The greenhouse gas emissions from the South African livestock industry

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Research focus area: Sustainable natural resource utilization
Livestock production with global competitiveness

Aims of the project

- To calculate on a regional basis the enteric methane emissions from all relevant livestock sectors.
- To calculate on a regional basis the methane emissions from livestock manure.
- To calculate on a regional basis the nitrous oxide emissions from livestock manure

Executive summary

There are increasing concerns about the impact of agriculture and livestock production on the environment. The objective of the study was to estimate methane and nitrous oxide emissions of South African livestock industries during 2010 on a provincial and national basis. The study focused on direct methane (CH4) and nitrous oxide (N2O) emissions originating from enteric fermentation and livestock manure management systems. Both methane and nitrous oxide are potent greenhouse gasses with 25 and 310 times the global warming potential of carbon dioxide. The Intergovernmental Panel on Climate Change (IPCC) Tier 2 methodology adapted for tropical production systems was used to

calculate emissions. The Tier 2 methodology defines animals, animal productivity, diet quality and management circumstances to support a more accurate estimate of feed intake for use in estimating methane production. Livestock, including privately owned game, emitted and estimated 1330.6 Gg of CH4 and 3.28 Gg of N20 during 2010. In South Africa, the principle species comprise of cattle, game and sheep producing collectively an estimated 95% of the total livestock emissions. Commercial beef cattle were the largest contributors of methane followed by emerging and subsistence cattle, sheep, game, dairy cattle, goats and feedlot cattle with 527 Gg, 276 Gg, 167 Gg, 131 Gg, 130.5 Gg, 40.7 Gg and 30 Gg of methane respectively. The poultry industry emitted the highest amount of N2O producing an estimated 2.61 Gg followed by dairy cattle, horses and pigs with 0.54 Gg, 0.09 Gg and 0.04 Gg of N2O respectively. The Eastern Cape, Kwa-Zulu Natal and the Free State were the provinces with the highest GHG emission profiles, incorporating all species, producing 24.3%, 15.3% and 14.9% of the total national emissions.