

Trend Analysis of GHG Emissions of LAKSHADWEEP

GHG Platform India is a civil society initiative providing an independent estimation and analysis of India's Greenhouse Gas (GHG) emissions across key sectors.

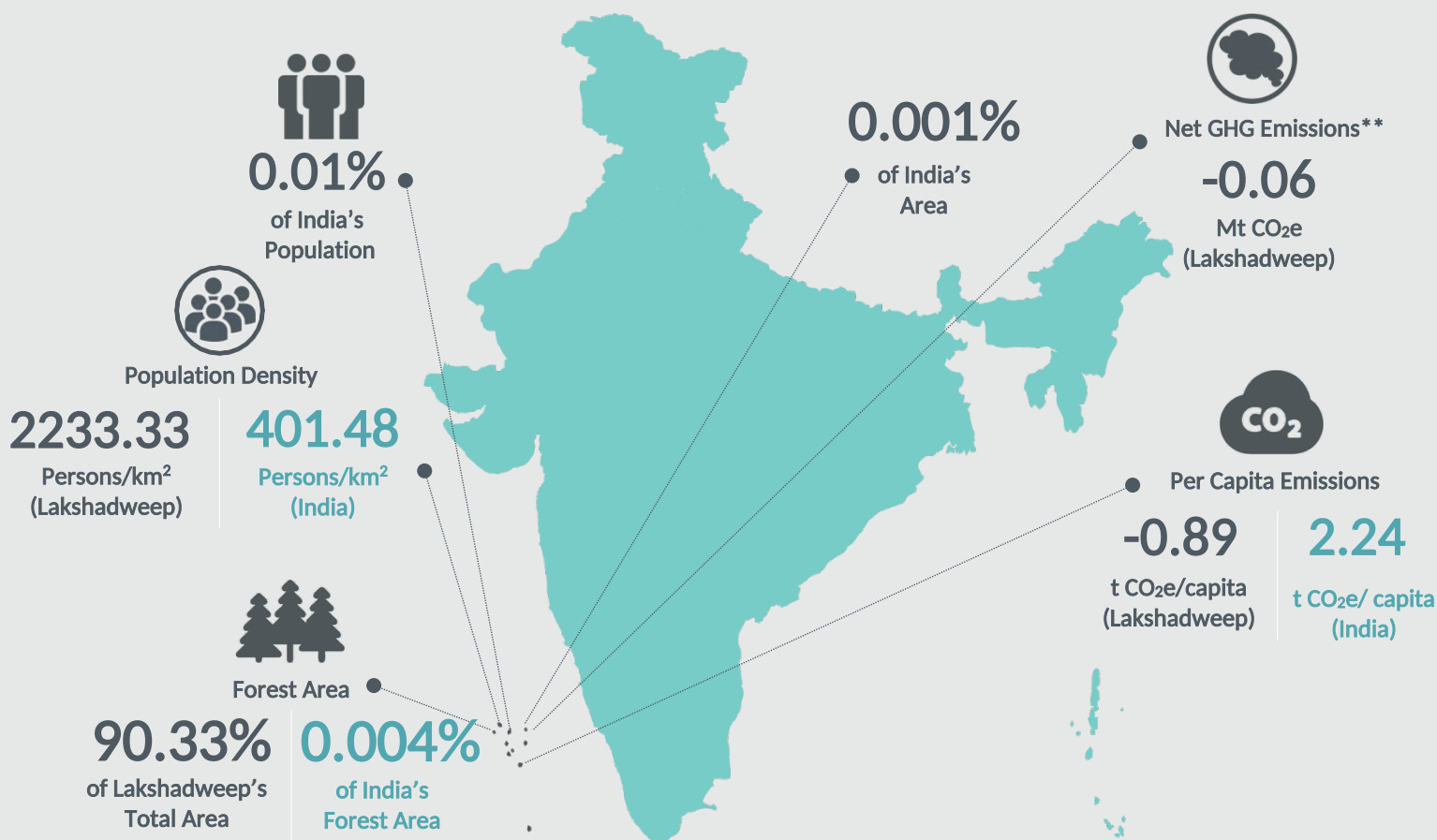
The Platform seeks to add value to the various ongoing GHG emissions estimation efforts by helping address existing data gaps and data accessibility issues, extending beyond the scope of national inventories to state inventories, and by increasing the volume of analytics and policy dialogue on India's GHG emissions sources, profile, and related policies.

The initiative estimates and assesses GHG emissions and removals from the following sectors:



* Fuel combusted for captive electricity generation (auto-producers) and direct fuel combustion (industrial energy) has been reported under Energy sector.

