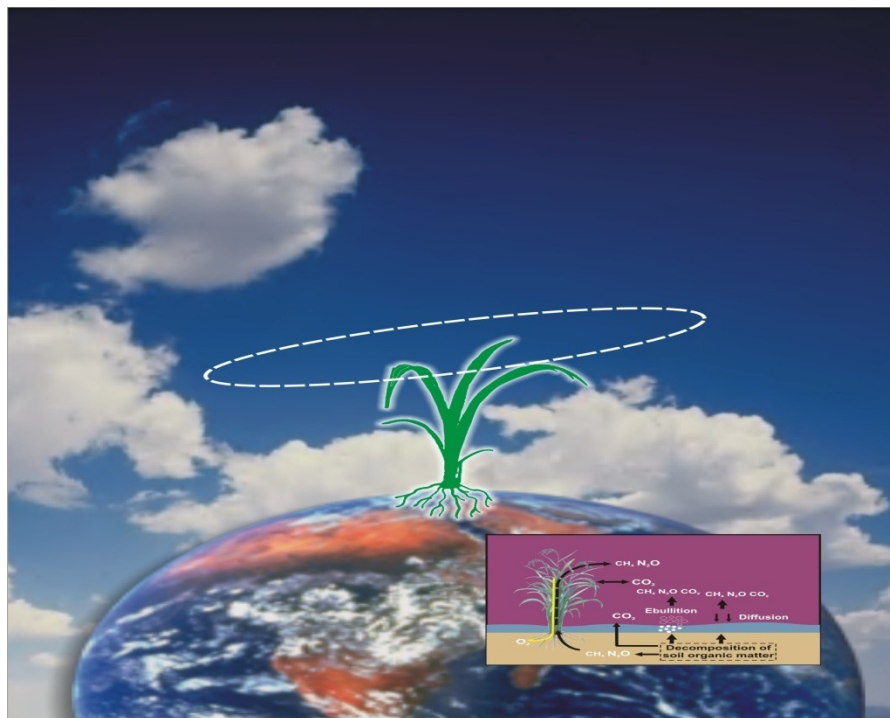


Greenhouse Gas Inventory for Rice Cultivation, Soil, and Field Burning of Crop Residues

