ABSTRACT

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The upstream of Kali Bekasi watershed condition plays an important role on the management of Kali Bekasi watershed, Jakarta and Bogor District. The presence of vegetation cover in sufficient area in the Permanent Green Open Space of upstream of Kali Bekasi watershed is crucial in maintaining environmental quality. CO₂ sequestration by the presence of vegetation in a landscape is substantial mitigation of climate change. It creates a low carbon society that is needed to get appreciation in environmental services. The objective study was to analyze structure and species diversity of stands, to analyze changes of the permanent green open space in upstream of Kali Bekasi watershed, its carbon stocks and their correlation. Observation plots amounting to 161 plots were established in the study site, which were laid out on the upstream of watershed, representing upper, middle and lower parts of the site. Estimation of carbon stocks was calculated by using non-destructive sampling method, using the existing allometric equations. The results of vegetation analysis showed that the level of Shannon-index was low until medium, 0,63 and 3,36 respectively. These species were identified to have high carbon sinks, which is potential to increase carbon stocks and biodiversity conservation. Stand structure in the agroforestry system in the upstream of Kali Bekasi watershed was found closely to natural forest structure. The upstream of Kali Bekasi watershed has 1,63x10⁶ tons carbon stock total equivalent 5,97x10⁶ tons of CO₂ uptake. Green open space in a private area (mix-garden, home garden, bamboo garden) most contributed to the total carbon stocks although the average carbon stock was lower than in pine forest and natural forest. The changes in permanent green open space area have the greatest influence on total carbon stocks. Carbon stocks were highly related to the basal areas, but stand density and species diversity has lower correlation to carbon stocks.

Keywords: CO₂ sequestration, correlation, diversity, permanent green open space, stand structure