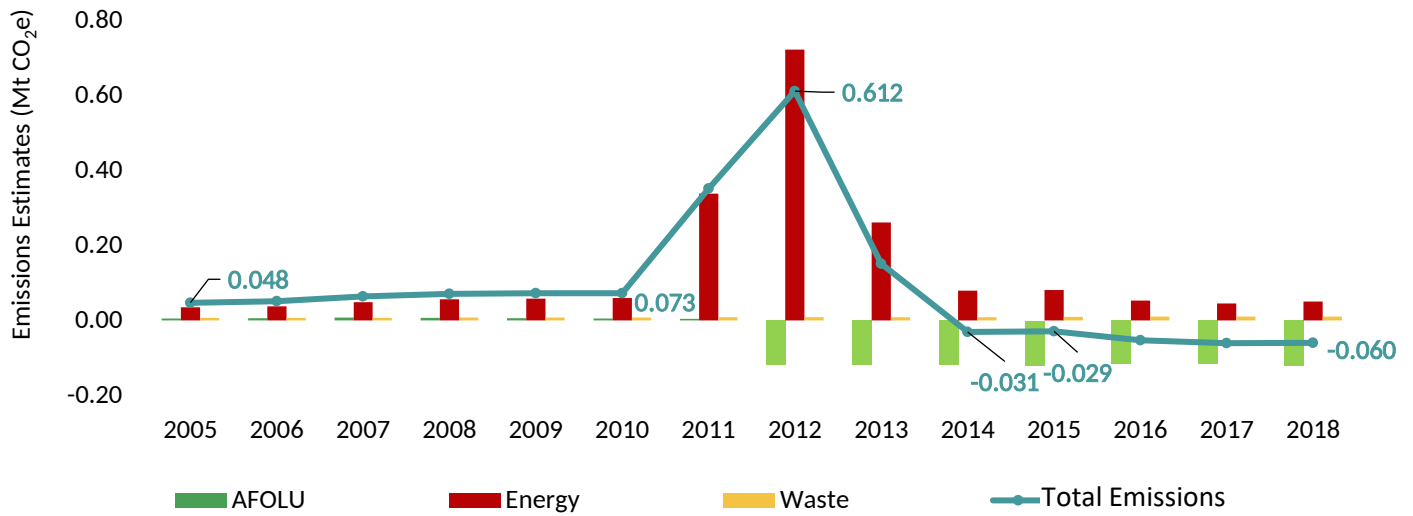
Lakshadweep at a Glance (2018)



*The map represents the data for 2018
**Lakshadweep is a net sink in 2018.

Economy-wide Emissions Estimates

Figure 1: GHG Emissions Estimates of Lakshadweep (2005 to 2018)

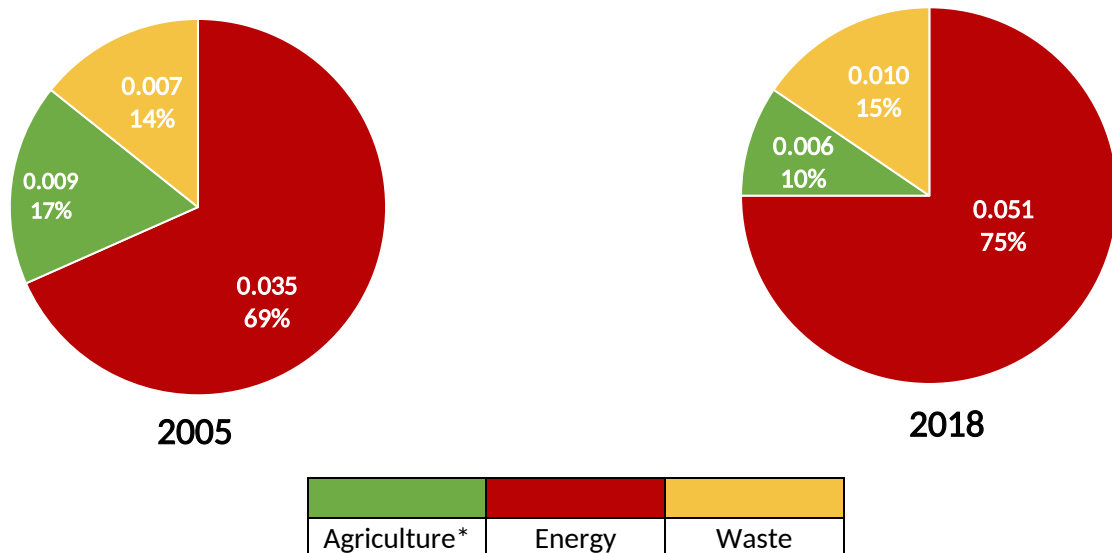


Lakshadweep was a net GHG emitter till 2013 and its emissions grew at a CAGR of 15.55% from 0.051 Mt CO₂e in 2005 to 0.151 Mt CO₂e in 2013. However, from 2014 onwards Union Territory (UT) became a net sink, with net removals increasing from 0.031 Mt CO₂e in 2014 to 0.060 Mt CO₂e in 2018 at a rate of 17.95% (compounded annually) as illustrated in Figure 1. The total economy-wide emissions spiked between 2011 and 2013 due to a significant increase in Energy sector emissions.

In 2005, the share of Energy sector in gross economy-wide emissions (excluding Land sub-sector within AFOLU) was ~69%. This was followed by Agriculture (~17%) and Waste (~14%) sectors. In 2018, the share of Energy sector emissions increased to ~75% of the gross economy-wide emissions. The share of Agriculture related emissions within AFOLU declined to ~10%, whereas, the Waste sector emissions increased to ~15% in 2018.

