

Zero Net Land Degradation

A Sustainable Development Goal for Rio+20

To secure the contribution of our planet's land and soil to sustainable development, including food security and poverty eradication



UNCCD secretariat
Recommendations for
Policymakers
May 2012

The time has come for the international community to commit itself to a land degradation neutral world by setting sustainable development goals on land use, with targets towards achieving zero net land degradation.

Africa Consensus Statement to Rio+20,
Addis Ababa, 25 October 2011

“The great opportunity of the Anthropocene is that we can choose to learn the lessons of the past and steer a new course to a safer future.”

Soils are the most significant non-renewable geo-resource that we have for ensuring water, energy, and food security for present and future generations while adapting and building resilience to climatic change and shocks. But soil’s caring capacity is often forgotten as the missing link in our pursuit of sustainable development.

The time is ripe to agree on a new **Sustainable Development Goal at Rio+20 for Zero Net Land Degradation** to secure the continuing availability of productive land for present and future generations.

LAND AND SOIL IN THE ANTHROPOCENE

We have entered the Anthropocene, a new geological period in our planet’s history. For the first time ever, the major cause of change on planet Earth is our human activity. Change to the carbon, nitrogen and water cycles. Change to biodiversity. Change to soil productivity. Change to our climate. We seven billion humans are in the driver’s seat as never before. How we steer will determine our future and that of the generations to come. Generations of human ingenuity and struggle have led to an

unprecedented quality of life for many people in many parts of our globe. However, at the same time, too many endure entrenched poverty. Our economic and development successes and failures (including enduring poverty) have degraded the environment, the very natural capital that will form the foundation of our future success.

Land and soil are no exception. Our use and management of land and soil are no small parts of the influence we will have – indeed are already having – on life on Earth, including our own.

Urban, rural and remote people across the planet have multiple and growing demands on land. The most prominent are food, feed, fibre, and fuel (including biofuels); settlements and infrastructure; environmental services; carbon sequestration in soil and vegetation and metals and minerals.

The ability of the Earth’s land-, water- and nutrient-constrained systems to meet all those demands is being tested by a wide range of factors: population growth, land degradation and desertification, climate change, water and nutrient depletion, increasing living standards, changing diets, urbanization, supply chain waste and losses and globalized trade.

At the same time in this 21st century land will continue to play a central role in national development strategies and plans while retaining its role as a fundamental basis for global prosperity.

Land degradation is the “Reduction or loss of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical and biological or economic properties of soil; and (iii) long-term loss of natural vegetation” (UNCCD, Article 1).

Desertification is a subset of land degradation under dry climates (arid, semi-arid and dry sub-humid areas).

Land degradation and desertification constitute a persistent decline in the services that healthy land provides, especially food. Given the extremely slow pace of soil formation, once the physical, biological and chemical properties of soils begin to deteriorate, their natural regeneration rate is practically unattainable.

A System in Stress: Land Degradation and Desertification (rates per minute)	
Causes	Consequences and compounding effects
Population increase: 150 people	Food insecurity
CO2 carbon increase: 6150 ton	Deaths from hunger: 16 people (including 12 children)
Tropical deforestation (total dryland and non-dryland): 25 ha	Political instability
Soil degradation: 10 ha	Civil strife
Desertification: 23 ha	
Urban encroachment: 5.5 ha	
	(Adapted from Lal, 2011)

Large swathes of land around the globe have been degraded or become deserts. Although estimates vary, over 20% of the planet's land is considered degraded. Hotspots include Africa south of the equator, South-East Asia, and south China (Bai et al., 2008).

The principal cause of land degradation and desertification is the unsustainable exploitation of land productivity by pastoral, farming, and agro-pastoral land uses. This is often exacerbated by misguided or missing policies.

Overpopulation and livestock are often seen as the culprits of land degradation and desertification. But they are ultimately the consequence of poor decisions and mismanagement.

For instance livestock are often referred to as the major cause of overgrazing leading to desertification, but with appropriate decision-making and management techniques such as Holistic Management (Savory, A., 1999) livestock could become an essential part of the solution.

