Country Profile

Cambodia

Investing in Land Degradation Neutrality: Making the Case

An Overview of Indicators and Assessments

THE GLOBAL MECHANISM
United Nations Convention to Combat Desertification
# Contents

1. Quick Facts .................................................................................................................. 3

2. Population on Degrading Land .................................................................................. 4
   2.1 National Overview ................................................................................................. 4
   2.2 Regional and Global Overview ............................................................................... 5

3. Economics of Land Degradation .............................................................................. 6
   3.1 National Overview ................................................................................................. 6
   3.2 Regional and Global Overview ............................................................................... 7

4. Land and Climate Change .......................................................................................... 8
   4.1 National Overview ................................................................................................. 8
   4.2 Regional and Global Overview ............................................................................... 11

5. Opportunities - The Way Forward ........................................................................... 12

6. Ongoing Projects and Programmes .......................................................................... 14

7. Country Studies ......................................................................................................... 15

8. Supplementary Information ....................................................................................... 16
   8.1 Glossary ................................................................................................................ 16
   8.2 Notes ..................................................................................................................... 17
   8.3 References ............................................................................................................ 18
   8.4 Photos ................................................................................................................... 19
   8.5 About this Publication ......................................................................................... 19
1. Quick Facts

In Cambodia, 6.3 million people were living on degrading agricultural land in 2010 – an increase of 38% in a decade, bringing the share of rural residents who inhabit degraded agricultural land up to 55% 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 37%, reaching 585 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 Cambodia is estimated at 677 million United States dollars (USD). This is equal to 8% 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 3 USD for every dollar invested in restoring degraded land in Cambodia. 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 Cambodia, the Agriculture, Forestry and Other Land Use (AFOLU) sector is responsible for 85% of the total greenhouse gas 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 and adaptation as also reflected in Cambodia’s Nationally Determined Contributions (NDC).

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) 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. Cambodia 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(4) 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 Cambodia is estimated to affect 21% of the rural population.(6) In 2010, 55% of the rural population of the country was living on degrading agricultural land, which amounts to approximately 6.3 million people.(7) Moreover, between the years 2000 and 2010, the number of people living on degrading agricultural land grew by 1.7 million, representing an increase of 38% over the decade (see table 1 for further details).

By 2010, 585 thousand people or 5% of Cambodia’s rural population resided in remote degrading agricultural areas without market access. This number increased by 37% 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, 54% of people employed in Cambodia are linked to the agriculture sector.(8) 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 Cambodia(4-9)

<table>
<thead>
<tr>
<th>Population categories</th>
<th>2000</th>
<th>2010</th>
<th>% change from 2000 to 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural population on degrading agricultural land</td>
<td>4,575,808</td>
<td>6,292,693</td>
<td>37.5%</td>
</tr>
<tr>
<td>Share (%) of rural population on degrading agricultural land</td>
<td>46.1%</td>
<td>54.6%</td>
<td>*8.6%</td>
</tr>
<tr>
<td>Rural population on remote degrading agricultural land</td>
<td>426,509</td>
<td>585,387</td>
<td>37.3%</td>
</tr>
<tr>
<td>Share (%) of rural population on remote degrading agricultural land</td>
<td>4.3%</td>
<td>5.1%</td>
<td>*0.8%</td>
</tr>
<tr>
<td>Rural population</td>
<td>9,930,802</td>
<td>11,518,160</td>
<td>16.0%</td>
</tr>
<tr>
<td>Total population</td>
<td>12,197,905</td>
<td>14,363,586</td>
<td>17.8%</td>
</tr>
</tbody>
</table>