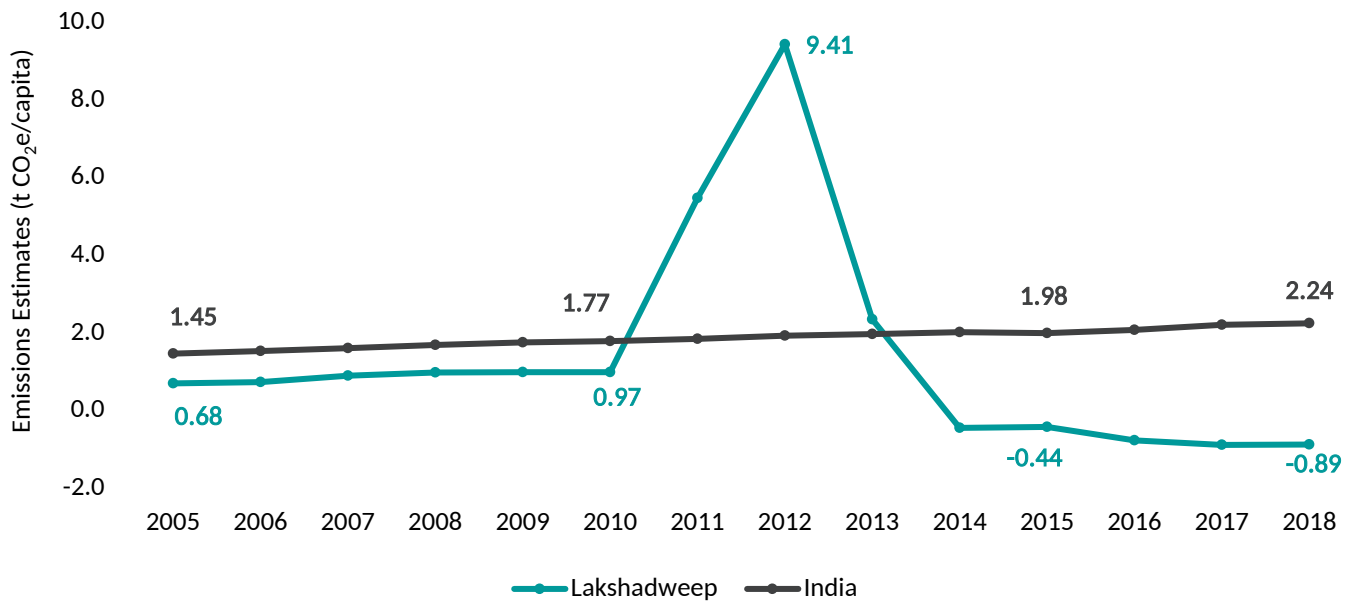
Lakshadweep does not have any activities that lead to Industrial Processes and Product Use (IPPU) emissions.

Figure 2: Sector-wise Contribution (Mt CO₂e) and Percentage Share in Gross Economy-wide GHG Emissions (excluding Land sub-sector within AFOLU) of Lakshadweep



* For the purpose of this comparison, agriculture emissions do not include removals from lands and forests. For further details, please see the section on AFOLU emissions below.

Figure 3: Per Capita Net GHG Emissions of Lakshadweep and India (2005 to 2018)



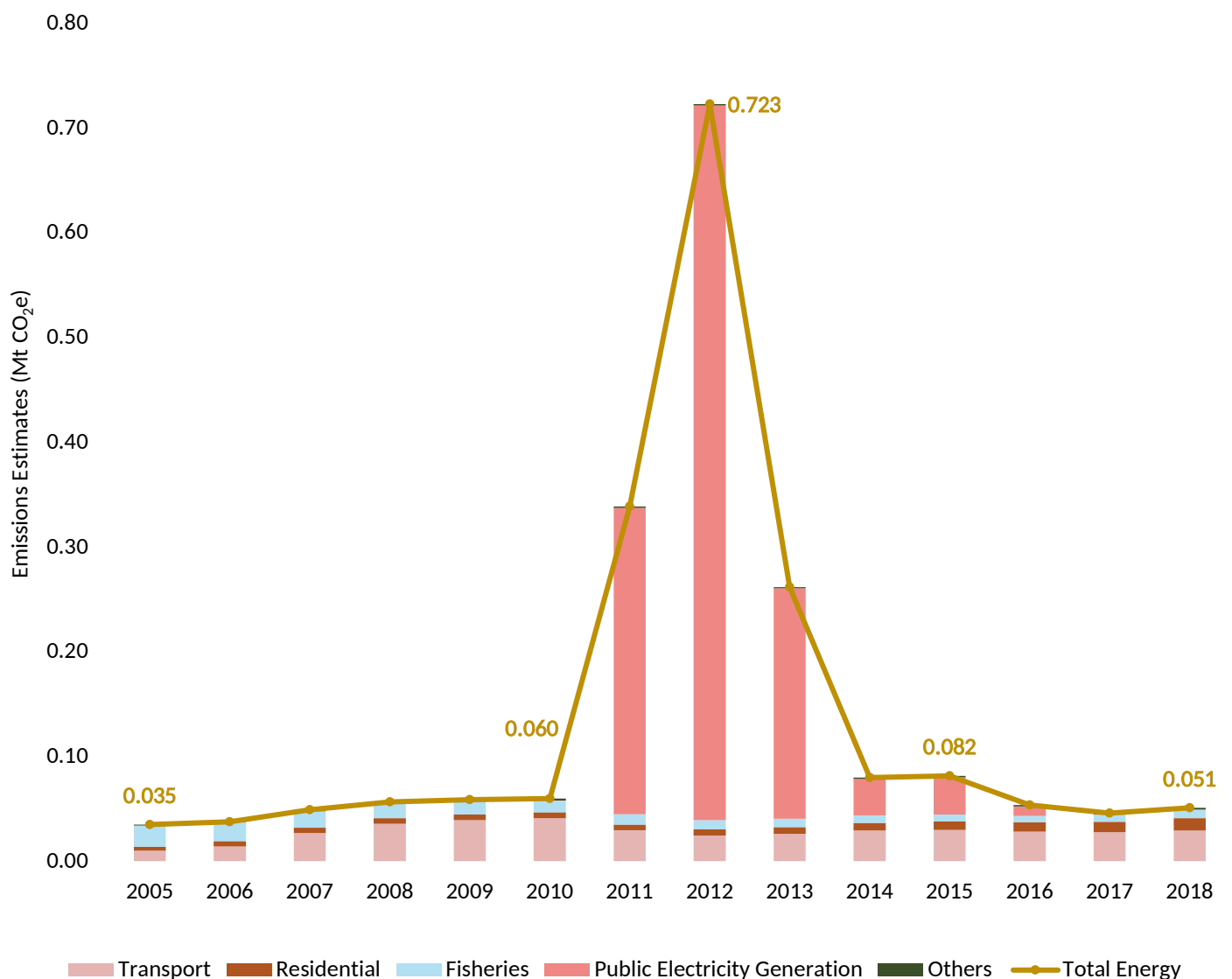
Since Lakshadweep was a net sink in 2018, its per capita emissions were -0.89 t CO₂e/capita, significantly lower than India's per capita emissions. As seen in Figure 3, between 2005 and 2010, Lakshadweep's per capita emissions were lower than India's per capita emissions. However, the per capita emissions of Lakshadweep increased from peaked in 2012, far beyond India's per capita emissions value, which can be attributed to sudden increase in Energy sector emissions in the UT. With the decline in overall emissions of Lakshadweep, the per capita emissions dropped below India's value from 2014 onwards and decreased at a CAGR of 17.77% from 2014 to 2018. Whereas, India's per capita emission increased at a CAGR of 2.91% during the same period.