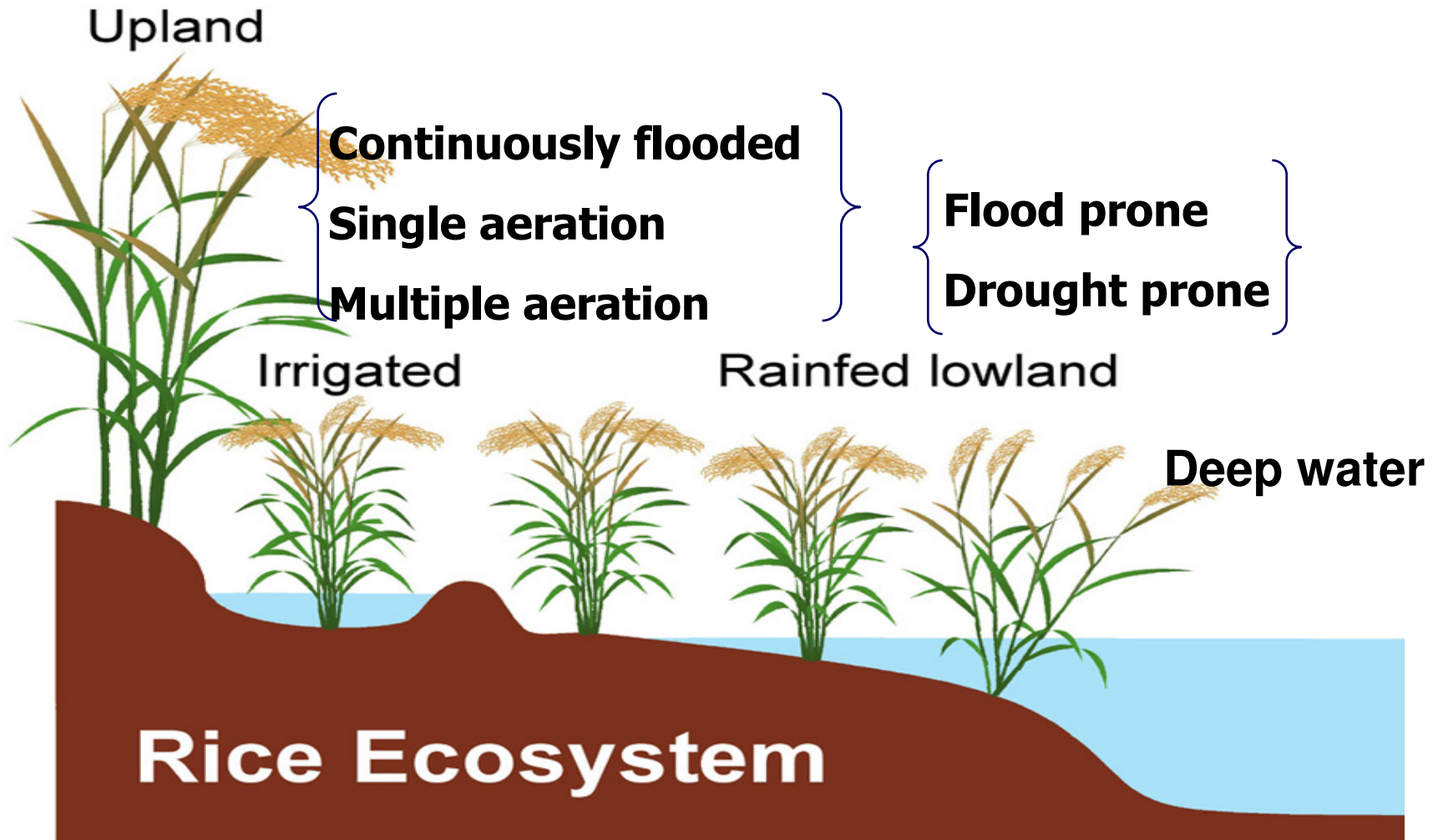


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Greenhouse gas inventory for rice cultivation, soil, and field burning of crop residue for the year 2007

