कृषि एवं किसान
कल्याण मंत्रालय
MINISTRY OF
AGRICULTURE AND
FARMERS WELFARE
सत्यमेव जयते

भाकृअनुप
ICAR

केकृवाअनुसं
CAFRI

Promising Agroforestry Models for Tamil Nadu

ICAR-Central Agroforestry Research Institute

Jhansi-284003, Uttar Pradesh, India

कृषि एवं किसान
कल्याण मंत्रालय
MINISTRY OF
AGRICULTURE AND
FARMERS WELFARE

सत्यमेव जयते

भाकृअनुप
ICAR

केकृवाअनुसं
CAFRI

Promising Agroforestry Models for Tamil Nadu

ICAR-Central Agroforestry Research Institute

Jhansi-284003, Uttar Pradesh, India

Citation

CAFRI (2024) Promising Agroforestry Models for Tamil Nadu. ICAR-Central Agroforestry Research Institute, Jhansi; 29 p.

Contribution

Agroforestry scientists working in ICAR-Central Agroforestry Research Institute, Jhansi and in the All India Coordinated Research Project on Agroforestry of the Indian Council of Agricultural Research, New Delhi.

Project Implementation Team

Dr. A. Arunachalam
Mr. Suresh Ramanan S.
Dr. A.K. Handa

Acknowledgement

This document has been prepared for spreading awareness and training of stakeholders for agroforestry in different states and is supported by Govt. of India's *Rashtriya Krishi Vikas Yojana* and training grants from the State.

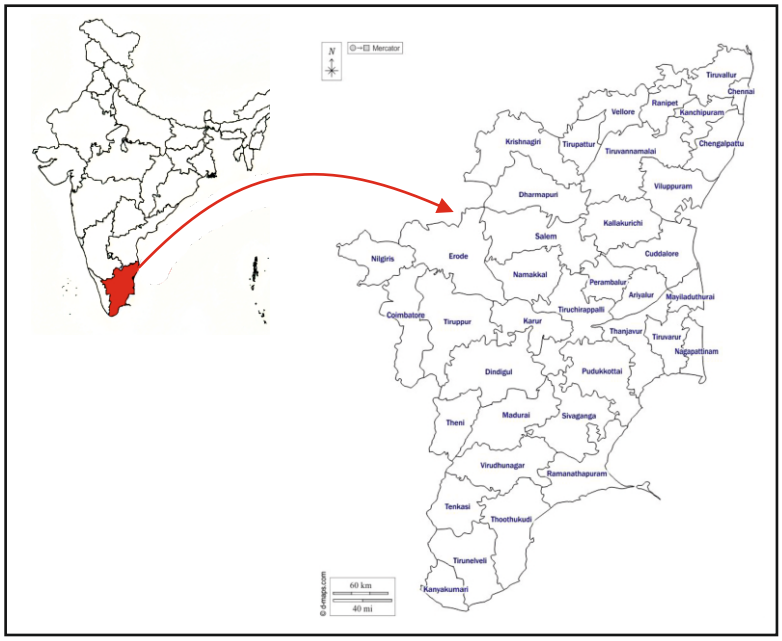
Disclaimer

The document has been prepared fully in academic spirit for educational and ready reckoning purposes. The information in the document is based on primary observations and secondary information from published sources. The information provided in this document is to best of our knowledge, accurate although we do not guarantee the information not are we liable for any damages arising from use of information.

Cover Page Design : Suresh Ramanan S. and A. Arunachalam

Photo Credit : AICRP on Agroforestry

Promising Agroforestry Models for Tamil Nadu



The region now known as Tamil Nadu possesses an ancient history. In 1953, the Telugu-speaking areas were separated from Madras State to form the new state of Andhra Pradesh. On November 1, 1956, Madras State was established from the former Madras Presidency according to the State Reorganization Act of 1965, and it was renamed Tamil Nadu on January 14, 1969. It is bordered by the Indian Ocean to the east and south, Kerala to the west, Karnataka to the northwest, and Andhra Pradesh to the north. The enclaves of Puducherry and Karaikal, part of the Puducherry union territory, are located along Tamil Nadu's north-central coast. The capital city, Chennai (formerly Madras), lies on the northeastern coast of the state. Geographically, Tamil Nadu extends between 11° 7' 37.6428'' N latitude and 78° 39' 24.8076'' E longitude. The state features a coastline that spans 1076 kilometers, accounting for approximately 15% of India's total coastal length (Government of Tamil Nadu, 2024).

Physiography

Geographically Tamil Nadu may be divided into four physical divisions

- The Hill region (Western Ghats and Eastern Ghats)
- The Plateau
- The Plain and
- The Coastline

The Hill region (Western Ghats and Eastern Ghats)

The Western Ghats extending from the Niligris to Marunthuvazh Malai in Kanyakumari district, have a height of 2,000 to 3,000 meters and include mountain peaks like Doddabeta (2637 m) and Mukuruthi (2540 m) covering 2,500 km^2, it has some passes like Palghat, Shencottah, Aralvaimozhi, and Achankoil. Major hills include Niligris, Anaimalai, Palani hills, Cardamom hills, Varusanadu, Andipatti, and Agasthiyar. The Eastern Ghats, a discontinuous and irregular range, is dissected by rivers draining into the Bay of Bengal and has heights ranging from 1,100 to 1,600 meters. Major hills include Javadhu, Servarayan, Kalrayan, Kollimalai, and Pachaimalai, located in northern districts of Tamil Nadu.

The Plateau

The Tamil Nadu Plateau covers 60,000 km^2, is a triangular region between the Western Ghats and Eastern Ghats. The Bharamahal plateau, part of the Mysore plateau, is located in the northwestern part of Tamil Nadu, with heights ranging from 350 to 710 meters. The Coimbatore plateau, between the Nilgiris and Dharmapuri districts, has heights ranging from 150 to 450 meters. The region is separated by the Moyar River and features valleys formed by rivers like Bhavani, Noyyal, and Amaravathi. The Madurai plateau extends up to the Western Ghats foothills, containing the Vaigai and Thamirabarani basins.

The Plain

Tamil Nadu's plains are divided into two types:

- Inland plains
- Coastal plains

Inland plains are drained by rivers like Palar, Ponnaiyar, Cauvery, and Thamirabarani, with Cauvery being one of the most fertile. The coastal plains, also known as Coromandel or Cholamandalam, extend from Chennai to Kanyakumari and are formed by rivers draining from the Bay of Bengal. They are over 80 kilometers wide and some parts are submerged in the sea. Sand dunes called Teri form along the coast of Ramanathapuram and Thoothukudi districts, while coral rocks can be found at the Gulf of Mannar in the east coastal plain.

