

# Low Carbon Options and GHG Abatement Potential in Agriculture and Energy using Sectors in Nepal

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## Abstract

This study analyzes GHG emissions from agriculture sector and activities using energy in Nepal during 2010-2050 in Business as usual (BAU) scenario as well as one no-regret and four GHG emission tax scenarios. The four GHG emission tax scenarios consider constant emission tax rates of \$10, \$100, \$300 and \$500 per tCO<sub>2</sub>e during the period 2020-2050. The AFOLUB model is used for the abatement analysis in the agriculture sector while AIM/Enduse model has been used the analysis in the energy using sectors.

Agriculture accounted for the highest share (70.6%) in the total GHG emission of Nepal in 2010; this is followed by the energy using sectors (18.1%), waste generation and other sectors. The transport sector accounted for highest share in energy related GHG emission in 2010 and would continue to do so till 2050. In case of agriculture sector, highest GHG is attributed to enteric fermentation in the case of livestock. Livestock management options (i.e., replacement of roughage with concentrates and high generic merits to reduce enteric fermentation) and midseason drainage in rice cultivation, use of dome digester and high efficiency fertilizer application are found to be the major low cost abatement options in the agriculture sector.

In the energy using sectors, emission reduction of 11% in 2030 would be achievable through no-regret options. In the emission tax scenarios, there would be emission reduction in the range of 13.1% to 65.7% for the tax rates of \$10/tCO<sub>2</sub>e to \$500/tCO<sub>2</sub>e considered in the study. The no-regret abatement options include solar water heating, biogas cooking and electric cooking in the residential and commercial sectors; and improved fixed chimney brick kiln, efficient coal boiler, electric motor and use of biomass in the industry sector. Abatement options in the transport sector are found to be attractive at relatively high tax rates. Biofuels and electric vehicles are found to be not attractive at tax rates up to \$100/tCO<sub>2</sub>e.