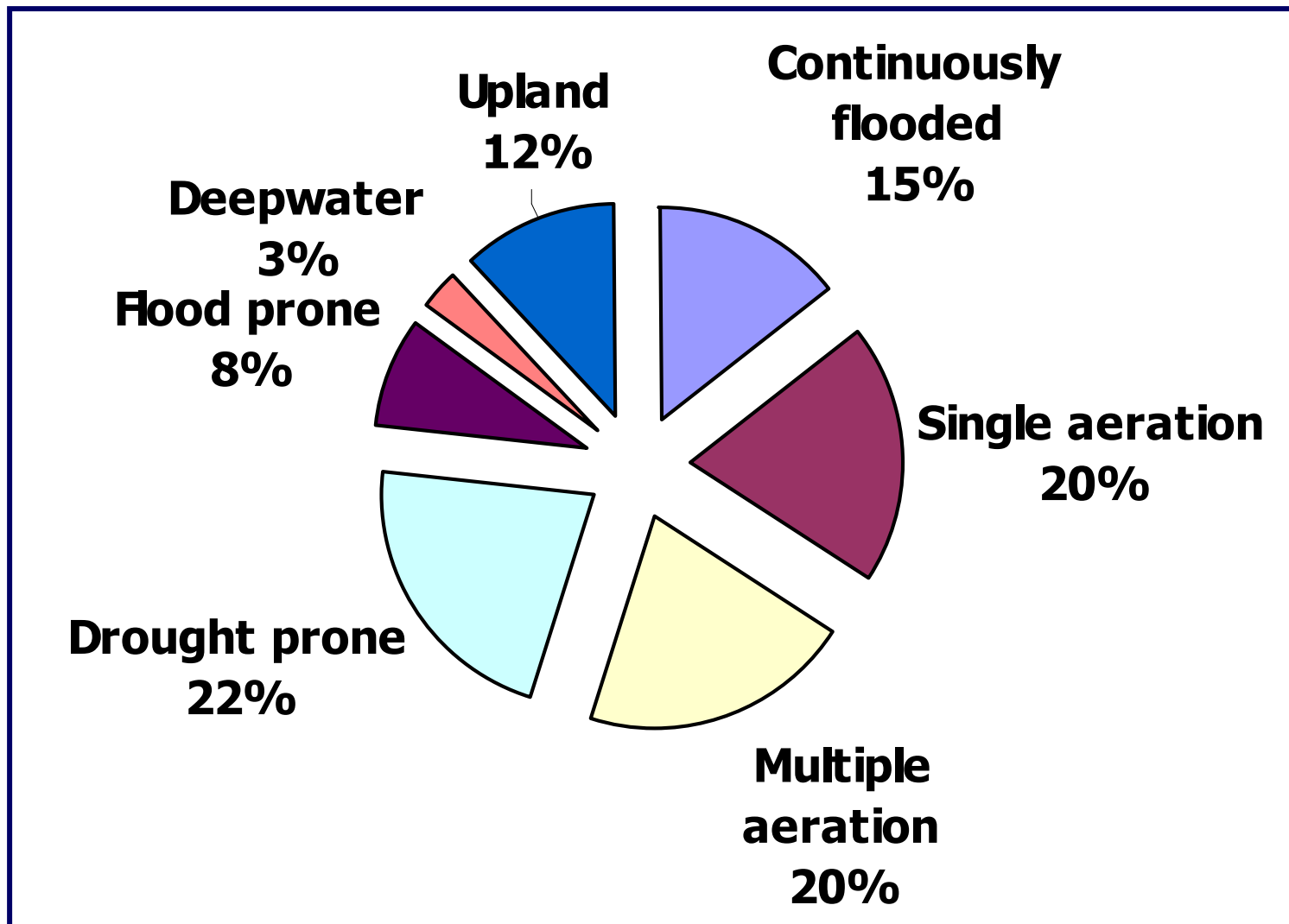
Source	Methane	Nitrous oxide	CO ₂ eq.
	(million ton)		
Rice cultivation	3.33	-	69.87
Agricultural soil	-	0.14	43.40
Crop residue burning	0.23	0.006	6.61
Total	3.56	0.146	119.88

