

Country Profile

Kyrgyzstan

Investing in
Land Degradation Neutrality:
Making the Case

An Overview of Indicators
and Assessments



**THE GLOBAL
MECHANISM**

United Nations Convention
to Combat Desertification

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1. Quick Facts

In Kyrgyzstan, 1.2 million people were living on degrading agricultural land in 2010 – an increase of 16% in a decade, bringing the share of rural residents who inhabit degraded agricultural land up to 33% of the total rural population. Land degradation can severely influence populations' livelihood by restricting people from vital ecosystem services (including food and water), increasing the risk of poverty.

During the same time period (2000-2010), the amount of people residing in remote degrading agricultural areas with limited market access increased by 17%, reaching 289 thousand people. Populations in remote areas have restricted options for managing land and accessing other benefits of economic development.

The annual cost of land degradation in Kyrgyzstan is estimated at 601 million United States dollars (USD). This is equal to 16% of the country's Gross Domestic Product. Land degradation leads to reduction in the provision of ecosystem services that takes different forms – deterioration in food availability, soil fertility, carbon sequestration capacity, wood production, groundwater recharge, etc. – with significant social and economic costs to the country.

The returns on taking action against land degradation are estimated at 6 USD for every dollar invested in restoring degraded land in Kyrgyzstan. Assessments of the costs of action against land degradation through restoration and sustainable land management practices versus the cost of inaction highlight the strong economic incentive for bold actions against land degradation.

In Kyrgyzstan, the Agriculture, Forestry and Other Land Use (AFOLU) sector is responsible for 37% of the total greenhouse gas emissions of the country. The removals of carbon emissions by forests are estimated at 6% of the total emissions of the country. Due to the role of terrestrial ecosystems as a source and sink of emissions land is positioned as a key point of intervention for climate change mitigation.

Land-based mitigation options rank among the most cost-effective opportunities to sequester carbon emissions. Economic evaluations of various climate change mitigation alternatives show that capturing carbon through restoring degraded lands (including degraded-forest) is a cost-effective option that offers multiple co-benefits.

Sustainable Development Goal 15, 'Life on Land', and its target 15.3 on Land Degradation Neutrality (LDN) is a unique opportunity for countries to curb the growing threats of land degradation and to reap multiple socioeconomic benefits of LDN. Kyrgyzstan has set national voluntary LDN targets, established an LDN baseline, and formulated associated measures to achieve LDN.

2. Population on Degrading Land

2.1 National Overview

Land is a source of well-being for present and future generations – it provides a wide range of ecosystem services that sustain human needs. Land degradation can severely influence livelihoods by limiting the availability of vital ecosystem services (including food and water), increasing the risk of poverty⁽¹⁾ and ultimately forcing people to migrate.⁽²⁾

A recent study⁽³⁾ shows that the state of the land, whether it is improving or degrading, can to a large extent influence the impact of the country's economic growth on the alleviation of poverty, making land an accelerator (or decelerator) of poverty eradication.

Poverty in Kyrgyzstan is estimated to affect 34% of the rural population.⁽⁴⁾ In 2010, 33% of the rural population of the country was living on degrading agricultural land, which amounts to approximately 1.2 million people.ⁱ Moreover, between the years 2000 and 2010, the number of people living on degrading agricultural land grew by 161 thousand, representing an increase of 16% over the decade (see table 1 for further details).

By 2010, 289 thousand people or 8% of Kyrgyzstan's rural population resided in remoteⁱⁱ degrading agricultural areas without market access. This number increased by 17% between 2000 and 2010 (see table 1). Populations in remote areas have more limited options for managing land and accessing other benefits of economic development.⁽²⁾

Moreover, 29% of people employed in Kyrgyzstan are linked to the agriculture sector.⁽⁴⁾ The intensification and expansion of land degradation may severely affect labor productivity, ultimately jeopardizing agricultural livelihoods in the country.

Improving land quality and living standards of the rural population requires policy responses that improve the condition of terrestrial ecosystems by avoiding, reducing and reversing degraded land. Investments, particularly in hotspot locations characterized by both high restoration potential and high socioeconomic benefits in poverty areas, will improve the conditions of the most vulnerable people and increase the resilience of ecosystems.