The Energy sector emissions comprise of emissions from Fuel Combustion and Fugitive Emissions. Fuel Combustion includes emissions from Public Electricity Generation, Transport, Captive Power Plants, Industries, Agriculture, Commercial, and Residential categories. Fugitive Emissions are due to Fuel Production.

The Energy sector of Lakshadweep accounted for ~75% of the gross economy-wide emissions (excluding Land sub-sector within AFOLU) in 2018. The emissions from the Energy sector grew at a CAGR of ~2.29% from 0.035 Mt CO₂e in 2005 to 0.051 Mt CO₂e in 2018 (see Figure 4). However, the overall emissions of Energy sector increased after 2010 and peaked in 2012 owing to the increase in emissions from Public Electricity Generation (PEG) category which declined subsequently.

Figure 4: GHG Emissions Estimates of Energy Sector- Lakshadweep (2005 to 2018)



Within the Energy sector, Transport category was the major contributor to GHG emissions with a share of ~58% in 2018. This was followed by Residential and Fisheries categories with shares of ~23% and ~16%, respectively (see Figure 5).

Within the Fuel Combustion sub-sector, emissions from Liquid Petroleum Fuels were the major contributor, with an average share of ~94% across the reference years. This was followed by Other Fuels with an average share of ~5% between 2005 and 2018 (see Figure 6).

Figure 5: Category-wise Emissions (Mt CO₂e) and Percentage Share in Total Energy Sector Emissions (2018)

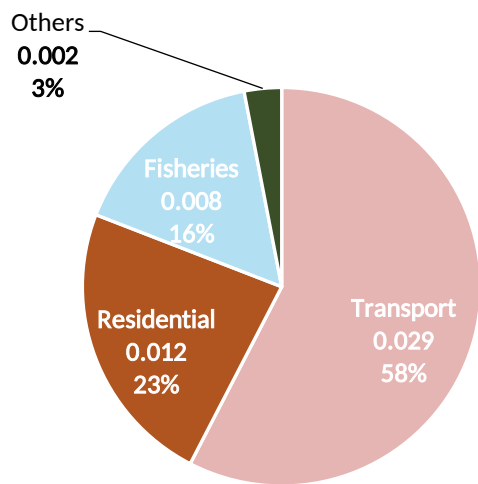
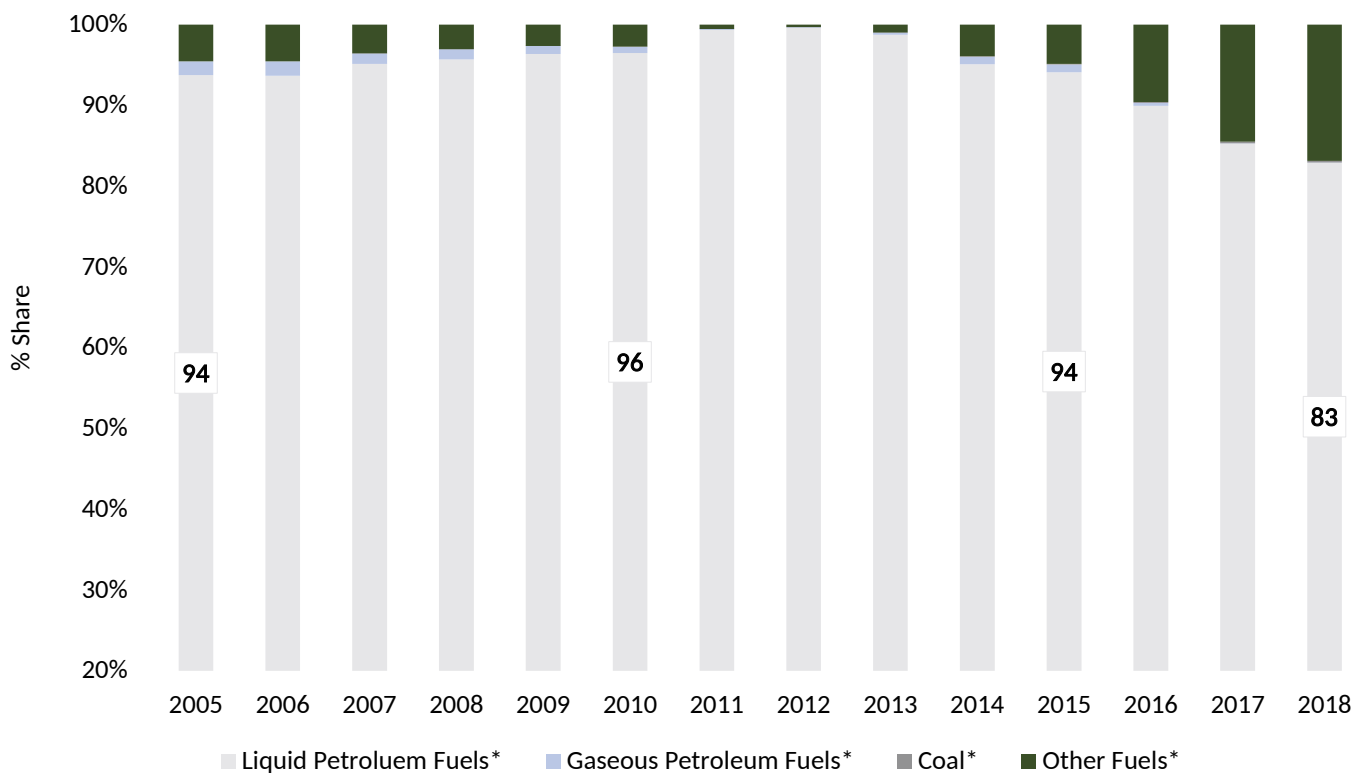


