



THE LAND IN NUMBERS

LIVELIHOODS AT A TIPPING POINT



FOREWORD

Numbers can tell a compelling story. In this brochure, the numbers highlight how much we rely on productive land. Amongst other valuable services, land feeds our families, provides fresh water and powers our future ambitions. Much of the data collected here, however, demonstrate how close we are to pushing our relationship with the land to breaking point. The magnitude of the challenges and potential consequences of failing to implement bold action on land and soil, in terms of future social stability and economic development, should not be underestimated. The figures vividly illustrate that. For example,

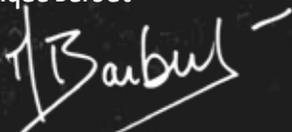
- 40% of all intrastate conflicts in the past 60 years are linked to natural resources.¹
- Over 70% of all countries in the world declare that climate change impacts – like land degradation and drought - are national security issues.²
- In 2008, more than 60 food riots occurred worldwide in 30 different countries, 10 of which resulted in multiple deaths.³
- Some 135 million people may be displaced by 2045 as a result of desertification.⁴

By securing land as vital natural capital, we can make a positive impact on food and water security while coping with a changing climate. By adopting sustainable land management practices, we can build the resilience of millions of people in each and every corner of the earth.

The numbers tell a story. From it, we can determine what we should do now in order to make land degradation neutrality a reality for us and for future generations.

We hope that you will find this brochure useful and inspiring.

Monique Barbut



Executive Secretary



LAND: THE HIDDEN STORE OF WEALTH

We often say that nature is priceless, however it is not valueless. It delivers goods and services that, far too often, we take for granted. A great bulk of ecosystem services are delivered by the world's finite land and soil resources. The most obvious services that land provides include the food we eat, the water we drink and the plant materials we use for fuel, building materials and medicines. There are also many less visible ecosystem services such as climate regulation and natural flood defences provided by land, soil and forests or the billions of tons of carbon stored underground.

- The surface of the earth is approximately 70.9% water and 29.1% land. ⁵
- Just 3% of the earth's water resources are fresh water. 70% of fresh water is used for agriculture. ⁶
- More than 75% of the earth's land (excluding Greenland and Antarctica) is already used by humans. ⁷
- Large-scale extraction of groundwater for irrigation leads to a sea level rise of 0.8 mm per year, approximately one fourth of the current rate of sea level rise of 3.3 mm per year. ⁸
- Humans obtain more than 99.7% of their food (calories) from land. ⁹



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- In 2008, there were 1,386 million hectares¹⁰ of arable land in the world.
- The soil's nutrient cycling provides the largest contribution (51%) of the total value (USD33 trillion) of all 'ecosystem services' provided each year.¹¹
- Healthy land and soil store and purify water. A fully functional hectare of soil can hold 3,750 tons of water.¹²
- Livestock production accounts for over 8% of global freshwater use¹³. Producing 1 kg of meat requires as much water as an average domestic household uses over a 10 month period (50 litres/person/day).¹⁴
- 40% of the world's population (up to 2.8 billion people) are now living in water-scarce regions and some 0.9 billion people lack access to safe water.¹⁵



EXPLODING NEEDS IN A RESOURCE FINITE WORLD

Productive land and soil are the basic building blocks for our lives and economies. They are our most precious natural capital resource, yet demand is spiraling out of control. The absolute minimum arable land required to sustainably support one person is 0.07 hectares¹⁶. In 1961, there was 0.45 hectares of land available to feed one person¹⁷. By 2011, the land has been reduced to just 0.20 hectares.¹⁸

There will be insufficient water available on existing croplands to produce food for the expected population of 9 billion in 2050 if the current dietary and management trends continue. With every product we consume, we also indirectly consume the land. How will we meet ever-increasing food demands when 52% of the land used for agriculture is moderately or severely affected by land degradation?¹⁹

- For an estimated world population of 9 billion in 2050, agricultural production must increase by about 70% globally and 100% in developing countries.²⁰
- If agricultural land productivity remains at its current levels, an estimated 6 million hectares of land (roughly equivalent to the size of Norway) would need to be converted to agricultural production every year until at least 2030 to satisfy the growing demand.²¹
- Total global water demand is expected to rise by 35 - 60% between 2000 and 2025, and could double by 2050.²²