Table 1: Population on degrading agricultural land in Kyrgyzstan^(3,4,5)

Population categories ⁱ	2000	2010	% change from 2000 to 2010
Rural population on degrading agricultural land	1,009,656	1,170,989	16.0%
Share (%) of rural population on degrading agricultural land	31.9%	33.2%	*1.4%
Rural population on remote degrading agricultural land	247,357	288,715	16.7%
Share (%) of rural population on remote degrading agricultural land	7.8%	8.2%	*0.4%
land			
Rural population	3,169,363	3,524,628	11.2%
Total population	4,898,400	5,447,900	11.2%

Note: Due to rounding, some figures in the text may not correspond with those reported in the tables or the sum of separate figures. * percentage-point difference between 2000-2010.

2.2 Regional and Global Overview

In Asia, 38% of the continent's rural population resided on degrading agricultural land in 2010, equivalent to 1.1 billion people. Moreover, 6% of the total rural population – or 175 million people – lived in remote degrading agricultural land with limited access to markets.

The changes in these indicators between the period 2000 and 2010 for the region depict increases of 11% and 9% for the case of population residing in degrading agricultural land and remote degrading agricultural land respectively; whereas the overall population in rural areas grew at 12% over the same period (see table 2).

On a global level, it is estimated that about 1.5 billion people worldwide – equivalent to 32% of the total rural population – resided on degrading agricultural land in 2010. Furthermore, during the same year, 233 million people lived on remote degrading agricultural land with limited access to markets, representing 5% of the global rural population.

Among the world's regions suffering from land degradation, the most affected continent is Asia with 79% of the global rural population residing in degrading agricultural areas (or 1.1 billion people). The second most affected region is Africa, with a share of 12% in the global rural population living in degrading agricultural areas. The remaining 9% are spread across Europe (5%), Latin America and the Caribbean (3%), and Northern America and Oceania (1%).

Regarding changes over time for the period 2000-2010, the global rural population in degrading agricultural areas and remote degrading agricultural areas increased by 12% and 14%, respectively.

Table 2 contains additional details of the populations living in degrading agricultural areas and remote degrading agricultural areas by region and globally for the years 2000 and 2010, as well as the percentage changes during this decade.

Table 2: Population on degrading agricultural land at regionalⁱⁱⁱ and global scale⁽³⁾

Regions	Population in 2010					% change from 2000 to 2010		
	Rural population (in millions)	Rural population on DAL (in millions)	% share	Rural population on remote DAL (in millions)	% share	Rural population	Rural population on DAL	Rural population on remote DAL
Africa	812.6	184.0	22.6%	47.6	5.9%	26.8%	34.7%	37.6%
Asia	3,102.9	1,176.8	37.9%	175.0	5.6%	12.2%	10.9%	8.6%
Europe	310.1	75.6	24.4%	2.5	0.8%	-2.6%	-6.5%	-5.9%
Latin America and the Caribbean	350.9	48.2	13.7%	7.2	2.1%	14.1%	17.8%	16.4%
Northern America	71.4	11.4	16.0%	0.7	1.0%	7.5%	7.5%	6.2%
Oceania	16.0	0.9	5.4%	0.3	1.8%	15.0%	0.8%	39.3%
World Total	4,663.9	1,496.9	32.1%	233.3	5.0%	13.4%	12.4%	13.6%

Note: DAL= Degrading Agricultural Land

3. Economics of Land Degradation

3.1 National Overview

Land provides valuable ecosystem services for human well-being, but land degradation leads to a reduction in the provision of these services with significant social and economic costs to the country. The decline of ecosystem services can take different forms, including decline in food availability, soil fertility, carbon sequestration capacity, wood production, groundwater recharge, among others.^(6, 7, 9)

The costs of land degradation for the country are measured in terms of the changes in land productivity by considering two aspects: changes in land cover from a high-value biome to a lower-value biome (e.g. forest land converted to cropland); and the decline in ecosystem services provision within a certain land cover type due to degrading land-use practices (e.g. reduced cropland productivity over time).⁽⁶⁾