The Food and Agriculture Organization of the United Nations expects an 11% increase in average per capita calorie consumption between 2003 and 2050 (FAO, 2006). An estimated additional 120 million hectares will be needed to support the required growth in food production by 2030 assuming current practices (FAO, 2003). That's a brand new farm the size of South Africa. Unless degraded land is rehabilitated, forests and other natural lands will have to be converted to make way for agricultural production.

Soil degradation and greenhouse gas emissions are two serious side effects. Moreover, availability of suitable land is already being tested by land degradation and desertification, and by water and nutrient depletion (OECD-FAO 2011). Meanwhile, investment in foreign land for food and biofuel

The Rubik's Cube of Land

Picture the planet Earth. Zero in on your hometown. Think about what you care about when it comes to land.

- Is it food security, free trade, climate change?
- Rice, tobacco, biofuels?
- Biodiversity, water, coal?
- National sovereignty, illegal immigration, defence?

Now think about the last week. What did you get from land? From land anywhere in the world.

Now look around you. Put yourself in the shoes of all the people you see. Think of all their different demands on land across the planet. Think of all their varied perspectives when they look at land. At their land and at your land.

Multiply your demands and perspectives by nine billion. That's Earth in 2050. Nine billion people on one planet. Multiple demands, multiple perspectives, one fixed land base.

It's like holding a Rubik's Cube. A jumble of multiple demands and perspectives on land. Right at a time when foreign investment in land is booming. When food security is a recurring concern. When land can provide around 40% of near-term climate change mitigation.

We have to work on the whole Rubik's Cube. There's no point getting one face of the cube nicely aligned with the same colour if in the process you mess up all the other faces.

And it's going to get more difficult in the decades ahead. We can no longer think only at the national scale. In a globalised and shrunken world, global land use must add up to less than one planet. (Ashton, 2010)

In the drylands, due to drought and desertification, 12 million hectares of land are transformed into new man-made deserts each year. That is an area with the potential to produce 20 million tons of grain every year.

(UNCCD, 2011b)

production continues apace: Western Europeans in Eastern Europe and Africa; the Gulf States in Asia and Africa; Japanese and Chinese in Brazil and other parts of Latin America; South Koreans in Russia and Africa. Asian countries will make up 60% of the world's population by 2050. It is no surprise then that Indians and Chinese are investing in Africa's land.

As the World Bank points out in "Rising Global Interest in Farmland" (2010), the "rediscovery" of investment in the agriculture sector could be an opportunity for land-abundant countries to gain better technology and create rural jobs. However, if improperly managed, it could result in "conflict, environmental damage, and a resource curse".

Land degradation and desertification adversely affect food security, water security, energy security, biodiversity, and many ecosystem services. They also compromise the associated

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recreational, heritage and cultural values. Global peace and political stability are threatened when basic needs of food and water are not adequately met.

LAND IN THE ENERGY-FOOD-WATER NEXUS

Land is central to the “nexus” that links energy, food, water, and environmental health in an interdependent loop (PBL, 2009). So, any action on land must be nested within a more holistic approach that takes into account all the elements of the nexus and the feedback loops between them.

For instance, the United Nations Environment Programme highlights in “The Environmental Food Crisis” (2009) that projections of a required 50% increase in food production by 2050 have not taken into account environmental degradation and a changing climate, which could reduce agricultural yields by 13 to 45%. Another study suggests that climate change, water scarcity, invasive pests and land degradation could cause up to 25% of world food production to be lost this century (Nellemann et al., 2009). Land degradation over the next 25 years may reduce global food production by up to 12% resulting in an increase of up to 30% in world food prices (IFPRI). As another example, improved management of the world’s land represents one half of the climate solution in 2020 (Project Catalyst, 2009). This includes both maintaining the carbon in forests, grasslands, and peatlands, and restoring natural systems.

Much attention is rightly focused on avoiding emissions from deforestation in developing countries (REDD+). However, carbon in other natural systems is critical. The Terrestrial Carbon Group estimates that if land expansion for food and other products continues on current trends (12 million hectares annually, the size of Cuba, Benin, Bhutan, or Honduras),

even if all forests in developing countries were protected, mitigation from forest protection would be reduced by up to 50% because of emissions from “deflected” expansion into non-forested land (TCG, 2010). We must act on all lands to maintain the health and productivity of our interconnected system. On the restoration side, sequestering half a billion tonnes of carbon in the tropics per year (equivalent to 1.8 billion tonnes of carbon dioxide, or 10% of the solution in 2020) would require between 50 million hectares (slightly less than Thailand) and 150 million hectares (slightly less than Mongolia) (Lovejoy and Ashton, 2011).

