

Nakarin Sobpresonk 2009: Soil Degradation Status in Khun Wang Area, Mae Wang District, Chiang Mai Province. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Mr. Somchai Anusontpornperm, Ph.D. 174 pages.

A study on degradation status of soils in Khun Wang area, Chiang Mai province was conducted on 16 areas by comparing their physical chemical and biological properties. It was aimed at assessing the changes in soil properties which might indicate degradation due to the conversion from native forests into agricultural areas. Field investigation and soil sampling for laboratory analysis were all based on standard procedures.

Results revealed that soils chosen were in four subgroups, namely Typic Palehumults, Typic Haplohumults, Rhodic Paleudults and Typic Paleudults. Sand particle dominated in most soils with the presence of argillic horizon in all soils. Clay content tended to increase with depth except for some soils that the clay content decreased in the lower part of their profiles. All soils had low bulk density in the topsoil layer and this value increased in the subsoils with the range of 0.95 to 1.78 Mg kg<sup>-1</sup>. The trend of saturated hydraulic conductivity within soil profiles was similar to that of bulk density where soils under native forest mainly having lower values of both properties in the topsoil than that in soils used for crop practices. Soil pH in native forest areas was slightly lower than in areas used for agricultural production. All soils were acidic with pH ranging from 4.1-6.0. Soil organic matter content was very high in forest areas (42-70 g kg<sup>-1</sup>) and in most areas under crop practices. Amounts of available P were extremely high in the topsoils of agricultural areas (49-643 mg kg<sup>-1</sup>) comparing to the fairly low in forest lands and in paddy rice fields. Potassium availability in surface layers of most soils was similarly high. Base saturation percentage of all layers in all soils was lower than 35.

The result of soil degradation status assessment showed that bulk density and loss of top soil indicated by respective higher values and thinner layer of some soils used for growing crops compared to those under natural condition were indicative of soil physical degradation. Soil fertility assessment signified that agricultural use of soils rarely caused discernable soil degradation when compared to soils under native forests nearby. This could severally be attributed to farmers' suitable conservation and management practices in the areas. However, there was a slight concern over the over-use of P and K fertilizers that left high residual amounts of both plant nutrients, especially in soils under greenhouse. This may cause imbalance plant nutrient in the soils. Soil biological degradation was seldom found. There were just a very few areas in comparison to soils under native forest within the same area that seemed to have a decline in soil organic matter content. However, modification of the assessment was made to give more precise status of soil degradation.

---

Student's signature

---

Thesis Advisor's signature