In Kyrgyzstan, the total annual cost of land degradation is estimated at 601 million United States Dollars (USD) — this is equal to 16% of the country's Gross Domestic Product (GDP).^{iv} Moreover, a considerable share of the costs of land degradation (51%) is due to the decline in provisioning ecosystem services (e.g. food availability, wood production, etc.), which has a significant impact on the population of the country. The remaining share refers to the regulating ecosystem services (e.g. carbon sequestration, water regulation flows), which has an impact not only at the country level, but also on the regional and global scale due to the transboundary nature of these services that provide incentives for international cooperation (see table 3).^v

Land degradation often stems from land-use decision-making processes driven by high market prices of specific ecosystem services — for example, food. In this context, land-use decisions may largely neglect the significance of other ecosystem services for which no markets exist, but which are also of high value to the society.⁽⁹⁾

Given the significant economic burden of land degradation, research has also focused on the study of the costs of action against land degradation through restoration and sustainable land management practices. These costs of action are often compared to the costs of inaction — the latter being derived from the projection of past degradation rates to the future.

In this context, a recent global assessment on land degradation⁽⁶⁾ shows that for Kyrgyzstan the returns on taking action against land degradation versus inaction are estimated at 6 USD for every dollar invested in reverting degraded land,^{vi} underlining the strong economic incentives for bold actions on achieving LDN.

Table 3: Economics of land degradation (LD) in Kyrgyzstan^(4, 6, 8)

Total annual cost of land degradation (base year 2007)	601 m USD
Cost of LD due to the decline in provisioning ecosystem services (as % of total cost)	51%
Cost of land degradation as % of GDP	16%
Cost of action (30-year planning horizon)	4.6 bn
Cost of inaction (30-year planning horizon)	26.3 bn
Returns on action against land degradation per dollar invested	6 USD
GDP 2016 (USD)	6.7 bn
Share of Agriculture in total GDP 2016	15%
GDP per capita 2016 (USD)	1,077

Note: m = million; bn=billion

3.2 Regional and Global Overview

For Asia, the total annual costs of land degradation are estimated at 84 billion USD, which amounts to about 0.6% of the total GDP of the region. This share, however, varies considerably among countries.

On a global scale, the costs of land degradation are estimated at about 297 billion USD.^{vii} As illustrated in table 4, Asia accounts for the largest share of the total global cost of land degradation (28%), followed by Africa (22%), Latin America and the Caribbean (20%), Northern America (12%), Europe (12%) and Oceania (5%).

Assessments of the cost of action against land degradation versus the cost of inaction show that the latter significantly outweighs the former. On the regional level, the costs of action for Asia are estimated at 976 billion USD, whereas the costs of inaction equal about 4.3 trillion USD^{vi} (see table 4). The regional breakdown reveals social returns ranging from about 4 USD in the case of Asia, Africa, and Latin America and the Caribbean, and up to 6 USD in Europe, Northern America, and Oceania (see table 4).

On a global level, estimates show costs of action in the amount of 4.6 trillion USD, whereas the costs of inaction equal about 23.2 trillion USD.^{vi} That means that the expected social returns of taking action are estimated at about 5 USD for every dollar invested in the restoration of degraded land and sustainable land management.

Table 4: Cost of land degradation at regionalⁱⁱⁱ and global scale⁽⁶⁾

Regions	Cost of Land Degradation (LD)		Cost of action and inaction		
	Total annual cost of LD (in billion USD; year 2007)	% of the annual cost of LD in the world total	Cost of action in 30-year time horizon (in billion USD)	Cost of inaction in 30-year time horizon (in billion USD)	Returns on action against LD (in USD)
Africa	65	22.0	731	3,112	4
Asia	84	28.4	976	4,359	4
Europe	35	11.8	945	5,652	6
Latin America and the Caribbean	61	20.4	789	3,107	4
Northern America	36	12.2	759	4,599	6
Oceania	15	5.2	407	2,442	6
World Total	297	100.0	4,606	23,272	5



4. Land and Climate Change

Land plays an important role in the global carbon cycle because terrestrial ecosystems continuously exchange carbon fluxes with the atmosphere. The exchange is two-way: on the one hand, terrestrial ecosystems sequester carbon through natural processes, and on the other hand, they release carbon through respiration as well as anthropogenic activities related to agriculture, forestry, and other land use. The role of terrestrial ecosystems as a source and sink of emissions positions land as a key element of intervention for climate change mitigation and adaptation.