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 regional and global scale

<table>
<thead>
<tr>
<th>Regions</th>
<th>Population in 2010</th>
<th>% change from 2000 to 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural population (in millions)</td>
<td>Rural population on DAL (in millions)</td>
</tr>
<tr>
<td>Africa</td>
<td>812.6</td>
<td>184.0</td>
</tr>
<tr>
<td>Asia</td>
<td>3,102.9</td>
<td>1,176.8</td>
</tr>
<tr>
<td>Europe</td>
<td>310.1</td>
<td>75.6</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>350.9</td>
<td>48.2</td>
</tr>
<tr>
<td>Northern America</td>
<td>71.4</td>
<td>11.4</td>
</tr>
<tr>
<td>Oceania</td>
<td>16.0</td>
<td>0.9</td>
</tr>
<tr>
<td>World Total</td>
<td>4,663.9</td>
<td>1,496.9</td>
</tr>
</tbody>
</table>

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.\(^6\),\(^7\),\(^10\)

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).\(^10\)

In Cambodia, the total annual cost of land degradation is estimated at 677 million United States Dollars (USD) — this is equal to 8% of the country’s Gross Domestic Product (GDP).\(^6\) Moreover, a considerable share of the costs of land degradation (37%) 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).\(^9\)

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\(^8\) shows that for Cambodia the returns on taking action against land degradation versus inaction are estimated at 3 USD for every dollar invested in reverting degraded land,\(^14\) underlining the strong economic incentives for bold actions on achieving LDN.

<table>
<thead>
<tr>
<th>Table 3: Economics of land degradation (LD) in Cambodia(^4),(^6),(^8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total annual cost of land degradation (base year 2007)</strong></td>
</tr>
<tr>
<td><strong>Cost of LD due to the decline in provisioning ecosystem services (as % of total cost)</strong></td>
</tr>
<tr>
<td><strong>Cost of land degradation as % of GDP</strong></td>
</tr>
<tr>
<td><strong>Cost of action (30-year planning horizon)</strong></td>
</tr>
<tr>
<td><strong>Cost of inaction (30-year planning horizon)</strong></td>
</tr>
<tr>
<td><strong>Returns on action against land degradation per dollar invested</strong></td>
</tr>
<tr>
<td><strong>GDP 2016 (USD)</strong></td>
</tr>
<tr>
<td><strong>Share of Agriculture in total GDP 2016</strong></td>
</tr>
<tr>
<td><strong>GDP per capita 2016 (USD)</strong></td>
</tr>
</tbody>
</table>

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. 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 (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. 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 regional and global scale

<table>
<thead>
<tr>
<th>Regions</th>
<th>Cost of Land Degradation (LD)</th>
<th>Cost of action and inaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total annual cost of LD (in billion USD, year 2007)</td>
<td>% of the annual cost of LD in the world total</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Africa</td>
<td>65</td>
<td>22.0</td>
</tr>
<tr>
<td>Asia</td>
<td>84</td>
<td>28.4</td>
</tr>
<tr>
<td>Europe</td>
<td>35</td>
<td>11.8</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>61</td>
<td>20.4</td>
</tr>
<tr>
<td>Northern America</td>
<td>36</td>
<td>12.2</td>
</tr>
<tr>
<td>Oceania</td>
<td>15</td>
<td>5.2</td>
</tr>
<tr>
<td>World Total</td>
<td>297</td>
<td>100.0</td>
</tr>
</tbody>
</table>
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 Cambodia, the AFOLU sector is responsible for 85% of the total emissions of the country (see table 5).

Within Cambodia’s AFOLU sector, the larger share of the emissions is from Forestry and Other Land Use (FOLU) subsector (47%). Emissions from Agriculture plays 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 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.\(^{(10)}\) 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.\(^{(10)}\)

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.\(^{(10)}\)

Table 5: Land as a source and sink of emissions\(^{(10)}\) in Cambodia (year 2010)

