

### 2.5.3. University Access to Local Farmers and Food Producers

#### Objective

VFSTR (Deemed to be University) extends its research and infrastructure facilities to local farmers and food producers with the goal of enhancing sustainable agricultural practices, promoting innovation, and improving livelihood security. Through collaborative engagement, the University enables farmers to access its laboratories, nurseries, models, and technological innovations that contribute to the development of climate-resilient and eco-friendly farming systems.

#### 1. Hi-Tech Nursery – Production of Quality Planting Material

The Hi-Tech Nursery at VFSTR serves as a model unit for large-scale production of high-quality seedlings and grafts of horticultural and forestry species. Equipped with mist chambers, shade nets, and polyhouses, the nursery ensures optimal growing conditions for producing disease-free and genetically superior planting material. Farmers are trained in propagation techniques such as budding, grafting, and micro-propagation to establish their own nurseries and orchards.

#### 2. Tree-Based Enterprise Incubation Centre (TBEIC)

The TBEIC provides entrepreneurial support to farmers and rural youth by offering access to facilities for value addition in wood-based enterprises. It is equipped with a **CNC wood carving machine** for precision wood processing, **wood seasoning and preservation units** to enhance durability, a **briquetting unit** for converting biomass residues into fuel, and an **agarbatti production setup** for small-scale cottage industries. This centre promotes sustainable use of forest resources and facilitates skill development for income diversification.

#### 3. Food Forest Model – Multi-Species Fruit Orchard

The Food Forest model demonstrates a sustainable agro-ecological approach where **22 different fruit crops** are grown together to mimic natural forest ecosystems. This model promotes biodiversity, enhances soil fertility through natural nutrient cycling, and provides year-round fruit production. Farmers visiting this model learn about species selection, canopy management, and polyculture systems that increase resilience and reduce input dependency.

#### 4. Six-Layered Agroforestry Model

This model integrates **timber and multipurpose tree species** such as Teak, Malabar Neem, Indian Rosewood, Red Sanders, Sandalwood, and Mahogany in a layered structure. The design ensures optimal use of sunlight and soil resources across six vertical layers. It exemplifies how farmers can combine forestry and agriculture for multiple income streams, improved soil conservation, and enhanced biodiversity while sequestering carbon effectively.

#### 5. IoT-Enabled Smart Sensor-Based Irrigation System

VFSTR's smart irrigation unit utilizes **Internet of Things (IoT)** technology to automate water management based on real-time soil moisture and weather data. The system helps farmers optimize irrigation scheduling, minimize water wastage, and improve crop productivity. Training sessions are organized for farmers to understand precision agriculture tools and adopt data-driven irrigation practices for sustainable resource use.

## 6. Soil Science Laboratory

The Soil Science Lab provides testing services for soil fertility assessment, pH, EC, organic carbon, and nutrient status. Based on laboratory results, farmers receive **customized nutrient management recommendations** for balanced fertilizer application. This helps prevent soil degradation,

enhances productivity, and reduces input costs. The lab also demonstrates techniques like compost quality testing and microbial inoculant preparation.

## 7. Petal Paradise – Circular Flower Crop Garden

The “Petal Paradise” is an aesthetically designed circular flower garden that serves as a **demonstration and training unit** for floriculture. It showcases cultivation techniques for commercial flower crops such as marigold, chrysanthemum, and jasmine under field and protected conditions. Farmers are trained in nursery management, floral arrangement, and post-harvest handling to develop micro-enterprises in ornamental horticulture.

## 8. Exotic Fruit Crop Production Model

This unit demonstrates cultivation of high-value **exotic fruit crops** including Avocado, Jaboticaba, Macadamia, Butter Fruit, Passion Fruit, and Abieu. The model introduces farmers to new market-oriented crops suited for agro-climatic diversification. Training focuses on crop management, grafting, irrigation, and marketing strategies, helping farmers tap into premium fruit markets and diversify income sources.

## 9. Dragon Fruit Orchard

The Dragon Fruit Orchard showcases the complete production cycle of this emerging commercial fruit crop. It demonstrates **trellising systems, pruning methods, flower induction, and post-harvest handling** practices. Farmers are provided with technical guidance on crop establishment and integrated pest management for profitable cultivation under semi-arid conditions.

## 10. Pental System for Production of Cucurbits

This system employs **structural supports (pendals)** to cultivate cucurbits such as bottle gourd, bitter gourd, and ridge gourd. The vertical growing system enhances yield, improves air circulation, and reduces disease incidence. Farmers learn about cost-effective structure fabrication, crop training, and intercropping methods suited for small and marginal holdings.

## 11. LARA OXY ZONE – Green Corridor in N Block

The “LARA OXY ZONE” represents a green corridor developed for **urban greening and carbon sequestration**. It features diverse tree species planted strategically to improve air quality and provide aesthetic value. Farmers and students learn about the ecological benefits of green corridors, carbon budgeting, and urban forestry initiatives that can be replicated in village environments.

## 12. Moringa + Curry Leaf Block

This block integrates **Moringa (drumstick)** and **Curry Leaf** cultivation to demonstrate mixed cropping for small-scale farmers. The combination provides regular income and improves soil health through leaf litter recycling. The block also serves as a learning model for nutrient management, pruning techniques, and post-harvest processing of leafy produce.

## 13. Vermicompost Unit

The Vermicompost Unit illustrates the process of converting agricultural and organic waste into nutrient-rich compost using earthworms. Farmers are trained in bed preparation, moisture regulation, and harvesting of Vermicompost. The unit promotes organic farming by supplying eco-friendly manure and reducing dependence on chemical fertilizers.

## 14. NADEP Composting Pits

The NADEP pits demonstrate aerobic composting for large-scale organic waste management. Farmers learn about pit construction, layering of materials, microbial decomposition, and compost maturation. This method is cost-effective and suitable for village-level waste recycling initiatives, contributing to soil fertility enhancement.

## 15. Agro-Meteorology Unit

The Agro-Meteorology Unit collects weather data and provides **location-specific agro-advisories** for informed crop management. Farmers receive guidance on sowing dates, irrigation scheduling, and pest management based on real-time weather patterns. The unit strengthens climate resilience and promotes adaptive agricultural planning.

### Impact

The University's outreach initiatives strengthen the link between academic research and field-level application. By granting access to these facilities, VFSTR empowers farmers to adopt sustainable and profitable agricultural practices. This collaborative model enhances knowledge transfer, supports rural entrepreneurship, and promotes long-term environmental sustainability.