



Greenhouse Gas Emissions in Cambodia

Cambodia Numbers at a Glance (2013)

51.67 MtCO₂e ^(a)

Total GHG emissions
(0.11% of world total)

World: 48,257 MtCO₂e

15,078,564

Population

World: 7,176,092,192

3.43

tCO₂e per capita

World: 6.72 tCO₂e

US\$13,877 Million

GDP ^(b)

World: US\$71,059 Billion

3,723

tCO₂e/million US\$ GDP

World: 679 tCO₂e/million US\$ GDP

+10.85 MtCO₂e (+27%)

Change in GHG emissions
(1990–2013) ^(c)

World: +14,434 MtCO₂e
(+43%)

Sources: WRI CAIT 2.0, 2017.

Emissions including Land-Use Change and Forestry.

(a) Million metric tons of carbon dioxide equivalent. Global Warming Potentials are from the Intergovernmental Panel on Climate Change Second Assessment Report.

(b) Gross Domestic Product (GDP) in constant 2010 US\$.

(c) Total GHG emissions for 1990 are the sum of WRI CAIT data for LUCF, agriculture, waste, and IP; energy sector emissions are not available and are excluded.

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Greenhouse Gas (GHG) Emissions by Sector

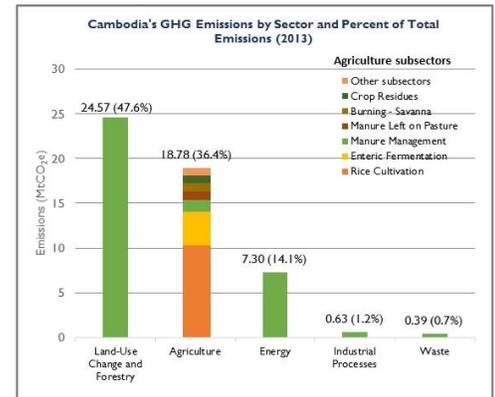
According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), Cambodia's 2013 GHG profile was dominated by emissions from the land-use change and forestry (LUCF) sector, which accounted for 47.6% of the country's total emissions.¹ Within LUCF, changes in forest land contributed 93% of emissions.² Agriculture was the second highest emitter (36.4%) with rice cultivation and enteric fermentation from livestock contributing 74% of agriculture emissions.³ Energy, industrial processes (IP), and waste contributed 14.1%, 1.2%, and 0.7% of total emissions respectively.⁴

Surprisingly, Cambodia's [Second National Communication \(SNC\)](#) to the UNFCCC, which includes a GHG inventory

for year 2000, does not show LUCF to have been the leading source of emissions. Instead, it shows the LUCF sector to have been a net sink in 2000, absorbing more emissions than it released.⁵ Other government and international sources have cited deforestation in Cambodia.⁶ Despite the difference in LUCF findings, both the SNC inventory and WRI CAIT show agriculture to be the second most significant sector after LUCF, followed by energy and waste.

Change in GHG Emissions in Cambodia (1990-2013)

According to WRI CAIT, Cambodia's GHG emissions increased by 10.85 MtCO₂e from 1990 to 2013.⁷ The average annual change in total emissions during this period was 1.1%, with sector-specific average annual changes as follows: LUCF (-0.2%), agriculture (1.7%), IP (29.3%), and waste (2.3%).⁸ The average annual change for energy from 1995 to 2013 was 5.3%. The change in the two highest emitting sectors is discussed below.



Sources: WRI CAIT 2.0, 2017; FAOSTAT, 2017.

¹ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT 2.0, 2017). WRI has followed the [Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories - Understanding the Common Reporting Framework](#). Global Warming Potentials (GWPs) are from the Intergovernmental Panel on Climate Change (IPCC) [Second Assessment Report \(SAR\)](#). WRI CAIT draws on the Food and Agriculture Organization (FAO) for LUCF and agriculture emissions, the International Energy Agency, primarily, for energy emissions, and the US Environmental Protection Agency for IP and waste sectors emissions.

² FAO Statistics Division (FAOSTAT). Cambodia, [Emissions – Land use total](#), viewed on April 26, 2017.

³ WRI CAIT 2.0, 2017 and FAOSTAT, Cambodia, [Emissions – Agriculture total](#), viewed on April 26, 2017.