Figure 6: Percentage share of GHG Emissions by Fuel Type due to Fuel Combustion in Energy Sector (2005 to 2018)



***Notes**

1. Liquid Petroleum Fuels- ATF, diesel, kerosene, motor spirit and other liquid fuels
2. Gaseous Petroleum Fuels- natural Gas, LPG and other gaseous fuels
3. Coke is included in coal because the bifurcation of pet-coke and coke was not available
4. Other Fuels comprise of firewood and charcoal



IPPU Sector

Emissions from the Industrial Processes and Product Use (IPPU) sector are largely driven by Chemical, Metal, Mineral Industries and Non-Energy Products from Fuels and Solvent Use. Industrial activities as listed by IPCC to be responsible for GHG emissions from IPPU were not present in Lakshadweep. Therefore, no IPPU emissions were registered in Lakshadweep throughout the reference period.

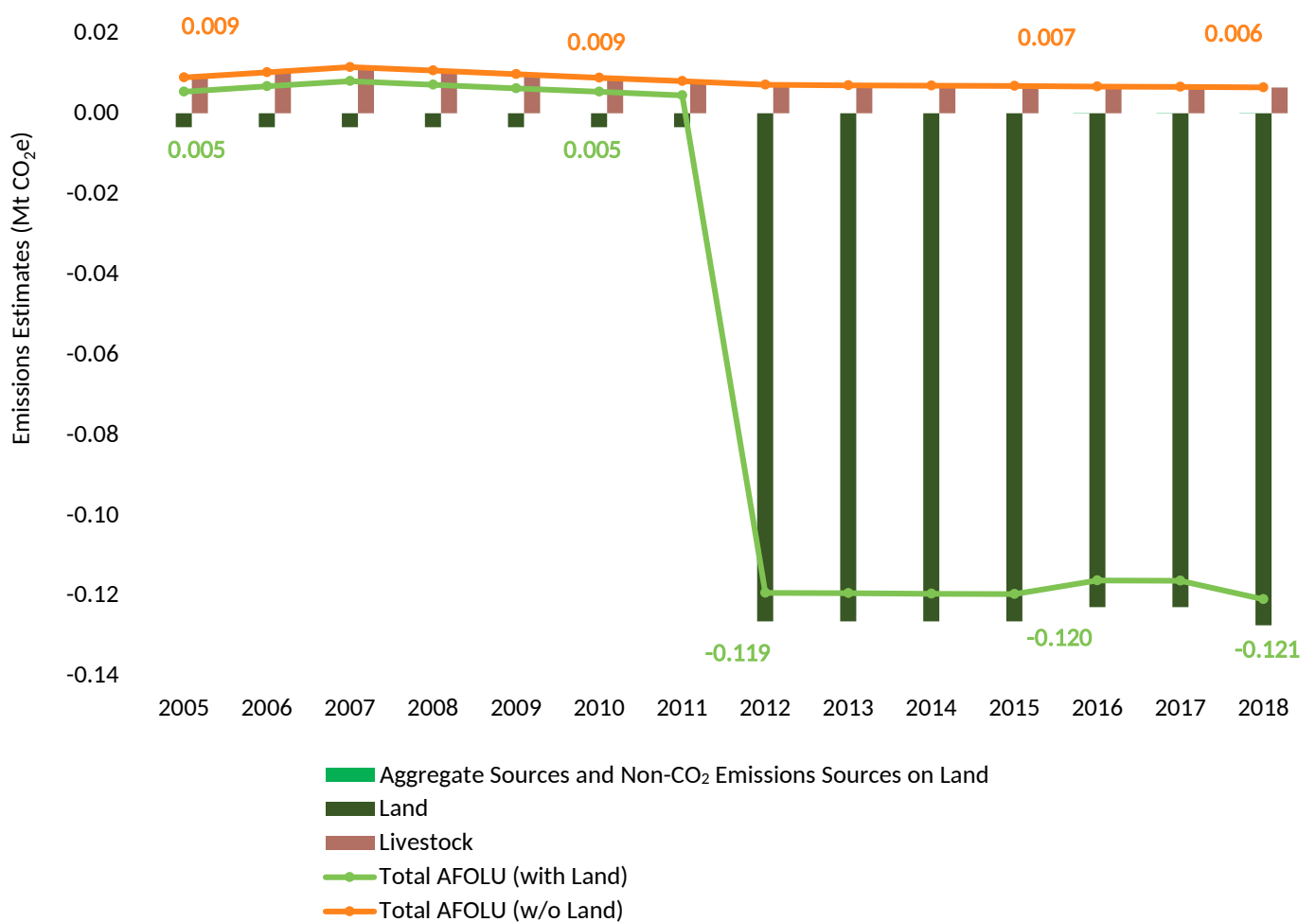


AFOLU Sector

Emissions from the Agriculture, Forestry and Other Land Use (AFOLU) sector arise from three main sub-sectors, namely Livestock, Land and Aggregate Sources and Non-CO₂ Emissions Sources on Land*. In Lakshadweep, Aggregate Sources and Non-CO₂ Emissions Sources on Land and Livestock sub-sectors were net GHG emitters, whereas the Land sub-sector was a net sink across the reference years.

The total AFOLU emissions in the UT declined at a rate of 3.05% (compounded annually), from 0.005 Mt CO₂e in 2005 to 0.004 Mt CO₂e in 2011. Post 2012, the overall AFOLU emissions became a net sink, which can be attributed to the Land Use and Land-Use Change practices. The average annual emissions from Livestock and Aggregate sources were 0.01 Mt CO₂e that were neutralized by CO₂ removals from the Land sub-sector which was, on average, annually removing 0.06 Mt CO₂e during the reference period (see Figure 7).

