Spring 4-11-2016

Emissions and Deforestation Associated with Household Energy Use: A Case of the Thulamela Local Municipality, South Africa

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Abstract

Fuel wood is regarded as a major source of energy around the world, particularly in developing nations forming part of the energy mix. Most rural communities around the world, consider forests as the repository of stored energy. The study focused on the role of fuel wood in deforestation and the emissions of greenhouse gases (GHG) in the Thulamela local municipality in South Africa. Information regarding the fuel wood consumption was collected during a manual field survey of 200 households in four villages in the municipality using questionnaires and interviews. The carbon dioxide (CO_2) emissions were calculated using the generic formula and the emission factors were applied in calculating the emissions of carbon monoxide (CO), nitrogen oxide (NO) and methane (CH_4). According to our results, the combined greenhouse gases emitted in the four studied areas are CO_2 14.91 Kg, CO 0.000349 Kg, NO 0.00548 Kg and CH_4 0.01222 Kg. Calculated vegetation change using the Normalized Difference Vegetation Index (NDVI) for a 5year interval (2007-2012) indicated that a change percentage of 56.23 in the four villages.

Key words: Deforestation; Emissions; Energy; Greenhouse Gases; Fuel wood; South Africa.