⁴ WRI CAIT 2.0, 2017. WRI CAIT notes that its LUCF data is useful as reference only and may not coincide with LUCF emissions reported by countries to the UNFCCC (WRI, [CAIT Country Greenhouse Gas Emissions: Sources & Methods](#), 2015).

⁵ Kingdom of Cambodia, Ministry of Environment. Cambodia's [Second National Communication \(SNC\)](#) to the UNFCCC, 2015. Cambodia's SNC uses GWPs from the IPCC SAR, and follows the Revised 1996 IPCC Guidelines. The SNC shows GHG emissions in Gg of CO₂e; converted to MtCO₂e in this factsheet (MtCO₂e=GgCO₂e/1000). The SNC notes that forest and grassland conversion emitted 22.85 MtCO₂e in 2000. However, changes in forest and other woody biomass stocks and abandonment of managed lands removed 48.16 MtCO₂e that year, resulting in a net sink of about 25.31 MtCO₂e in LUCF. The SNC notes a high level of uncertainty in LUCF sector emissions due to the absence of regular data collection, the inventory being based on extrapolation of the 1992/93 and 1996/97 forest assessment, concerns about reliability of harvesting/logging statistics due to illegal logging activities, and the absence of soil classification in the country. The SNC does not include IP emissions.

⁶ The Forestry Administration (FA), under the Ministry of Agriculture Forestry and Fisheries (MAFF), conducted a series of forest cover assessments between 1993 and 2006 to monitor the loss of forest land. The 2002–2006 results revealed that Cambodia lost 373,510 hectares (ha) of its forest area in only 4 years. The study notes that in 1965 forests covered an estimated 73% of the country's total area. This figure dropped to 59.82% in 1993; 58.6% in 1997; 61.15% in 2002; and 59.09% in 2006 (FAO Regional Office for Asia and the Pacific, and The Forestry Administration, Phnom Penh. [Cambodia Forestry Outlook Study](#). 2010). Another source on the forest cover trends in the Northern Plains of Cambodia shows a 0.79% deforestation rate in the study area over the 2002–2010 period (Kingdom of Cambodia, UNDP, GEF. [Forest Cover Trends in the Northern Plains of Cambodia 2002–2010](#), 2010).

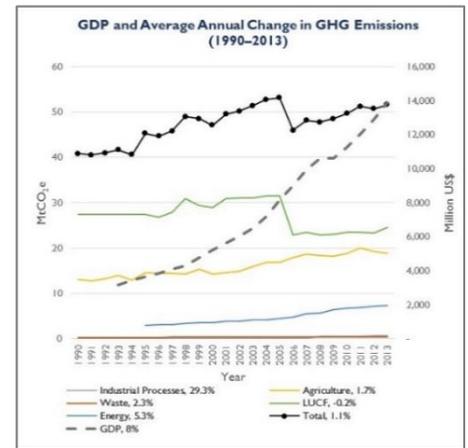
⁷ WRI CAIT 2.0, 2017. National total GHG emissions are the sum of WRI CAIT data for LUCF, agriculture, energy, IP, and waste.

WRI CAIT does not present energy data for 1990–1994. Therefore, total GHG emissions for 1990–1994 do not include energy.

⁸ WRI CAIT 2.0, 2017.

LUCF: According to the FAO, Cambodia's LUCF emissions decreased 11% between 1990 and 2013.⁹ LUCF emissions in Cambodia are driven primarily by changes in forest land.¹⁰ Cambodia has a relatively high level of forest cover but the deforestation rate is also high. Also according to the FAO, Cambodia's annual deforestation rate was 1.45% between 2000 and 2005, and 1.22% between 2006 and 2010.¹¹ As of 2010, forests covered 10.09 million ha, nearly 57% of the total land area.¹² The main causes of deforestation include agricultural expansion, illegal logging, construction activities and increasing demands for land associated with growth in foreign direct investment from South East Asia.¹³ In 2010, Cambodia prepared its [2010-2029 National Forest Programme](#) with 14 strategic targets including the increase of forest cover to 60% of total land area; implementation of sustainable forest management with silviculture on 2.4 million ha of production forest; 3 million ha of protected forest; establishment of 500,000 ha of high value commercial plantation; and allocation of 2 million ha of forest land for community forestry. Cambodia also participates in the UN-REDD Programme and the Forest Carbon Partnership Facility. As part of the former, in 2010, Cambodia prepared its [National REDD+ Strategy Roadmap](#), and received funding for a UN-REDD National Programme which is currently being implemented.¹⁴

