United Nations
Convention to Combat
Desertification

LAND IN NUMBERS 2019

RISKS AND OPPORTUNITIES

FOREWORD

Numbers can tell a compelling story. In this brochure, the numbers highlight how land has sustained us over millennia. They also show the extent to which our land resources are under pressure. In the face of growing demand from an exploding population and the impacts of climate change, the ability of the land to provide the goods and services we need is at breaking point.

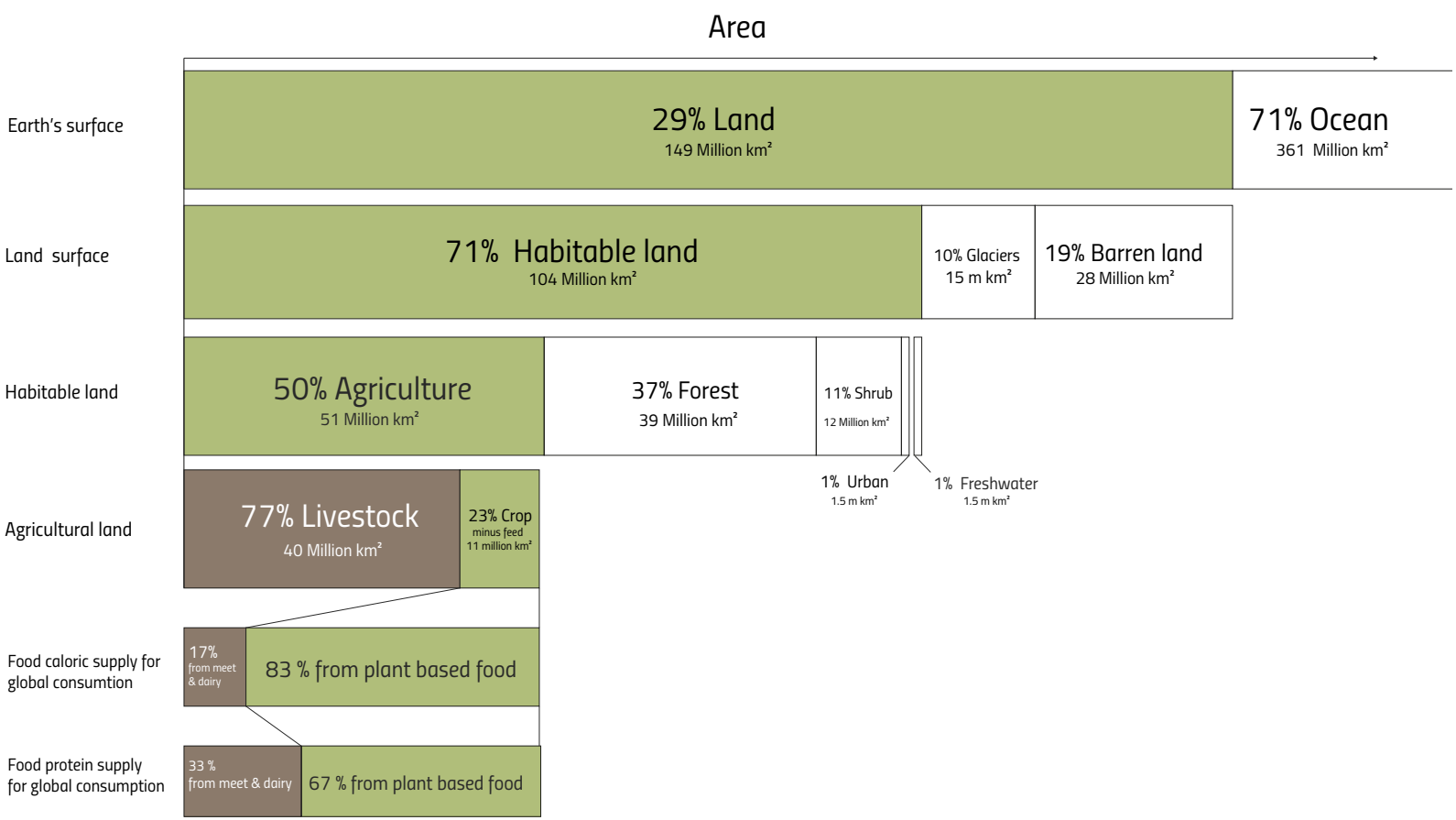
Despite the ominous facts and figures about pressures and risks, this brochure tells a story about opportunity too. There has never been a better time to invest in the rehabilitation of the world's degraded landscapes and make land degradation neutrality a reality for us and for future generations. Around 2 billion hectares of land—twice the size of China— is now degraded[1], with little economic or ecological value. However with the adoption of the new UN Decade on Ecosystem Restoration, and the Sustainable Development Goals especially target 15.3 Land Degradation Neutrality (LDN)[2], echoed by various other initiatives such as the Bonn Challenge[3], the New York Declaration on Forests[4], the Initiative 20x20[5], the African Forest Landscape Restoration Initiative[6], change is in the air.