4.1 National Overview

Land as a Source of Emissions

The Agriculture, Forestry and Other Land Use (AFOLU) sector is an important source of Greenhouse Gases (GHG). Figures vary on how this sector contributes to the national emission inventories across countries. In Kyrgyzstan, the AFOLU sector is responsible for 37% of the total emissions of the country (see table 5).

Within Kyrgyzstan's AFOLU sector, the larger share of the emissions is from Agriculture (33%). Emissions from Forestry and Other Land Use (FOLU) play a minor role.

Land as a Carbon Sink

Terrestrial ecosystems also play an important role as carbon sinks, offsetting emissions released by various sectors of the economy. The removals of carbon emissions through the sector Forestry and Other Land Use (FOLU) are estimated at 1 million tonnes of CO₂ in 2010 for Kyrgyzstan (see table 5). This is equal to 6% of the total emissions of the country. The potential carbon storage per hectare (ha) and year varies considerably depending on the type of biome, the practice on the ground, and the prevalent climate.⁽¹¹⁾ The mean rate of sequestration is estimated at 1.5 tonnes of carbon (tC)/ha per year, where 0.5 tC is from soil organic carbon sequestration and an additional 1.0 tC from biomass.^{viii (11)}

In general, terrestrial ecosystems have a significant potential for carbon sequestration linked to the cumulative historic loss of carbon from land-use change. The capacity of land to further store carbon is crucial for bridging the time until new technologies to tackle climate change are adopted on a larger scale.⁽¹¹⁾

Table 5: Land as a source and sink of emissions⁽¹⁰⁾ in Kyrgyzstan (year 2010)

Sectors	GHG (Mt-CO ₂ e)	%
Sources total	13.33	100.0
AFOLU sources	4.93	37.0
Agriculture	4.38	32.8
FOLU net sources	0.56	4.2
Other sectors	8.40	63.0
FOLU net sinks	-0.80	
FOLU total	-0.25	
Total net emissions with FOLU	12.53	
Total net emissions per capita with FOLU (in tonnes of CO ₂ e)	2.3	

Note: GHG=Greenhouse Gases; Mt-CO₂e = million tonnes of carbon dioxide equivalent.

The UNCCD Science Policy Interface developed the Land Degradation Neutrality (LDN) conceptual framework⁽¹²⁾, which refers to three hierarchical policy responses to achieve LDN that go hand in hand with climate actions: i) **avoid** further land degradation by halting conversion of land types, for example, not converting forest land into agricultural land; ii) **reduce** the impact of land-intensive activities by using Sustainable Land Management (SLM) practices, so that less carbon is released from soil, crops and other biomass; and iii) **reverse** land degradation, for example, by restoring or rehabilitating land that has lost productivity.⁽¹²⁾

Land as a cost-effective mitigation option

Within the various climate change mitigation alternatives, land-based mitigation options rank among the most cost-effective opportunities to sequester or avoid carbon.⁽¹³⁾ The cost of capturing one tonne of carbon (tC) by restoring degraded land is estimated at 51 USD per tC; while alternative engineering techniques such as 'gas plant capture and carbon sequestration' have a cost of 306 USD per tC (see table 6). Moreover, land-based mitigation options are estimated to be more cost-effective than other widely-used strategies to avoid emissions — for example, the substitution of fossil fuels by solar or wind energy.^(13, 14)

Moreover, it is worth noting that the option of storing carbon in terrestrial ecosystems by restoring land generates several other co-benefits that should also be factored in. They include for instance improving soil health, reducing food insecurity and enhancing water regulation flows.

Land matters play a key role in developing climate change mitigation and adaptation policies. Box 1 presents the leading land-based mitigation and adaptation strategies considered in Kyrgyzstan's Nationally Determined Contributions.

