AGRICULTURAL SECTOR SOUTH AFRICA



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Department: Minerals and Energy REPUBLIC OF SOUTH AFRICA

AGRICULTURAL SECTOR IN SOUTH AFRICA

BACKGROUND

South Africa has a dual agricultural economy, comprising a well-developed commercial sector and subsistenceoriented farming in the rural areas. Primary agriculture contributes about 2, 6% to the gross domestic product (GDP) of South Africa. The largest area of farmland is planted with maize, followed by wheat and, to an extent, sugar-cane and sunflowers. Maize is the largest locally produced field crop and most important source of carbohydrates for human and animal consumption.

Livestock is farmed in most parts of South Africa. The latest estimates for cattle and sheep are 13, 5 million and 28, 8 million respectively.

GREENHOUSE GAS EMISSIONS IN THE AGRICULTURAL SECTOR

The activities in the agricultural sector that contribute to GHG emissions in South Africa include enteric fermentation; manure management; burning of agricultural residues; fire and deforestation. These activities contribute directly to emissions of greenhouse gases through a variety of processes and practices.

According to the South African greenhouse gas inventory, emissions from agriculture in 1990 were 11.6% and 9.3% in 1994. Methane emissions from agriculture amounted to 2.1Mt (equivalent to 44.1 Mt CO2) in 1990 and 1994. Enteric fermentation emissions from livestock were the largest contributor to methane emissions, contributing 40% of the total methane emissions. Other sources of methane in this sector are:

- Enteric fermentation in livestock emissions associated with microbial fermentation during digestion by ruminant domestic livestock and some non-ruminant livestock
- Manure management emissions associated with decomposition of animal wastes while held in manure management systems
- Agricultural soils emissions associated with the disturbance of agricultural lands by cropping, degradation, the application of fertilisers and animal wastes to crops and pastures
- · Prescribed burning of savannas -

emissions associated with the burning of tropical savannah and temperate grasslands for pasture management and prevention of wildfires

• Field burning of agricultural residues - burning of agricultural residue is considered on of the major causes of emissions

POTENTIAL CDM PROJECTS IN AGRICULTURE

Changing Cropping Practices

Farming practices used in grain cropping systems play a role in fluctuations of greenhouse gases. Some farming practices increase soil carbon levels; others deplete the store of carbon in the soil, often releasing it into the atmosphere as CO₂. Adding nitrogen fertilisers boosts plant growth, but some of the nitrogen is released to the atmosphere as N₂O. The Intergovernmental Panel on Climate Change (IPCC) recognises that a change from conventional tillage to non-till farming can reduce greenhouse gas emissions significantly while raising carbon levels in the soil and increasing fertility and productivity. Conservation agriculture could play a large role in reducing global warming.

Reduced biomass emission

Biomass burning in the agricultural sector is the main source of NOx emission. Reduction of uncontrolled burning of biomass would also reduce smoke pollution locally.

The following biomass related project types have tangible potential to sell carbon credits:

- Use of biomass to generate electricity
- Use of biomass for cogeneration
- Use of biomass to replace fossil fuel use in boilers; and
- Avoidance of the dumping of biomass in landfills

Animal waste / Manure management

A lot of methane is released into the atmosphere from livestock manure. Such emissions may be reduced through manure management. Reducing animal waste or using produced animal waste for energy generation and any other changes in agricultural practices resulting in the reduction of any category of greenhouse gas emissions

Reducing methane emissions from livestock

Strategies to reduce methane emissions from livestock include:

 Intensification - feeding livestock highly digestible feed such as grain or high-quality pasture increases milk production per cow and reduces methane emissions.

- Rumen modifiers Monensin is one of the products shown to be consistently effective in reducing rumen methane emissions.
- Dietary fats Addition of unsaturated fatty acids to ruminant diets reduce methane emissions.
- Carbohydrate type The type of carbohydrate fermented in the rumen influences methane production. For example, dairy cows fed on temperate perennial ryegrass or white clover pasture will produce less methane than dairy cows fed sub-tropical pastures
- Forage processing Grinding and pelleting of forages can decrease methane production
- Defaunation As animal's refaunate rapidly by grazing, only dairy production systems offer possibility of administering defaunating agents regularly during milking.
- Acetogens Acetogens are rumen microbes that convert carbon dioxide and hydrogen gas to acetate, an energy source for the cow.
- Vaccination Methane-producing microbes are immunologically distinct from other organisms in the rumen. White

Optimising herd composition and feed intake

Optimisation of the herd sex, age and breed would allow the national herd to be reduced while maintaining the same level of production. Supplementing the feed with high protein forage would reduce the methane production and increase productivity.

Energy Efficiency in Agriculture

Energy within the agricultural sector is used in tractors, pumped irrigation, harvesters, transport, heating, drying, refrigeration and processing of crops. Some alternative ways could be formulated to use less energy.

REGULATORY INSTRUMENTS SUPPORTING CDM PROJECT DEVELOPMENT

- Energy Bill 2005
- National Climate Change Response Strategy 2004
- National Environmental Management: Air Quality Act 2004
- National Water Resource Strategy
- Paper on National Water Policy

Republic of South Africa, 2000: *Initial National Communication Under Framework Convention on Climate Change*, DEAT, Pretoria Designation National Authority • Tel: 012 317 8614/8309