The Coastline

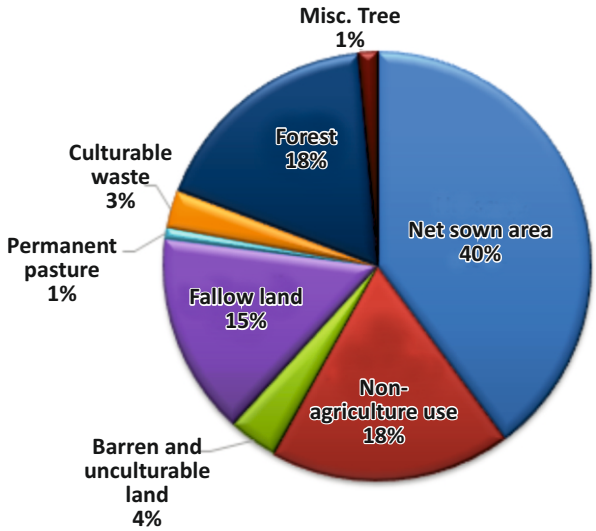
Tamil Nadu boasts the country's second longest coastline, stretching approximately 1076. Pamban Island, along with a series of smaller limestone shoals, forms the northern part of Adam's Bridge, which was once a natural link between India and Sri Lanka. Marina Beach, extending up to 13 km, is the second longest beach in the world and a major tourist attraction in Chennai. Rameswaram is famous for its coastal features (Physical Geography of Tamil Nadu, 2020).

Climate

The climate of Tamil Nadu, influenced by its topographical features is distinct from the general climate of India. It is characterized as semiarid and tropical monsoon due to its long eastern coastal stretch, western hills, and inland plains. The state experiences consistently high temperatures throughout the year with little variation between summer and winter. Summers, from April to June, can reach up to 43°C, while the coolest period, from November to February, averages around 18°C. The proximity to the sea keeps temperatures and humidity relatively high year-round. Projections from the regional meteorological center focus on maximum and minimum temperatures and rainfall for the region. Tamil Nadu, projections indicate that the maximum temperature will increase by 1.0°C by the 2020s (2005–2035), 2.2°C by the 2050s (2035–2065), and 3.1°C by the 2080s (2065–2095), compared to the baseline period of 1970–2000. Similarly, the minimum temperature is projected to rise by 1.1°C, 2.4°C, and 3.5°C for the same respective periods (NCDC, 2024).

Land use pattern

In Tamil Nadu, which spans a total geographical area of 130,000 km², forest cover comprises only 16.59% of the land. In 2022-23, the net sown area was 48,377.99 km², making up 37.21% of the state's total area. This represents a slight decrease of 0.55% in the net sown area compared to the previous year.



Source: Government of Tamil Nadu (2024)

Forests and its resources

Tamil Nadu contains five of India's sixteen major forest types, including dry deciduous forests, moist deciduous forests, semi-evergreen forests, and wet evergreen forests (Environment and Forest Department, 2009). Tamil Nadu has a recorded forest area of 26,419.23 km², accounting for 20.31% of its total geographical area. The state's forest cover includes 3,593.01 km² of very dense forest, 11,034.03 km² of moderately dense forest, and 11,792.19 km² of open forest. The Hill district Nilgiris has the highest forest cover, accounting for 67.50% of its geographical area (ISFR, 2021). Tamil Nadu encompasses 17,531 km² within the Recorded Forest Area (RFA) and 8,888 km² outside it. Tree cover in the state decreased from 4,830 km² in 2019 to 4,424 km² in 2021. Trees outside forests (TOF) cover 13,312 km², including both forest and tree coverage. In Tamil Nadu rural areas, the top five TOF tree species are *Cocos nucifera* (29.47%), *Azadirachta indica* (11.25%), *Borassus flabellifer* (10.41%), *Mangifera indica* (5.93%), and *Areca catechu* (4.49%). In urban areas, the leading species are *Cocos nucifera* (32.32%), *Azadirachta indica* (13.32%), *Moringa oleifera* (5.25%), *Mangifera indica* (4.16%), and *Borassus flabellifer* (3.66%). Tamil Nadu's forests, including TOF patches larger than one hectare, store 214.61 million tonnes of carbon, accounting for 2.98% of India's total carbon pool. Major Non-Timber Forest Produce (NTFP) species in Tamil Nadu include *Albizia amara, Cymbopogon citratus, Anacardium occidentale, Emblica officinalis,* and *Tamarindus indica*. (ISFR, 2021).

Forest types

S.No.	Type of Forest	Area (in sq.km)	% of the total mapped area
1.	Southern hilltop tropical evergreen forest	108.55	0.39
2.	West Coast tropical evergreen forest	679.02	2.46
3.	West Coast semi-evergreen forest	410.10	1.49
4.	Tirunelveli semi-evergreen forest	119.82	0.43
5.	Moist bamboo brakes	322.88	1.17
6.	Very moist teak forest	58.65	0.21
7.	Moist teak forest	173.79	0.63
8.	Slightly moist teak forest	51.22	0.19
9.	Southern moist mixed deciduous forest	1249.80	4.53
10.	Southern secondary moist mixed deciduous forest	260.86	0.94
11.	Littoral forest	7.96	0.03
12.	Mangrove scrub	27.33	0.10
13.	Mangrove forest	17.50	0.06
14.	Submontane hill valley swamp forest	2.12	0.01
15.	Riparian fringing forest	37.15	0.13
16.	Very dry teak forest	0.90	0.00
17.	Dry teak forest	157.01	0.57
18.	Dry red-sanders-bearing forest	10.40	0.04
19.	Southern dry mixed deciduous forest	6193.06	22.43
20.	Dry deciduous scrub	941.05	3.41
21.	Dry savannah forest	258.73	0.94
22.	*Euphorbia* scrub	3.28	0.01
23.	Dry grassland	51.21	0.19
24.	*Hardwickia* forest	438.74	1.59

25.	Dry bamboo brakes	150.98	0.55
26.	Dry tropical riverain forest	112.74	0.41
27.	Secondary dry deciduous forest	2734.24	9.90
28.	Southern thorn forest	1858.24	6.73
29.	Carnatic umbrella thorn forest	1469.21	5.32
30.	Southern thorn scrub	514.59	1.86
31.	Southern *Euphorbia* scrub	43.50	0.16
32.	Tropical dry evergreen forest	309.75	1.12
33.	Tropical dry evergreen scrub	75.99	0.27
34.	Nilgiri sub tropical hill forest	173.08	0.63
35.	South Indian sub-tropical hill savannah (woodland)	19.07	0.07
36.	Reed brakes (*Ochalandra*)	3.47	0.01
37.	Southern montane wet temperate forest	186.31	0.67
38.	Southern montane wet scrub	4.16	0.01
39.	Southern montane wet grassland	17.08	0.06
40.	TOF/Plantation	7825.20	28.34
41.	Dry Savannah forest	107.68	0.39
42.	Dry grassland	232.84	0.84
43.	Southern montane wet grassland	194.44	0.71
	Grand Total	**27613.70**	**100.00**

Source: ISFR (2021)

Forest types have been assigned to the natural forest formations under forests cover and scrub categories shown in forest cover mapping (ISFR, 2019). Grassland forest type outside forest cover has also been mapped. The total mapped area therefore, is sum of forest cover, scrub and grassland forest types (found in non-forest). add the below the ISFR citation.

