

Food Forest: A Green Initiative for Food and Ecosystem Sustainability

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A food forest is meant to combine nature and agriculture. Food forests literally mean “from forest to table to feed the future’. The concept of food forest is a farming system that integrates the views of great organic farmers Sri. Narendra Dabholkar, Sri. Subhash Palekar, Sri. Masanobu Fukuoka who brought new ideas in the field of agriculture into Permaculture Approach. In order to ensure the canopy management, one sapling is planted in every 10 feet distance so that the canopy of one plant will not disturb the canopy of another one that makes this concept a forest. This multi-dimensional approach captures light energy efficiently, offers habitat to biodiversity, and stores carbon while producing food for human consumption. Each layer of the ecosystem is put to use in the production of edible plants. Every layer is a niche market and therefore food forest products are very unique. In addition, nitrogen-fixer plants support the system by drawing key nutrients into the soil. Moreover, custodian farmers of food forest can select from their food basket more wisely through consumption of locally grown organic produce which provide essential nutrients and protect their health.

Combining ancient wisdom with modern technology, green initiatives like Food forests are established by "Jaivorg" community. It is a farmer group under the leadership of Central government’s prestigious Plant Genome Saviour awardees Sri. K Aravindan, and Sri. Reji Joseph. Jaivorg, is a registered organisation namely Sreekrishnapuram Jaiva Karshaka Samithi formed a group of more than twenty farmers with the aims to spread awareness and to promote safe and balanced organic farming practices while also ensuring food security. They established food forests with an idea to provide healthy, non-toxic environment and sufficient safe food to be produced in as short time span as possible with a hope to create a healthy society. Over 380 food forests have been successfully created with plot size ranging from 5 cents to 7 acres, in diverse areas including arid to tropical. In Sreekrishnapuram panchayat itself, more than 30 food forest were established.

Structure and Design

Food Forest is a sustainable canopy-based farming technique which includes crop mixtures,

composting and water conservation methods. A well-designed food forest generally consists of seven layers—the overstory, the understory, the shrub layer, the herbaceous layer, the root layer, the ground cover layer, and the vine layer. Each layer includes plants chosen for multiple purposes such as food production, nitrogen fixation, soil building, and feeding pollinators. By fostering a diversity of complementary plants and fungi, food forest can be both highly productive and resilient to extreme weather events and pests.

There are seven stages for the construction of an efficient food forest

Stage 1. Planning

This stage involves steps like designing the layout of the food forest, including the selection of plants, their placement, and the overall structure. Planning helps in the efficient management of resources such as water, nutrients, and sunlight. Deciding when to plant fruit trees and whether the plants are to be rain-fed or irrigated is also considered. This diverse planting strategy ensures interim returns, improves soil fertility, controls weed, provides mulching, fixes nitrogen, and continuously supplies a variety of leafy, safe, and diverse vegetables.

Stage 2. Composting

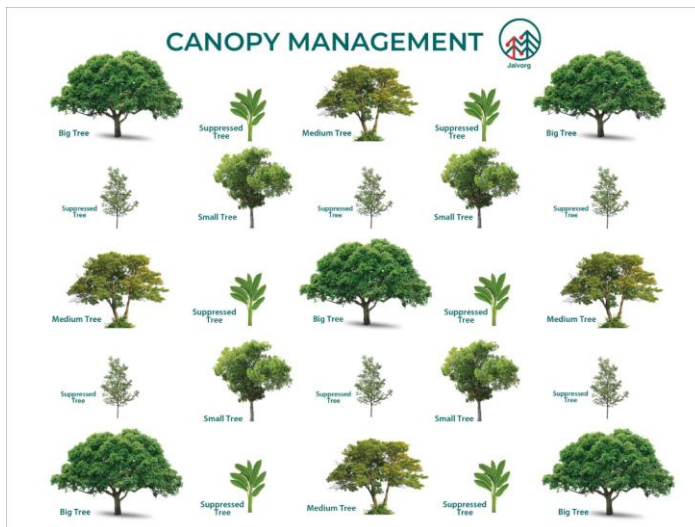


A scientifically prepared compost is essential for the healthy survival of food forest. A generous amount of coir pith based microbial compost is made in the first phase.