Table 6: Cost of carbon sequestration using different techniques^{ix(13)(14)}

Technique/Strategy	Cost of abatement USD per tC
Second-generation biofuels	25
Pastureland afforestation	51
Degraded-land restoration	51
Degraded forest restoration	61
Agriculture conversion	128
Biomass co-firing power plant	153
Coal-C capture and sequestration	229
Gas plant capture and sequestration	306
Solar VP*	92
Wind*	76

Note: tC= tonne of Carbon



Box 1. Highlights on Climate Change and Land from Kyrgyzstan's Nationally Determined Contributions⁽¹⁵⁾

Policy frameworks: Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic till 2017; Program of the Kyrgyz Republic on Transition to Sustainable Development for 2013-2017; National Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017; National Action Plan (NAP); and the Activity frameworks for Implementing the UNCCD in the Kyrgyz Republic for 2015-2020.



4.2 Regional and Global Overview^{xi}

In Asia, 17% of the total emissions released were from the Agriculture, Forestry and Other Land Use (AFOLU) sector in the year 2010. This percentage represents 3,974 Mt-CO₂e out of the total 23,421 Mt-CO₂e emitted in the region (see table 7). In the AFOLU sector, the 'Forestry and Other Land Use (FOLU)' subsector accounts for 7% (or 1,712 Mt-CO₂e), while the 'Agriculture' subsector is responsible for 10% (or 2,262 Mt-CO₂e) of the total emissions from the region.

At a global level, it is estimated that the AFOLU sector is responsible for 23% of the GHG emissions, which is equal to 11,380 Mt-CO₂e (see table 7). Breaking down the AFOLU sector into 'Agriculture' and 'FOLU' shows that the majority of emissions come from the latter subsector with a total amount of 6,304 Mt-CO₂e; while Agriculture emitted 5,075 Mt-CO₂e.

Regarding the regional contributions to the global emissions of the AFOLU sector, greenhouse gas (GHG) inventories report that the Asia region is the leading contributor of global AFOLU emissions. Asia is responsible for 35% of global AFOLU emissions, followed by Latin America and Africa which are responsible for 24% and 23% of emissions respectively. Table 7 displays further details of the regional contributions of the AFOLU sector in relation to the total global emissions as well as the regional breakdown for the Agriculture and FOLU subsectors.

Evidence also shows that the global forest ecosystems alone removed 3,234 Mt-CO₂e from the atmosphere in the year 2010 (see table 7). More generally, out of the total global carbon emissions to the atmosphere by human activities, an estimated 42% are accumulated in the atmosphere; another 23% is sequestered by the oceans; and the remaining 34% is attributed to sequestration by terrestrial ecosystems,⁽¹¹⁾ highlighting the essential role of land-based ecosystems to mitigate climate change.

Table 7: Regionalⁱⁱⁱ and global emissions/removals from the Agriculture, Forestry and Other Land Use (AFOLU) sector and related indicators⁽¹⁶⁾ in 2010

Regions	Sources total		AFOLU Net sources		Agriculture		FOLU net sources		Forest net sink		Total emissions per capita with FOLU Mt-CO ₂ e
	Mt- CO ₂ e	in %	Mt- CO ₂ e	in %	Mt- CO ₂ e	in %	Mt- CO ₂ e	in %	Mt- CO ₂ e	in %	
Africa	4,109	8.3	2,610	22.9	794	15.7	1,816	28.8	-159	4.9	3.8
Asia	23,421	47.5	3,974	34.9	2,262	44.6	1,712	27.2	-936	28.9	5.4
Europe	8,268	16.8	875	7.7	567	11.2	308	4.9	-847	26.2	10.1
Latin America and the Caribbean	4,838	9.8	2,724	23.9	896	17.7	1,828	29.0	-545	16.9	7.2
Northern America	7,711	15.6	752	6.6	406	8.0	346	5.5	-494	15.3	21.0
Oceania	1,001	2.0	445	3.9	150	3.0	295	4.7	-253	7.8	20.7
World total	49,349	100	11,380	100	5,075	100	6,304	100	-3,234	100	6.7

Note: Mt-CO₂e = million tonnes of carbon dioxide equivalent; FOLU= Forestry and Other Land Use.