Soil resources

The predominant soils of Tamil Nadu are red loam, laterite, black, alluvial and saline soils. In the State can be broadly classified into 10 different land forms and three main physiographic groups and 94 soil families total, divided into 6 orders (Entisols, Inceptisols, Alfisols, Mollisols, Ultisols and Vertisols). In Tamil Nadu (14% of a TGA's soils are shallow or very shallow), soil depth is not a limiting element for agricultural development. Tamil Nadu's soils vary widely in composition from sand to clay (18% sandy surface, 53% loamy, and 22% clay). For the state's agricultural output, soil drainage is not a significant issue (14% of the soils have poor to fair drainage, 64% have fair to good drainage, and 15% of TGA soils have excessive drainage). Red soil covers a significant portion of the state, especially the inner districts and coastal districts. Kancheepuram, Cuddalore, Vellore Salem, Dharmapuri, Ramanathapuram, Coimbatore, Trichy, Pudukkottai, Thanjavur, Sivaganga, Virudunagar, Madurai, Dindigul, Nagapattinam, Thoothukudi, Tirunelveli, and the Nilgiris are the most common locations. The crimson or brown hue of the earth is due to iron concentration diffusion. The calcareousness of the soil impacts 34% of the territory in Tamil Nadu. According to the Land Capability classification in Tamil Nadu, 79% of the land is ideal for agriculture and 21% is not suitable for cultivation. Good land (class II) accounts for approximately 34% of cultivable land, reasonably good land (class III) accounts for approximately 30%, and pretty good land (class IV) accounts for approximately 15% of the state's land area (Class IV) (*ENVIS* Tamil Nadu).

Water Resources of Tamil Nadu

Tamil Nadu's water demand is rapidly increasing due to population growth and economic growth. However, the state's per capita water resource availability is only 900 cubic meters, compared to the national average of 2,200 cubic meters. Agriculture is the largest water consumer using 75% of the state's resources. The state heavily relies on monsoon rains with an annual average rainfall of 930 mm (*ENVIS* Tamil Nadu). State has 17 major river basins, 73 reservoirs and about 41,127 tanks. The state has an annual water potential of 47,125 million cubic meters (MCM), with surface flow accounting for roughly half. Most of this surface water

has already been utilized mainly for irrigation. Irrigation sources in Tamil Nadu include canals, tanks, tube wells, open wells, and bore wells. The state features 34 major rivers and 17 river basins. Key reservoirs and their capacities have more potential for conserve the water like Mettur Reservoir having the highest capacity at 2,647 MCM, followed by the Bhavanisagar Reservoir at 929 MCM (Kuttimani *et al*, 2017).

S.No.	Major River Basins	Minor River Basins	Surface water (Mcum)	Ground water (Mcum)
1	Chennai	Araniyar	849	1119
		Kosaithalaiyar	-	-
		Cooum	-	-
		Adyar	-	-
2	Palar	Palar	1772	3416
3	Varahanadhi	Ongur	545	1237
		Varahanadhi	-	-
4	Ponnaiyar	Malattar	820	1499
		Ponnaiyar	-	-
		Gadilam	-	-
5	Vellar(n)	Vellar(n)	1027	1021
6	Cauvery	Cauvery	7067	10573
7	Agniyar	Agniyar	447	555
		Ambuliyar	-	-
		Vellar (S)	-	-
8	PAP	Parambikulam Basin Complex	866	899
9	Pambar	Koluvanar	551	879
		Pambar	-	-
		Manimuthar	-	-
10	Kottakaraiar	Kottakaraiar	218	398
11	Vaigai	Vaigai	1272	760
12	Gundar	Uttarakosaamangai	451	866
		Gundar	-	-
		Vembar	-	-
13	Vaippar	Vaippar	310	669
14	Kallar	Kallar	203	37
		Korampallamar	-	-
15	Tambaraparani	Tambaraparani	1706	827
16	Nambiyar	Nambiyar	194	276
		Karimaniar	-	-
		Hanumanadhi	-	-
17	Valliar	Palayaru	421	241
		Valliar	-	-
		Kodaiyar	-	-
		Others	6145	
		Total	24864	25291

Source: Water resources of Tamil Nadu (2024)

Agriculture

Agriculture remains the most significant sector of Tamil Nadu's economy, with around 60% of the population engaged in agriculture and related activities for their livelihood. The state covers an area of 130.33 lakh hectares, with a gross cropped area of approximately 59.42 lakh hectares. The state government is primarily tasked with ensuring the stability and sustainability of agricultural production. Significant progress has been made with food grain production 100 lakh metric tonnes. Technological advancements have enhanced productivity and expanded cultivable areas through initiatives such as soil fertility improvement, sustainable dryland agriculture, rice intensification, collective farming, integrated farming systems, farm mechanization, water conservation, post-harvest management, risk insurance, agro-information technology, organic farming, food processing policies, and connecting agricultural markets through eNAM (Government of Tamil Nadu). Tamil Nadu is a leading horticulture state, contributing 6.09% to national horticulture production and 5.47% to total crop area. It covers 4.59% of the fruit area and 3.36% of vegetable area in India. The state has a 6.31% share in fruits and 4.64% in vegetables. Out of the 130.05 lakh hectares of agricultural land 15.89 lakh hectares are cultivated for horticulture crops. Mango and banana are the leading fruit crops, contributing over 75% to the total fruit area. Off-season mango production and round-year grape production are unique to Tamil Nadu (DHPC, 2024). Production of major crops in the State during 2022 is presented in the given table.

Major crops in Tamil Nadu (in tonnes)

Crops	Production
Paddy	6881725
Cholam (Jowar)	427228
Cumbu (Bajra)	158889
Ragi	288627
Maize	2564805
Korra (Little millet)	1169
Varagu	3066
Samai	18638
Other Cereals	7644
Bengalgram	5220
Redgram	49625
Greengram	58936
Blackgram	225009
Horsegram	56517
Cowpea	48903
Other Pulses	28365
Groundnut	1023404
Gingelly (Sesame)	34449
Coconut@	51282
Castor	1801
Cotton#	242935
Sugarcane**	13284215
Tobacco	2704
Total	**25465156**

** Sugarcane- In terms of Cane

@Coconut- Production in lakh nut

Cotton- Production in Bales of 170 kg lint

Source: Department of Economics and Statistics, (2022)

Schemes of Tamil Nadu

Government of Tamil Nadu has launched several schemes to boost agricultural productivity and environmental sustainability. Key initiatives include the National Food Security Mission (NFSM) for enhancing food availability, *Rashtriya Krishi Vikas Yojana* (RKVY) for flexible agricultural development, and the National Horticulture Mission for improving horticulture. Additionally, the Green Tamil Nadu Mission focuses on afforestation and resource conservation. Together, these programs aim to ensure food security, promote agricultural growth, and maintain ecological balance in the state. According to the 20th livestock census, livestock population Tamil Nadu is 145.23 million (Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, 2019).