<table>
<thead>
<tr>
<th>Sectors</th>
<th>GHG (Mt-CO(_2)e)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources total</td>
<td>49.73</td>
<td>100.0</td>
</tr>
<tr>
<td>AFOLU sources</td>
<td>42.17</td>
<td>84.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>18.76</td>
<td>37.7</td>
</tr>
<tr>
<td>FOLU net sources</td>
<td>23.41</td>
<td>47.1</td>
</tr>
<tr>
<td>Other sectors</td>
<td>7.56</td>
<td>15.2</td>
</tr>
<tr>
<td>Forest net sink</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>FOLU total</td>
<td>23.41</td>
<td></td>
</tr>
<tr>
<td>Total net emissions with FOLU</td>
<td>49.73</td>
<td></td>
</tr>
<tr>
<td>Total net emissions per capita</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with FOLU (in tonnes of CO(_2)e)</td>
<td>3.5</td>
<td></td>
</tr>
</tbody>
</table>

Note: GHG=Greenhouse Gases; Mt-CO\(_2\)e = million tonnes of carbon dioxide equivalent.
The UNCCD Science Policy Interface developed the Land Degradation Neutrality (LDN) conceptual framework, 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.

### 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. 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.

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.

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

Note: tC = tonne of Carbon

Land matters play a key role in developing climate change mitigation and adaptation policies. Box 2 presents the leading land-based mitigation and adaptation strategies considered in Cambodia’s Nationally Determined Contributions.
Box 2. Highlights on Climate Change and Land from Cambodia’s Nationally Determined Contributions

Land-based mitigation plans

Forestry and Other Land Uses (FOLU) target: 60% forest cover of total land area / 4.7 tCO2eq/ha/year

Conservation: Protected areas: 2.8 million hectares; Protected forest: 3 million hectares; Community forest: 2 million hectares; Forest concessions reclassified to protected and production forest: 0.3 million hectares; Production forest: 2.5 million hectares

Biofuels: Use of biogas

Efficient Cookstoves: Promoting more efficient cookstoves

Land-based adaptation priorities

Reforestation: Increasing forest cover to 60% of national land area, and maintaining that level from 2030 onwards

Climate Smart Agriculture: Promoting climate resilient agriculture in coastal areas through building sea dykes and scaling-up of climate-smart farming systems; Developing climate-proof agriculture systems for adapting to changes in water variability to enhance crop yields

Irrigation: Developing climate-proof tertiary-community irrigation to enhance the yields from agricultural production of paddy fields; Increasing the use of mobile pumping stations and permanent stations in responding to mini-droughts, and promoting groundwater research in response to drought and climate risk

Agroecology: Developing crop varieties suitable to Agro-Ecological Zones (AEZ) and resilient to climate change

Disaster Risk Management: Strengthening early warning systems

Mitigation and adaptation policy frameworks: Green Growth Policy and Roadmap (2009); Climate Change Strategic Plan (2014 - 2023); National Adaptation Plan (NAP) - Under Preparation; National Adaptation Programme of Action to Climate Change (2006); FLEGT Programme (Forest Law Enforcement, Governance and Trade)
4.2 Regional and Global Overview

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: Regional and global emissions/removals from the Agriculture, Forestry and Other Land Use (AFOLU) sector and related indicators(10) in 2010

<table>
<thead>
<tr>
<th>Regions</th>
<th>Sources total</th>
<th>AFOLU Net sources</th>
<th>Agriculture</th>
<th>FOLU Net sources</th>
<th>Forest net sink</th>
<th>Total emissions per capita with FOLU Mt-CO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mt-CO₂e</td>
<td>in %</td>
<td>Mt-CO₂e</td>
<td>in %</td>
<td>Mt-CO₂e</td>
<td>in %</td>
</tr>
<tr>
<td>Africa</td>
<td>4,109</td>
<td>8.3</td>
<td>2,610</td>
<td>22.9</td>
<td>794</td>
<td>15.7</td>
</tr>
<tr>
<td>Asia</td>
<td>23,421</td>
<td>47.5</td>
<td>3,974</td>
<td>34.9</td>
<td>2,262</td>
<td>44.6</td>
</tr>
<tr>
<td>Europe</td>
<td>8,268</td>
<td>16.8</td>
<td>875</td>
<td>7.7</td>
<td>567</td>
<td>11.2</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>4,838</td>
<td>9.8</td>
<td>2,724</td>
<td>23.9</td>
<td>896</td>
<td>17.7</td>
</tr>
<tr>
<td>Northern America</td>
<td>7,711</td>
<td>15.6</td>
<td>752</td>
<td>6.6</td>
<td>406</td>
<td>8.0</td>
</tr>
<tr>
<td>Oceania</td>
<td>1,001</td>
<td>2.0</td>
<td>445</td>
<td>3.9</td>
<td>150</td>
<td>3.0</td>
</tr>
<tr>
<td>World total</td>
<td>49,349</td>
<td>100</td>
<td>11,380</td>
<td>100</td>
<td>5,075</td>
<td>100</td>
</tr>
</tbody>
</table>

