Abstract

Fossil fuel combustion, deforestation, land degradation and other human activities have been the major culprit in increasing carbon emissions, and they majorly contribute to global warming and climate change. Forests and woodlands are considered as one of the most important habitat types in the world, because they contribute to the sustainability of ecosystems. The practice of planting forests by either seeding or planting, during reforestation and afforestation practices, have been promoted to provide solutions regarding challenges of climate change mitigation. This study was conducted to assess the tree biomass and carbon stored in trees, and mapping and valuation of other ecosystem services provided by Machhu Plantation, District Layyah, Punjab. It is situated southwest of two left minors, between 30.8945° N and 71.2071° E. Field survey was done and about 20 plots (20 * 20 m) were made to assess tree carbon, soil, and dead carbon, the data from this survey was analyzed later, through various allometric equations to estimate tree carbon stock. Valuation of ecosystem services was done using ArcGIS. A semi-structured questionnaire was administered to 50 residents, living in the vicinity of Machhu plantation. The results showed that that total tree carbon for all the species of the Machhu plantation was 0.49 Mg/ha. Around 5.14 Mg/ha carbon is being sequestered by the given number of plants in Machhu plantation each year, and replacement cost of which is around 0.212 million rupees. The findings of present study showed that around 13.7 Mg oxygen was being produced every year. Total monetary benefit value for carbon storage and carbon sequestration was reported as 2.54 Rs. Millions and 0.212 Rs. Millions/yr. respectively. The respondents marked clean air and climate mitigation as the most prominent ecosystem service, along with religious and spiritual services. The study can be helpful for decision and policy makers for sustainable management and monitoring of the site.