ABSTRACT

Among tropical terrestrial ecosystems, montane forests are one of the most vulnerable ecosystems subject to both land cover and climate changes. Spatial distribution patterns of tree populations may adapt, migrate, or extirpate when their usual environmental conditions rapidly change. Thus, species distribution models have become a useful tool to predict distributions under various environmental scenarios. *Pinus kesiya* is one of the tropical montane species native in the Philippines susceptible to direct anthropogenic pressures and climate changes. The present study aims to determine the potential distribution of *P. kesiya* under climate change and land cover scenarios in the southern Cordillera Mountain Range, Philippines. A widely used ensemble technique – *biomod2* was utilized as the species distribution model in the study. Model results suggest that climate and elevation were the most important predictors of *P. kesiya*'s distribution. The results were based on the substantial agreement (72%) of biomod2 in modelling *P. kesiya*'s distribution. Benguet province expectedly forms part of the species' current distribution. In the future, *P. kesiya* was projected to increase, decrease, and be stable in areas within the site with differed projections. *P. kesiya* would generally increase across the study site by 34% to 42% and likely attributable to the increase in precipitation during the wettest quarter. In contrast, there was a decrease in high probability of occurrence to medium probabilities by about 30% in the ca model and 98% in the wmean model. These reductions coincided with the predicted increase in precipitation in the driest month, higher diurnal temperatures and temperatures during the warmest month. Anthropogenic land cover, particularly agriculture and built-up areas has reduced *P. kesiya*'s ≥50% probability of occurrence from ~19% in 2010 to ~32% in 2019. Such pressures within *P. kesiya* forests would be expected to persist due to its extensive nature and accessibility. With the projected impacts of climate change and direct human activities, *P. kesiya* would remain in the future however, its population's productivity and provenances may be of concern.

Keywords: *Pinus kesiya*, species distribution model, *biomod2*, climate change, land cover change