GHG emissions from Agriculture Soils in India

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India's Initial National Communication for the Base Year 1994: Emissions from Agriculture Sector (Gg)

GHG source and sink categories (Gg per year)	CO_2 emissions	CO_2 removals	CH_4	N_2O	CO_2eq. emissions*
Total (Net) National Emission	**817023**	**23533**	**18083**	**178**	**1228540**
3. Agriculture			14175	151	344485
Enteric Fermentation			8972		188412
Manure Management			946	1	20176
Rice Cultivation			4090		85890
Agricultural crop residue			167	4	4747
Emission from Soils				146	45260

Source: India's Initial National Communication to UNFCCC

GHG Emissions from Agriculture Sector in India in 2007 (Gg)

	CH_4	N_2O	CO_2 eq.
	13767.80	**146.07**	**334405.50**
Enteric fermentation	10099.80		212095.80
Manure management	115.00	0.07	2436.70
Rice cultivation	3327.00		69867.00
Soils		140.00	43400.00
Crop residue	226.00	6.00	6606.00

Source - India: Greenhouse Gas Emissions 2007, Report of Indian Network for Climate Change Assessment (INCAA)

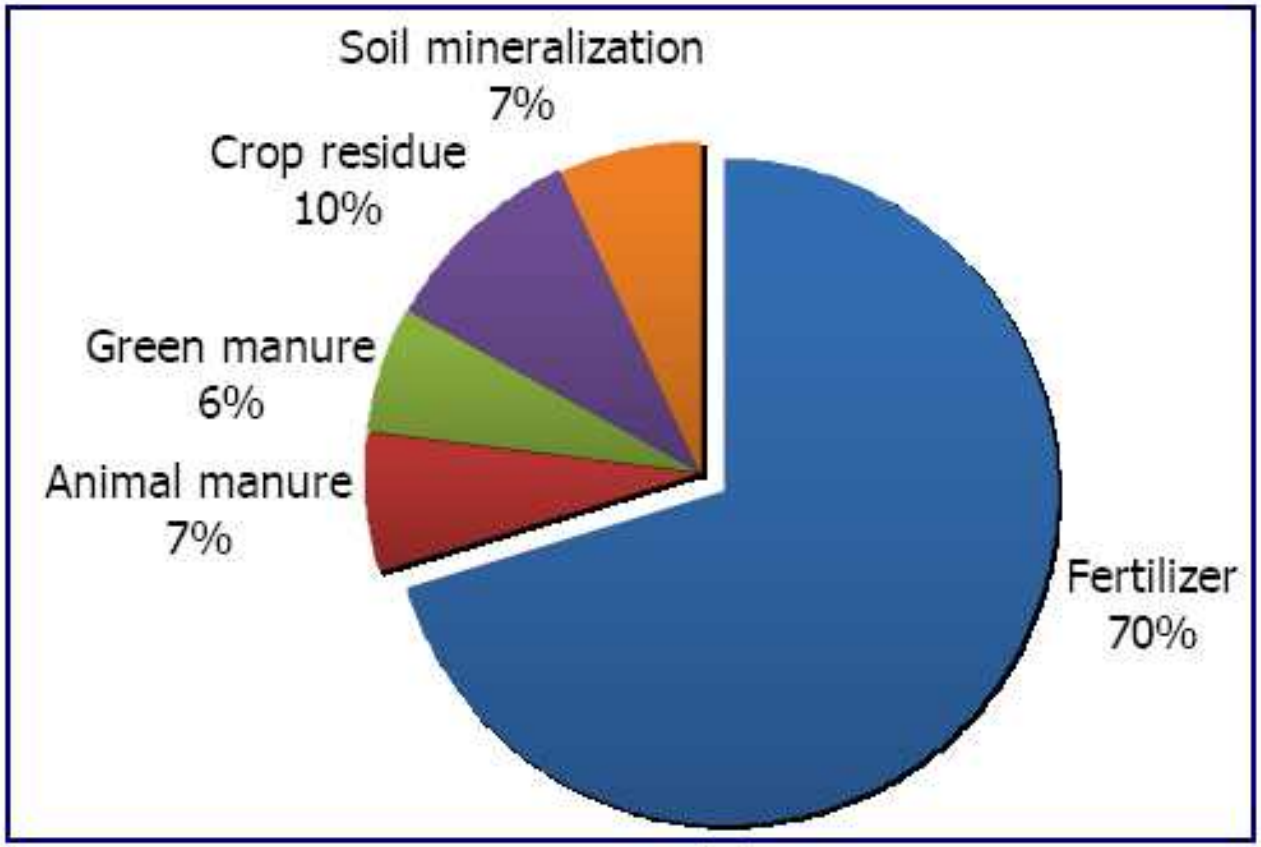
Emission Factors

- 1994 Estimation – 0.93 kg/ha N_2O-N

- 2007 Estimation – Country specific emission factors
  - rice-wheat system
    - 0.76 kg ha^{-1} N_2O-N for rice
    - 0.66 kg ha^{-1} N_2O-N for wheat

