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Title: CARBON SEQUESTRATION POTENTIAL OF DIFFERENT MULTIPURPOSE TREE SPECIES

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Abstract: Carbon Sequestration in urban sectors and forest areas is of great attention due to its concerns about global climate change. The Carbon Sequestration means the provision of long term storage of carbon in the terrestrial biosphere, underground or the oceans so that the build up (the principal green house gases) concentration in the atmosphere will reduce. The present study was planned with the objectives to estimate carbon sequestered by tree species in MPTs plantation, to estimate carbon sequestered in the soil by tree species in MPTs plantation and to find out best tree species for carbon sequestration in MPTs plantation. The species are *Acacia mangium*, *Azadirachta indica*, *Dalbergia sissoo*, *Eucalyptus* spp., *Gmelina arborea*, *Pongamia pinnata*, *Syzygium cumini* and *Terminalia arjuna* species of six years old plantation from the arboretum maintained by Department of Silviculture and Agroforestry under Birsa Agricultural University, Kanke, Ranchi, Jharkhand. The Dry Ashing method was used for estimating the total carbon content in the trees. The data for carbon estimation, aboveground parts i.e. bole, branches, and leaves and belowground parts i.e. roots is collected. Walkley and Black method was used for estimation of Soil Organic Carbon. The samples from three profiles of soil i.e. 0-30 cm, 30-60 cm and 60-90 cm were collected and analyzed in soil laboratory. The total Aboveground and Belowground carbon stalk per hectare as estimated for *Acacia mangium* was 55.27 ton/ha and 9.12 ton/ha respectively, for *Azadirachta indica* was 7.36 ton/ha and 5.41 ton/ha respectively, for *Dalbergia sissoo* was 6.71 ton/ha and 4.93 ton/ha respectively, for *Eucalyptus* spp. was 64.52 ton/ha and 38.77 ton/ha respectively, for *Gmelina arborea* was 10.63 ton/ha and 7.24 ton/ha respectively, for *Pongamia pinnata* was 9.46 ton/ha and 7.40 ton/ha respectively, for *Syzygium cumini* was 8.34 ton/ha and 6.13 ton/ha respectively and for *Terminalia arjuna* was 8.01 ton/ha and 5.89 ton/ha respectively. The soil carbon content in the plots from all the three profiles i.e. 0-30 cm, 30- 60 cm and 60- 90 cm are estimated as, for control plot 28.24 ton/ha, for *Acacia mangium* was 45.67 ton/ha, for *Azadirachta indica* was 56.25 ton/ha, for *Dalbergia sissoo* was 61.28 ton/ha, for *Eucalyptus* spp. was 64.14 ton/ha, for *Gmelina arborea* was 41.55 ton/ha, for *Pongamia pinnata* was 33.65 ton/ha, for *Syzygium cumini* was 68.13 ton/ha and for *Terminalia arjuna* was 38.06 ton/ha. Finally, the total carbon stalk from the aboveground and belowground tree and soil was estimated as, for *Acacia mangium* (110.06 ton/ha), for *Azadirachta indica* (69.02 ton/ha), for *Dalbergia sissoo* (72.92 ton/ha), for *Eucalyptus* spp. (167.43 ton/ha), for *Gmelina arborea* (59.42 ton/ha), for *Pongamia pinnata* (50.51 ton/ha), for *Syzygium cumini* (68.13 ton/ha) and for *Terminalia arjuna* (51.96 ton/ha). Hence, the result reveals that *Eucalyptus* spp. is a fast growing multipurpose tree species which is very much effective in sequestering atmospheric carbon (167.43 ton/ha) both in tree as well as soil, it is followed by *Acacia mangium* (110.06 ton/ha) and *Dalbergia sissoo* (72.92 ton/ha).

Description: CARBON SEQUESTRATION POTENTIAL OF DIFFERENT MULTIPURPOSE TREE SPECIES

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