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.

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

The LDN targets provide Cambodia 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).\(^{(1)}\)
Box 2. Cambodia’s National Voluntary LDN Targets and Measures

Cambodia is committed to work on combating desertification and land degradation, through the implementation of sustainable land management practices and institutional and legislative measures in order to achieve Land Degradation Neutrality by 2030, with national, regional and international partners. To that effect, Cambodia has set the following voluntary national LDN Targets:

1. Increase forest cover will be increased to 47% of the total land area;
2. Increase agricultural growth by 5% per annum as compared to 3% in 2016;
3. Increase soil organic carbon (SOC) stock in forest and cropland by 1.2% per year as compared to 2015; and
4. Maintain and enhance ecosystems and their services by establishing 23,500 sq. km of protected forest and 3,900 sq. km of production forest, and restoring at least 8% of degraded and depressed protected areas, conservation areas, agroecosystems and forest ecosystems including mangroves.

In line with the commitments of RGC in the UN framework and conventions (UNFCCC, UNCBD, UNCCD, and in line with national forest program, national biodiversity strategy and action plan, and national agricultural strategic development plan, and others relevant policies and strategies, the RGC is committed to combat land degradation and to achieve a state of Land Degradation Neutrality by 2030, through the following measures:

1. Promote reforestation by intensifying tree planting and forest rehabilitation with 10 million tree seedlings and 233 sq. km per year.
2. Maintain protected forest and wildlife conservation at 390 sq. km per year.
3. Keep forest land for community forest (CF) development with by confining area of 783 sq. km and forming 50 CF per year.
4. Restore degraded and deforested landscapes in 3 provinces (Kampong Thom, Preah Vihear and Siem Reab) by implementing Forest Landscape Restoration (FLR) and Restoration Opportunities Assessment Methodology (ROAM) approach.
5. Reduce conversion of forest land by cessation of economic land concession program.
6. Enforcement of laws by strengthening the coordination, public meeting and dialogues amongst senior forestry officials, military and police officials, and subnational government officials.
7. Increase the productivity of cropland (all kind of crops) at 10% per annum, contributing to achieving 5% agricultural growth per annum, by promoting programs on agricultural land conservation and improvement for sustainable soil management.
8. Apply GAHP (Good Animal Husbandry Practices) in animal production farms that will increase number of pigs by 2%, poultry - 4% and cattle - 1% per year; and to promote animal waste management for soil improvement and rural energy by installing around 1,000 biogas digesters.
9. Strengthen the implementation of rice production and export policy and industrial development policy, especially focusing on improved quality and safety of agricultural produce, and access to national and international markets.
10. Improve land productivity by applying sustainable agricultural practices (Conservation agriculture, organic farming) that will increase soil organic matter content to 4% of cropland (Rice, vegetables, fruit trees) per year.
11. Develop and apply policy and legislations for payment for ecosystem services (PES) to provide incentives for the conservation and sustainable use of biodiversity.
12. Apply best practices to the identified degraded ecosystems for their restoration and resilience, and assess their contribution to soil organic carbon stock.
13. Strengthen human, institutional, technological, and financial capacity building including legislations and incentives.
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. xx