S.No.	Scheme	Objective
1.	*Mahatma Gandhi National Rural Employment Guarantee Scheme* (MGNREGS)	The scheme aims to provide livelihood security to households in rural areas by guaranteeing at least 100 days of wage employment per financial year to every household willing to undertake unskilled manual work. This program is designed to enhance employment opportunities and ensure income stability for rural households, thereby contributing to their overall well-being and reducing poverty.
2.	*Pradhan Mantri Krishi Sinchayee Yojana* - Watershed Management Programm (IWMP/ Now PMKSY)	This program aims to restore ecological balance through the harnessing, conservation, and development of degraded natural resources such as soil, vegetation cover, and water. Key outcomes include preventing soil erosion, implementing rainwater harvesting, replenishing groundwater levels, and promoting the regeneration of natural vegetation.
3.	National Mission for a Green India	This is a Centrally Sponsored Scheme of Green India Mission (GIM) is one of the eight Missions identified under the National Action Plan on Climate Change (NAPCC). The GIM aims to address key concerns related to Climate Change in the forest sector, namely: Adaptation, Mitigation, Vulnerability and Ecosystem Services.
4.	*Rastriya Krishi Vikas Yojna* (RKVY)	*Rashtriya Krishi Vikas Yojana* was initiated in 2007 as an umbrella scheme for ensuring holistic development of agriculture and allied sectors by allowing states to choose their own agriculture and allied sector development activities as per the district/state agriculture plan.
5.	*Paramparagat Krishi VikasYojna* (PKVY)	*Paramparagat Krishi Vikas Yojna* (PKVY) is a scheme under National Mission for Sustainable Agriculture (NMSA). It aims at development of sustainable models of organic farming through integrating traditional and modern science to ensure long term soil fertility, resource conservation and address climate change.
6.	National Horticulture Mission	The National Horticulture Mission (NHM) is a centrally sponsored scheme launched during the 10th Five Year Plan (2005-06 and 2006-07), providing full assistance to State missions. Its main objective is to achieve comprehensive development of horticulture through an "end to end" approach, covering everything from planting material

		production to marketing and export after value addition. NHM aims to double the output and productivity of key horticultural crops and improve the quality of produce.
7.	National Mission for Sustainable Agriculture (NMSA), Sub Mission on Agroforestry (SMAF)	The initiative is designed to promote and enhance tree plantation systematically, ensuring access to high-quality plant materials like seeds, seedlings, clones, and improved varieties. It aims to encourage diverse agroforestry practices suited to different agro ecological regions and land use patterns, while also providing extension services and capacity-building support to the agroforestry sector. The funding structure consists of 60% central government contribution and 40% state government contribution.
8.	*Nagar Van Yojana*	The *Nagar Van Yojana* (NVY) was introduced in 2020 to establish Nagar Vans in urban areas, promoting urban forestry with stakeholders like local communities, NGOs, and educational institutions. The scheme aims to create 1,000 Nagar Vans/Nagar Vatikas in cities with Municipal Corporations, Municipal Councils, Municipalities, or Urban Local Bodies (ULBs) to foster a healthier living environment and contribute to clean, green, healthy, and sustainable cities. In Tamil Nadu, ten projects have been approved under NVY, with a fund allocation of 630 lakh rupees released during 2022-23.
9.	Tamil Nadu Millet Mission	The mission launched in 2014-15 under the National Agriculture Development Programme (NADP), aimed to revive millet cultivation by incentivizing their growth and distribution, organizing frontline demonstrations, and training farmers in millet farming and value addition. The plan includes demonstrations over 11,500 hectares in various clusters of millet-growing districts. Beneficiary farmers will receive technology demonstration kits with essential inputs like liquid bio-fertilizers, micro-nutrients, fungicides, fertilizers, pesticides, and weedicides. Subsidies are set at Rs. 3000/ha for major millets and Rs. 2000/ha for minor millets, up to a maximum of 2 hectares per farmer.
10.	Tamil Nadu Biodiversity Conservation and Greening Project (TBGP)	This project aims to conserve biodiversity by protecting forests and enhancing the socio-economic development of villagers and tribal communities living near forest edges. It also supports the State's efforts to increase tree cover outside forests by encouraging tree cultivation on private lands.
11.	Tamil Nadu Mission on Sustainable Dryland Development (Phase II)	The objective of this scheme is to improve the livelihoods of dryland farmers. To achieve this, the scheme provides a subsidy of Rs. 11,250 per hectare for summer ploughing and the cultivation of maize and cotton crops. This financial assistance is intended to support farmers in adopting improved agricultural practices, thereby increasing crop yields and profitability. By focusing on maize and cotton, the scheme aims to enhance the productivity and income of

		farmers operating in dry land areas, ultimately contributing to their economic stability and growth.
12.	Integrated Horticulture Development Scheme (IHDS)	This scheme implemented to expand horticulture crop areas, this 100% state-funded scheme encourages farmers to diversify by cultivating fruits, vegetables, flowers, and other crops. This diversification enhances agricultural productivity and sustainability while creating new income opportunities. Increasing horticulture areas aims to improve food security, nutrition, and rural economic development, supported by comprehensive state funding for farmer resources, training, and support.
13.	Tamil Nadu Irrigated Agriculture Modernization Project (TNIAMP)	Project funded by the World Bank and administered by the Government of Tamil Nadu, aims to accelerate crop diversification from water-intensive crops to high-yield, water-efficient horticultural crops. The program focuses on promoting advanced cultivation and water conservation technologies in designated sub-basins. The key interventions include demonstrations of horticultural crops and the promotion of micro-irrigation systems.
14.	State Horticulture Farm (SHF)	The State Horticulture Farm Scheme started in Vengalam village, Veppanthattai block, was established in 2015 on an area of 4.72 hectares. The primary purpose of this scheme is to produce high-quality planting materials, including seedlings, fruit seedlings, and grafts, which are then distributed to farmers through various schemes or sold directly to them. Additionally, the farm serves as a demonstration center and showcasing the latest horticultural technologies to encourage their adoption by farmers in the region.
15.	National Edible Oil Mission-Oil Palm	The National Mission on Edible Oils - Oil Palm (NMEO-OP) aims to increase edible oil availability in India by expanding areas and increasing crude palm oil production. The Reassessment Committee of ICAR-Indian Institute of Oil Palm Research (IIOPR) 2020 assessed 95719 hectares of potential for oil palm cultivation in Tamil Nadu, considering environmental and biodiversity parameters. The committee recommended cultivation in 17 districts in the Tamil Nadu states.
16.	Palmyra Development Mission	To promote the cultivation of Palmyra trees and the Government has distributed 2 million seed nuts and 100,000 saplings over the past two years through the Palmyra Development Mission and he Rs. 2 crore skill development training program will be initiated to enhance the value addition of palmyra products and handicrafts. This program, focusing on women and marginal farmers, aims to boost employment opportunities and increase income. The Government also plans to explore exporting products derived from the palmyra tree and its produce.

