SUMMARY


Forest inventory can be carried out by three approaches, i.e., terrestrial, remote sensing, and combination between both of them (Simon 1993). Generally, the terrestrial approach provides more reliable and accurate results, but it is more time consuming, costly and needs more labours than the remote sensing approach (Husch 1987). Conversely, the remote sensing technology can be applied in a quick way with a large area providing relatively more complete information. Combination between the terrestrial and remote sensing frequently provides advantages in keeping accurate estimation, but lower cost all at once (Simon 1993). This study examined the application of double sampling technique which combines the use of high resolution remotely sensed data and ground measured data (terrestrial approach).

The study objective is to evaluate the application of double sampling technique using non-metric digital imageries to estimate the standing stock. The equipments used for field measurements are GPS, compass, digital camera, SLR camera with a fish eye lens, haga hypsometer, suunto clinometer, tape, and rope; while the the data analysis was performed using a set of computers with MS Excel, SPSS, Hemiview and ArcView softwares. The data used were high resolution non-metric digital imageries of KPH Madiun, the result of ground truthing, and other supporting data.

The double sampling study applied in this study shows that the total standing stock of total area for BKPH Dagangan using \( V_{bc} = -10,164 + 1,027N_{ctr} + 1,752D_{ctr} + 0,081C_{ctr} \) is about 39.281,31 m\(^3\) with sampling error of 4,37%. For BKPH Dungus, the total standing stock using \( V_{bc} = 1,499E-5C_{ctr}^{2.693} D_{ctr}^{1.159} N_{ctr}^{0.267} \) is amounted to 73.641,1 m\(^3\) with sampling error of 9,01%. To produce a maximum sampling error of 5%, the optimum number of plots in the image and in the field are 114 and 11 plots for BPKH Dagangan, while BPKH Dungus is 508 and 67 plots. The efficiency relatives using double sampling technique provided in this study are 299,11% for BPKH Dagangan and 211,40% for BPKH Dungus. The use of another model with one variable (\( N_{ctr} \) for BPKH Dagangan and \( C_{ctr} \) for BKPH Dungus) gave slightly lower efficiency relatives, i.e., 151,48% with sampling error of 5,06% for BKPH Dagangan and 150,76% with sampling error of 10,67% for BKPH Dungus.

Key words: double sampling technique, potential stands, non-metric digital imageries