Mitigation in Agriculture: Main Findings of IPCC AR4

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Baseline emissions: Agriculture

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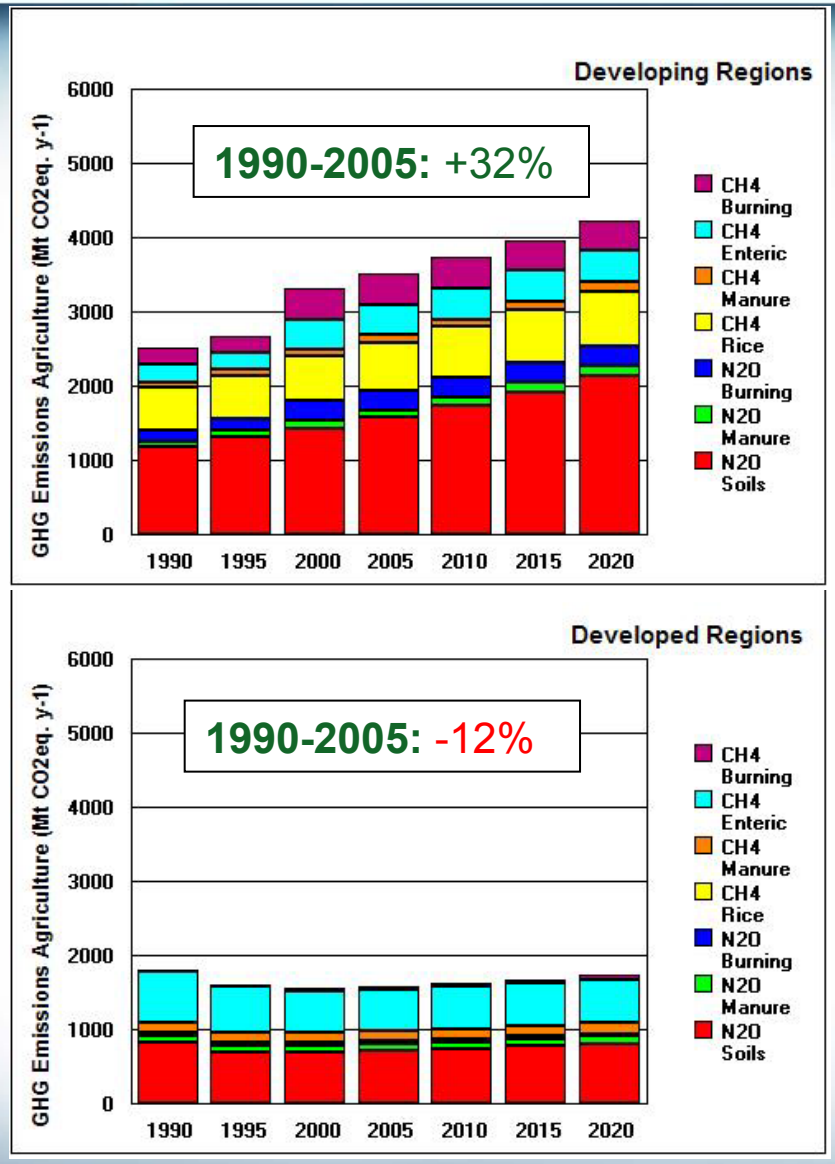

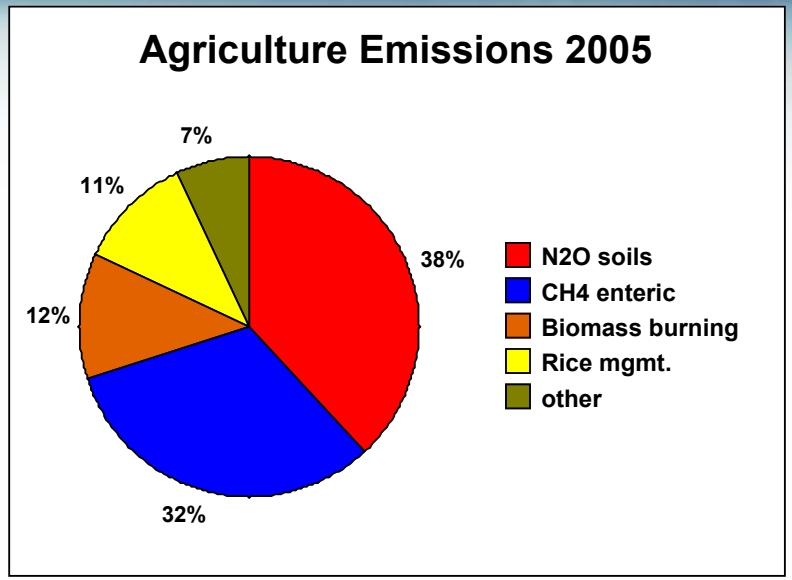

Main drivers for trends

- Increase in GHGs: population pressure, income increase, diet changes, technological changes
- Decrease in GHGs: increased land productivity, conservation tillage, non-climate policies

Economic Mitigation Potential in 2030

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Carbon price (US$/tCO$_2$-eq)	Mitigation Potential (Gt CO$_2$-eq/yr)
20	**1.6** (0.3-2.4)
50	**2.7** (1.5-3.9)
100	**4.4** (2.3-6.4)
Emissions 2030	**8.2**

Mitigation practices in Agriculture

Cropland management; Restoration of organic soils; Rice management; Grazing land management – 90% of potential is carbon sequestration

Relative contribution of Agriculture to total mitigation potential

US$ 20/tCO2 – 12%

US$ 50/tCO2 – 14%

US$ 100/tCO2 – 19%

Contribution to Energy Sector

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- Biomass as energy feedstock produced in agricultural land may cause indirect emissions reductions of 70-1,260 Mt CO_2-eq./yr (at US$ 20/tCO2) by 2030.
- In addition, emissions reductions of 770 Mt CO2-eq./yr can be achieved through energy efficiency
- Associated impacts:
  - Competition with other land uses, positive or negative environmental impacts, implications for food security

Limitations of the Assessment

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- Mitigation potential in livestock systems may have been underestimated. Emphasis was on per-head emissions, but relevance of per-unit-product emissions (i.e., getting certain amount of products with lesser animals) was overlooked.
- Some possible synergies between mitigation options were not quantified (e.g., grazing land/cropland productivity and reduced deforestation)
- Estimates of some options with possibly good potential (lifestyle changes) are not provided
- Sink enhancement or reversal due to climate change are identified, but uncertainties remain high

Key Messages

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- Carbon sequestration in agricultural soils has a mitigation potential of 1 to 4 billion t CO_2/yr at carbon prices of 20 to 100 US$/t$CO_2$
  - This represents between 11 and 17% of total mitigation potential
  - C stock in soils is highly correlated with productivity/resilience and soil conservation
  - Historical transfer of C from terrestrial ecosystems: 500 billion t CO_2
- 70% of mitigation potential is in developing regions
  - This potential was neglected by Kyoto, thus wasting an opportunity for adaptation and sustainable development benefits.
  - The other 30% is also not explored by Kyoto, since very few Parties selected cropland/grassland management under Art. 3.4
- Potential of mitigation of livestock emissions may have been underestimated (especially for grazing systems in warm regions).

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The report of IPCC Working Group III is available at www.mnp.nl/ipcc