The reliability of determining merchantable log volume using green weights of *Araucaria hunsteinii* K. Schum, Bulolo pine plantation

Louis Veisami

Bulolo Campus, School of Forestry, Faculty of Natural Resources, PNG University of Technology, Papua New Guinea

Abstract

An indigenous coniferous species *Araucaria hunsteinii* K. Schum (Klinkii pine) of Araucariaceae family is commercially grown in a state-owned forest plantation, Bulolo, Papua New Guinea. Determination of peeler and sawlog volumes of *A. hunsteinii* via conversion of weight (ton) obtained from a weigh bridge into volume (m^3) has been a major concern for the state and processing industry. Generally, it has been expressed that volume obtained from the weigh bridge is inaccurate and unreliable. This has prompted this research with the aim to validate the use of weigh-bridge to determine log volume for plantation pine logs compared to Huber's scaling method. Also, this study intended to develop a regression model that will reliably predict log volume for the *A. hunsteinii* logs.

The logs of *A. hunsteinii* from two plantation compartments (Middle Creek 5 and Nauti 6) were transported to the weigh bridge in order to obtain the log weights, compute the conversion factor (CF) and determine the volume. The same logs were scaled using Huber's method and volume was determined. The volumes obtained from two methods (weigh bridge and Huber's method) were compared and appropriate statistical analysis were performed to test for any significant differences. The results showed that there was a significant difference in volume derived from the two methods. This study revealed that inconsistency in green weights from the weigh-bridge influenced inaccurate volume estimate and hence, weigh bridge technique for volume estimation was unreliable. Also, the regression test for 50 residual independent sample data showed a decent fit and the model indicated a potential for predicting volume using weights, CF, and daily temperatures.