Restoring degraded landscapes has the potential to become the new business paradigm. The so called restoration economy[7] is set to take-off. New business models are emerging, technology is advancing and governments are showing political will. This is great news for investors looking for a growth opportunity. And this is good news for the economy, jobs, food security and the planet. By protecting, securing and rehabilitating key ecosystems at scale we can ensure a more secure future.

Ibrahim Thiaw
Executive Secretary

LAND AT A GLANCE

Graphic: land at a glance[8]



Land, literally the ground beneath our feet, is an essential part of our life support system. It is the key building block of our societies and economies. Land provides all species with the means to survive and thrive and has been a resilient provider of vital goods and services.

- Viewed from space, 70 % of the Earth's surface is covered with water but only 1% of all the freshwater on Earth is available for human use.[9]
- The remaining 30 % is the terrestrial land surface and home to a human population of currently 7.6 billion.[10]
- Only 71 % of terrestrial land surface is defined as habitable; the remaining 29% is comprised of glaciers and barren land.[11] Humans use half of this area for agricultural production and obtain more than 99.7% of their food (calories) from land[12] and 83% from plant-based food only.[13]
- 44 % of the world's agricultural land is located in drylands, mainly in Africa and Asia, which supplies about 60 % of the world's food production.[14]
- Currently, about 30-45 % of Earth's land surface is dedicated to livestock and livestock-feed production which represents 77 % of all agricultural land.[15]
- Over the past 50 years, increased demand for animal products has accounted for 65% of agricultural land-use change.[16]
- Nearly 25 % of global greenhouse gas (GHG) emissions are directly or indirectly related to agriculture.[17]
- More than half of the world's population now resides in urban areas, despite these covering only around 1 % of the land surface.[18]
- The land area needed to provide food, energy and materials to a city is often 200 times greater than the area of the city itself.[19]
- Cities account for 70 % of the world's GHG emissions.[20]

FOOD WASTE IN NUMBERS[21]:

One-third of all food produced is wasted.
This is equivalent to:

1.3 Gt.
edible food every year

1.4 billion
ha.
of land
an area larger than China

230km^3
Water

750 billion USD -
equivalent to the GDP of Switzerland

3.3CO_2-e
making food waste the third largest emitter after the United States and China

WAST(ED) LAND: LOST CAPITAL

Increasing misuse of land resources and growing demand for the goods and services land produces are intensifying desertification and land degradation globally. Additional stressors such as climate change are further decreasing the ability of land to respond to natural or anthropogenic pressures. While more than 800 million people are currently malnourished, by 2050 global food production would need to increase by 50% to feed the more than 9 billion people expected to live on our planet.[22] But how will we meet these ever-increasing food demands when land degradation and climate change together are predicted to reduce crop yields by an average of 10 % globally and up to 50 % in certain regions[23]? Moreover the degradation of land and other natural resources is not only an ecological liability but a social and economic threat for many countries.

- Land degradation has already had a pronounced impact on ecosystem functions worldwide amounting to a 5 % reduction in total global net primary productivity.[24]
- Degradation of the Earth's land surface through human activities is negatively impacting the well-being of at least 3.2 billion people.[25]
- Global estimates of total degraded area vary from less than 1 billion ha. to over 6 billion ha.[26]
- Between 2000 and 2009, land degradation was responsible for annual global emissions of 3.6–4.4 billion tonnes of CO_2.[27]
- Over the past two centuries, soil organic carbon, an indicator of soil health, has seen an estimated 8% loss globally from land conversion and unsustainable land management practices (176 Gt C),[28] and projections to 2050 predict further losses of 36 Gt C from soils, particularly in sub-Saharan Africa.[29]

