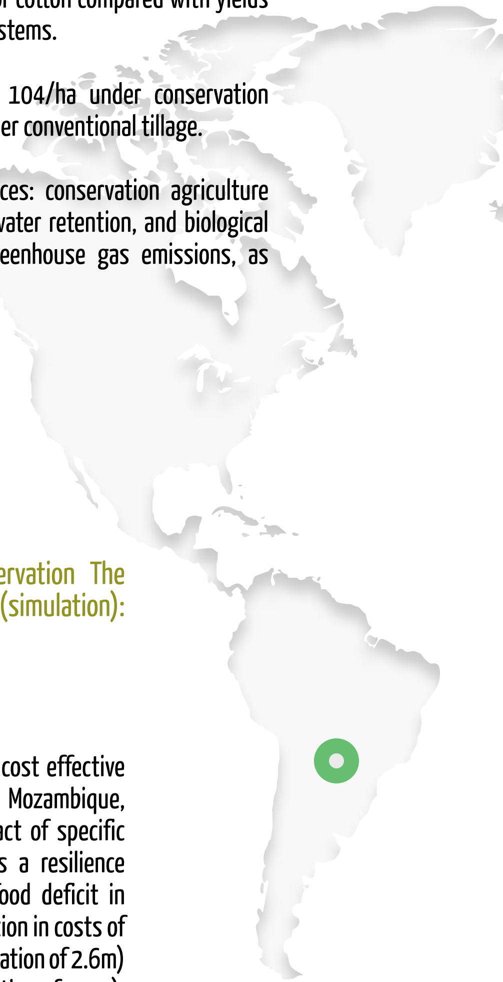
CASE STUDY 11 Conservation Agriculture, Zambia[64]

BENEFITS

Increased agricultural output: yields doubled in maize plots and were 60 % higher for cotton compared with yields under conventional plowing systems.

Higher return rates: USD 104/ha under conservation agriculture and USD 19/ha under conventional tillage.

Improved ecosystem services: conservation agriculture has improved soil structure, water retention, and biological activity, and has reduced greenhouse gas emissions, as residue is not burned.



CASE STUDY 12 Soil and water conservation The Economics of Early Response and Resilience, (simulation): Niger and Mozambique[65]

RESULTS:

Early response and resilience are far more cost effective than late humanitarian response. In Niger and Mozambique, the modeling incorporated the cost and impact of specific initiatives in soil and water conservation as a resilience building measure, to model the change in food deficit in household economies. The impact was a reduction in costs of USD 375 m in Mozambique (for a modeled population of 2.6m) and USD 844 m in Niger (for a modeled population of 5.2m). The benefits of investing in resilience consistently outweigh the costs, yielding benefits ranging from USD 2.3 to USD13.2 for every dollar invested.

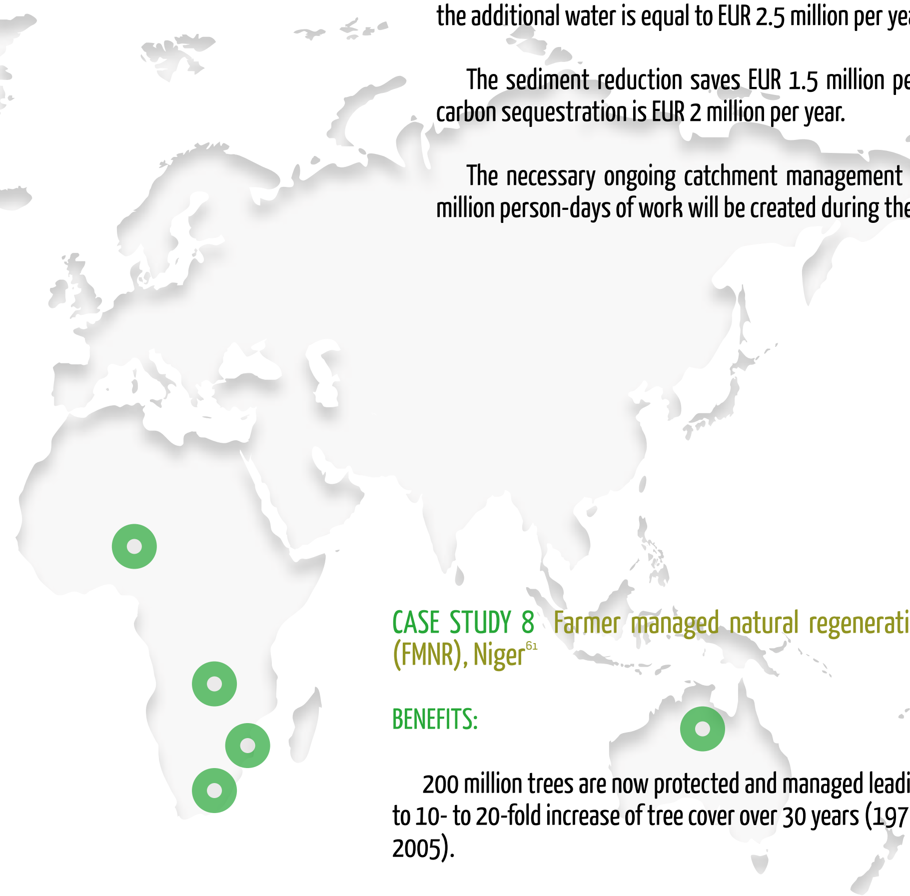
CASE STUDY 9 Rehabilitation of degraded grasslands and riparian zones in the Drakensberg mountains, Africa[62]

BENEFITS

While the sale value of the water is approximately EUR 250,000 per year, the economic value added of the additional water is equal to EUR 2.5 million per year.

