LEADS DEVELOPMENT MODEL

Sustainable Livelihood Promotion Initiative

MODEL 1: PLANTATION WITH INTERCROPPING

Background

Jharkhand falls under Agro-Climatic Zone–VII, with annual rainfall typically ranging between 1,100–1,300 mm. Agriculture remains the state's principal source of livelihood, yet SECC 2011 data shows that while 29% of Jharkhand's land is surrounded by forest, only 27% is under agricultural use and just 11% is irrigated — conditions well suited to mango plantation. For families with upland, a mango-based orchard becomes an additional long-term asset that yields income every year after a medium-term gestation period, is easy for the family to maintain, and generates enough income to keep them invested in its upkeep. Marginal uplands that were earlier poorly utilised for seasonal crops are thereby converted into an enriched, income-generating resource. With irrigation, one acre can become a family's primary source of livelihood within 3–4 years and continue producing for at least 30–40 years. The Amrapalli and Mallika varieties are particularly suited to these areas for their small canopy, close spacing, high yield, and fruit that can be stored for a longer time.

Concept



Barren and fallow uplands, locally known as "Tanr," represent an untapped resource for rural livelihoods. Practicing Plantation following the Intercropping model have proven to transform such underutilized land into a source of sustained income, without disrupting farmers' existing agricultural activities. It is an affordable, accessible, reliable, and sustainable model, as demonstrated in various projects of LEADS's during its field interventions. LEADS has been actively engaged in promoting sustainable livelihoods among tribal and vulnerable communities, and the Mango Plantation with Intercropping model has emerged as one of its most successful initiatives.

Under this model, 112 mango saplings are planted per acre of land, maintaining a spacing of 15 feet on all sides to ensure adequate sunlight for cultivation. Following plantation, the underground area, surface land, and fencing space are optimally utilised through creeper cultivation — ensuring maximum productivity from every inch of land.

Steps of Implementation

Step 1: Site Selection — Selection of upland or fallow land suitable for this model, preferably near water bodies or in areas where water sources can be developed.

Step 2: Land Preparation — Preparation of land using available resources such as ploughing, trench and bund cutting, live fencing (or other suitable fencing methods), and manuring with soil treatment.

Step 3: Pit Digging — Pits measuring 3' x 3' x 3' are dug at each planting point, with the topsoil and subsoil separated and kept on opposite sides for treatment. The pits are then left open for 15–20 days, allowing sunlight exposure and natural enrichment with micronutrients before plantation.

Step 4: Plantation and Pit Filling — The topsoil is used first to fill the pit, followed by the subsoil. A small hole matching the size of the plant's root ball is then made at the centre, the sapling is placed carefully, and the soil is gently firmed around the stem and roots to provide necessary support. This is followed by regular irrigation, except during the rainy season as it is not required.

Step 5: Fencing and Border Plantation — Live fencing or other suitable methods are used based on available resources. Plants such as Mahogany, Sesame, Sagwan (Teak), and Gamhar are planted such, that they encircle the cultivated area. Being tall-growing species, they not only act as a natural fence and border, but also protect the crops from heatwaves and wind pressure while improving the overall soil fertility. In addition, they as well provide substantial income to farmers after 15–20 years.



Step 6: Intercropping — The key component of this model is to provide farmers a regular and ongoing source of income between plantation cycles. The method allows for integrating the cultivation of a variety of crops at the same time. The layers include underground crops such as groundnut, potato, onion, foot yam, garlic, ginger, turmeric, and sweet potato. While the surface is cultivated with seasonal vegetables such as cauliflower, cabbage, spinach, tomato, coriander, mustard, mint (pudina), green and red chilli, capsicum, peas, and maize. The third layer includes creepers such as long beans, bitter gourd, snake gourd, yellow pumpkin, pineapple, and watermelon are also grown, ensuring optimal utilisation of every inch of land.

Step 7: Plant Management — Flowering begins from the 2nd year, and farmers are encouraged to remove the first flush of flowers. Irrigation during summers and proper pruning are essential for healthy growth, ensuring field activities remain unaffected. Organic manure, pesticides, and fungicides are applied as needed.

Step 8: Harvesting — Harvesting of fruits such as mango, guava, litchi, and jackfruit is carried out following defined protocols to ensure quality produce reaches the market.

Outcome for Sustainability

1. Large-scale barren land is put to productive use through plantation and intercropping, generating income for the community.
2. Sustained, year-round employment is ensured for migrant labourers and other farmers.
3. Approximately Rs. 40,000–50,000 per acre per year can be earned through intercropping, and Rs. 80,000–85,000 through fruit sales from the third or fourth year onward — an average of Rs. 1.2 lakh in cash income annually, in addition to meeting household consumption needs.
4. Soil nutrition is maintained ensuring sustainability, along with long-term carbon sequestration.
5. Migration is curbed in states with adequate natural resources and rainfall ranging between 900–1600 mm.
6. Biomass generated can be used as fuel through smokeless chullahs, and fodder is readily available for livestock.

LEADS Experience

LEADS has promoted this model across more than 3,500 acres of land in 14–15 districts of Jharkhand, with support from the Government of Jharkhand, Government of India, CSR partners, and foreign donors. To date, 2,727 farmers have developed mango orchards across 5,135 acres, raising over 5,62,349 mango and mixed-variety plants along with 4,52,960 timber-yielding plants.

Concluding Remarks

This model can be implemented in any area with adequate irrigation facilities. Since 2015–16, the MGNREGA scheme has been leveraged in Jharkhand to support such initiatives. The model ensures a long-term, sustainable source of livelihood by utilising both community and state-provided resources and schemes.

Note: *A plant survival rate of up to 98% can be achieved if the above protocol is followed diligently, from site selection through to plant management and harvesting.*

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