Systems approach vis-à-vis carbon sequestration: issues and strategies

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Potential carbon sequestration in a cropping system depends on biophysical factors like soil type, water availability, agro-climate, land use and tillage practices. The benefit accrued depends on socio-economic factors and legal rights of land, which have been discussed. Potential barriers to adoption and relative importance of such hurdles have been discussed; the relative importance followed the order: knowledge > economic > biophysical > cultural = right to soil. A scale neutral nationwide policy framework for carbon sequestration and attaining land degradation neutrality has also been suggested.

Keywords: Barriers to adoption, carbon sequestration, factor interplay, policy framework.

purposes: it restores degraded soils, increases land productivity, promotes biodiversity and helps reduce atmospheric CO_2 levels. This, in turn, helps lower greenhouse gas emissions and contributes to climate change mitigation.

In arable farming systems, incorporating cover crops and legumes into crop rotations is essential to prevent extended periods of bare soil. These crops are typically ploughed back into the soil as green manure before planting the next primary crop. In autumn-planted sugarcane, short-duration crops like pulses, potatoes, mustard and cover crops are grown as intercrops. This approach helps prevent soil erosion, minimizes weed growth and increases crop yields while improving soil quality and carbon sequestration, as these crops can serve as green manure, mulch or forage[1,2]. Cover crops are cultivated mainly to enhance soil health rather than to boost crop yields. They often suppress weeds,