Rice-ecosystems in India



Total area 43.62 Mha

Area under different rice ecosystems (43.62 Mha)



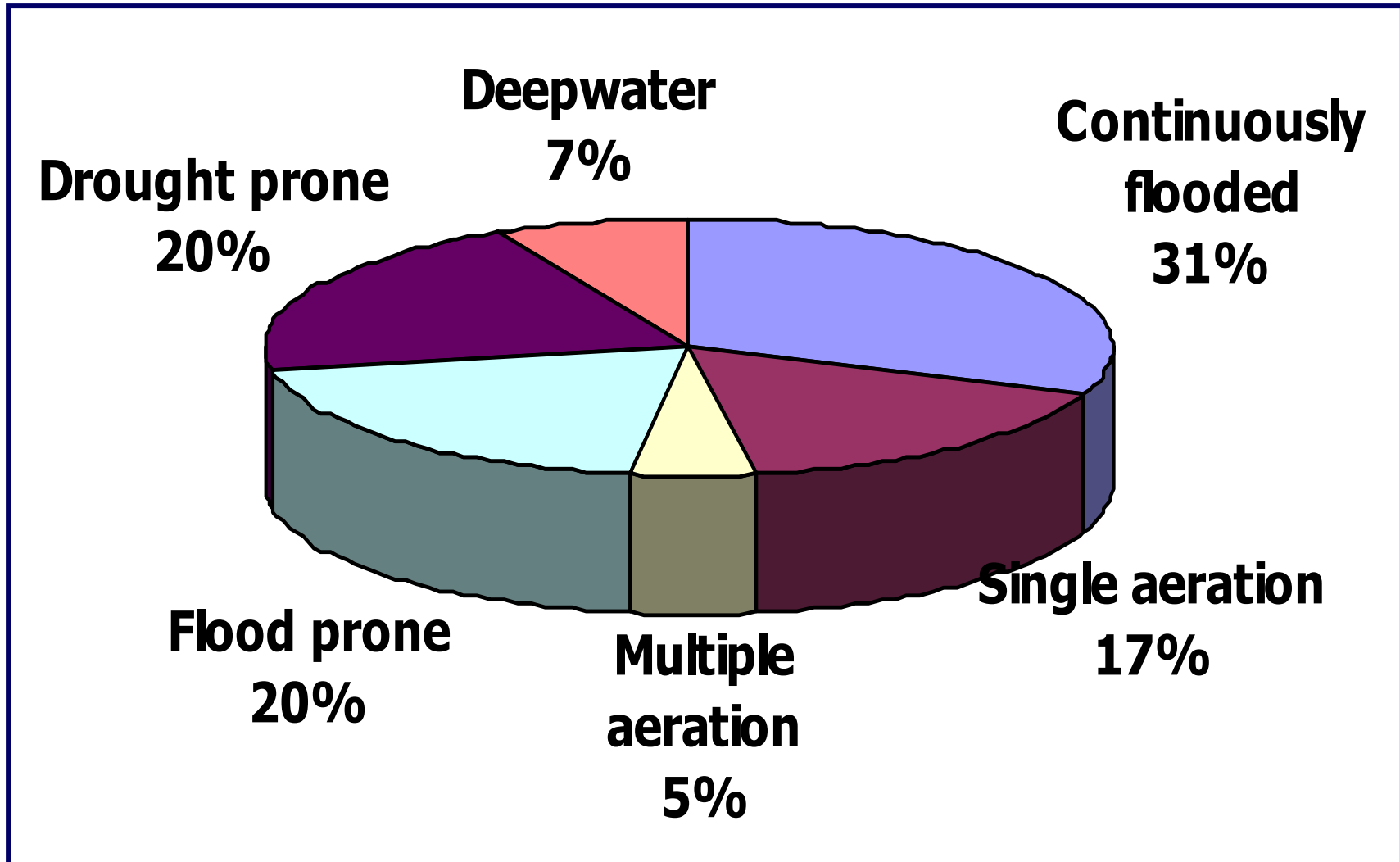
Source: MoA (2008), WRS (2008), IRRI (2009)

Methane emission from various rice ecosystems

Ecosystem	Water regime	Emission (kg ha⁻¹)
Irrigated	Continuous flooding	162±28
	Single aeration	66±10
	Multiple aeration	18±5
Rainfed	Drought prone	66±4
	Flood prone	190±60
Deep water		190
Upland		0