Stage 3. Preparation of land

The land selected should be easily accessible. The land is cleared for the purpose. The method of planting used is square planting for large medium and small trees. Modern equipments are used for digging pits and planting seedlings with precision. This will help to reduce costs and limit labour. Markings made on the land for placing the seedlings are accurately marked on a graph paper. This graph is used primarily to decide which trees to plant. After the site is prepared and the sketch is made, the next step is to plant the fruit tree.

Stage 4. Planting/ Canopy Management

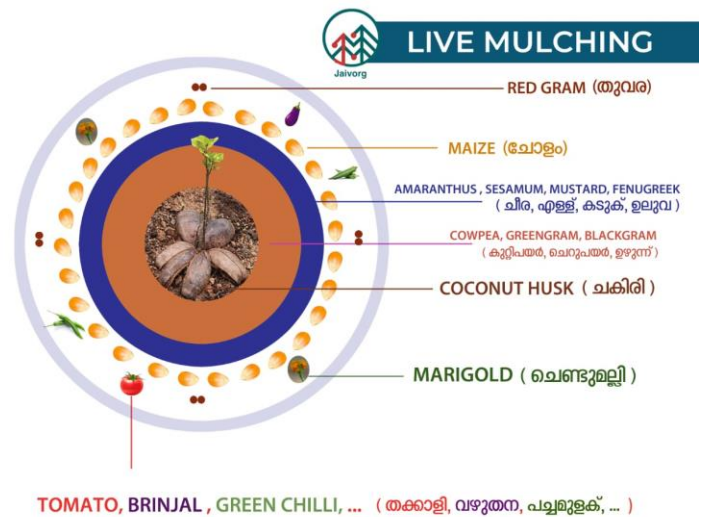


The size of the pit is determined according to the size and nature of the fruit tree to be planted. Each sapling is planted within 10 feet distance by following the canopy management strictly. Each high yielding grafted fruit tree is placed in a 3x3x3 feet pit filled with 3 cubic feet of enriched compost and are irrigated with drip system. Around these trees, seeds of various vegetable species are sowed. The entire plot is then lightly tilled, and seeds of diverse species of cereals, pulses, oil seeds, spices, and other plants are sown [Fig. 2].

Stage 5. Live mulching

A living mulch is a cover crop interplanted or under sown with a main crop intended to serve the purpose of a mulch such as weed suppression and regulation of soil temperature. At the base of the planted fruit tree coconut husk should be placed at a radius of half foot. Pulse varieties should be sown at a subsequent distance of one foot. It is best to sow chickpeas, black gram and green gram randomly. The following step involves sowing sesame seeds and amaranths in a foot-wide row. Corn can be planted next

at a distance of about one foot. Seeds of pigeon pea should be planted on the four sides of the pit. In the middle of this, marigold, lady's finger, brinjal, etc. can be planted. Legumes used as living mulches helps in nitrogen fixation reducing need for fertilizers. This five layer mulching process can protect the fruit crops for a year [Fig. 3].



Stage 6. Live shading

In order to protect the land and tree saplings from excessive exposure of sunlight, live shading is implemented. Commonly cultivated plants for shade are pulses, grains, spices, and oilseeds. They naturally provide sunlight as they grow and spread their foliage profusely. It provides energy to the plants and nutrients, including nitrogen, to the soil.

Stage 7. Protection of fruit trees

To ensure the healthy growth of fruit trees, it is crucial to manage competing plants such as live mulch and live shade by cutting and compacting them periodically. Fruit trees need ample sunlight, so care must be taken to avoid obstruction. Maintaining soil fertility is a key, and applying Jeevamrutham monthly is beneficial. Jeevamrutham, an organic fertilizer rich in microorganisms, is made using cow dung, cow urine, powdered green gram, jaggery, a handful of topsoil, and water. The preparation involves mixing 10 kilos of cow dung, 5 liters of cow urine, 2 kilos of powdered green gram, 2 kilos of jaggery, 200 liters of water, and a handful of soil, stirring three times daily for three days. The solution is ready for use on the fourth day, suitable for half an acre. After ten months, the live mulch and shade plants will naturally die off, making space for planting different tuber varieties between the fruit trees. Coconut husk used in the process of mulching helps in

retaining soil moisture, reducing the need for frequent watering. It also prevents weed growth by blocking sunlight and suppressing weeds.