17.	Green Tamil Nadu Mission	The Green Tamil Nadu Mission, launched in September 2022, aims to increase the state's tree and forest cover from 23.69% to 33% over the next decade. The mission involves planting 265 crore native tree species seedlings over 13,500 km^2, conserving soil and moisture, providing socio-economic benefits to rural communities, and capturing carbon and mitigating climate change. Collaboration with industries, private organizations, and the public is crucial. The mission involves collecting 2.8 billion seedlings from private charities and nurseries, geo-tagging seedlings for real-time survival monitoring, and forming green committees for annual action plans.

Biodiversity

India is among the 17 mega diverse countries globally, housing approximately 7–8% of documented species. Tamil Nadu boasts abundant biodiversity, spanning from marine coastal systems in the Gulf of Mannar to terrestrial evergreen forests in the Western Ghats. The state's varied climatic conditions and physical landscapes have led to a variety of natural habitats, including forests, grasslands, and wetlands, which support a wide range of plant and animal species. The Protected Area in the State includes 5 National Parks and 15 Wildlife sanctuaries as well as 2 conservation reserves, 4 Tiger Reserves, 5 Elephant sanctuaries, 15 Bird Sanctuaries, 3 Biosphere reserves, 2 Zoo and 5 Crocodile farms plays pivotal role in in-situ conservation of biodiversity (*ENVIS* Tamil Nadu).

Group of organisms	Number of species in Tamil Nadu
Angiosperm	5640
Gymnosperm	64
Pteridophytes	184
Polypetalae	1944
Gamopetlae	1720
Monochlamydae	642
Freshwater faunal	595
Marine faunal	2247
Terrestrial faunal	1898
Fresh water fishes	165
Amphibians	76
Reptiles	177
Birds	454
Mammals	187

Source: TNBB, (2024).

Agro-climatic Zones

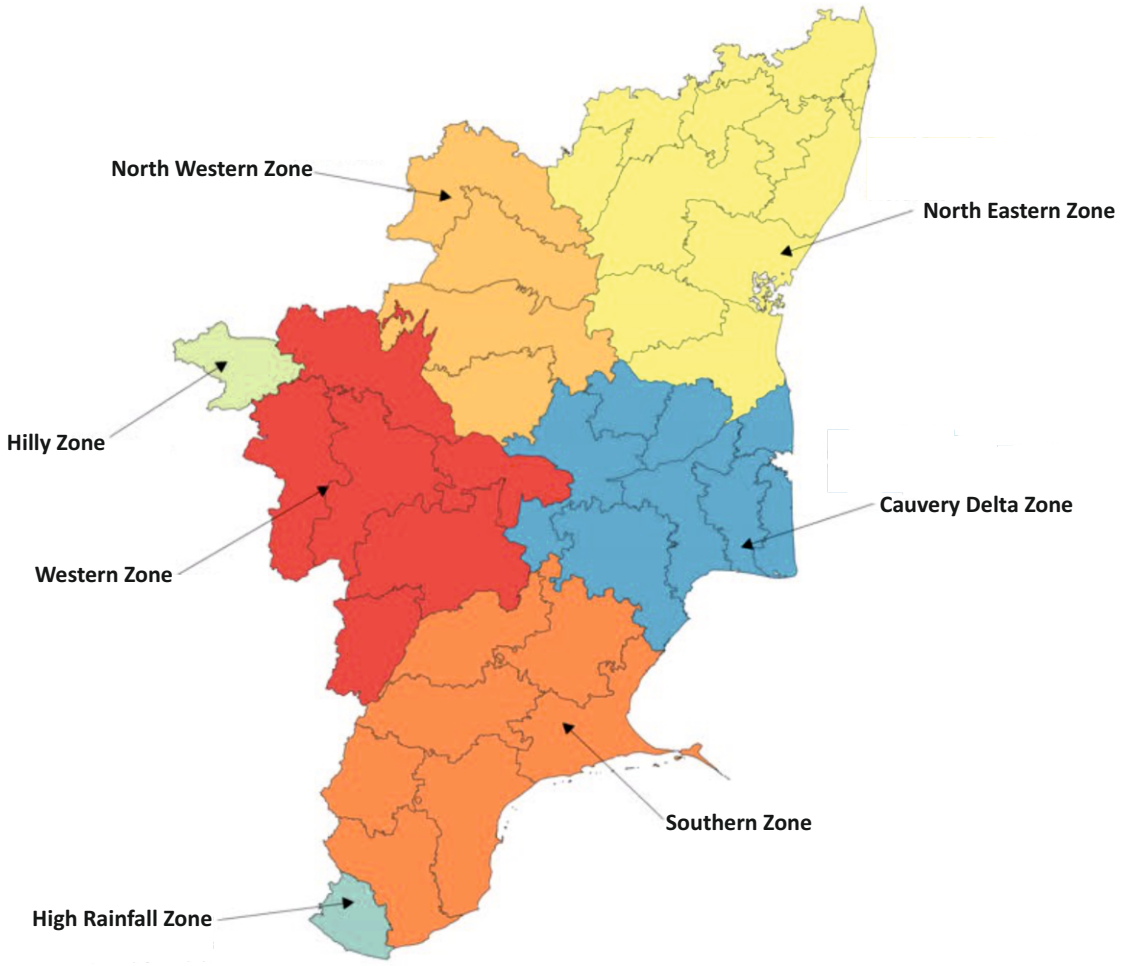
The Tamil Nadu state is divided into seven distinct agro-climatic zones based on soil type, topography, crops and rainfall. These are the zones: North Eastern Zone (NEZ), North Western Zone (NWZ), Western Zone (WZ), Cauvery Delta Zone (CDZ), Southern Zone (SZ), High Rainfall Zone (HRZ) and Hilly Zone (HZ). Tamil Nadu's major plantation crops include cashew, coffee, tea, rubber, betel vine, areca nut, coconut, bamboo, and cocoa. Cashew, often referred to as the 'gold mine' of wastelands, can thrive in nearly all soil types

