Greenhouse Gas Emissions in Bangladesh

Bangladesh Numbers at a Glance (2012)

190 MtCO₂e*
Total GHG emissions
(0.40% of world total)
World: 47,599 MtCO₂e

154,695,368**
Population
World: 7,043,181,414

1.23
tCO₂e per capita
World: 6.76 tCO₂e

US$91,745 Million
GDP**
World: US$55,261 Billion

2,069
tCO₂e/million US$ GDP
World: 861 tCO₂e/million US$ GDP

+70 MtCO₂e (+59%)
Change in GHG emissions (1990–2012)
World: +13,661 MtCO₂e (+40%)

*Source for all Numbers at a Glance values: WRI CAIT 2.0, 2015
Emissions including Land-Use Change and Forestry*
*Million metric tons of carbon dioxide equivalent
**Gross Domestic Product (GDP) in constant 2005 US$*

Greenhouse Gas (GHG) Emissions by Sector

Bangladesh's GHG emissions from various sectors are shown below for 2012, the most recent year for which data are available. Agriculture is the leading contributor, with 39% of total emissions coming from the following agriculture sub-sector activities: rice cultivation (32%), enteric fermentation (31%), manure left on pasture (12%), and the remainder from five other sub-sectors.[1] The energy sector is the second highest emitter, with energy sub-sectors as follows: electricity and heat production (46%), other fuel combustion (21%), manufacturing and construction (20%), and transportation (14%).[2] Land-use change and forestry (LUCF) and Waste represent the third and fourth highest emitters, accounting for 31% and 18%, respectively.

Bangladesh's GHG Emissions by Sector and Percent of Total Emissions (2012)
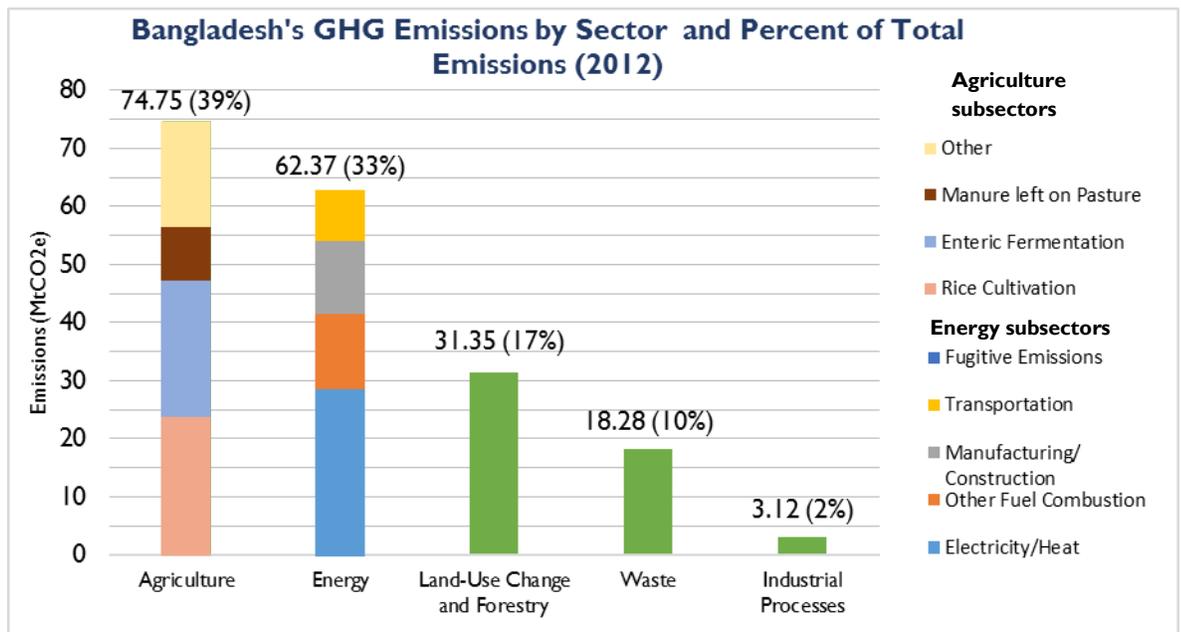
*Sources: WRI CAIT 2.0, 2015; FAOSTAT, 2015
Note: Percentages do not add up to 100% due to rounding*

Change in GHG Emissions in Bangladesh (1990-2012)[2]

Bangladesh's emissions grew 59% from 1990 to 2012 according to WRI CAIT. The average annual change during this time was 2%, with sector-specific annual change as follows: agriculture (1%), energy (7%), land-use change and forestry (0%), waste (2%), and industrial processes (IP) (17%). Agriculture sector emissions grew slightly from around 60 MTCO₂e in 1990, whereas IP grew dramatically but from a very low 1990 value.