As global population hurtles towards 9.2 billion in 2050, difficult land use decisions will have to be made. Many will entail trade-offs.

A SUSTAINABLE DEVELOPMENT GOAL FOR RIO+20 ON ZERO NET LAND DEGRADATION

Global trends such as population dynamics and the increasing demands for energy, food, and water are expected to dramatically increase pressure on the land. By 2030 – and compared

to present levels – the demand for food, energy and water will increase at least by 50%, 45% and 30% respectively (High-level Panel on Global Sustainability, March 2012). Meeting those demands would require 175 million to 220 million hectares of additional cropland (McKinsey Global Institute, Nov 2011). These needs will not be met unless we preserve our land.

Poverty is largely rural and land is the main, if not the sole asset of those poor. If we do not take bold action to protect, restore and manage land and soils sustainably, we will not achieve our commitments for climate change adaptation and mitigation, biodiversity conservation, forest and MDG targets; we will not alleviate rural poverty and hunger, ensure long-term food security or build resilience to drought and water stress.

This will lead to severe consequences including more political conflicts over scarce resources and continued forced migration. Setting goals and targets for addressing climate change, biodiversity loss,

Wisdom or Train Wreck?

Can the “competing” demands on land co-exist mid- to long-term, or will they cancel each other out? If they can, how? If they cannot, what data, policies, and actions can be used to make deliberate land use choices with a more complete and transparent understanding of their implications?

To better answer these questions, we need an integrated understanding of land and our land use trajectory towards 2050 at the global and national levels. We need a concerted global effort to bring together experts, agenda-setters, and decision-makers in a safe and informed venue to understand and resolve perceived competing interests, and to build a three-way re-enforcing flow between knowledge, practice, and policy.

Without such efforts, it is difficult to expect wise land management decisions for multiple outcomes. A mid-century train wreck of competing visions is more likely.

and poverty while ignoring land degradation and desertification can have only limited success.

So, we have no real medium-to long-term choice. We can only reach our goals with the help of our planet's land. We must ensure that land degradation is avoided as far as possible and that any further degradation of the Earth's land is balanced by new restoration of degraded land. In that regard, we must set to ourselves a target of **Zero Net Land Degradation by 2030**. This must be our common vision, our North Star, shining at a global level and a national level.

But our ambition should not stop there.

As we welcome another two billion people to our planet over the next 30 years, we must restore more land than we degrade. We must bring productive land back to life. Land is our natural ally, but its patience is not eternal.

The great opportunity of the Anthropocene is that we can choose to learn the lessons of the past and steer a new course to a safer future. But it is not predestined; it requires a choice and significant effort. Indeed, we have already set ourselves ambitious goals through the Rio Conventions (on climate, biodiversity and desertification) and the Millennium Development Goals. We are in the early years of the United Nations Decade for Deserts and the Fight against Desertification (2010-2020) as well as the United Nations Decade on Biodiversity (2011-2020). We are taking serious steps to curtail the destruction and degradation of forests, particularly because of the large contribution deforestation makes to climate change. We have understood the links between agriculture and forests. We have begun to think and act within the framework of the energy-food-water nexus. And there is an expectation that the nations of the world will agree to sustainable development goals at the Rio+20 Summit in June 2012.

Freezing the Footprint of Food

The single largest impact on our finite planet comes from producing food.

By 2050, we may need three Earths to meet the demands of our consumption. We urgently need to find ways to do more with less. I have identified eight strategies that, if applied globally and simultaneously, will help to reform the food system and protect the planet. Work has started on each of these 'food wedges', but no group is tackling them all at once.

(Clay, J. in Nature, July 2011)

The time is ripe to agree on a Sustainable Development Goal at Rio+20 on Zero Net Land Degradation to secure the continuing availability of productive land for present and future generations.

