



Multitier agroforestry system for integrated resource conservation on uplands of Eastern Ghats region in India

Praveen Jakhar · Anchal Dass · Partha Pratim Adhikary · S. Sudhishri ·
B. S. Naik · H. C. Hombegowda · M. Madhu · N. K. Lenka ·
P. R. Chaudhary · R. K. Panda

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Abstract Soil and water conservation along with crop productivity improvement is indispensable for sustainable development of rainfed areas. Integration of suitable fruit trees within the cropping system can reduce risk allied with rainfed farming. The system of raising multi-height plant species with agricultural crops known as multitier agroforestry system was assessed (2007–2010) for resource conservation and production potential in rainfed conditions of Eastern Ghats region in India. Thirty experimental plots, each of 18 × 12 m dimension with 2 % slope having different multitier agroforestry treatments were

assessed for soil erosion, nutrient loss and crop yield. Results revealed that multitier plantation of drumstick (*Moringa oleifera*) with *Gliricidia sepium* hedgerow and ginger (*Zingiber officinale*): pigeonpea (*Cajanus cajan*) (8:2) intercropping enumerated minimum mean runoff (8.26 %) and soil loss (3.45 Mg ha⁻¹). This treatment saved 74 % more soil organic carbon, 64 % more phosphorus and 66 % more potassium, respectively than broadcasted finger millet cultivation (traditional farmers' practice). An increase of 24–27 % drumstick fruit yield was observed in *Gliricidia* hedgerow based multitier agroforestry systems over non-*Gliricidia* systems. The findings will contribute as a technical reference for the promotion of hedgerow based multitier agroforestry for resource conservation and fertility restoration of sloping lands.

P. Jakhar (✉) · P. P. Adhikary · B. S. Naik ·
H. C. Hombegowda · M. Madhu
ICAR-Indian Institute of Soil and Water Conservation,
RC, Koraput, Odisha 763002, India
e-mail: icarpraveen@yahoo.co.in

A. Dass · S. Sudhishri
ICAR-Indian Agricultural Research Institute,

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