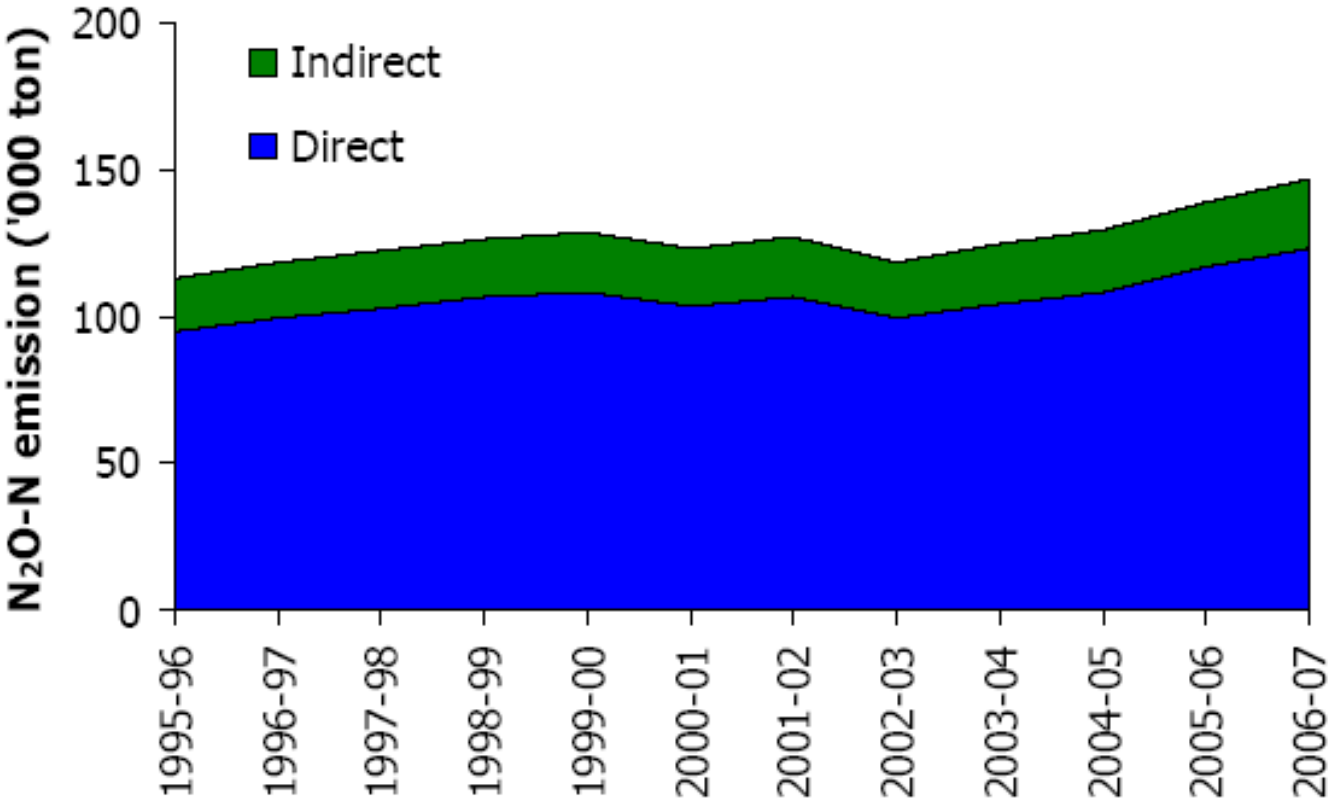
» *for urea application without inhibitors*

Emission of N_2O-N from different sources in agricultural soils (Total emission 0.14 Mt)