Economic Importance

Food forests in Sreekrishnapuram grama panchayat have significant economic potential. They provide a variety of products, including fruits, vegetables, medicinal plants, spices, and oils. The economic analysis of 79 plant species from five food forests reveals that 81.01% are fruit-yielding, 7.59% have medicinal value, 3.79% are spices, and others provide vegetables, oils, pulses, and cereals. The diversity of produce can lead to unique and exotic products that can fetch higher market prices, enhancing profitability for local farmers.

Ecosystem Services

The concept or notion of food forest is to make the soil alive through composting, live mulching and live shading; maintain diversity through canopy-based planting system for food production, conserve water through water harvesting and drip irrigation and controlling pests naturally by ecosystem balance and enhanced fruit production and income through bee keeping. The ecosystem within the food forest provides cultural services, provisionary services, regulating services and supporting services. Their cultural services include recreation, social connection and cultural heritage. They have the potential to provide healthy food, sufficient livelihoods, environmental services, and spaces for recreation, education, and community building. In food forest, the provisionary services include food products, medicinal and food products. The regulating services given by food forest are habitat, pest regulation, agriculture productivity and water regulation. The food forest provides supporting services such as nutrient cycling, photosynthesis and soil formation. They also protect soils and moderates harsh climates, for example, by cooling the air, reducing wind speeds and giving shade. Trees and other vegetation intercept particles and gaseous pollutants and thus help reduce air pollution. The level of biodiversity of urban green areas is often surprisingly high, representing nature and the “wild” close to where people live.

SWOT Analysis

Strength: Food forest can be both environmentally sustainable as well as profitable. One other reason why the intrinsic motivation is high, is because they are family owned. This will improve communication as well

as stimulating accountability. This method will create entrepreneurial and experimental attitude. The produce from food forests will also include unique and exotic products.

Weakness: Food forest is set up on a small acreage and hence the harvest will be limited, and a big sales market is difficult to realise. Growing a food forest takes time which is contradictory for a fast-paced living world with an ever-growing population.

Opportunities: Food forest trends transparent and sustainable food as well as promotes a healthy diet as no pesticides are used and fresh produce as well as flexible menu is offered. The food forest also has a focus on increasing biodiversity and promoting native plants. Therefore, lots of different plants are available for harvest in the future and this results in a diverse, sustainable and healthy supply of food.

Threats: The efficiency of conventional agriculture is high when compared to food forest. There is little knowledge on food forests by the public and there is lack of existing sales channels.

Recommendations for Improvement

To enhance the impact and sustainability of food forests in Sreekrishnapuram, the following steps are recommended:

Public Awareness and Education: Increase awareness about the benefits of food forests through workshops, seminars, and community programs.

Government Support: Encourage local and state governments to provide funding and resources for establishing and maintaining food forests.

Research and Development: Continue research on plant species, soil health, and pest management to optimize food forest productivity.

Market Development: Develop local markets and sales channels to ensure farmers can sell their diverse and unique products profitably.

Conclusion

Food forests is a way of combining agriculture and forestry to create edible landscapes. There is no doubt in the potential of food foresting technique in the restoration of the multifunctional green space which provide services including food and nutrition in Palakkad. This technique is highly effective in the establishment of urban forests as well as converting unproductive wastelands into ecological and socially beneficial productive lands. Moreover, food forest is the

best solution to bring back nutrients and life to the soil. Soil carbon management which is an important strategy for improving soil quality, increasing crop yields, and reducing soil loss can be accomplished through food foresting. Capturing carbon in the soil helps improve soil health and productivity, and stabilize the global

carbon cycle, benefiting agricultural production. Food forests nurture soil to be healthy which makes it productive, sustainable and profitable.

Acknowledgement

Sri. Reji Joseph- Co-founder & President of JaivOrg, Sreekrishnapuram.