Goal: Sustainable land use for all and by all (in agriculture, forestry, energy, urbanization)

Target 1: Zero net land degradation by 2030

Target 2: Zero net forest degradation by 2030

Target 3: Drought policies and drought preparedness implemented in all drought-prone regions/ countries by 2020

REASONS FOR HOPE

The good news is that we know how to reach a goal of Zero Net Land Degradation. More than two billion hectares of land worldwide is suitable for rehabilitation through forest and landscape restoration. Of that, 1.5 billion hectares would be best suited to mosaic restoration, in which forests and trees are combined with other land uses, including agroforestry and smallholder agriculture (WRI).

In the last two decades, significant land recovery and improvement have occurred in drylands. In many cases, local communities have taken charge. For instance, farmer-managed natural regeneration and agroforestry techniques, such as planting of "fertilizer trees" on farmlands and grazing lands, have already been adopted in many regions. Such techniques have contributed to improving millions of hectares across Africa.

Land Restoration: Hope in a Changing Climate

People across the globe are already restoring the vegetation, soil, and waterways on vast tracts of degraded land. They are not waiting for outside help or money. They are acting out of sheer self-interest. John Liu's documentary film, "Hope in a Changing Climate" (2009) gives powerful and illuminating examples in places as different from each other as China, Ethiopia, and Rwanda (Environmental Education Media Project). As the project's website explains, "On the Loess Plateau, an area the size of Belgium has been successfully restored over ten years. A barren, brown landscape, denuded and degraded, has been brought back to life; a people entrenched in back-breaking poverty now work, farm, herd and live, in a functioning, green ecosystem". <http://www.hopeinachangingclimate.org/>

RECOMMENDATIONS TO REACH ZERO NET LAND DEGRADATION BY 2030: PROPOSED INTERGOVERNMENTAL ACTION

Achieving Zero Net Land Degradation by 2030 will require the commitment, the support and the active investment of all public and private sector actors, and all parts of the supply and value chain related to land use, as well as local and community stakeholders. Current and future generations will benefit from the return on investment in terms of gains in efficiency, resilience, and social inclusiveness.

These four key actions can be taken by the international community to ensure progress on Zero Net Land Degradation:

1. Agree on a Sustainable Development Goal at Rio+20 for Zero Net Land Degradation
2. Agree on a new legal instrument (such as a **Protocol on Zero Net Land Degradation**) to the UNCCD as a global policy and monitoring framework to focus efforts and empower the international community to act with the speed and scale required to address this crucial problem
3. Establish an Intergovernmental **Panel / Platform on Land and Soil** as a credible and transparent global authority on scientific and technical knowledge on land and soil, including land degradation and desertification
4. Undertake a comprehensive assessment of the **"Economics of Land"**.

Stepping up the ambition for carbon management: a vision for carbon-rich, cross-continental biodiversity corridors

Imagine the sustained and exuberant applause as the world's leaders and powerful announce in 2012 a land restoration program that would simultaneously provide 10% of the climate solution, assist with climate change adaptation, replenish depleted watersheds, reverse desertification, and provide around 100 million hectares of new biodiversity corridors linking important habitats and ecosystems. [...] With a modicum of international cooperation and sensible planning, these carbon-rich, cross-continental biodiversity corridors could be focussed on degraded land with high biodiversity potential. A starting point would be the work of the Global Partnership for Forest Landscape Restoration and the biodiversity hotspot analysis by WWF, the Nature Conservancy, Conservation International, IUCN, and others. And with a little more planning, it could be implemented with low impact on food production systems. In fact, the restoration could enhance food production by increasing soil fertility / productivity and water security. Actually this has already begun in the Yellowstone to Yukon corridor, the Paseo Panthera (Jaguar corridor in Mexico and Central America) and a major Atlantic Forest restoration project in Brazil. (Lovejoy and Ashton, 2011)

This paper is based on a longer Policy Brief on the the need for a Sustainable Development Goal for Zero Net Land Degradation. It provides a snapshot of the state of the world's land, and explains the characteristics, causes, impacts, and inter-linkages of land degradation and desertification. It suggests a path to Zero Net Land Degradation. Finally, it makes recommendations for implementing a Zero Net Land Degradation Goal. Please see the Policy Brief for full references on www.unccd.int.



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