Agro-Climatic Zones of Tamil Nadu

S.No.	Name of the Zones	District covered	Annual Rainfall (mm)	Soil type	Crops grown
1.	North Eastern Zone(NEZ)	Kanchipuram, Chengalpet, Tiruvallur, Cuddalore, Villupuram, Kallakuruchi, Vellore, Tirupathur, Ranipet,Tiruvannamalai	1105	1. Red Sandy Loam 2. Clay Loam 3. Saline coastal Alluvium	Rice, Pearl Millet, Sorghum, Gingelly, Finger Millet, Groundnut, Red Gram, Sugarcane, Cashew, Mango, Guards, Green Chillies, Brinjal, Tapioca, Yam, Banana, Jack, Guava, Watermelon, Turmeric, Tube rose, Crossandra and Lemongrass.
2.	North Western Zone (NWZ)	Dharmapuri, Krishnagiri, salem and Namakkal (Part)	875	1. Non Calcareous Red 2. Non Calcareous Brown 3. Calcareous Black	Sorghum, Rice, Millet, Groundnut, Horse Gram, Cotton, Sugarcane, Tapioca, Cotton, Gingelly, Chillies, Mango, Banana, Tobacco, Pulses, Jack, Tomato, Radish, Brinjal, Ladies Finger, Pepper, Arecanut, Cocoa, Coconut, Palmarosa, Chrysanthemum, Jasmine, Marigold, Rose, Tuberose, Cutflowers, Turmeric and Red Chillies.
3.	Western Zone (WZ)	Erode, Coimbatore, Tiruppur, Theni, Karur (part), Namakkal (part), Dindigul, Perambalur and Ariyalur (part)	715	1. Red Loamy 2. Black	Sorghum, Pulses, Groundnut, Rice, Millets, Cumbu, Cotton, Sugarcane, Ragi, Black Gram, Sunflower, Green Gram, Gingelly, Red Gram, Turmeric, Maize, Banana, Onion, Castor, Tobacco, Guava, Onion, Guards, Tomato, Tea, Coffee, Coconut, Gloriosa, Flowers, Tapioca, Jasmine, Rose and other Vegetables.
4.	Cauvery Delta Zone (CDZ)	Thanjavur, Nagapattinam, Tiruvarur, Trichy and parts of - Karur, Ariyalur, Pudukkottai and Cuddalore	984	1. Red Loamy 2. Alluvium	Rice, Cumbu, Maize, Cholam, Ragi, Black Gram, Green Gram, Coconut, Gingelly, Castor, Groundnut, Banana, Onion, Cashew, Betel vine, Citrus, Jack and other Vegetables.

5.	Southern Zone (SZ)	Madurai, Sivagangai, Ramanatha-puram, Virudhunagar, Tenkasi, Tirunelveli and Thoothukudi	857	1. Coastal Alluvium 2. Black 3. Red Sandy soil 4. Deep red soil	Rice, Maize, Cumbu, Cholam, Ragi, Black Gram, Greengram, Groundnut, Fodder Crops, Gingelly, Castor, Cotton, Chillies, Banana, Jasmine, Coriander, Onion, Lime, Cashew and Amla.
6.	High Rainfall Zone (HRZ)	Kanyakumari	1420	1. Saline Coastal 2. Alluvium 3. Deep Red Loam	Rice, Banana, Jackfruit, Mango, Tapioca, Cashew nut, Coconut, Clove, Vegetables & Tamarind.
7.	Hilly Zone (HZ)	The Nilgiris and Kodaikanal (Dindigul)	2124	1. Lateritic	Wheat, Garlic, Lemon, Lime, Pomegranate, Pineapple, Beans, Beetroot, Cabbage, Chowchow, Cotton, Pepper, Coffee, Potato, Banana, Mandarin, Orange, Pear, Cardamom, Cutflowers, Strawberry, Avocado, Tea and Ginger.

Source: (TNAU, 2024., DHPC, 2024)



Source: RS & GIS lab, ICAR-CAFRI

Demography

According to the 2011 Indian Census, the population of Tamil Nadu was 7.21 crore, comprising 3.61 crore men and 3.60 crore women, representing 5.96% of India's total population of 121.09 crore. The population density in Tamil Nadu was 555 people per square kilometer, higher than the national average of 382 per square kilometer. The state had a literacy rate of 80.09%, with male literacy at 86.77% and female literacy at 73.14%. Tamil Nadu had a sex ratio of 996 females per 1,000 males, which was significantly higher than the national average of 940 (Tamil Nadu at a Glance, 2023).

Administrative profile

Chennai, formerly known as Madras, is the capital of Tamil Nadu. The state is divided into 38 districts and has a long history of collaboration with key planning bodies at district and municipal levels. Rural self-government entities in Tamil Nadu include 87 Revenue Divisions, 15 Municipal Corporations, 121 Municipalities, 310 Taluks, 385 Blocks, 528 Town Panchayats, 1,349 Firkas, 12,618 Village Panchayats, 17,680 Revenue Villages, 39 Lok Sabha Constituencies, and 234 Assembly Constituencies. The name of 38 Administrative Districts are as follows: Ariyalur, Chengalpattu, Chennai, Coimbatore, Cuddalore, Dharmapuri, Dindigul, Erode, Kallakruichi, Kancheepuram, Karur, Krishnagiri, Madurai, Mayiladuthurai, Nagapattinam, Kanniyakumari, Namakkal, Perambalur, Pudukottai, Ramanathapuram, Ranipet, Salem, Sivagangai, Tenkasi, Thanjavur, Theni, Thiruvallur, Thiruvarur, Thoothukudi, Trichirappalli, Thirunelveli, Tirupathur, Tiruppur, Tiruvannamalai, The Nilgiris, Vellore, Vilupuram, Virudhunagar (Governement of Tamil Nadu, 2024).

State symbols

Tamil Nadu state symbols include the Nilgiri tahr (*Nilgiritragus hylocrius*) as the state animal and the Emerald dove (*Chalcophaps indica*) as the state bird. The state flower is the Gloriosa lily (*Gloriosa superba*), the state tree is the Palm tree (*Borassus flabellifer*), and the state fruit is Jackfruit (*Artocarpus heterophyllus*). Tamil yeoman (*Cirrochroa thais*) is the State butterfly of the state (TNBB, 2024). Tamil is the predominant language spoken by the majority of people in the state of Tamil Nadu. On December 27, 1956, the Tamil Nadu Official Language Act was passed, which was then published in the Tamil Nadu Government Gazette on January 23, 1957. This law officially designated Tamil as the official language to be used for all governmental purposes in the state of Tamil Nadu (Government of Tamil Nadu, 2024).

Promising Agroforestry Models for Tamil Nadu

S.No.	Agroforestry models	Tree component	Crop component	Economic returns/ Benefit Cost Ratio (BCR)
1.	Agri- silvicultural system	*Sesbania sesban*	Turmeric	The fresh and dry fodder biomass yield was 3.406 and 0.799 t/ha by pruning of *Sesbania* and the turmeric as a sole crop obtained higher yield 32.0 t/ha as compared *Sesbania* + Turmeric 31.67 t/ha.
2.	Agri- silvicultural system	*Ailanthus excelsa*	*Stylosanthes*, *Desmanthus*, Fodder Sorghum and Fodder cowpea	The higher yield recorded in Pure crop as well as Intercropping similar in Fodder sorghum (2611.11 kg/ha, 2000.00 kg/ha) followed by Fodder cowpea (1611.11 kg/ha, 1361.11 kg/ha).