The sediment reduction saves EUR 1.5 million per year in costs, while the value of the additional carbon sequestration is EUR 2 million per year.

The necessary ongoing catchment management will create 310 permanent jobs, while about 2.5 million person-days of work will be created during the restoration phase.



CASE STUDY 8 Farmer managed natural regeneration (FMNR), Niger[61]

BENEFITS:

200 million trees are now protected and managed leading to 10- to 20-fold increase of tree cover over 30 years (1975–2005).

After 20 years real farm incomes had doubled on 900.000 farms (an addition of roughly USD 1000 per household or USD 180 per hectare,) soil fertility had improved to boost grain yields by 10% on average, and biodiversity had significantly improved.

CASE STUDY 7 Restoration of eucalyptus woodlands and dry forests (cost benefit analysis), Australia[60]

RESULTS:

Cost for the restoration range from EUR 285 per hectare for passive restoration to EUR 970 per hectare for active restoration. Using a benefit transfer approach and a discount rate of 1% over 40 years these services may constitute a Net Present Value (NPV) of more than EUR 13,000 per ha.

Business as usual is no longer an option.

As the global map of land restoration case studies shows, an investment in the environment is an investment in development. Governments and financial institutions can realize the full value of investing in land to enhance the flow of ecosystem services while simultaneously reclaiming degraded land, lowering greenhouse gas emissions and sustainably boosting crop production.

Attaining land degradation neutrality requires us to see the bigger picture. The way we currently manage our land is too fragmented. This fragmentation undermines social and economic development in all regions. Achieving Land Degradation Neutrality would be a real game changer and an opportunity for systemic change. LDN requires interventions and investments that go beyond our existing siloed approaches.

Instead, SLM interventions needed to be systematically mainstreamed into priority strategies.[66]

As the graphic shows there are numerous funding streams and mechanisms both domestic and with external finance that target issues like climate change, biodiversity, renewable energy, rural development or food and water security that could be tapped to scale up financing for SLM.

Table 3: Investment mechanisms available for integrated and sustainable land-based activities[67]

	Enabling Investment			Asset investment			
Investor	Governement	Donors Philanthropists	Rights-holders Product investors, Philanthropists	Private sector companies	Philanthropists	Banks	Private investors and equity funds
Vehicle	Projects, Policy	NGOs, Research & policy institutions	Small businesses Intermediaries	Capital Expenditure Research & Development	Capital investment	Financial services	Risk-adjusted return on capital
Mechanism	Public expenditure: Infrastructure Fiscal reform Regulatory reform Subsidies	Grants: Organisational & policy development Institutional reform	Enterprise Philanthropy Grants & seed funding to demonstrate validity of business model	Purchase of capital assets	Impact investment via equity, loans	Loans secured against assets	Investment via equity or loans
Output	Public good			Private Assets			

Land Degradation Neutrality certainly needs a sustainable financing strategy targeting both public and private sector actors. To optimize existing financing, the full spectrum of private and public financial institutions needs to be activated. Innovative mechanisms to unlock the new opportunities and potential of large scale land-based interventions will also be to our advantage.

Public resources should be focused on providing the right enabling environment. This environment should incentivize SLM related activities versus more conventional alternatives. Private sector actors would then provide the critical mass needed to make SLM practices the "new normal".

The private sector needs to be encouraged to see the two billion hectares[68] which still hold the potential for restoration and rehabilitation as a market opportunity. However, private land users, businesses and capital investors will invest in sustainable land use rather than unsustainable practices only when they are provided with the right enabling conditions, market based mechanisms and incentives.

To trigger and activate this switch an appropriate blending of investments will be required.

Enabling Investment: Triggering change

Soft investments have traditionally consisted of a mixture of policy, regulatory and institutional tools that are meant to generate incentives and put in place a supporting policy infrastructure to facilitate cost-effective investments in land. The willingness of governments to raise domestic funds or allocate development assistance for such investments is therefore a key factor for the prospects of SLM-finance as a whole.

For landscape-scale-actions, these are investments in stakeholder engagement and cooperation, the appropriate legal and regulatory framework, knowledge and capacity to plan and manage on a landscape scale and the development of incentive mechanisms for the private sector. The resources needed for such soft investments will typically come from public funds.

- Without any doubt, for LDN to be achieved appropriate resource rights and tenure systems must be in place. Secure property and resource access rights are needed for individual land users to invest in the long-term. The Voluntary Guidelines on the Responsible

Governance of Land Tenure, endorsed by the Committee on World Food Security in 2012 for instance, are an important first step to overcoming one of the greatest bottlenecks to adopting and scaling up investments in SLM practices.