5. Opportunities – The Way Forward

The 2030 Agenda for Sustainable Development offers opportunities for countries to curb the growing threats of land degradation and to reap multiple socioeconomic benefits of LDN.

Sustainable Development Goal 15 'Life on Land' and its target 15.3 on Land Degradation Neutrality (LDN) particularly encourage countries to 'combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030'.

In October 2015, UNCCD country Parties decided that striving to achieve SDG target 15.3 is a strong vehicle for driving the implementation of the Convention and requested the UNCCD secretariat and appropriate UNCCD bodies to take the initiative and invite other relevant agencies and stakeholders to cooperate on achieving SDG target 15.3 (decision 3/COP12).

To achieve SDG target 15.3, the following five elements have been identified:

- (1) **LDN targets:** setting targets and establishing the level of ambition;
- (2) **Leverage and impact:** catalyzing the multiple benefits that LDN provides from climate change mitigation and adaptation to poverty reduction;
- (3) **Partnerships and resource mobilization:** rationalizing engagement with partners, overcoming fragmentation and systematically tapping into increasing finance opportunities, including climate finance;
- (4) **Transformative action:** designing and implementing bold LDN transformative projects that deliver multiple benefits; and
- (5) **Monitoring and reporting:** tracking progress towards achieving the LDN targets.

As of April 2018, 116 countries have made the commitment to translate the global goal of achieving LDN by 2030 into national action by setting national voluntary targets with the support of the LDN Target Setting Programme (LDN TSP) – a programme established by the Global Mechanism in collaboration with the UNCCD secretariat and supported by various partners.

Kyrgyzstan is among the countries that have set national voluntary LDN target, established an LDN baseline, and formulated associated measures (see box 2).

The LDN targets provide Kyrgyzstan with a strong vehicle for fostering coherence of policies and actions by aligning the national LDN targets with measures from the Nationally Determined Contributions and other national commitments.

Investing in LDN also accelerates the advancement of other SDGs due to the close linkages between land and other goals and targets, such as: Goal 1 (No poverty), Goal 2 (Zero hunger), Goal 5 (Promote gender equality), Goal 6 (Clean water and sanitation), Goal 8 (Decent work and economic growth), and Goal 13 (Climate action).⁽¹⁷⁾

Box 2. Kyrgyzstan's National Voluntary LDN Targets ⁽¹⁸⁾

In line with the Sustainable Development Goal (SDG) target 15.3, the government of Kyrgyzstan decided to set the following voluntary targets on Land Degradation Neutrality:

1. Improve environmental condition of pastures through introduction of pasture rotation system in, at least, 40 village districts (ayil aimaks);
2. Better access to 10,000 Ha of pastures via improved pasture infrastructure (bridges/roads, water points);
3. Sustainable land management practices are adopted on 100,000 Ha of land area (including both pastures and forests);
4. Land improvement works are conducted on 10,000 Ha.



6. Ongoing Projects and Programmes

To illustrate land-based approaches, the following section features some of the ongoing projects and programmes supported by national and international organizations.^{xiii}

Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia. The project goal is to improve the management of land resources through integrated approaches that are environmentally and economically sustainable, and take into account climate change. Countries involved: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan. Timeline: 2016 – 2019. Total financial commitment: 39.1 million €. For further information click [here](#).

Integrated Natural Resources Management in Drought-prone and Salt-affected Agricultural Production Landscapes in Central Asia and Turkey. The objective of the project is to scale up integrated natural resources management in drought prone and salt affected agricultural production landscapes in the Central Asian Countries and Turkey. Funding Source: GEF Trust Fund. Implementing Agency: Food and Agriculture Organization. GEF Project Grant/Co-financing Total: 10.88 million USD/64.89 million USD. Link: for further information click [here](#).

Integrated Forest Ecosystem Management. The objective of this project for Kyrgyz Republic is to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. Funding Source: International Development Association. Implementing Agency: State Agency for Environmental Protection and Forestry. Total Project Cost: 12.00 million USD. Link: for further information click [here](#).