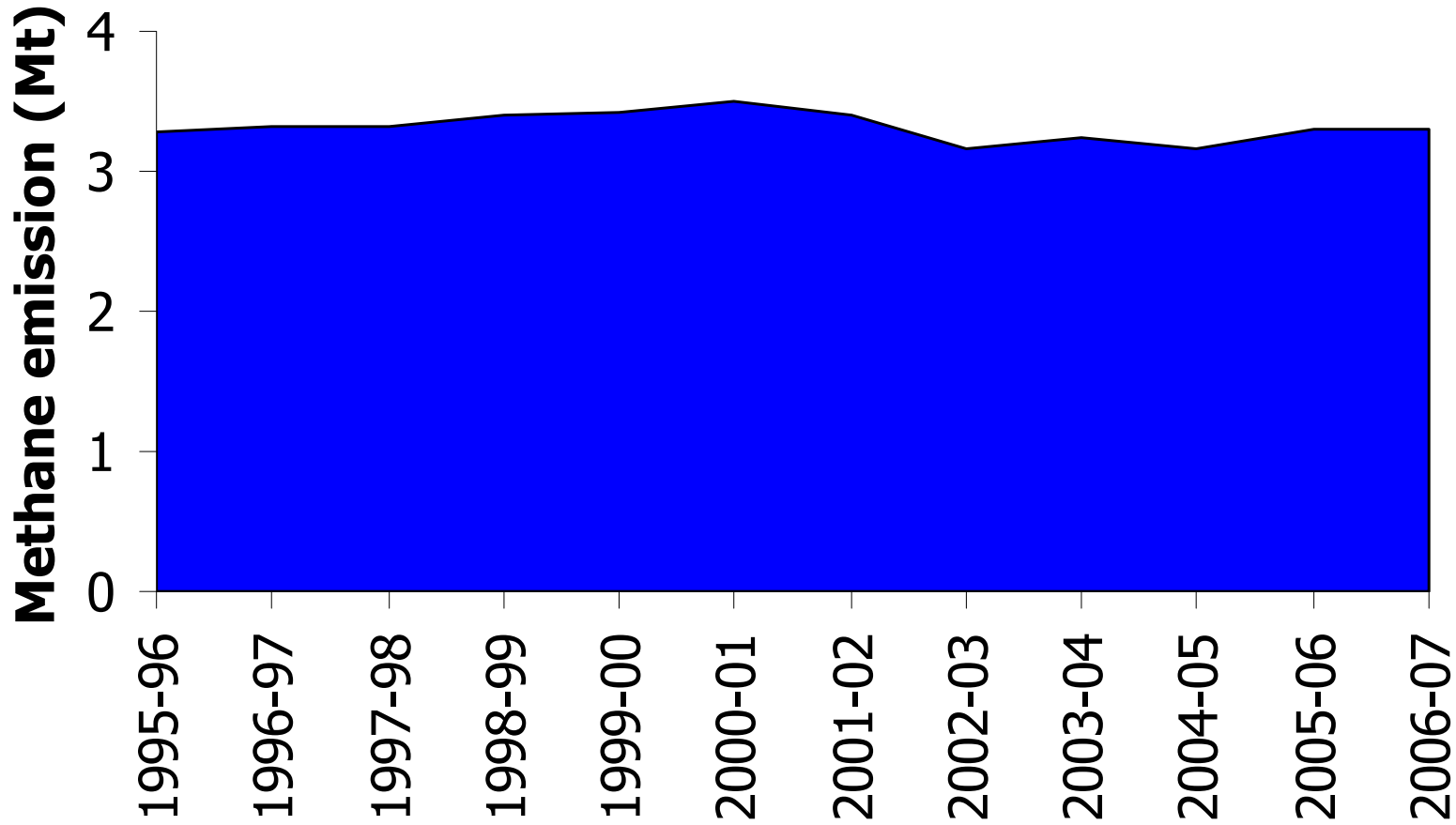
Data source: Majumdar et al. (2003), Pathak et al. (2003), Gupta et al. (2009), Jain et al. (2009), Mandal et al. (2009)