The annual global cost of land degradation due to land use change and reduced cropland and rangeland productivity has been estimated at roughly USD 300 billion.[30]

- Urbanization is projected to cause the loss of between 1.6 and 3.3 million hectare of prime agricultural land per year in the period between 2000 and 2030.[31]
- Current global water demand has been estimated at about 4,600 km^3 per year and projected to increase by 20%–30% to between 5,500 and 6,000 km^3 per year by 2050.[32]
- Nearly half the global populations are already living in potential water scarce areas at least one month per year and this could increase to some 4.8–5.7 billion in 2050. About 73% of the affected people live in Asia.[33]
- Land degradation in tandem with climate change may force 50 to 700 million people to migrate by 2050.[34]
- Globally, the estimated annual costs of land degradation range between USD 18 billion and 20 trillion.[35]
- The loss of ecosystem services due to land degradation cost between USD 6.3 and 10.6 trillion annually, representing 10-17% of the world's GDP.[36]
- In Africa, Tanzania and Malawi the annual costs of degradation account for, respectively, USD 2.5 and 0.3 billion, and represent roughly 15 and 10% of their GDP.[37]
- In Central Asia, the annual costs of degradation across Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan are estimated at USD 6 billion.[38]

THE CASE FOR INVESTING IN LAND REHABILITATION

Degraded lands offer little economic or biological productivity. By implementing sustainable land management practices, it is possible to protect and avoid degradation, leading to increased carbon sequestration[39] and water storage over the long term. This can also help protect jobs and bring them back to rural areas. Around 2 billion hectares of land—twice the size of China — now degraded, could be restored or rehabilitated. Yet tapping nature's full potential is not just good for people and the planet but for profit too; the social returns of taking action at global level are estimated at 5USD for every USD invested in restoration of degraded land.[40]

- A fully functioning soil reduces the risk of floods and protects underground water supplies by neutralizing or filtering out potential pollutants and storing as much as 3750 tonnes of water per hectare.[41]
- Across biomes, the benefits of restoration are estimated to exceed the costs by an average margin of 10 to 1.[42]
- In several Asian and African countries, the cost of inaction has been estimated to be 3.8 to 5 times higher than the estimated costs to avoid land degradation.[43]
- The combined 150 million hectares of restored agricultural lands could provide USD 30–40 billion/year in extra smallholder income, additional food for close to 200 million more people, more resilient landscapes, and an additional two Gt per year in sequestered CO_2-e.[44]

Studies estimate that every USD1 invested in restoring degraded forests can yield between USD7 and USD30 in economic benefits.[45]

- Initiating forest restoration of at least 350 million hectares by 2030 could generate USD170 billion/year in net benefits from watershed protection, improved crop yields, and forest products. This would also sequester about 1–3 Gt CO_2e/year, depending on the areas restored.[46]
- Economic rates of return from 12 to 40% have been found for a number of projects including soil and water conservation (Niger), farmer-managed irrigation (Mali), forest management (Tanzania), farmer-to-farmer extension (Ethiopia) and valley-bottom irrigation (northern Nigeria and Niger). Returns of over 40% are on record for small-scale, valley bottom irrigation[47]
- In Mali, the restoration of degraded Kelka forest land by adopting agroforestry practices has been estimated to provide for an economic return of USD 500 per hectare over a 25 year time horizon.[48]

EXAMPLE CASE : INITIATIVE 20X20[49]

According a study by the World Resource Institut, a successful effort to restore Latin America and the Caribbean's degraded forests, savannas, and agricultural landscapes—one with the scope and character of Initiative 20x20—would result in substantial net economic benefits of about USD23 billion over a 50-year period. On a per hectare basis, the average regionwide benefit, measured in net present value, would equal about USD1,140.

WOOD FOREST PRODUCTS

USD170 PER HECTARE

NON WOOD FOREST PRODUCTS

USD245 PER HECTARE

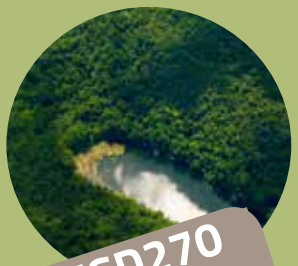
AGRICULTURAL PRODUCTION

USD 274 PER HECTARE

FOOD SECURITY

USD19 PER HECTARE

CARBON STORAGE



USD270 PER HECTARE

ECOTOURISM

USD161 PER HECTARE

EXAMPLE CASES: CLIMATE CHANGE MITIGATION - POWERED BY LAND

Actions to avoid, reduce and reverse land degradation can provide more than one third of the most cost-effective climate mitigation needed to keep global warming under 2°C by 2030.[50]