Figure 7: GHG Emissions Estimates of AFOLU Sector - Lakshadweep (2005 to 2018)

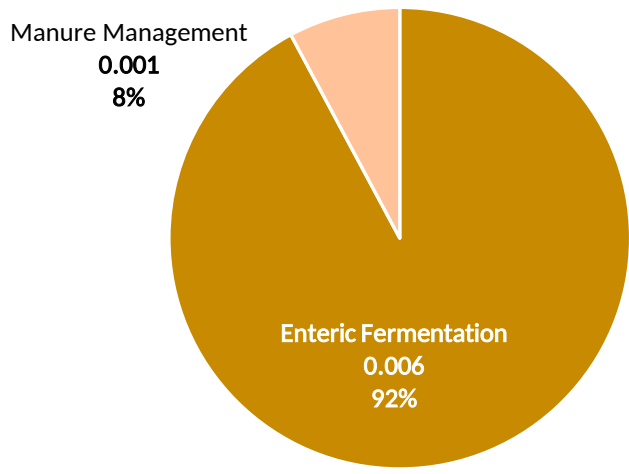


In 2018, almost all the emissions were registered from the Livestock sub-sector and negligible emissions were registered from Aggregate Sources sub-sector, during the reference period (see Figure 8). From the Livestock sub-sector, Enteric Fermentation had an average share of ~93%, while Manure Management had an average share of ~7% of positive AFOLU GHG emissions between 2005 and 2018.

Under the Aggregate Sources and Non-CO₂ Emissions Sources on Land sub-sector, majority of emissions were registered from Biomass Burning in Cropland, with an average share of 0.03% of positive AFOLU GHG emissions during the reference period.

* The sub-sector called 'Aggregate Sources and Non-CO₂ Emission Sources on Land' includes emissions from Rice Cultivation, Agriculture Soils and Biomass Burning in Cropland and Forestland.

Figure 8: Category-wise Emissions (Mt CO₂e) and Percentage Share in Positive AFOLU Emissions (excluding Land sub-sector) (2018)





Waste Sector

Solid Waste Disposal, Domestic Wastewater and Industrial Wastewater are the key sources of GHG emissions in the Waste sector. In Lakshadweep, Waste sector contributed to almost ~12% of the gross economy-wide emissions (excluding Land sub-sector within AFOLU) in 2018. Emissions from the Waste sector grew at a CAGR of 2.83% from 0.007 Mt CO₂e in 2005 to 0.010 Mt CO₂e in 2018 (see Figure 9).

Figure 9: GHG Emissions Estimates of Waste Sector – Lakshadweep (2005 to 2018)

