

India needs a carbon policy for agriculture

Ashok Gulati, PurviThangaraj write: The share of agriculture in India's total emissions has gradually declined. However, in absolute terms emissions from agriculture have increased to a level similar to China's.

The Indian Express

Written by [Ashok Gulati](#) , [PurviThangaraj](#) |

Updated: October 11, 2021 8:52:07 am

The Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) Working Group – 1 has literally issued a “code red” to humanity as we rush towards a 1.5 degree Celsius hotter planet by 2040. The UK is set to host the 26th UN Climate Change Conference of the Parties (CoP26) in Glasgow from October 31 to November 12 with a view to accelerate action towards the Paris Agreement's goals. Union minister for environment, forest and climate change, Bhupender Yadav, says that the focus should be on climate finance and transfer of green technologies at low cost.

Despite developed countries having collectively emitted more than their estimated emission allowances and keeping the arguments of climate justice in mind, the action on the ground is already too late. Nations are still quibbling about historical global emitters and who should take the blame and fix it. But the fact that 22 of the 30 most polluted cities in the world are in India is a major cause of concern. We know well that Delhi is the world's most polluted capital as per the World Air Quality Report, 2020. For those of us residing in Delhi, the winter months become a challenge as stubble burning in adjoining states and low wind speeds take the AQI beyond 300 on average, with some days going as high as 600 to 800, while the safe limit is below 50.

According to the Global Carbon Atlas, India ranks third in total greenhouse gas emissions by emitting annually around 2.6 billion tonnes (Bt) CO₂eq, preceded by China (10 Bt CO₂eq) and the United States (5.4 Bt CO₂eq), and followed by Russia (1.7Bt) and Japan (1.2 Bt). But global negotiations on climate change often talk about emissions on a per capita basis and the emission intensity of GDP. Of these top five absolute emitters, the US has the highest per capita emissions (15.24 tonnes), followed by Russia (11.12 tonnes). India's per capita emissions is just 1.8 tonnes, significantly lower than the world average of 4.4 tonnes per capita. But negotiators are not likely to be convinced by this argument. If one takes emissions per unit of GDP, of the top five absolute emitters, China ranks first with 0.486 kg per 2017 PPP \$ of GDP, which is very close to Russia at 0.411 kg per 2017 PPP \$ of GDP. India is slightly above the world average of 0.26 (kg per 2017 PPP \$ of GDP) at 0.27 kg, while the USA is at 0.25, and Japan at 0.21. But India ranked seventh on the list of countries most affected due to extreme weather events, incurring losses of \$69 billion (in PPP) in 2019 (Germanwatch, 2021). This is worrying. In our Nationally Determined Contributions (NDCs) submitted in 2016, India committed to “reduce emission intensity of its GDP by 33 to 35 per cent by 2030 from 2005 level.”

Sector-wise global emissions show that electricity and heat production and agriculture, forestry and other land use make up 50 per cent of the emissions. But the emissions pie in India owes its largest chunk (44 per cent) to the energy sector, followed by the manufacturing and construction sector (18 per cent), and agriculture, forestry and land use sectors (14 per cent), with the remaining being shared by the transport, industrial processes and waste sectors. The share of agriculture in total emissions has gradually declined from 28 per cent in 1994 to 14 per cent in 2016. However, in absolute terms, emissions from agriculture have increased to about 650 Mt CO₂ in 2018, which is similar to China's emissions from agriculture.

Agricultural emissions in India are primarily from the livestock sector (54.6 per cent) in the form of methane emissions due to enteric fermentation and the use of nitrogenous fertilisers in agricultural soils (19 per cent) which emit nitrous oxides; rice cultivation (17.5 per cent) in anaerobic conditions accounts for a major portion of agricultural emissions followed by livestock management (6.9 per cent) and burning of crop residues (2.1 per cent).

A carbon policy for agriculture must aim not only to reduce its emissions but also reward farmers through carbon credits which should be globally tradable. With the world's largest livestock population (537 million), India needs better feeding practices with smaller numbers of cattle by raising their productivity. Rice cultivation on around 44 million hectares is the other culprit for methane emissions, especially in the irrigated tracts of north-west India.

While direct seeded rice and alternative wet and dry practices can reduce the carbon footprint in rice fields, the real solution lies in switching areas from rice to maize or other less water-guzzling crops. In this context, opening up corn for ethanol can help not only reduce our huge dependence on crude oil imports but also reduce the carbon footprint. If we can devise a system for rewarding farmers for this switch by making corn more profitable than paddy, it can be a win-win situation. And if we develop global carbon markets, India needs to clearly spell out in its policy how it would adjust

carbon credits when it sells to polluting industries abroad so that emission reductions are not double counted in India and the country buying carbon credits.

Agricultural soils are the largest single source of nitrous oxide (N₂O) emissions in the national inventory. Nitrous oxide emissions from use of nitrogen-fertiliser increased by approximately 358 per cent during 1980-81 to 2014-15, growing at a statistically significant rate of 5,100 tonnes per year. An alternative for better and efficient fertiliser use would be to promote fertigation and subsidise soluble fertilisers. Almost 70 per cent of the granular fertilisers that are thrown over plants are polluting the environment and leaching into the groundwater, while polluting the same. Ultimately, the government should incentivise and give subsidies on drips for fertigation, switching away from rice to corn or less water-intensive crops, and promoting soluble fertilisers at the same rate of subsidy as granular urea.

This column first appeared in the print edition on October 11, 2021 under the title ‘A carbon policy for the farm’. Gulati is Infosys Chair professor for Agriculture and Purvi is Research Assistant at ICRIER