Farmland Restoration[51]
Applied on 424 million acres could generate by 2050:
14.08 gigatons reduced CO_2
USD72.24 Billion net implementation cost
USD1.34 Trillion net operational savings

Regenerative Agriculture[52]
Applied on 1 billion acres could generate by 2050:
23.15 gigatons reduced CO_2
USD 57.22 Billion net implementation cost
USD 1.93 Trillion net operational savings

Afforestation[53]
Applied on 913 million acres could generate by 2050:
18.06 gigatons reduced CO_2
USD 29.44 Billion net implementation cost
USD 392.33 Billion net operational savings

Silvopasture[54]
Applied on 554 million acres could generate by 2050:
31.19 gigatons reduced CO_2
USD 41.59 Billion net implementation cost
USD 699.37 Billion net operational savings

EXAMPLE CASE: OREGON'S RESTORATION ECONOMY[55]

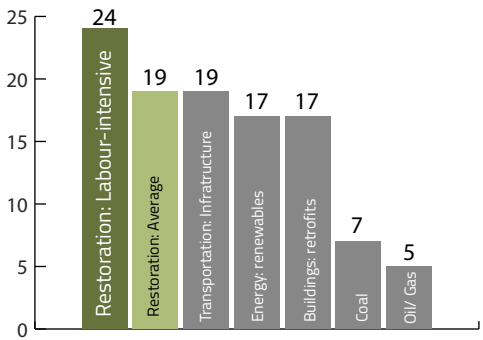
There are no official measures of the size of the global restoration economy, but a 2015 study estimated that the American restoration economy generated USD 9.5 billion in annual economic output, created an additional USD15 billion in indirect and induced output and employed 126,000 Americans in 2014, exceeding jobs in coal mining by 59 %. The case below illustrates the benefits of restoration projects in Oregon USA.[56]

Restoration creates jobs.
Restoration projects put people to work. Investing in habitat restoration can create more new jobs than comparable investments in other sectors of the economy. (See graph below) **Total investments in 6,740 projects completed in the state of Oregon from 2001 to 2010 have supported 4,628–6,483 jobs.**

Restoration dollars are local dollars.
Unlike in other economic sectors, restoration jobs can't be outsourced to far-off places. **An average of USD 0.80 of every USD1.00 spent on a restoration project stays in the county where the projectis located, and USD 0.90 stays in Oregon. That's goodnews for local and regional economies.**

Restoration investments stimulate economic growth.
Every dollar spent on salaries or supplies for a restoration project generates additional spending and economic activity. **In Oregon,USD 411.4 million invested in restoration work from 2001 to2010 generated an estimated USD 752.4– 977.5 million in economic output.**

Graphic: Average number of jobs per USD1 million of investment by select sector



CONCLUSION

The numbers tell a sometimes eye-watering tale. They offer a critical lesson for humanity and our future. We have an opportunity though to secure multiple benefits if we take appropriate action urgently. There is a growing political impetus for the sustainable use of our land resources and the time is right to accelerate implementation on the ground. 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, prosperity and security for all.

As shown in this brochure investing in restoration brings many economic benefits, both direct and indirect. For example, restoration creates jobs on the land and in tree nurseries; farms and timber industries can enjoy higher and more sustainable yields; and the costs of repairing flood damage to infrastructure, dredging lakes and rivers to remove silt, and of filtering drinking water are avoided.

The wider benefits include social and environmental gains in water and food security, biodiversity conservation and climate protection that help us all. As highlighted applying sustainable land management techniques, restoring degraded landscapes and other natural solutions could, for instance, offer more than one third of the solution to the climate crisis. Investments in nature based solutions are also safer, less costly and more beneficial to society than many technological alternatives that are currently being discussed.

Landscape restoration has come of age. Its costs are known and measurable and are clearly outweighed by the immense benefits. It is an approach that has proved itself and is ripe for wide application. It is an opportunity that we cannot afford to pass up.

ENDNOTES AND PHOTOS

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2. So far 118 countries have committed to set LDN targets to achieve land degradation neutrality by 2030. https://www.unccd.int/actions/achieving-land-degradation-neutrality.
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Photos

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