•A lack of land managers and land-use planners with the necessary skills and capacity can also be a determining risk factor. Investments in extension services, technology and knowledge transfer mechanisms can help mitigate this.

•Finally, reaching LDN requires appropriate market-based incentive mechanisms that attract finance to land-based activities. These can include instruments such as first-loss protection and partial guarantees to shield investors from a pre-defined amount of financial loss, higher premiums for selling eco-certified products, payment for the provision of ecosystem services, or direct subsidies or taxes on certain practices. Incentives at the farm level can overcome the fact that farmers often lack access to the capital required to make the necessary changes.[69]

Asset investment: Changing the game at scale

Looking at land and achieving LDN from an asset investor's perspective, numerous land-based investment opportunities exist or can be created to generate tangible value with a profit to the investor or land manager while also contributing to social, environmental and developmental objectives.

Investments could flow into:

- sustainable agricultural production practices that reduce inputs and are land friendly such as improved irrigation systems or the switch to SLM practices that reduce fertilizer and pesticide use;

- the rehabilitation or protection of natural assets on public or private lands, such as the establishment and maintenance of protected areas, the rehabilitation of degraded land in dry or wetlands;

- improving environmental and social performance by raising production standards. Compliance with such standards can offer a significant business opportunity for producers by enabling them to receive price premiums for their products;

- large-scale green infrastructure. The creative use of green spaces and farmed areas provide water quality, waste processing and other essential services. Benefits can often include significant operational cost savings over the life of the infrastructure, and avoidance of costs to other businesses and communities.

There is enormous, so far, untapped potential for investors who are ready to innovate and create value. The good news is that if properly harnessed sufficient financial capital is available to meet investment needs. Both private and institutional investors[70] have an appetite for conservation finance, in particular for those financial products that offer wealth protection.[71]

The Global Mechanism of the UNCCD is designing a layered fund to attract investments in sustainable land use and land rehabilitation offering adequate risk and capital protection (see box).

Box 5: UNCCD in action: Land Degradation Neutrality Fund

The LDN Fund will promote the rehabilitation of a minimum of 12 million hectares of degraded land per year. It aims to leverage private finance and be an accelerator and amplifier of viable business models on rehabilitated land. The Fund will operate as a coordinated investment platform among private institutional investors, international finance institutions and donors.

The Fund aims to:

- generate revenue streams from sustainable production/use of rehabilitated lands
- contribute to the achievement of global and local food and water security by the year 2050
- mitigate climate change by sequestering up to 20% of CO_2 emissions by 2050
- increase the resilience of vulnerable populations, species and ecosystems to climate change and other stresses

The Fund will mobilize up to USD 2 billion per year in investments to generate market rate returns from sustainable production on rehabilitated land. Structured as a layered fund, with different classes of shares and notes to ensure adequate capital protection, the Fund will be launched with anchor investors and gradually evolve towards a full-fledged multi-layer platform. The Fund will mainly focus on direct-investment into large-scale rehabilitation. Large projects would constitute the majority of the total assets under management. However, small and medium sized projects will benefit from a dedicated stream of financing that might, for example, help strengthen business operations and value chains or support the creation of micro-credit programmes.

The value of terrestrial ecosystem goods and services goes beyond what the land provides for important sectors, such as food, water and forestry. Recognizing that trade-offs among competing land-use sectors such as agriculture, industry, urbanization and tourism are somehow inevitable; economic assessments and approaches to managing and investing in land resources should aim to understand the total range of values that are important to the entire society.

Investing in SLM is both an affordable and a low-risk proposition. More financing is needed to support scaling up of SLM but this can mostly come from existing sources. In the scaling up of SLM and achieving LDN, the public sector should focus on mainstreaming SLM into existing policies, providing the enabling environment and driving institutional and policy reform. In the future, new investments could be dominated by private funding.

10 recommendations:

- Economic assessments and approaches to managing land resources must capture the total range of values that are important to the entire society.
- Develop rigorous risk analysis tools to identify the risks of action and inaction and identify viable business models.
- Plan and coordinate sectoral investments and trade-offs at scale.
- Communicate the potential value of, and safeguards around, private sector involvement.
- Develop appropriate institutional structures that permit negotiation, democratic decision-making and trust-building between stakeholders.
- Progressively reduce subsidies that promote degrading practices for short-term gain.
- Improve the incentive structure for SLM, such as payment for the provision of ecosystem services, or direct subsidies or taxes on certain practices. Provide incentives at the farm level so farmers can access the capital required to make the necessary changes.
- Improve tenure and governance regimes to promote long term sustainable investment by land users.
- Use public finance to attract private investment through risk guarantees, seed capital and catalytic funding.
- Establish innovative financial mechanisms based on appropriate time horizons, scales and risk profiles.

Achieving land degradation neutrality is feasible, measurable and compelling. It has the potential to make real impact. To feed more people; provide opportunities for growth, restore natural ecosystems; address climate change impacts and build justice and security for the world's rural poor, sustainable land management should be the "new business as usual".

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