3.	Agri-silvicultural system	Pungam (*Pongamia pinnata*)	Balckgram, Redgram, Frenchbean, Greengram, Rice bean, Grain amaranth and Sunflower	The higher yield recorded in Pure crop as well as Intercropping similar in Redgram (1256 kg/ha and 1226 kg/ha) followed by Greengram and Blackgram (1172 kg/ha, 1107 kg/ha) and (1134 kg/ha, 1054 kg/ha).
4.	Agri-silvipastoral system	*Acacia leucophloea*	Fodder Sorghum (*var*. CO 27), Fodder Sorghum (*var*. COFS 29), *Cenchrus ciliaris*, *Cenchrus setigerus*, *Cenchrus glaucus*, *Medicago sativa*, *Desmanthus virgatus* and *Stylosanthes scabra*	The fodder crops obtained higher yield in sole fodder sorghum (COFS 29) (16 t/ha) followed by the sole fodder sorghum (CO 27) and *C. glaucus* (15 t/ha) and (9.92 t/ha).
5.	Agri-silvicultural system	*Simarouba glauca*	Balckgram, Cowpea, Greengram and Redgram	The Red gram (1256 kg/ha, 1226 kg/ha) followed by Green gram (1172 kg/ha, 1107 kg/ha) and Blackgram (1134 kg/ha, 1054 kg/ha) recorded the similar higher yields in pure crop and intercrops.
6.	Agri-silvicultural system	Silver oak (*Grevillea robusta*), Eucalyptus (*Eucalyptus tereticornis*), Teak (*Tectona grandis*) and Simarouba (*Simarouba glauca*)	Cowpea (*var.* C152), Black gram (*var.* CO 50), Fodder maize (*var.* CO 1) and Fodder sorghum (*var.* CO 27)	The yield of intercrops was reduced when compared to their respective sole crops. The yield of cowpea was 620 kg/ha under sole cropping and ranged from 296 kg/ha under eucalyptus to 545 kg/ha under simarouba. Almost similar trend was recorded for other crops also.
7.	Horti-silvopastoral system	Kadam (*Neolamarckia cadamba*), Subabul (*Leucaena leucocephala*), Agathi (*Sesbania grandiflora*), Amla (*Phyllanthus emblica*), Moringa (*Moringa oleifera*), and Custard apple (*Annona squamosa*)	*Cenchrus glacus*, *Cenchrus glacus* + *Stylosanthus scabra*	In the silvopastoral system, the profits from the tree species, Kadam (plywood), recorded a higher income of Rs. 39,525 (104 trees), while the income received from the intercrops Kadam + Fodder crops was determined to be Rs. 60,244, which was the highest among the tree species. In the Hortipastoral system, the income acquired from the fruit yield of Moringa (46 trees) was found to be Rs. 42,550, which was higher than Amla, and the income obtained from the intercrops Moringa + Fodder crops was found to be Rs. 63,542, which was higher among the fruits trees.

8.	Agri-silviculture system	*Casuarina equisetifolia*	Cotton	The higher economic productivity of the Casuarina-Cotton model was recorded Rs. 41,000 in comparison of sole Casuarina, Sole cotton crop and traditional rice cultivation net incomes of Rs. 22,800, Rs. 24,000, and Rs. 32,500, respectively.
9.	Agri-silviculture system	*Acacia mearnsii* and *Eucalyptus spp*	Grass (*Pennisetum clandestinum*), Legume (*Trifolium repens*), Scented geranium (*Pelargonium graveolens*) and Potato (Kufri Jyoti)	The Eucalyptus-based agroforestry model (T3 treatment) achieved a higher Benefit-Cost ratio of 4.25 compared to the similar treatment in Acacia based system which had a ratio of 2.71.
10.	Agri-silviculture system	*Melia dubia*	Pulse crops blackgram (*Vigna mungo*; var.CO5), Greengram (*Vigna. radiata*; var. CO6), Cowpea (*Vigna unguiculata*; var. CO7), Oilseed Groundnut (*Arachis hypogaea* var. CO4), and sesame (*Sesamum indicum* var. CO1) and Vegetable crops Small onion (*Allium cepa* local variety), Bhindi (*Abelmoschus esculentus* var. COBH1), Brinjal (*Solanum melongena* local variety), Chillies (*Capsicum annuum* local variety)	The brinjal + Melia combination recorded the highest benefit-cost ratio of 4.30, while the lowest ratio of 2.10 was observed in small onion + Melia.

11.	Agri-silviculture system	Sandal (*Santalum album*) and Amla (*Emblica officinalis*)	Horsegram	The highest B:C ratio was recorded in the Sandal block plantation (4.4) followed by Sandal + amla + horsegram (3.8) which was similar to the ratio for Sandal + amla (3.8).
12.	Agri-silviculture system	Palmyra *Borassus flabellifer*	Groundnut	The highest groundnut yield of 876 kg/ha was recorded at a tree density of 4.7x4.7m, followed by 792 kg/ha at 4.2x4.2m and 618 kg/ha at 3.7x3.7m.
13.	Horti-pasture System	*Psidium guajava*	*Cenchrus ciliaris*	The net return from the models is approximately Rs. 81,526/year earned through the sale of fruit and fodder.

Agroforestry Systems for Tamil Nadu

Ailanthus-based Agri-silvicultural System

Scientific name: *Ailanthus excelsa* Roxb.

Suitable Spacing: 5 x 5 m under rainfed conditions and as a block and boundary plantation the spacing should be 3 x 3 m.

Suitable Intercrops: Green gram, cluster bean and cowpea.

Tree productivity: Timber volume: 944.2 cubic feet/ha; Fuel wood: 10834 kg/ha.

Economic Returns: The highest net return from Ardu intercropping with green gram was Rs. 76,024/ha, surpassing both sole cropping and other agri-silvi systems. However, the benefit-cost ratio (B:C ratio) from sole Ardu was greater at 8.53 compared to the Ardu + green gram system.

Source: Handa *et al*. (2020).

Sandal based Agri-silvicultural System

Scientific name: *Santalum album*

Suitable Spacing: 3 m x 3 m and 6 m x 3 m.

Suitable Intercrops: Horse gram, Field bean low spreading legume fodder during initial years, *Phyllanthus emblica* as fruit plant and *Sesbania grandiflora* as fodder crop and host.

Economic Returns: The higher B:C ratio at 10% discount rate for Sandal block plantation is 4.4 followed by Sandal+Amla+horse gram B:C is 3.8 and Sandal + Amla is 3.8.

Source: Handa *et al*. (2020).

