

## **Biomass and carbon sequestration in different agroforestry systems of a Western Himalayan watershed**

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Climate change is one of the major issues that require immediate attention. Sequestering carbon (C) through agroforestry is one of the ways to contribute to global climate change mitigation. In the present study, agroforestry land use systems existing on arable and non-arable lands in the Kwalkhad Watershed of middle Himalayan region of Himachal Pradesh, India, were evaluated for C sequestration and C credits. In total, eight land use systems existed in the watershed. Agrisilviculture (ASH) system ( $14.78 \text{ Mg ha}^{-1}$ ) and agrihortisilviculture (AHS) system ( $14.45 \text{ Mg ha}^{-1}$ ) sequestered a high amount of C than silvipasture (SP), pure agriculture or grassland and abandoned land, though not significantly more than agrisilviculture (AS) or agrihorticulture. Total C pool in abandoned soils (0–40 cm) was highest followed by SP and ASH system. C stocks in soil (0–40 cm) exceeded C stocks in plants by a factor of 15.81 for AHS system. SP, ASH and AS systems, with their higher C mitigation potential of 1.71, 1.52 and 1.43, respectively, were more suitable land use systems for C mitigation in the region. The ASH system produced the most (21.49) C credits on a per-hectare basis.