Energy: Bangladesh's energy needs are met by natural gas (56%), traditional biomass and waste (24%), oil (16%), coal (3%), and hydropower and solar (1% combined).[3] Demand for electricity is growing by an estimated 500MW per year due to population growth, industrialization, and use of modern household appliances. The Bangladesh Climate Change Strategy and Action Plan

[1] Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT), viewed October 16, 2015: http://faostat3.fao.org/browse/area/*/E.
[2] World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2015.
[3] Grantham Research Institute on Climate Change and the Environment, 2015. The 2015 Global Climate Legislation Study – Bangladesh.

(BCCSAP, 2009) identifies improving transportation sector energy consumption as a priority since its share of emissions is growing faster than any other sector. One study[4] notes the steady decline of gas production and severe shortages that are causing rolling electricity blackouts, which calls into question the projection of the Second National Communication (SNC)[5] to the UNFCCC that emissions growth from power generation would be mitigated by the replacement of steam turbines by plants using combined cycle gas turbines. The SNC, published in October 2012 for the inventory years 2001 and 2005, projected a threefold increase in energy sector GHGs from 2005 to 2030, with industrial energy use driving the growth, followed by transportation. In power generation, the SNC also noted that planned expansion of 10,000MW of coal fired capacity would increase emissions. It identified textile, leather, fertilizer, and brick production to also be major sources of carbon dioxide from industry and road transport taking an increasing share of all transportation carbon dioxide emissions.

Agriculture: Rice is by far the leading crop produced in Bangladesh, with production growing from 36 to 51 million tons from 2001-2011.[6] Bangladesh's SNC describes several water regimes employed for rice cultivation: irrigated, upland, rain-fed, flood-prone, and drought-prone. Of these, irrigated fields show the highest rates of methane emissions and upland fields, which are not flooded, the least. The SNC reported a slight decrease in emissions from rice cultivation from 2000 to 2005, however the reason for this is not clear. It is also important to note that irrigated rice is more productive than upland rice. From 2000-2005, the SNC also reported an increase in GHG emissions from enteric fermentation, manure and poultry litter management, and a very slight decrease in GHG emissions from field burning of agricultural residue. The SNC further notes many uncertainties in these estimates, in particular from emissions from manure management and field burning of agriculture residues.

Source: WRI CAIT 2.0, 2015

Contribution of GHG Emitting Sectors to Economic Growth and Development Objectives

The country's Vision 2021 and the associated Perspective Plan (2010-2021) set development targets to transform Bangladesh from a low income economy to the first stages of a middle income economy by 2021. Bangladesh's Sixth Five Year Plan FY2011-FY2015 notes that agriculture's share of gross domestic product (GDP) continues to fall, employing 48% of the labor force in FY2010 but accounting for 19% of GDP. Overall, according to CAIT, Bangladesh's GDP over 1990-2012 increased at a considerably greater rate than total GHG emissions, signaling that Bangladesh's carbon intensity had decreased relative to 1990. However, emissions relative to GDP remain well over double the world average and there remains great potential to further reduce carbon intensity.