Productive agricultural land is becoming an increasingly rare and valuable asset. More than 37 million hectares have been acquired by international investors.²³

- Competition over water resources could cause a global 18% reduction in the availability of water for agriculture by 2050.²⁴
- A 40% global gap between demand from economic development and supply of accessible and reliable water is expected by 2030.²⁵
- By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world's population (5.3 billion) could be living under water stressed conditions.²⁶
- Increased water scarcity could lead to annual grain losses of 30%.²⁷
- In 2030, biofuels could consume between 20% and 100% of current global agricultural water use.²⁸
- 20-30 million hectares of land are needed to meet the EU target of 10% biofuel use by 2020; 60% of its supplies are expected to be grown outside the European Union.²⁹

DO YOU KNOW YOUR LAND FOOTPRINT?

Every product comes from the land in one way or another. This consumption of land is often called "virtual land" because it is not visible in the final product.³⁰



1 car	150 m ²
1 kg beef	22 m ²
1 laptop	10 m ²
1 cup of coffee	4.3 m ²
1 burger with french fries and salad	3, 61 m ²
1 bicycle	3.4 m ²
1 liter milk	1.5 m ²

WASTE(D) LAND: LOST CAPITAL



Land resources are under pressure in the face of growing demand from an exploding population and the impacts of climate change. The ecosystems services that the land provides are at breaking point.

The numbers demonstrate that we are wasting our natural capital at an accelerating pace. Poorly-managed natural capital is not only an ecological liability but also a social and economic threat. The overexploitation of natural capital can be disastrous, and not just in terms of land degradation and desertification. The loss of ecosystem productivity and resilience makes many regions more prone to extreme weather events such as floods, landslides and droughts.

- 60% of all ecosystem services are degraded. ³¹
- Since the beginning of the 20th century, about 75% of the genetic diversity of agricultural crops has been lost. ³²
- 25% of the world's land area is either highly degraded or undergoing high rates of degradation. ³³
- Land use change and degradation is responsible for about 20% of carbon emissions globally. ³⁴



It is estimated that during the last 40 years nearly one-third of the world's arable land has been lost to erosion and continues to be lost at a rate of more than 10 million hectare per year.³⁵

- Over the last ten years, approximately 5.2 million hectares of forest has been destroyed each year.³⁶
- Land degradation over the next 25 years may reduce global food production by up to 12%, resulting in a possible 30% increase in world food prices.³⁷
- As a result of climate change, median crop yields may fall by 2% every 10 years for the rest of the century.³⁸
- By 2050, the number of people at risk of hunger as a result of climate change is expected to increase by 10 - 20% more than would occur without climate change.³⁹
- It is estimated that two-thirds of African land is already degraded to some degree and that land degradation affects at least 485 million people - 65% of the entire African population.⁴⁰
- By the 2050s, 50% of agricultural land in Latin America will be subject to desertification.⁴¹