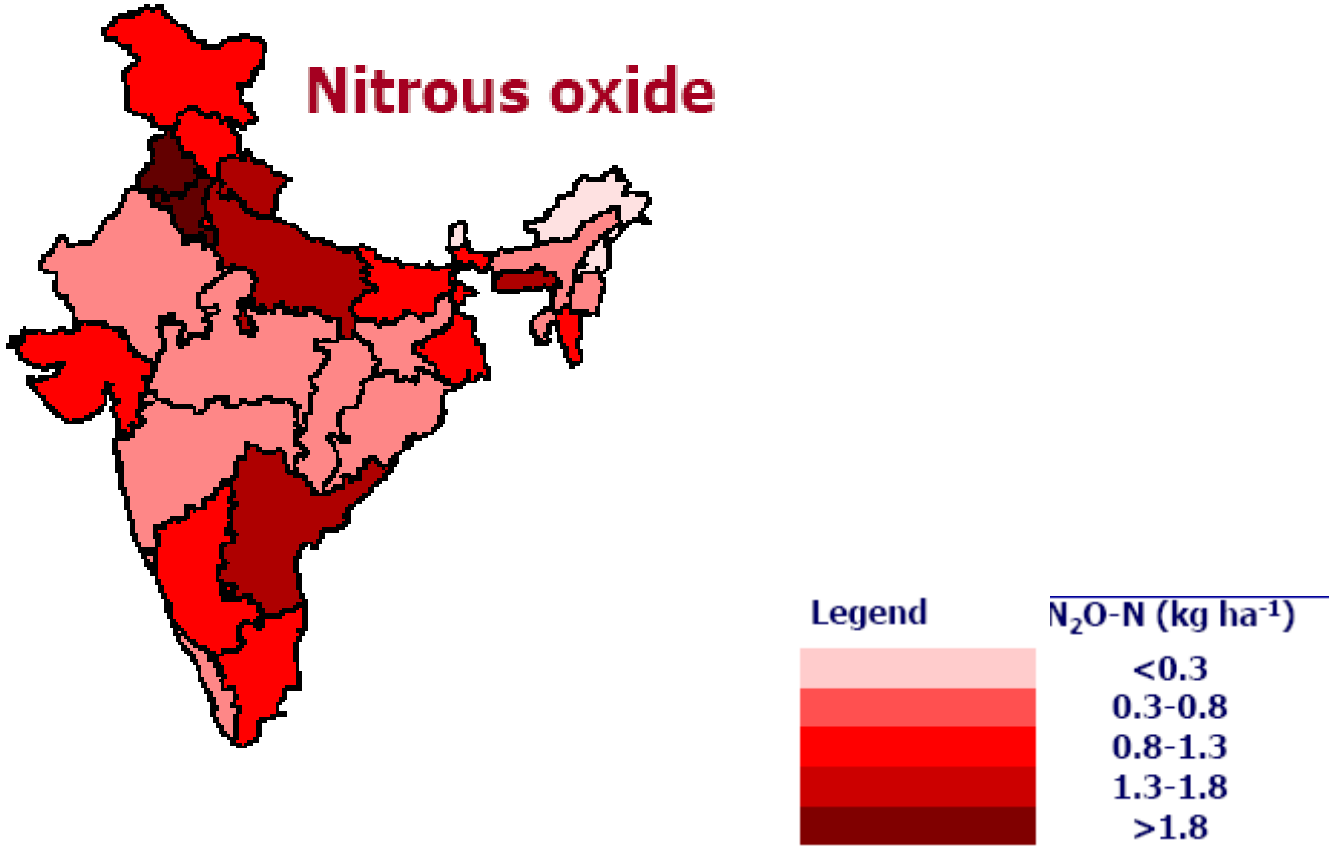
Data source: Majumdar et al. (2000), Pathak et al. (2002; 2004), Bhatia et al. (2005), Malla et al. (2005), Jain et al. (2009)

Nitrous oxide emission from agricultural soils during 1995-2007



Source: Pathak et. al. 2010

Nitrous oxide emissions from agricultural soils in different states of India in 2007



Source: Pathak et. al. 2010

Methodology Used in 2007 Estimation

- IPCC 2006 methodology followed
- Activity data for 1995 to 2007 compiled
- Emission coefficients developed and updated for different crops, crop residues and soils
- Uncertainty estimated (3-40%)

Source: Pathak et. al. 2010

Ongoing Work..

- Efforts to reduce uncertainties by developing country specific emission factors
  - For different agro-ecosystems
  - Covering fallow periods

Thanks