



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

## Tree Species Composition, Diversity and Structure in Tunas Logging Concession Area of Papua, Indonesia

YOSIAS GANDHI<sup>1,2</sup>, RALPH MITLÖHNER<sup>2</sup>

<sup>1</sup>*The State University of Papua, Fac. of Forestry, Indonesia*

<sup>2</sup>*Georg-August-Universität Göttingen, Burckhardt-Inst., Tropical Silviculture and Forest Ecology, Germany*

### Abstract

Tree species composition, diversity and structure of pre-logging (ULG), 4-year post-logged (LG4) and 8-year post logged (LG8) plots in Tunas Timber Harvesting Area of Papuan tropical lowland forest were studied in July 2013. Composition of families and number of species identified in unlogged forest were mostly dominated by tree families, dipterocarpaceae, lauraceae and myrtaceae among 30 families and 71 species found in the plot. However, the occurrences of the three families were at middle places in 4-year logged forest. Whereas in 8 years logged forest, dipterocarpaceae appeared as most populated families. Interestingly, this dominant species was not followed by lauraceae and myrtaceae but moraceae which mainly consist of pioneer species. There was a slightly dissimilarity floristic composition between plots found in all tree size classes as indicated by Sorensen similarity index ranging from 59.65 to 77.78%. Shannon-Wiener index ( $H'$ ) showed a high heterogeneity of rare species in all plots while Simpson's index performed a high diversity of common species found in different forest disturbances. Species richness and evenness were also the best indices for presenting diversity changes between unlogged and logged forest. In addition, they showed an increase in species diversity from plot ULG (71 species) to plot LG4 (85 species) and a slightly decrease in LG8 (80 species). In the case of size class distributions, the negative exponential function showed nearly continuously inverse J-shaped curves for all forest plots. However, there was a slight disruption in the number of tree classes of logged plots which more likely explained that alteration in tree basal area and density have occurred. Shifts in species composition were apparent following logging, however the alter mechanisms behind is expected to be short-lived during first few years after logging. At last, the potential of the forest area as ecosystem services including provision of timber, carbon storage and sequestration, conservation value and biodiversity value is considerably affected by this successional pattern.

**Keywords:** Logging area, Papuan forest, species alteration