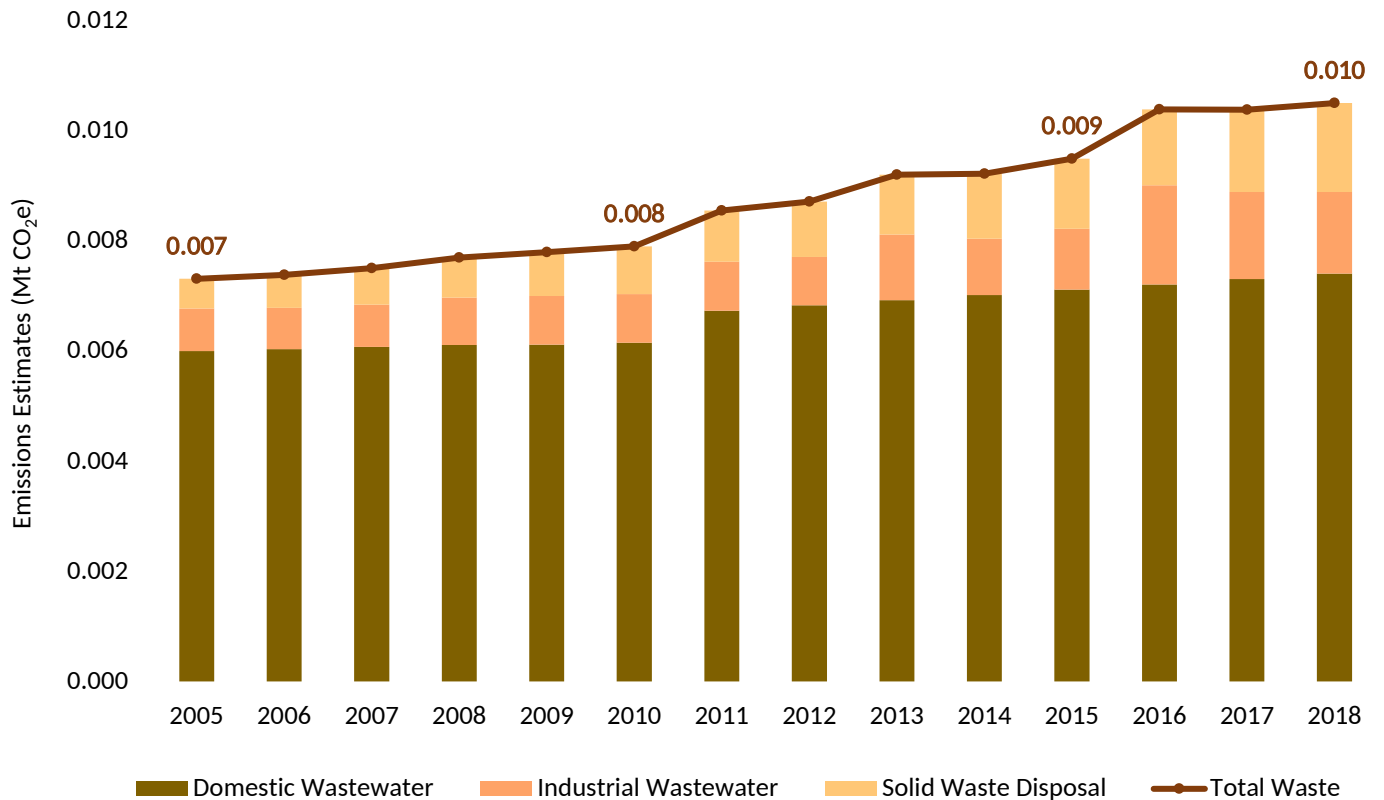
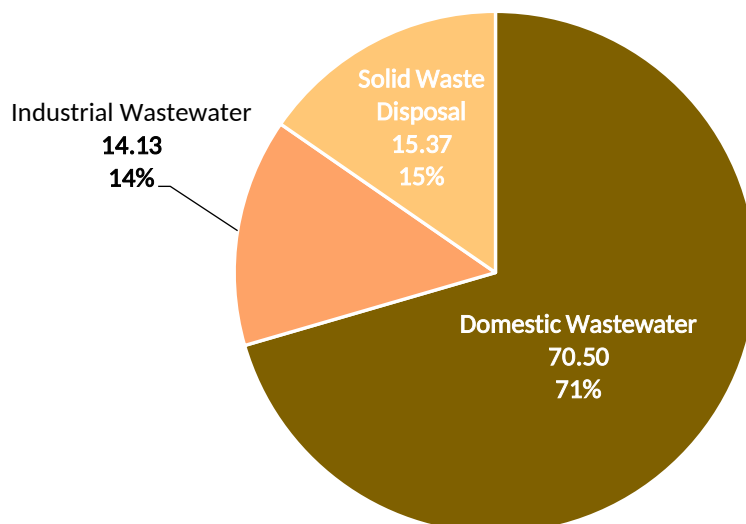