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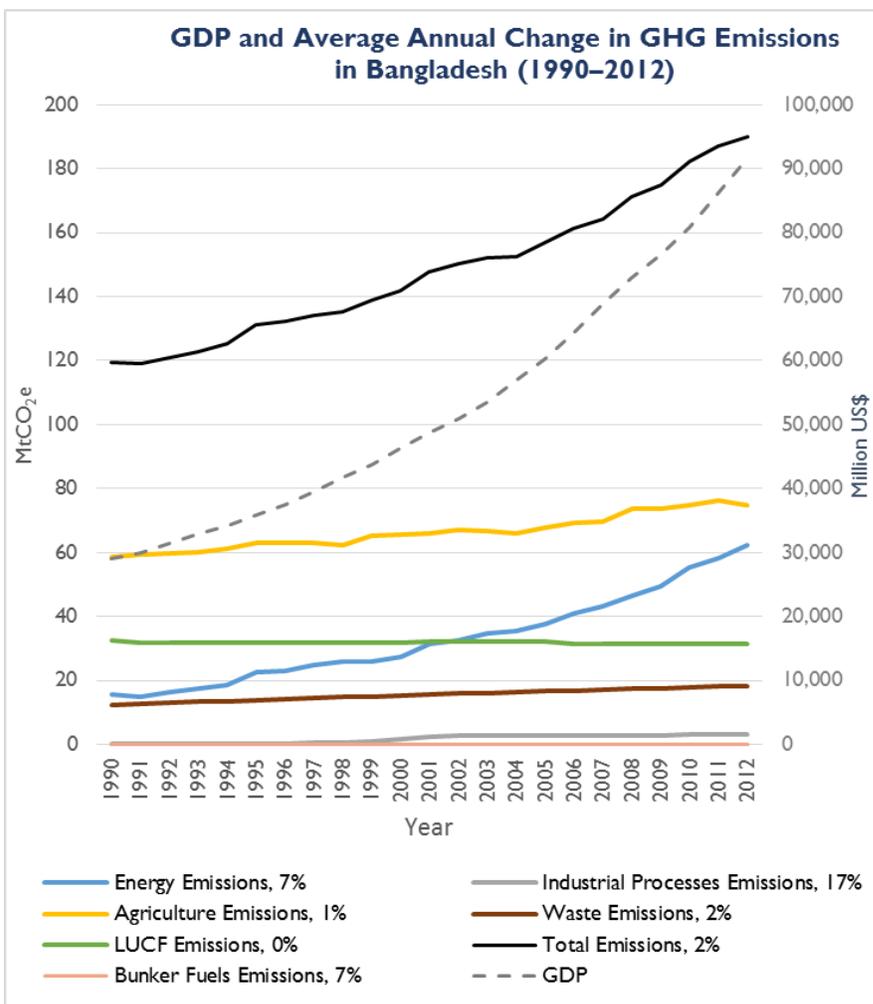
[4] Ibid.
[5] Government of the People's Republic of Bangladesh. Second National Communication of Bangladesh to the United Nations Framework Convention on Climate Change, October 2012.
[6] FAOSTAT.

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Climate Change Mitigation Targets and Plans

Bangladesh's Intended Nationally Determined Contribution (INDC[7]), published in September 2015, puts forth an unconditional contribution to reduce GHG emissions by 5% from business as usual levels by 2030 (12 MtCO$_2$e) from power, transportation, and industry. It pledges to increase its contribution to 15% reduction (36 MtCO$_2$e), subject to international support, and pledges further mitigation actions in other sectors, also subject to additional international resources.

5% unconditional reduction from existing mitigation actions, such as:	Increased, conditional contribution to 15% from additional mitigation actions, such as:	Further mitigation in other sectors, conditional upon international support, such as:
• Improve energy efficiency in energy production and consumption • Gas exploration and reservoir management • Develop coal mines and coal-fired power stations(s) • Renewable energy development • Lower emissions from agricultural land • Manage urban waste • Afforestation and reforestation	• Power: All new coal generation to use super-critical technology; increase penetration of wind power; implement grid-connected solar • Transport: Modal shift from road to rail; reduce traffic congestion including building expressways and public transport • Industry (energy-related): energy audits to incentivize uptake of energy efficiency in the main industrial sectors	• Households: Improve gas cookstoves; replacement biomass with LPG; encourage energy efficiency • Commercial buildings : Incentivize energy efficiency and rainwater harvesting • Agriculture: Increase mechanization to reduce draft cattle; increase organic manure, scale up production by alternate drying and wetting irrigation • Waste: Composting and landfill gas capture and power generation • Land use, land-use change and forestry: Plant coastal mangroves; plantation in island areas; afforestation/reforestation in reserved forests; social and homestead forestry • Policy level: Policy and institutional capacity building for adaptation planning

Bangladesh's strategies and plans serve as the foundation of the INDC, including:

- BCCSAP, September 2009 – Mitigation and Low Carbon Development is one of six pillars
- Renewable Energy Policy 2008 – Deliver 5% of energy from renewable sources by 2015 and 10% by 2020
- Energy Efficiency and Conservation Master Plan, March 2015 – Reduce energy intensity per unit of GDP by 20% by 2030 relative to the 2013 baseline
- National Sustainable Development Strategy (2010-2021), May 2013 – Discusses climate change under the environment, natural resource, and disaster management priority area

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