CHAPTER 5

Conclusion

5.1 Plant Species Diversity

The three subtype communities dominated by *Dipterocarpus obtusifolius*, *D. tuberculatus* and *Shorea obtusa* of the pine-dry dipterocarp forest and a subtype of pine-montane forest were investigated for the carbon storage potentials. A total of 70 sampling plots, 40 x 40 m in size were used for vegetation survey by a stratified random method in watershed areas at altitude between 900-1,200 m. Stem girth at 1.3 m above ground and height of all trees in the plots were measured. Soil samples within one meter in each subtype community were analyzed for the carbon contents, and calculating amounts of the carbon storages.

The species richness values in these subtypes were 37, 46, 56 and 24 species, respectively, whereas the species diversity indexes by Shannon-Wiener equation were in the order of 2.55, 3.66, 3.88 and 3.61. Though pine-montane forest had the lowest species richness, the species diversity index was adversely high according to the high population abundance.

5.2 Soil Characteristics

The soils under all subtypes of the natural pine forest were classified into Order Ultisols with the depth of more than one meter, well developed horizons and high clay accumulations in subsoils. There were some small differences of physical properties among soils. The bulk density varied from moderately low to medium. The texture of top soils was mainly sandy clay/sandy loam, and the soil reaction were strongly acid to slightly acid (pH, 5.4-6.5). The texture in subsoils was mainly clay, and the soil reaction varied from slightly to moderately acid (pH, 5.6-6.1). The soil under P-LMF was more fertile than the remained subtypes of pine-dry dipterocarp forest.

5.3 Ecosystem Carbon Storages

The amounts of forest biomass in these subtypes were estimated to 139.2, 103.9, 85.0 and 79.5 Mg ha^{-1}, and calculated to be carbon of 69.0, 51.5, 42.1 and 39.4 Mg ha^{-1}. The carbon amounts in their soils were in the order of 53.4, 52.1, 65.8 and 85.5 Mg.ha-1. Ecosystem carbon storages in these subtypes were different; 122.5, 103.6, 107.9 and 124.9 Mg. ha-1, respectively. The highest biomass carbon was found in pine-*D. obtusifolius* subtype according to good forest condition. Soils under pine-dry dipterocarp forest were poor, and not attractive to farmers for shifting cultivation whereas pine-montane forest had fertile soil, and was previously the shifting cultivated area. Thus, the large carbon amount was stored in soil and lower in biomass.