Contribution of various rice ecosystems on methane emission in 2007

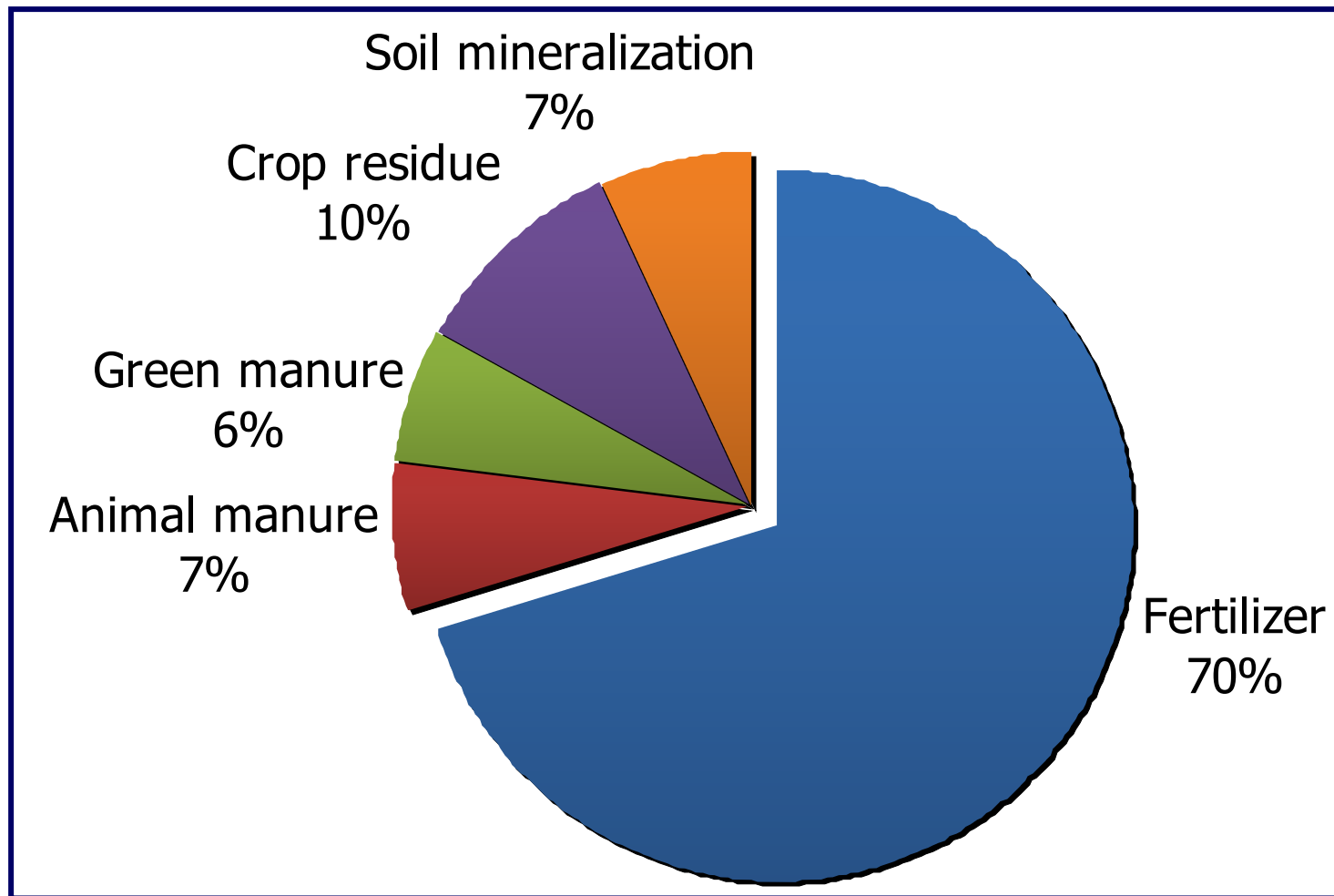


Total emission 3.33 Mt

Methane emission from rice fields during 1995-2007

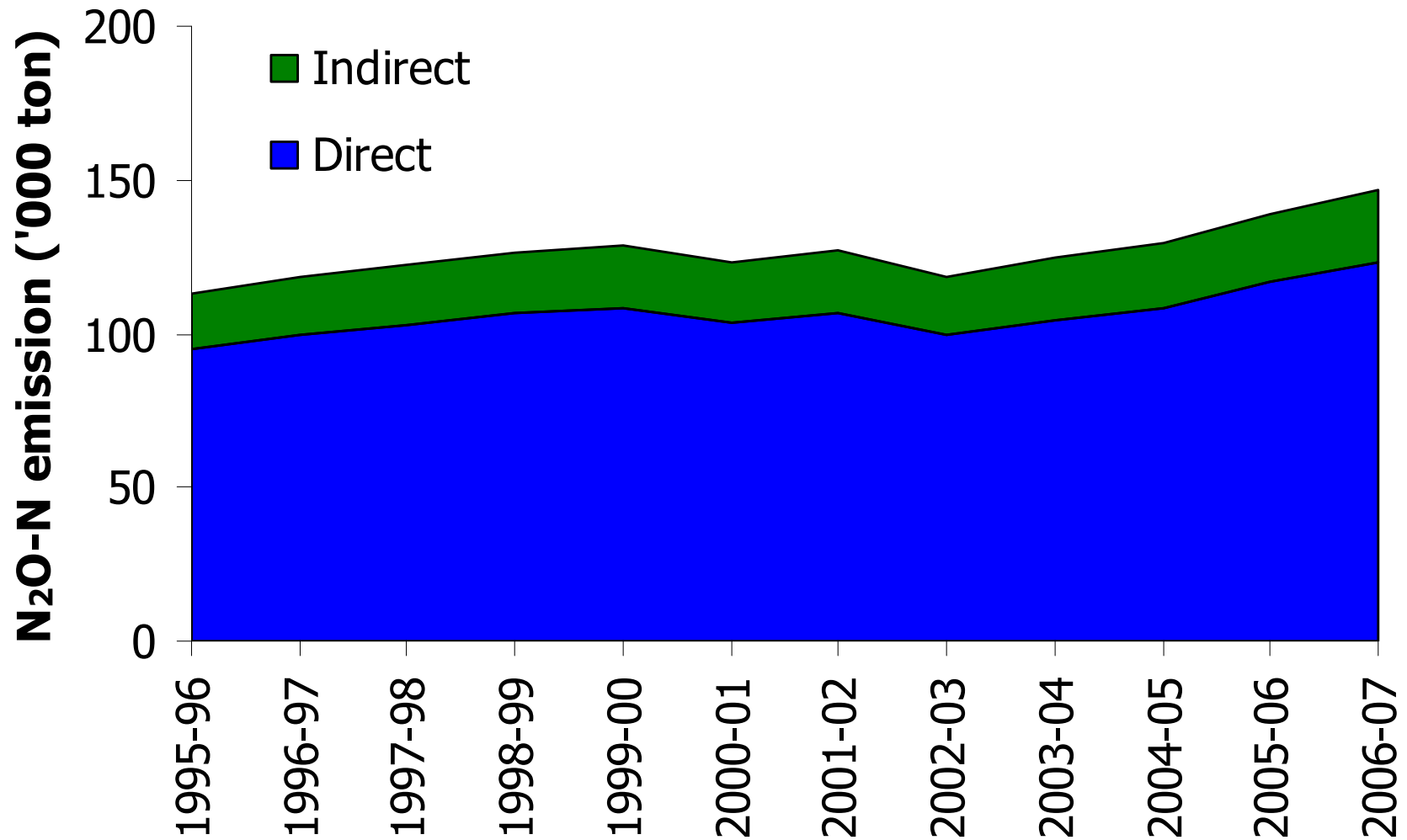


Emission of N₂O-N from different sources in agricultural soils (Total emission 0.14 Mt)

