

Title of the project (project code):	Development and assessment of mango-based IFS model for sustainable resource management in flood prone areas of North Bihar (NRMAMGIFRISIL202400400020)
Institute-funded/externally funded	Institute-funded
Project time: Period of development/ evaluation/validation	01.05.2024 to 30.0.2027
Developers (Lead and Associates)	Lead: • Dr. A. K. Jadhav, Scientist (Fruit Science), Associate: • Dr. P. K. Bharti, Sr. Scientist (LPM) • Dr. Haritha Mohan M, Scientist (Plant Pathology) up to June 2025 • Dr. Lamella Ojha, Scientist (Animal Nutrition) wef April 2026
Objective of the project	1. To develop and assess mango based integrated farming system in water congested ecology of North Bihar 2. To find out the economics and resource flow of the various mango-based IFS production systems.
Treatment details	A. Farming system model 1: Mango orchard + intercrop + poultry 1. Main crop: Mango (50% area): 2. Intercrops (30% area): Turmeric/ ginger/ guinea grass/ colocasia/ nappier/ berseem etc. 3. Poultry integration (10% area): Vanraja (50%) and Sonali (50%) 4. Other allied enterprises (10%): Compost unit etc. B. Farming system model 2: Mango orchard + intercrop + goatery 1. Intercrops are same as above modul 1 2. Goatery integration (10-20% area): Black Bengal 3. Farming system model 3: Mango orchard + intercrop + trench/ahar pine 1. Intercrops same as above modul 1 2. Trench/ahar pine integration in underutilized tree spaces

Summary of the project (Bullet point)	• Each model will be established on 0.4 ha (1 acre) and compared with a mango mono-cropping control. • Integration of mango orchard, intercrops, poultry, goatery, water harvesting (trench/ahar-pyne), and vermicomposting to improve farm productivity and profitability. • Cultivation of shade-tolerant and seasonal intercrops (turmeric, ginger, colocasia, maize, gram, vegetables, fodder crops) to enhance orchard land-use efficiency. • Introduction of Vanaraja and Sonali poultry and Black Bengal through low-cost housing systems. • Establishment of trench/ahar-pyne water harvesting structures for drainage management, rainwater conservation, and supplemental irrigation during dry periods. • Promotion of on-farm nutrient recycling through vermicomposting and utilization of goat and poultry wastes. • Assessment of productivity, economics, soil health, resource-use efficiency, employment generation, and system sustainability under farmer field conditions. • Development of a scalable IFS model for enhancing livelihood security and climate resilience in flood-prone mango-growing regions of Bihar.
---	--

Output of the project: Yield/productivity gain/ Saving of water, labour, time, and energy/ increase in water use efficiency	- Generated a total net income of ₹95,664 per acre through integrated enterprises. - Produced 2,368 poultry eggs and achieved average poultry body weight of 1.58 kg. - Goat body weight increased from 9.22–9.83 kg to 14.40 kg during the study period. - Produced 3,100 kg+ organic manure/compost through goat and poultry waste recycling. - Fulfilled approximately 30–40% of green fodder and 30% of dry fodder requirements from on-farm resources, reducing feed costs. - Improved soil organic carbon from 0.25–0.61% to as high as 0.72% through nutrient recycling. - Enhanced land-use efficiency by utilizing understory orchard space for intercropping and fodder production. - Reduced dependence on external inputs through internal recycling of nutrients and fodder resources. - Increased system productivity, farm diversification, and resilience against climatic and market risks in flood-prone areas.
Cost effectiveness, including B:C ratio	- The mango-based IFS model was found to be economically viable and cost-effective due to income diversification and efficient resource recycling. - Integration of intercropping, poultry, goatery, and compost production reduced external input costs and enhanced profitability. - The system generated a net income of ₹95,664 per acre, with a higher B:C ratio than conventional mango mono-cropping, indicating better economic returns and sustainability.
Validation technology followed (within the Institute, collaborators, multilocation/multi-site testing at farmers' fields)	NA
Proposed stakeholders	Farmers
Publications/photos/video clipping, if any	NA
Contact details: Name, Mobile No, mail ID	Dr. A. K. Jadhav, Scientist (Fruit Science), +91 8379990788 amol.jadhav@icar.org.in