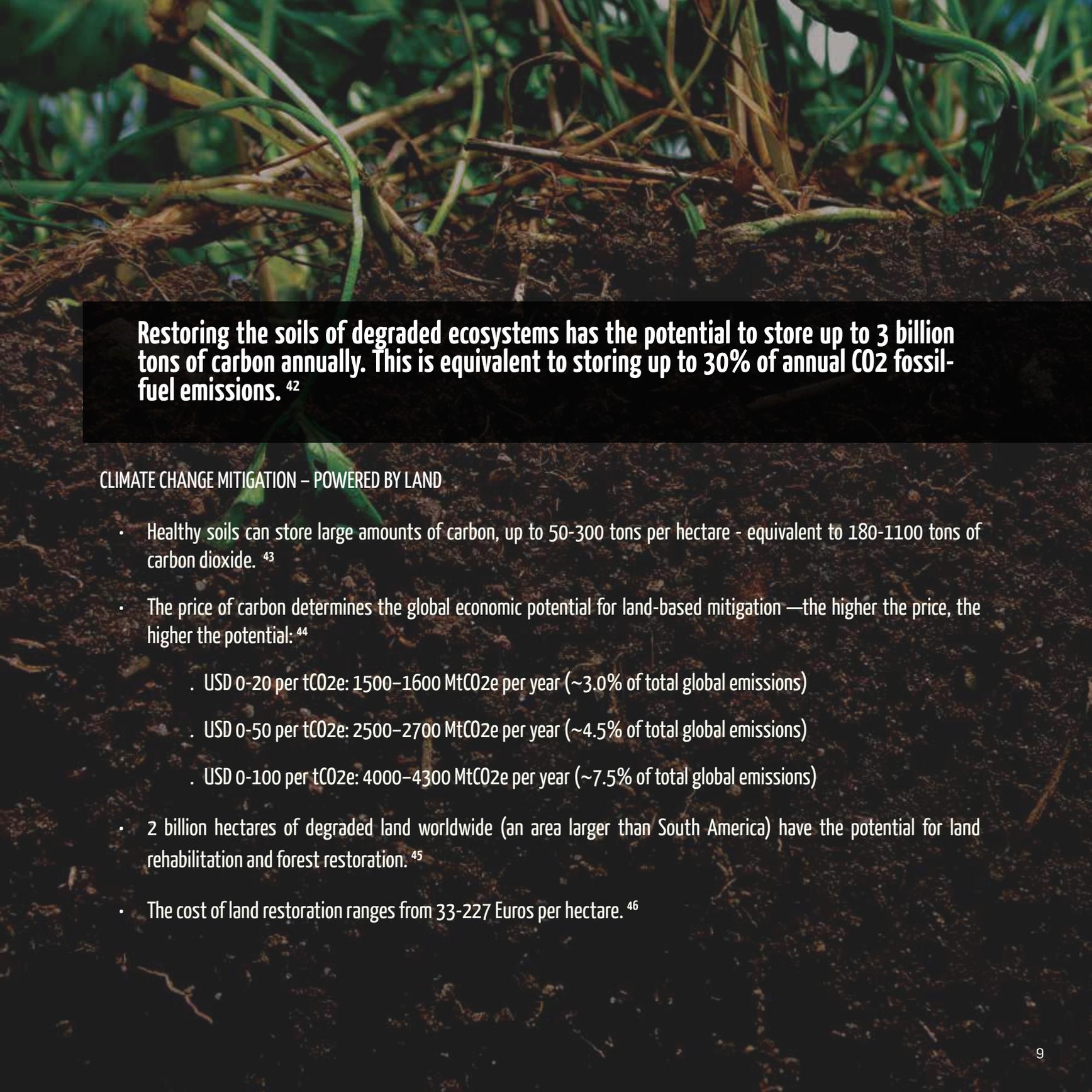


LAND DEGRADATION NEUTRALITY: FOR A FUTURE IN HARMONY WITH NATURE

When we spend too much money, we accumulate debt. Likewise, we run into debt when we over-exploit our stock of natural resources. It is this debt to nature that needs to be accounted for. By implementing sustainable land management practices, we can simultaneously protect our natural capital, help populations adapt to climate change and build resilience to drought. We would also reduce the risk of forced migration and conflict and would secure sustainable food and energy production. Halting and reversing the current trends in land degradation and desertification through sustainable land management (SLM) is not only achievable but is the logical, cost-effective next step for national and international development agendas. Committing to the goal of land degradation neutrality as an international community would generate huge benefits for every nation and every industry. If we can put our account with nature in credit by better managing the land, the land will offer us great opportunities in the future.

WHAT IS LAND DEGRADATION NEUTRALITY?

Land degradation neutrality can be defined as a state whereby the amount of healthy and productive land resources, necessary to support ecosystem services, remains stable or increases within specified temporal and spatial scales.

A close-up photograph of dark, rich soil with numerous plant roots extending downwards. Some green plant stems are visible at the top of the frame, partially obscured by the soil. The lighting is natural, highlighting the texture of the soil and the organic matter.

Restoring the soils of degraded ecosystems has the potential to store up to 3 billion tons of carbon annually. This is equivalent to storing up to 30% of annual CO₂ fossil-fuel emissions. ⁴²

CLIMATE CHANGE MITIGATION – POWERED BY LAND

- Healthy soils can store large amounts of carbon, up to 50-300 tons per hectare - equivalent to 180-1100 tons of carbon dioxide. ⁴³
- The price of carbon determines the global economic potential for land-based mitigation —the higher the price, the higher the potential: ⁴⁴
 - USD 0-20 per tCO₂e: 1500–1600 MtCO₂e per year (~3.0% of total global emissions)
 - USD 0-50 per tCO₂e: 2500–2700 MtCO₂e per year (~4.5% of total global emissions)
 - USD 0-100 per tCO₂e: 4000–4300 MtCO₂e per year (~7.5% of total global emissions)
- 2 billion hectares of degraded land worldwide (an area larger than South America) have the potential for land rehabilitation and forest restoration. ⁴⁵
- The cost of land restoration ranges from 33-227 Euros per hectare. ⁴⁶