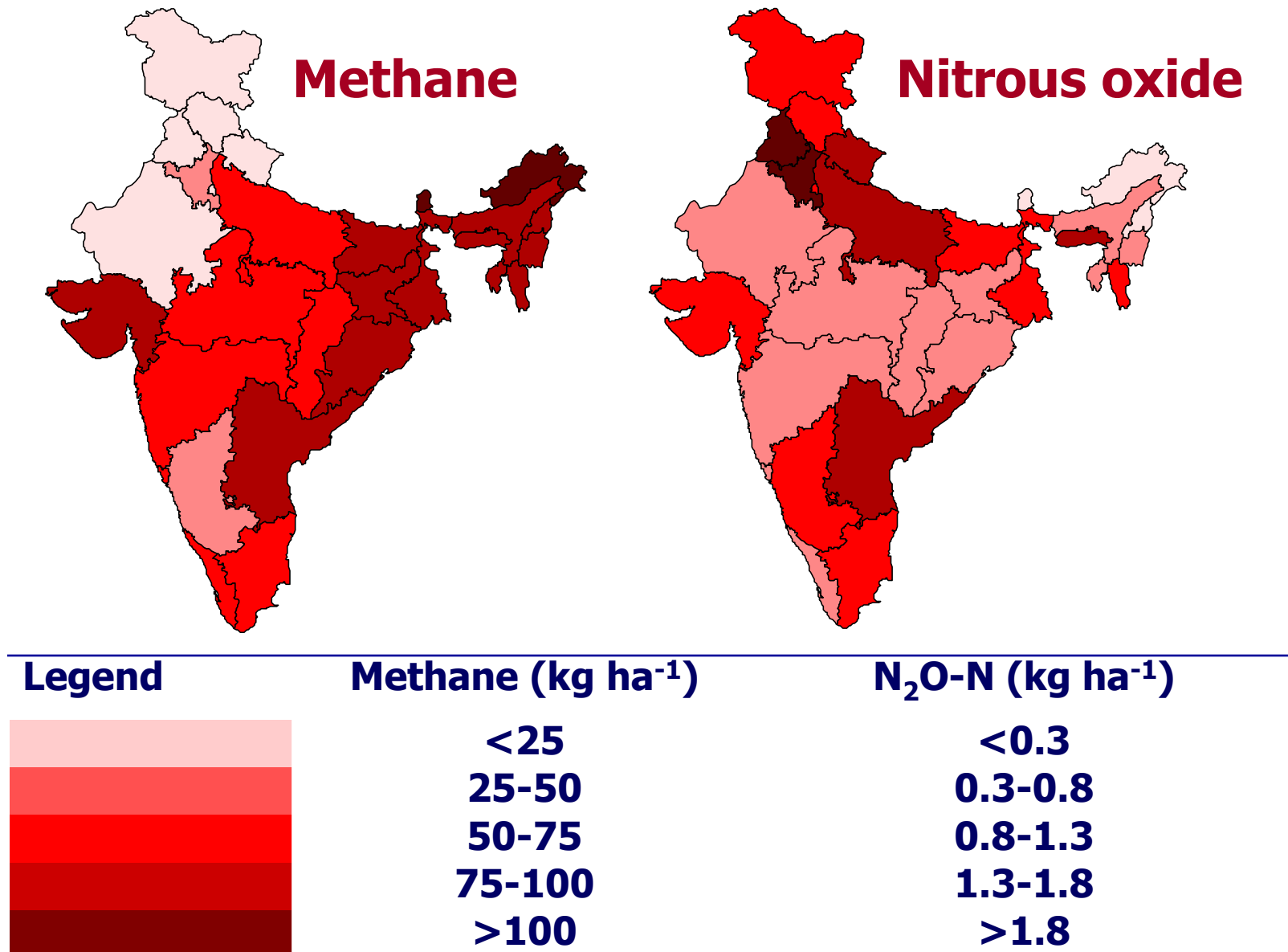


Data source: Majumdar et al. (2000), Pathak et al. (2002; 2004), Bhatia et al. (2005), Malla et al. (2005), Jain et al. (2009)

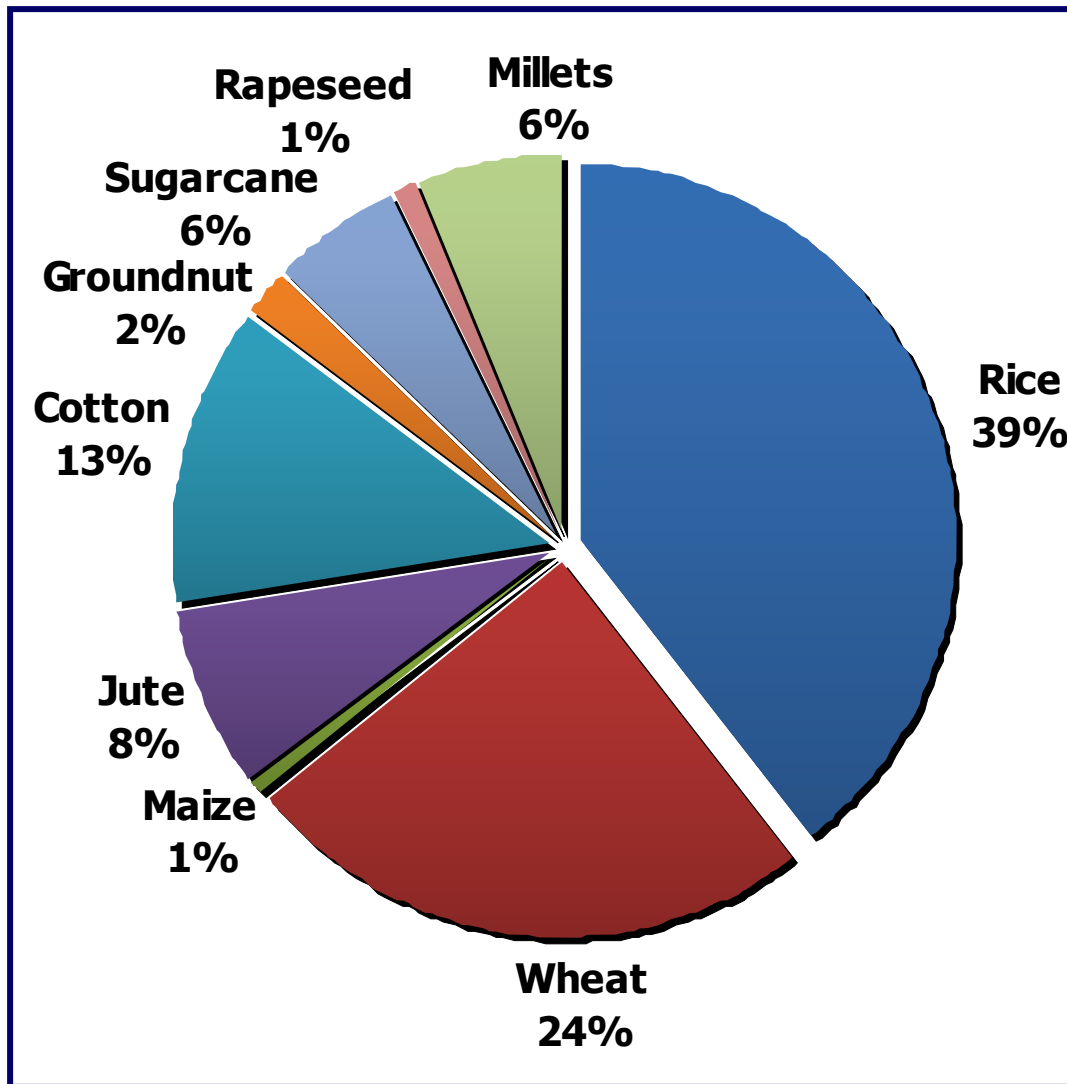
Nitrous oxide emission from agricultural soils during 1995-2007



