

Nutrient circulation of the dry evergreen forest at Sakaerat.

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ABSTRACT

Nutrient circulation of the dry evergreen forest at Sakaerat Environmental Research Station., Pakthongchai , Nakhon Ratchasima was investigated from June 1982 to June 1983. One sample plot of 50 X 50 m.² was subdivided and intensively studied in 25 subplots of 10 X 10 m.² each.

Biomass of all large trees (DBH \geq 4.5 cm) was estimated by the allometric equations of Tsutsumi *et al.* (1983), saplings (DBH < 4.5 cm, H > 1.3) by the allometric equations of Issariya (1982) and Tsutsumi *et al.* (1983) and that of seedling (H < 1.3 m.) was obtained from the result studied by Issariya (1982). Nutrients contained in mineral soil (0-70 cm depth) was adopted from the study of Puriyakorn (1982) and in the A₀-layer was determined from samples in 10 subplots which randomly selected inside the whole plot. The return of nutrients to the soil through litterfall was estimated in 25, 1 X 1 m² littertraps. Nutrients input and output to and from the forest ecosystem by rain forest and stream discharge was not studied. The decomposition rate of fine litter in the A₀-layer was estimated by the litterbag method using 12 litterbag (30 X 30 cm.², fine nylon net). The accumulation of nutrients in plant biomass was studied by multiplying the nutrient concentration in each part (stem, branch, leaf and root) of 10 sample tree (DBH \geq 4.50 cm) with high importance value index (IVI) reported by Visaetana (1983). Nutrient uptake was estimated from the nutrient accumulation in biomass increment of the two layers by the same concentrations in plant parts and that of annual litterfall.

Nutrient storage in this dry evergreen forest ecosystem is estimated to be composed of 13,722.74, 88.70, 1,549.40, 1,710.13 and 3,222.80 kg./ha. of N, P, K, Ca and Mg respectively. Over 85% of N and Mg are stored in the mineral soil but P, K and Ca are mainly stored in plant

biomass, up to 70 % for Ca. Accumulation of nutrients of plants biomass are found to be 6 times higher in aboveground than the subterranean part.

Annual nutrient circulation in terms of plant uptake from soil accounts for 168.97, 5.48, 58.73, 117.65 and 20.23 kg/ha/yr. of N, P, K, Ca and Mg respectively. About 60% of these nutrients return to soil through litterfall except for K which is lower (50 %). Nutrient loss from soil by plant uptake is estimated to be replaced by the litter decomposition about 57.13, 57.66, 31.45, 58.93 and 51.66% of annual plant uptake of N, P, K, Ca and Mg respectively. These findings are considered to be an underestimate because only fine litter remaining on the forest floor was incorporated into this estimation neglecting the input of nutrients through the death of fine roots, rainfall transport and release from parent material weathering.