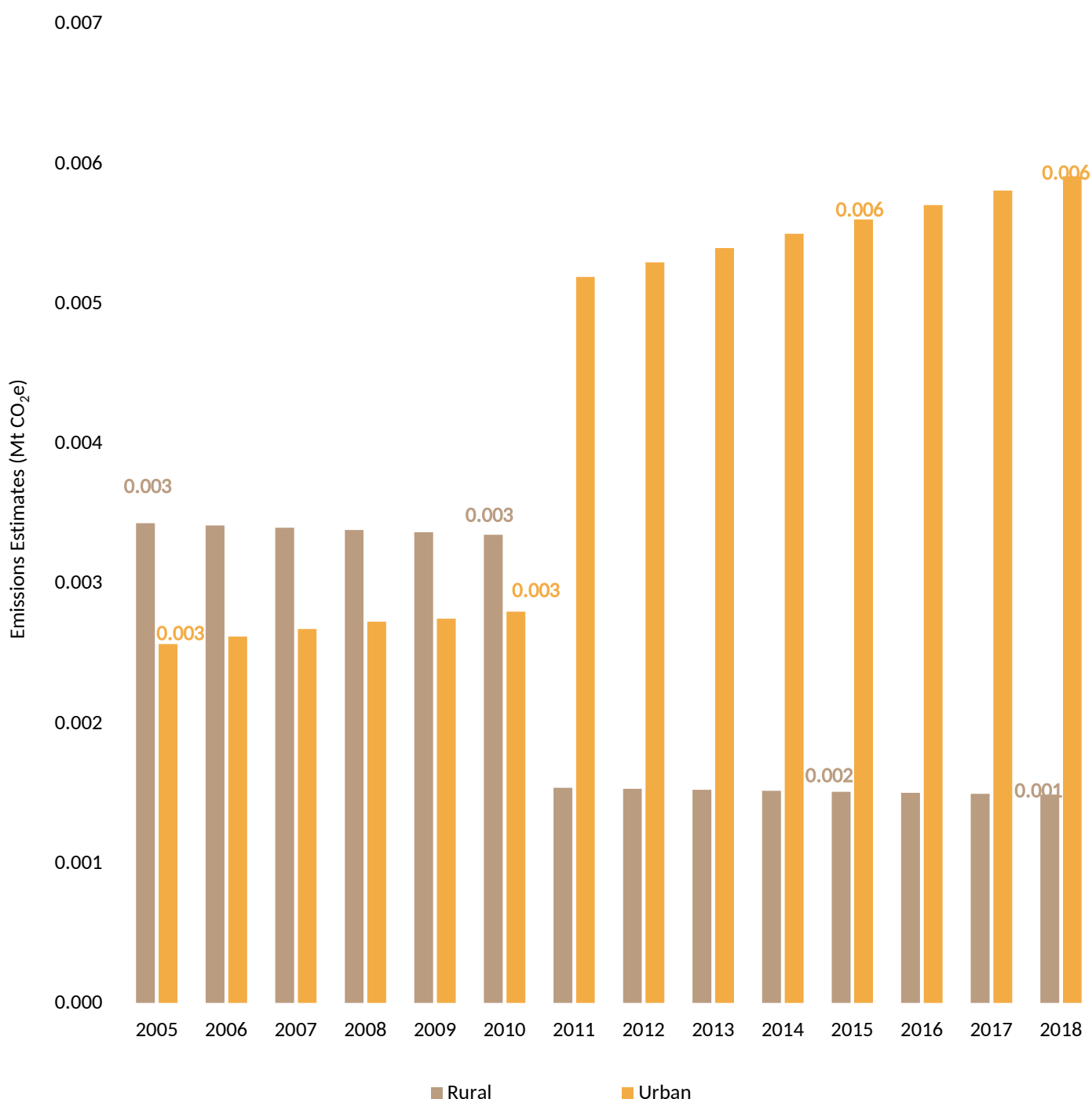
Figure 10: Sub-sector Emissions (Mt CO₂e) and Percentage Share in Total Waste Sector Emissions (2018)



Discharge of untreated wastewater and use of septic tanks are key drivers of emissions due to Domestic Wastewater sub-sector. Domestic Wastewater contributed ~71% to the total Waste emissions of Lakshadweep in 2018. Approximately ~15% of the total Waste sector emissions were from the Solid Waste Disposal, which grew at an estimated CAGR of 8.83% from 0.001 Mt CO₂e in 2005 to 0.002 Mt CO₂e in 2018. Industrial Wastewater accounted for nearly ~14% of Waste sector emissions in 2018. Emissions from this sub-sector grew at a CAGR of 5.13% from 0.0008 Mt CO₂e in 2005 to 0.0015 Mt CO₂e in 2018 (see Figure 10).

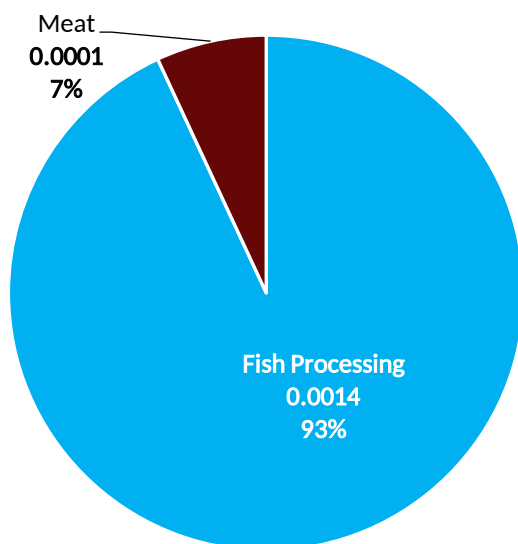
Emissions from Domestic Wastewater sub-sector in both rural and urban areas grew at a CAGR of 1.63% from 0.006 Mt CO₂e in 2005 to 0.007 Mt CO₂e in 2018. Almost 80% of Domestic wastewater emissions were from the urban areas of Lakshadweep in 2018 (see Figure 11).

Figure 11: Area-wise GHG Emissions Estimates of Domestic Wastewater (2005 to 2018)



Fish Processing Industry was the major contributor to the Industrial Wastewater emissions with a share of ~93% in 2018, followed by Meat Industry (~7%) (see Figure 12).

Figure 12: Category-wise Emissions (Mt CO₂e) and Percentage Share in Industrial Wastewater Emissions (2018)





The GHG Platform India is a civil society initiative providing an independent estimation and analysis of India's Greenhouse Gas (GHG) emissions across key sectors, namely- Energy, IPPU, AFOLU and Waste.

The Platform comprises of the following civil society:



The **Council on Energy, Environment and Water (CEEW)** is one of South Asia's leading not-for-profit policy research institutions. It uses data, integrated analysis and strategic outreach to explain – and change – the use, reuse, and misuse of resources.

The **International Maize and Wheat Improvement Center (CIMMYT)** is the global leader in agricultural research for development in wheat and maize-based farming systems.

Center for Study of Science, Technology and Policy (CSTEP) is a not for profit research organisation incorporated in 2005 u/s 25 of The Companies Act, 1956.

ICLEI - Local Governments for Sustainability is a leading global network of over 1,500 cities, towns and regions committed to building a sustainable future.

Vasudha Foundation, set up in 2010, is a not for profit organisation, working in the clean energy and climate policy space.

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