Capacity Building for Sustainable Land Management. The project supports the Central Asian Countries efforts to halt land degradation by enhancing the capability of each nation to execute their national programmes. Implementing Organization: United Nations Development Programme. Budget Sources: Voluntary Contributions/Global Environment Fund Truste. Link: for further information click [here](#).

Sustainable Management of Mountainous Forest and Land Resources under Climate Change Conditions. The aim of the project is to enhance the enabling environment in the forestry and agricultural sectors and sustain the flow of ecosystem services, including enhancement of carbon stocks in forests and agro-ecosystems. Funding Source: GEF Trust Fund. Implementing Agency: Food and Agriculture Organization. GEF Project Grant/Co-financing Total: 5.45 million USD/19.00 million USD. Link: for further information click [here](#).

Sustainable Forest and Land Management. Funding Source: GEF Trust Fund. Implementing Agency: The World Bank. GEF Project Grant/Co-financing Total: 4.11 million USD/12.00 million USD. Link: for further information click [here](#).

7. Country Studies

For further reading, this section offers country studies that may be useful in making the case for investing in Land Degradation Neutrality.

The National Action Plan (NAP) and the activity frameworks for implementing the UNCCD in the Kyrgyz Republic for 2015-2020. — Apasov, et al. (2014,)

National Action Programme of Kyrgyzstan. — (2000).

Destruction of the soil as the destruction of society. — Apasov (2015).

Kyrgyzstan Case Study Policy Brief: Summer pastures across the Kyrgyz Republic can provide greater economic and environmental benefits through improving pasture yields sustainably. — ELD. (2016).

Introducing More Transparent and Efficient Land Management in Post-socialist Cities: Lessons from Kyrgyzstan. — Kaganova. et al. (2008).

Sustainable Land Management in Kyrgyzstan and Tajikistan: A Research Review. — Shigaeva. et al. (2013).

Developing criteria and indicators for evaluating Sustainable Forest Management: A Case Study in Kyrgyzstan. — Jalilova. et al. (2012).

Sustainable Pasture Management in Kyrgyzstan and Tajikistan: Development Needs and Recommendations. — Ludi, E. (2003).

Central Asia Regional Report: Broadening Land Management Options for Improved Economic Sustainability across Central Asia. — Quillérou, E. et al. (2016).

Kyrgyzstan Case Study Policy Brief: Summer Pastures across the Kyrgyz Republic Can Provide Greater Economic and Environmental Benefits through improving Pasture Yields Sustainably. — Sabyrbekov, R. et al. (2016).

8. Supplementary Information

8.1 Glossary

This subsection provides a brief description of the indicators presented above.

Annual cost of land degradation

The UNCCD defines land degradation as 'any reduction or loss in the biological or economic productive capacity of the land resource base. It is generally caused by human activities, exacerbated by natural processes and often magnified by and closely intertwined with climate change and biodiversity loss.' In the study featured here on the cost of land degradation, Nkonya and colleagues⁽⁶⁾ approach the study of land degradation by investigating declines in land productivity in the past due to: i) land cover changes from a high value-biome to a lower-value biome, such as the conversion from forest land into cropland; and ii) declines in the ecosystem services provision within a land cover type due to the use of degrading practices.

Cost of action

The costs of action are estimated by taking into account the following two cost categories: i) initial fixed investments and maintenance expenses that are related to the restoration of the high-value biome until it reaches biological maturity; ii) the inclusion of the opportunity cost given by the forgone benefits from the lower-value biome under replacement. The analysis of the cost is carried out over a planning period of 30 years.⁽⁶⁾

Cost of inaction

Cost of inaction represents the 'business as usual' (BAU) scenario. In this case, future land degradation trends are assumed to continue along patterns similar to those of the past. The total costs of inaction are calculated by the sum of future annual costs of land degradation over a 30-year planning horizon - where land degradation is captured by land cover changes from a high-value biome to a lower-value biome.⁽⁶⁾

Returns of action

Nkonya and colleagues⁽⁶⁾ measure the benefit of action as the difference between the cost of inaction minus the cost of action. When this difference is positive, then taking action is justified in economic terms. Moreover, the figures on returns on investment are calculated as the cost of inaction over the cost of action. For further methodological details on the annual cost of land degradation, cost action, inaction and returns on action, see Nkonya and colleagues.⁽⁶⁾