SUSTAINABLE LAND MANAGEMENT: INCREASING YIELD - ENHANCING RESOURCE FLOWS

The impacts of land degradation and climate change are mostly felt at the local level – by households, individuals and communities. We need a simple approach that everyone can understand and follow.

Adaptation powered by the land is a good starting point because everyone can relate to it. We have simple and affordable techniques that can stop land degradation in its tracks; techniques that support the health of entire ecosystems and make them resilient to climate shocks.

Replicating these practices on a large scale would have a global impact. It would create employment in rural areas and transform once unproductive lands into fields of opportunity. This is why we advocate for land-based ecosystem adaptation. This is why land degradation neutrality is an achievable and desirable goal



In Zimbabwe, water harvesting combined with conservation agriculture increased farmers' gross margins 4-to-7-fold and increased returns on labour 2-to-3-fold compared to standard practices. These practices have had the greatest success in zones with lower rainfall. ⁴⁷



From 1991 to 2004, Brazil's grain production more than doubled, from 58 million tons to 125 million tons, as a result of the widespread adoption of conservation agriculture and the introduction of improved crop varieties. ⁴⁸



In China, the adoption of no-till systems for wheat production raised yields and reduced production costs, resulting in an average increase of 30% net economic returns over 4 years. ⁴⁹



60,000 smallholder farmers in western Kenya are benefiting from carbon credits generated by applying sustainable land management farming techniques. So far they have achieved a reduction of 24,788 Mt CO₂, which is equivalent to emissions from 5,164 vehicles in a year. By using SLM practices, some yields also increased by 15-20%.⁵⁰



Over 5 million hectares of degraded land in the Sahel have been restored through a practice known as 'farmer-managed natural regeneration'. This has resulted in an additional half a million tons of grain production each year and enough fodder to support many more livestock. To date, it has improved the food security of about 2.5 million people.⁵¹



Research in Malawi indicates that agroforestry practices generally increase yields from 1 tonne/hectare to 2-3 tonnes/hectare, even if farmers cannot afford inorganic fertilizers.⁵²



MORE FACTS FOR A BETTER FUTURE...

- Sustainable land management, including closing yield-potential gaps and reaching 95 % of potential maximum crop yields could result in an additional 2.3 billion tons of crop production per year, equivalent to a potential gain of USD 1.4 trillion.⁵³
- Improving land and water management on just 25% of sub-Saharan Africa's 300 million hectares of prime cropland would result in an additional 22 million tons of food or about 64 trillion calories.⁵⁴
- Sustainable land management can increase water productivity by up to 100%. Water use efficiency in multiple cropping systems is often 18%-99% higher than in single crop systems.⁵⁵
- Water harvesting is a sustainable and cheap option to improve water and food security. For example, a typical sand dam road crossing can enhance rural infrastructure and yield 50,000 litres of water/day.⁵⁶
- Conservation agriculture can reduce water run-off by 40-69%. This decreases herbicide, nitrate and soluble phosphate contamination of surface waters (by 70%, 85% and 65% respectively).⁵⁷

CONCLUSION

Globally, we face increasing demand for the goods and services that come from the land. As the population grows, we will clearly need more food and water. Demand will increase at a time when human activity and climate change will have diminished our freely-available natural resources – particularly our productive land and available water.

While land degradation affects the growth and development of all countries, it is the world's rural poor that suffer most. These numbers tell an eye-opening tale that is a critical lesson to humanity and our future. We have an opportunity to secure multiple benefits if we take appropriate action. Achieving land degradation neutrality, i.e. preventing land degradation and rehabilitating already degraded land, by scaling up sustainable land management and accelerating restoration initiatives is a pathway to greater resilience and security for all.

The UNCCD is working with Parties to the Convention, the public sector, businesses and civil society to raise the profile of land and soil in order to better protect these vital assets.

Each decision about how we manage the land counts. The numbers make this clear. It is time to choose. It is time to act.



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