

Thesis Title	Study of Greenhouse Gas Resulting from Land Use Change and Forestry Sector in Thailand
Thesis Credits	6
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Abstract

Forest acts as global source and sink of carbon dioxide, the most significant greenhouse gas. Deforestation and land use change play the important role in carbon dioxide emission source as well as decreasing in carbon storage source. Currently, few researchs have been focus on data of greenhouse gases emissions from forestry in Thailand. This study aims to estimate quantity of greenhouse gases emission from forestry sector by follow IPCC 1996 methodologies.

The estimate of greenhouse gases emission from forestry sector in the base year 1990, with the remained 14,006 k ha forest area, show that, the total carbon storage was 1,690 TgC. The carbon dioxide emission from forestry and land use change was 33.65 TgCO₂/yr, and the sequestration of carbon dioxide was 4.98 TgCO₂/yr. Non-CO₂ trace gases emission of methane, carbon monoxide, nitrous oxide and nitrogen oxide were 36.99 GgCH₄/yr, 323.68 GgCO/yr, 0.25 GgN₂O/yr, and 9.19 GgNO_x/yr, respectively.

The estimate of greenhouse gases emission from forestry sector in the base year 1994, with the remained 13,252 k ha forest area, show that, the total carbon storage was 1,519 TgC. The carbon dioxide emission from forestry and land use change was 10.65 TgCO₂/yr, and the sequestration of carbon dioxide was 7.23 TgCO₂/yr. Non-CO₂ trace gases emission of methane, carbon monoxide, nitrous oxide and nitrogen oxide were 11.39 GgCH₄/yr, 99.67 GgCO/yr, 0.08 GgN₂O/yr, and 2.83 GgNO_x/yr, respectively.

It is note that, to sequester carbon dioxide of the net emission from forestry sector in 1994 in term of reforestation, the area of 192 k ha (1.2 million rai) is required.

The reduction of forest area from 1990-1994 lead to the less carbon storage (171 TgC). In 1994 the deforested area was somehow lower than in 1990, on the contrary, higher reforested area was observed. Therefore, they caused the reduction of carbon dioxide emission (23.57 TgCO₂) and increased the carbon dioxide sequestration of 2.25 TgCO₂. Non-CO₂ trace gases emission were also reduced in 1994 which were 25.60 GgCH₄/yr, 224.03 GgCO/yr, 0.17 GgN₂O/yr, and 6.36 GgNO_x/yr.

The carbon dioxide emission from imported timber and wood products in 1990 and 1994 were 90 and 109 GgCO₂/yr, respectively. These emission were higher than the exported timber and wood products in the same year which were 9.28 and 16.43 GgCO₂/yr, respectively.

It is found that the statistical records of The Royal Forestry Department on log and fuelwood taken out from the forest in the two study years were different from FAO records and the estimate in this study which represent the data missing during logged processes.

Keywords : Greenhouse gases/Carbon dioxide/Land use change/Forestry/Deforestation