Population on degrading agricultural land

Estimates of the population in degrading agricultural areas are based on the work of Barbier and Hochard.⁽³⁾ They identify agricultural degrading land by looking at the areas that experienced negative changes in net primary productivity, using the Normalized Difference Vegetation Index. Note that estimates are mainly constrained to populations residing on 'agricultural land' in this study; the consideration of other land cover types may therefore increase the magnitude of these figures. Regarding data on the spatial distribution of rural population, this study uses data published by the Global Rural-Urban Mapping of the Socioeconomic Data and Applications Center (SEDAC). In order to further identify population in remote areas, Barbier and Hochard⁽³⁾ use data from the Global Environment Monitoring Unit of the Joint Research Centre of the European Commission.

Rural poverty

The rural poverty headcount ratio is used to calculate rural poverty, i.e. the percentage of rural population living below the national poverty line. National poverty line is the benchmark for estimating poverty indicators that are consistent with the country's specific economic and social circumstances and reflect local perceptions of the level and composition of consumption or income needed to be non-poor.⁽⁴⁾

Sustainable Land Management

SLM is the use and management of land resources—soil, water, animals and plants – for the production of goods to meet changing human needs, while ensuring the long-term productive potential of these resources and the maintenance of environmental functions. Degradation of water, soil and vegetation as well as emissions contributing to climate change can be limited through SLM practices that simultaneously conserve natural resources and increase yields.

8.2 Notes

i. Figures on population on degrading agricultural land are calculated by using the shares of rural population on degrading agricultural land and remote degrading agricultural land estimated in the work of Barbier and Hochard⁽³⁾, in combination with data on rural population from the World Bank Development Indicators.⁽⁴⁾

ii. Population in remote degrading areas is identified in terms of market accessibility, where access to market is defined as less than five hours of travel to a market city with a population of 50,000 or more.⁽³⁾

iii. Country grouping is based on geographic regions as defined by the United Nations Statistics Division (see: <https://unstats.un.org/unsd/methodology/m49/>.)

iv. Estimates of the economic costs of land degradation illustrated in this country profile are based on the work of Nkonya and colleagues.⁽⁶⁾

v. The relationship between food production (provisioning ecosystem service) and the supply of other ecosystem services often depicts important trade-offs.⁽¹⁾

vi. These figures correspond to a 30-year planning horizon in terms of quantification of costs and benefits.

vii. Global estimates of the costs of land degradation vary to a great extent depending on the study. A study led by the Economics of Land Degradation Initiative⁽⁹⁾ estimates the global costs of land degradation at 9.6 trillion USD. In this regard, the figures presented in the current publication are conservative.

viii. This is a global average coefficient used as a default in this publication, and it should be replaced with that of national level when available. Note also that one tonne of carbon (C) is approximately equivalent to 3.66 tonnes of carbon dioxide (CO₂).

ix. This version of the country profile uses the 'Global GHG Abatement Cost Curve' as default information.⁽¹⁴⁾ National GHG Abatement Cost Curve should be used when available.

x. Although solar and wind power are not sequestration techniques, but rather technologies that avoid (or reduce) emissions from the source, figures still show how competitive is restoring degraded land in comparison with solar or wind abatement alternatives.

xi. Figures related to Greenhouse Gases in this subsection are retrieved from FAOSTAT.⁽¹⁶⁾

xii. The information on projects and programmes presented in this section has been obtained from the websites of the following organizations: Climate Investment Funds, Food and Agriculture Organization of the United Nations, Global Environment Facility, Green Climate Fund, United Nations Development Programme, United Nations Environment Programme and the World Bank.

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8.4 Photos

Cover “Road trip to Bishkek, Kyrgyzstan” by [Oziel Gómez](#) on [Unsplash](#)

p.7 <http://pexels.com>

p.9 <http://pexels.com>

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8.5 About this Publication

This country profile is intended to provide a brief overview of recent studies, assessments and indicators that demonstrate multiple benefits of taking bold actions to achieve Land Degradation Neutrality.

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