Agriculture: According to WRI CAIT, agriculture emissions increased by 43% from 1990 to 2013, driven by rice cultivation and enteric fermentation from livestock.¹⁵ According to data from the FAO, rice production more than tripled in the same period.¹⁶ Three-quarters of the country's 3.7 million ha of cultivated land are used for rice cultivation.¹⁷ While Cambodia's farms are dominated by smallholders, in the livestock sector, there is an emerging trend of large-scale commercial businesses entering the livestock industry.¹⁸ FAO data show a 33% increase in the number of cattle in the period 1990-2013.¹⁹ In 2014, Cambodia developed its [Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries 2014-2018](#) identifying adaptation and mitigation actions to be implemented including the promotion of research on climate-smart agriculture.



Source: WRI CAIT 2.0, 2017

Carbon Intensity: GHG Emissions Relative to Gross Domestic Product (GDP)

According to WRI CAIT,²⁰ Cambodia's GHG emissions increased 24% from 1993 to 2013, averaging 1% annually, while GDP increased 240% in the same period, averaging 8% annually. Although GDP grew faster than GHG, as of 2013, Cambodia's economy emitted approximately six times more GHGs relative to GDP than the world average, indicating significant potential for improvement. In 2013, Cambodia developed its [2014-2023 Climate Change Strategic Plan](#) to shift towards a green development path by promoting low-carbon development and technologies, as one of its strategic goals.

Climate Change Mitigation Targets and Plans

Cambodia committed in its [Intended Nationally Determined Contribution \(INDC\)](#) to reduce its GHG emissions by 27% by 2030, relative to its 2010 GHG emissions, contingent upon international support. In the LUCF sector, the INDC reiterates the National Forest Programme aim to increase and maintain its forest cover at 60% of the total land area. This will be achieved through the reclassification of forest areas and the implementation of the Forest Law Enforcement, Governance and Trade, which aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber. The commitment will be implemented in the energy sector (16%) through increased on-grid and off-grid renewable energy generation and promotion of energy efficiency; in the IP sector (7%) through the promotion of renewable energy and adoption of energy efficiency in garment factories, rice mills, and brick kilns; in transport (3%) through the promotion of public transport and use of energy efficient vehicles, and actions in other sectors (1%). Cambodia ratified the Paris Agreement in February 2017.²¹

⁹ FAOSTAT, 2017 and WRI CAIT 2.0, 2017. Data show that LUCF emissions dropped 8.52 MtCO₂e between 2005 and 2006. This decrease in emissions may be due to various reasons including (1) an over-estimate of emissions reductions, and (2) FAO applying different deforestation rates over the periods 2000-2005; 2006-2013.

¹⁰ FAOSTAT, 2017.

¹¹ FAO. [Global Forest Resources Assessment](#), Global Tables, 2010.

¹² UN-REDD Programme, [Cambodia](#), Viewed on April 26, 2017.

¹³ FAO - Regional Office for Asia and the Pacific, and the Forestry Administration, Phnom Penh. [Cambodia Forestry Outlook Study](#), 2010.

¹⁴ UN-REDD Programme. [Cambodia](#), Viewed on April 26, 2017.

¹⁵ FAOSTAT, 2017.

¹⁶ FAOSTAT. [Cambodia – Rice Production Quantity](#). Viewed on April 26, 2017.

¹⁷ FAO and European Union (EU). [Country Factsheet on Food and Agriculture Policy Trends – Cambodia](#), 2014.

¹⁸ Kingdom of Cambodia, Ministry of Environment. Cambodia's [SNC](#) to the UNFCCC, 2015.

¹⁹ FAOSTAT. [Cambodia – Live Animals - Cattle](#). Viewed on April 26, 2017.

²⁰ WRI CAIT does not present GDP data for Cambodia from 1990-1992 because its main source for this information, the [World Bank](#), does not report GDP data for Cambodia during this period. The figures for this section cover the 1993-2013 time period. Moreover, since WRI CAIT does not present energy data for the period 1990-1994, the total emissions from this period are the sum of WRI CAIT data for LUCF, agriculture, waste, and IP.

²¹ UNFCCC, [Paris Agreement – Status of Ratification](#), viewed on April 26, 2017.