



(Sameshi), Lucknow. The project helped reclaim waterlogged barren and low-yielding crop lands and enhanced the incomes of the rural poor by increasing the crop yields. Besides, these interventions provided an opportunity to the rural people, especially the school drop-out youth, for skill development in the field of integrated farming. The average income of the farmers increased more than 1.5 lakh ha<sup>-1</sup> year<sup>-1</sup> from per unit model. Uttar Pradesh Bhumi Sudhra Nigam and Department of Agriculture, after assessing the impact of the model, have included it in their work plan.

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## Quasi Equilibrium of Soil Carbon Stock in Saline Vertisols under Different Land Use Systems

In Gujarat State, swell-shrink soils are spread over about 4.9 million ha area of which about 0.12 million ha area is saline. This study was conducted at the Samni Experimental Farm, Bharuch, Gujarat characterized by shrink-swell soils with sub-surface salinity. Three land use systems viz., agriculture, pasture and woody biomass species were selected to determine the quasi-equilibrium value (QEV) of SOC and total carbon stock under these systems. QEV, which is an indicator of soil organic matter sustainability was calculated using SOC (%) of the soil over different depths (0-15, 0-30, 0-50 and 0-100 cm) under different land uses. The QEV of SOC under the different system showed that at 15 cm depth agricultural system had the lowest value of 0.57% as compared to woody biomass species (0.85%) and pasture land use system (0.95%). At this depth, carbon decreased to 0.57% after 8 to 10 years of agricultural practices indicating that the QEV of SOC in saline shrink-swell soils decreases when they are used for agricultural production. The data indicated that the agricultural system had the lowest SOC stock at all the depth as compared to pasture and woody biomass systems. Since all the soils under study were developed on similar substrate and under the similar pedoclimatic conditions, it is evident that variability in QEV of these soils is primarily controlled by the land use practice. Addition of organic inputs such as FYM

and green manures is suggested to enhance the QEV of SOC under agricultural production.

Among the woody biomass species, carbon sequestration potential of tree species under saline Vertisol condition was studied. Carbon sequestered by three tree species (*Eucalyptus tereticornis*, *Syzygium cumini* and *Pongamia pinnata*) grown on saline Vertisols at a spacing of 5m x 5m was determined by non-destructive method. The age of all three woody species was 9 years. The soil pH and EC<sub>e</sub> were between 7.8-8.1 and 2.4-5.2 dS m<sup>-1</sup>, respectively. The SOC was the highest under *Eucalyptus tereticornis* (0.127 t ha<sup>-1</sup>) followed by *Syzygium cumini* (0.117 t ha<sup>-1</sup>) and *Pongamia pinnata* (0.089 t ha<sup>-1</sup>). The total biomass carbon stock sequestered by these plantations were 63.13, 26.48 and 23.42 t ha<sup>-1</sup>, respectively. The results showed that the carbon sequestration potential of fast growing tree species like *Eucalyptus tereticornis* was about two-fold higher compared to the other two tree species. The net annual carbon sequestration rate was significantly higher in *Eucalyptus* (7.01 t C ha<sup>-1</sup>) followed by slow growing species like *S. cumini* (2.94 t C ha<sup>-1</sup>) and *P. pinnata* (2.60 t C ha<sup>-1</sup>).

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## Resource conservation through the adoption of DSR technology: A success story

Sardar Harpreet Singh, a progressive farmer from Kalvehri village of Karnal district, Haryana has pioneered the use of different resource conservation technologies to sustain the soil health and crop productivity. Being aware of the rapid deterioration in soil health and declining water table in Haryana due to paddy-wheat cropping system, he feels that unless farmers adopt conservation agriculture, this problem will

aggravate in coming years. He was looking for the alternate method of rice cultivation instead of Transplanted Rice (TPR) cultivation to save the resources. He visited ICAR-CSSRI's resource conservation experiments and other international organization's demonstrations on DSR method of cultivation and was impressed with the Direct Seed Rice (DSR) technology. Initially, in 2011, he allocated 4 ha for DSR method of rice cultivation.

