

Biomass production and carbon sequestration in different tree-based systems of Central Himalayan Tarai region

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Biomass, carbon storage and carbon dioxide mitigation potential of plantations of *Populus deltoides*, *Eucalyptus tereticornis*, *Dalbergia sissoo*, *Mangifera indica*, *Litchi chinensis* and *Prunus salicina* were assessed. Being economically viable, such tree plantations are grown by farmers on a large scale in north India. The maximum total biomass (94.8 Mg ha^{-1}) was observed in a 10-year-old *D. sissoo* monoculture plantation, followed by an 8-year-old *P. deltoides* block plantation (63.0 Mg ha^{-1}). Carbon stocks ranged from 4.51 Mg ha^{-1} in an 8-year-old *P. deltoides* boundary plantation to 43.39 Mg ha^{-1} in *D. sissoo* plantation. The carbon sequestration rate for *P. deltoides* block and boundary plantations was estimated to be 2.75 and $0.43 \text{ Mg C ha}^{-1} \text{ year}^{-1}$, respectively. *Eucalyptus* boundary plantation sequestered $0.84 \text{ Mg C ha}^{-1} \text{ year}^{-1}$ while *D. sissoo* plantation sequestered $2.73 \text{ Mg C ha}^{-1} \text{ year}^{-1}$. Among fruit trees, the highest sequestration rate was recorded in *M. indica* (mango) plantation, with $1.43 \text{ Mg C ha}^{-1} \text{ year}^{-1}$.