Methane and nitrous oxide emissions from agricultural soil in different states in 2007



Emission of methane and nitrous oxide from field burning of crop residues in 2007



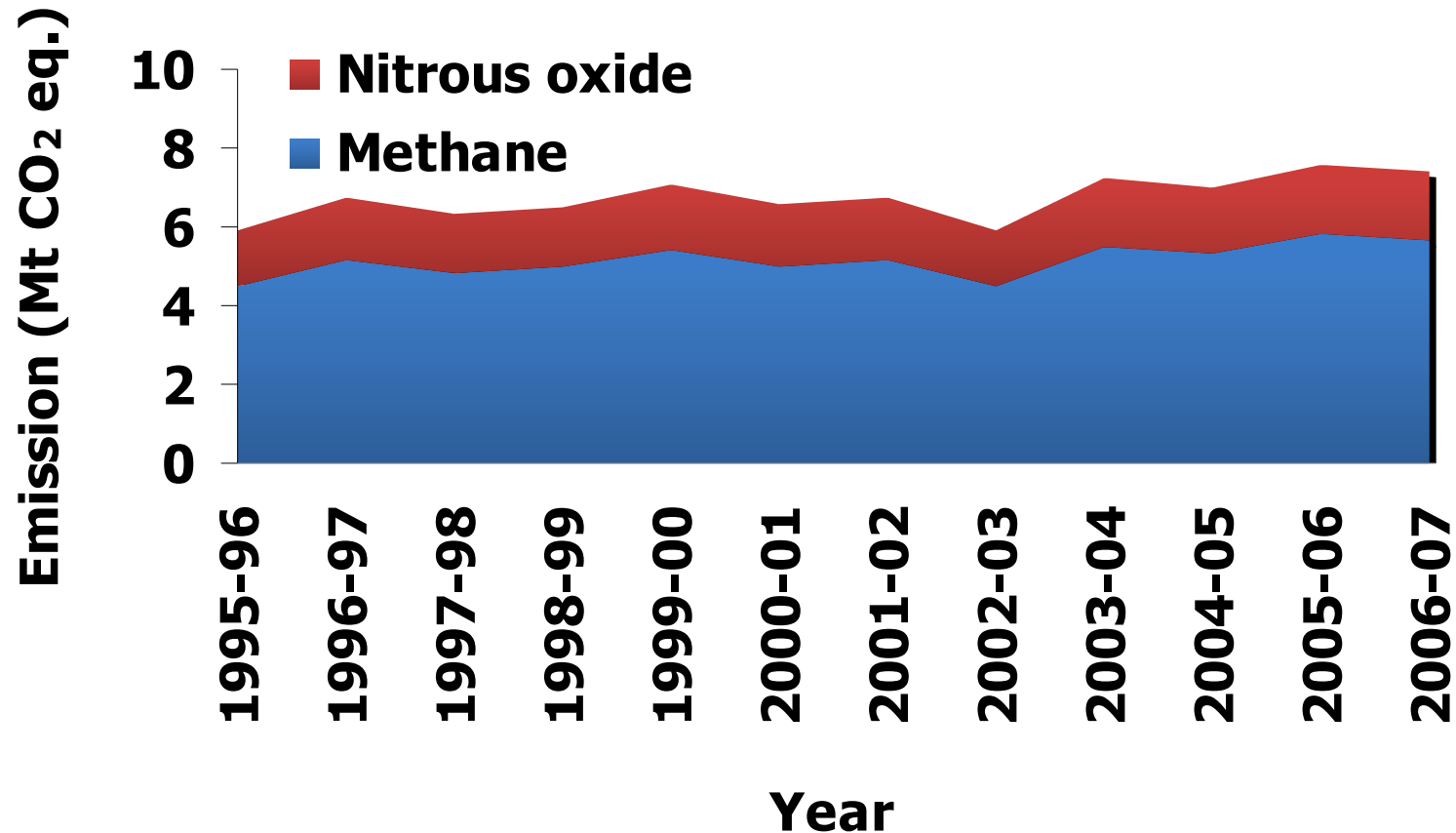
Emission:

Methane - 0.226 Mt

N₂O - 0.006 Mt

Data source: Andreae and Merlet (2001), Bandyopadhyay et al. (2001), Streets et al. (2003), MoA (2008), Gadde et al. (2009)

Emission of methane and nitrous oxide from field burning of crop residues during 1995-2007



Methodology

- **IPCC (2000; 2006) methodology followed**
- **Activity data for 1995 to 2007 compiled**
- **Emission coefficients developed and updated for different crops, crop residues and soils**
- **Uncertainty calculated**

Conclusions

- **Rice cultivation, soil, and field burning of crop residues in India emitted 120 Mt CO₂ eq. of methane and nitrous oxide in 2007.**
- **There is uncertainty (3-40%) in methane and nitrous oxide emission, particularly in emission coefficients.**
- **Need to strengthen GHG measurement and extrapolation with simulation model to reduce the uncertainties.**

Thank You