Collaborative Management for Watershed and Ecosystem Service Protection and Rehabilitation in the Cardamom Mountains, Upper Prek Thnot River Basin. The objective of this project is to restore and maintain forest cover and watershed stability functions while providing for sustainable livelihoods and ecosystem services in the Upper Prek Thnot Watershed. Funding Source: GEF Trust Fund. Implementing Agency: United Nations Development Programme. GEF Project Grant/Co-financing Total: 1.10 million USD/4.94 million USD. Link: for further information click here.


Forest Carbon Partnership Facility Readiness. The project aims to develop and enhance the Cambodian government’s capacities for tackling deforestation and forest degradation as well as for measuring, reviewing and verifying emission reductions. Implementing Organization: Forestry Administration. Budget Sources: Voluntary Contributions/Forest Carbon Partnership Facility Trustee. Total Resources Required: 6.75 million USD. Link: for further information click here.

Forest Carbon Partnership Facility Phase 2 This project builds upon the existing forest carbon partnership facility project and aims to further enhance the capacities of the government of Cambodia for tackling deforestation and forest degradation to reduce greenhouse gas emissions. Implementing Organization: GDANCP/MoE. Budget Sources: Voluntary Contributions; Forest Carbon Partnership Facility Trustee. Link: for further information click here.

National Soil Information and Land Suitability Evaluation System for Cambodia. The project output is to increase productivity, diversification and commercialization of agriculture, including livestock and aquaculture for poverty reduction and food and nutrition security. Donor: FAO Resource. Grant: 297.000 USD. Link: for further information click here.

Enhancement of Flood and Drought Management in Pursat Province. A project to improve capacity and preparedness to manage and mitigate the impacts of flood and drought events. Grant Funding: 5.80 million USD. For further information click here.

Strengthening National Biodiversity and Forest Carbon Stock Conservation through Landscape-based Collaborative Management of Cambodia’s Protected Area System (PAS) as Demonstrated in the Eastern Plains Landscape. The objective of the project is to enhance Cambodia’s PAS management effectiveness and secure forest carbon through improving inter-sectoral collaboration, landscape connectivity and sustainable forest management. Funding Source: GEF Trust Fund. Implementing Agency: United Nations Environment Programme. GEF Project Grant/Co-financing Total: 4.72 million USD/14.57 million USD. Link: for further information click here.

Project on Land Suitability Assessment and Site-Specific Soil Management for Cambodian Uplands. This project aims to improve soil and land management practice in southwest Cambodia to increase crop yields and profitability for diverse crop options and mitigate or prevent land degradation. Funding source: Australian Centre for International Agricultural Research (ACIAR). Implementation agency: Cambodian Agricultural Research and Development Institute (CARDI) in collaboration with Murdoch University, and Department of Agriculture and Food Western Australia.
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 Values of Land Resources in the Cardamom Mountains of Cambodia. — Sam. et al. (2011).

Inventory of Incentive and Market Based Instruments in Cambodia. — Brander, L. (2014).

Sandy Soils of Cambodia. — Seng Vang et al. (2005).


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\(^8\) 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\(^8\) 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.\(^6\)
Sustainable Land Management

SLM is the use and management of land resources—soil, water, animals and plants—as 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\(^a\), in combination with data on rural population from the Word Bank Development Indicators.\(^{\text{41}}\)

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.\(^{\text{39}}\)

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.\(^{\text{40}}\)

v. The relationship between food production (provisioning ecosystem service) and the supply of other ecosystem services often depicts important trade-offs.\(^{\text{19}}\)

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\(^{\text{39}}\) 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 (CO\(_2\)).

ix. This version of the country profile uses the ‘Global GHG Abatement Cost Curve’ as default information.\(^{\text{14}}\) 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.\(^{\text{110}}\)

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.
8.3 References


8.4 Photos

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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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