Coconut based Horti-pastoral System

Scientific name: *Cocos nucifera*

Suitable Spacing: 7.5 m x 7.5 m.

Suitable Intercrops: Perennial fodder, Cumbu Napier hybrid grass is planted as understorey of Coconut.

Economic Returns: The net return by the horticultural component (Coconut) is Rs. 55,800/acre from the 62 trees and additionally net return by the fodder is Rs. 2,16,000/ acre.

Source: Handa *et al*. (2020).

Teak based Agri-silvicultural System

Scientific name: *Tectona grandis*

Suitable Spacing: 4 m x 4 m**.**

Suitable Intercrops: Turmeric.

Economic Returns: The income from the turmeric is Rs. 1.50 lakh for one year and the net income from teak is Rs. 6.80 lakh. Teak-turmeric based agri-silvi model gives risk free farming to farmers, enhances overall productivity which ensures higher net farm income.

Source: ICFRE (2020).

Melia based Agri-silvicultural System

Scientific name: *Melia dubia*

Suitable Spacing: 5 x 5 m and 6 x 4 m.

Suitable Intercrops: Finger millet and Cowpea.

Tree productivity: The tree recorded 10 to 12 cubic/ft after 10 years.

Economic Returns: The net return from the melia model is Rs. 7,92,000 per acre.

***Sources*:** Handa *et al*., 2020

Casuarina based Agri-silvicultural System

Scientific name: *Casuarina equisetifolia*

Suitable Spacing: 2 m x 1 m, 2 m x 1 m paired row and 2 m x 2 m and 1.5 m x 1.5 m intercrops.

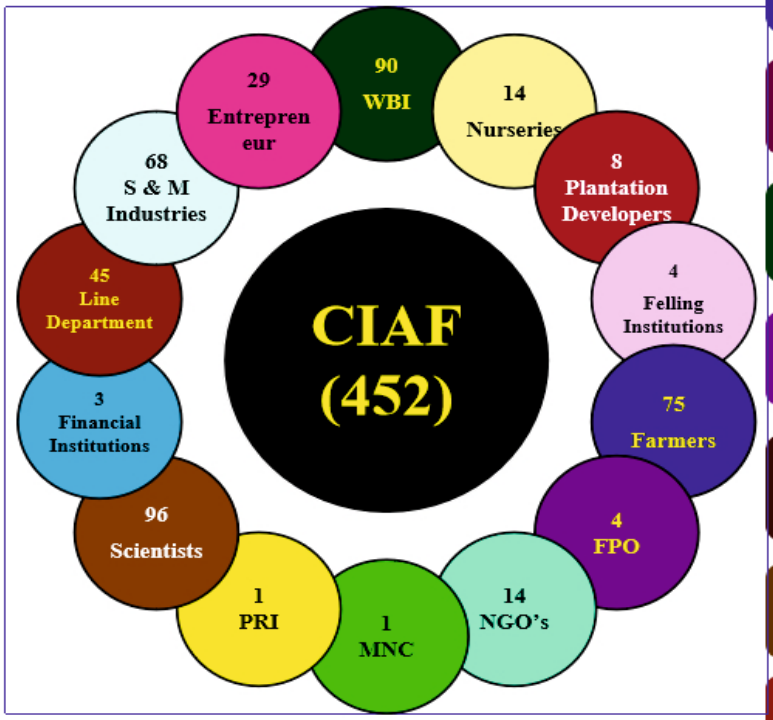
Suitable Intercrops: Cowpea, Blackgram, Groundnut, Sesame, Tomato, Bhindi and Small onion.

Economic Returns: The highest B:C ratio was recorded in the Casuarina + Cowpea combination (1.84) followed by Casuarina + Bhindi (1.81) at a 2m x 1m paired row spacing. In the 2m x 2m intercrop spacing, the B:C ratios followed a similar trend with Casuarina + Cowpea (2.37) followed by and Casuarina + Bhindi second (2.19).

Sources: Divya *et al*., 2011

CONSORTIUM OF INDUSTRIAL AGROFORESTRY

Industry supported R&D – 120 lakhs



Production to Consumption

- Networking & Linkages
- Technology Development and Transfer – Research & development
- Ensure quality planting material through technology & genetic resource transfer
- Organized Plantation Establishment through value chain approach
- Creation of Price Supportive System and Marketing Platform
- Facilitating Felling and Transportation
- Capacity building & skill development
- Suggesting Policy Issues for PCS
- Design & implementation of Out Growers Scheme

The Consortium of Industrial Agroforestry

The Consortium of Industrial Agroforestry (CIAF) was established on 21st March 2015 at the Forest College and Research Institute (FCRI) under the Tamil Nadu Agricultural University (TNAU), Mettupalayam, Tamil Nadu. The objective of the Consortium is to promote a value chain in agroforestry by linking farmers, industries, institutions, and other stakeholders to ensure sustainable tree cultivation and industrial raw material supply. CIAF aims to transform the agroforestry sector from fragmented efforts to a structured and market-oriented model—from production to consumption.

Since its inception, the Consortium has grown to include 452 members, drawing participation from diverse regions including Tamil Nadu, Kerala, Karnataka, Telangana, Andhra Pradesh, and Puducherry. The stakeholders include 75 farmers, 90 wood-based industries (WBI), 68 small and medium industries, 29 entrepreneurs, 14 NGOs, 14 nurseries, 4 farmer producer organizations (FPOs), 4 felling institutions, 3 financial institutions, 1 multinational corporation (MNC), 1 Panchayati Raj Institution (PRI), 45 line departments, and 96 scientists. This wide network reflects the consortium's inclusive and multi-dimensional approach to promoting agroforestry.

One of CIAF's landmark achievements is facilitating industry-supported research and development, with contributions totaling ₹120 lakhs. This has led to the development and transfer of advanced technologies for agroforestry practices, ensuring improved productivity and profitability. The consortium has also ensured the availability of quality planting material by fostering strong links between nurseries, scientists, and farmers, backed by robust genetic resource transfer systems.

CIAF has implemented a value chain-based plantation establishment model that guides farmers from land preparation to post-harvest handling, ensuring that each stage of agroforestry is optimized for market linkage and profitability. In addition, it has developed a price supportive system and marketing platform, providing farmers with assured buyers and stable prices. The consortium has successfully established partnerships with wood-based biomass energy units and packaging industries, integrating farm-grown industrial wood into reliable industrial supply chains.

To ease the often-complicated processes of tree harvesting and transport, CIAF has worked with felling institutions and government departments to streamline procedures, making felling and transportation more accessible to farmers. Simultaneously, capacity building and skill development programs are conducted regularly, equipping farmers, entrepreneurs, and field technicians with the necessary skills for successful agroforestry practice.

CIAF also plays an active role in policy advocacy, making significant recommendations for reforms such as simplifying Pre-Cultivation Sanction (PCS) processes. It further contributes to the design and implementation of Out-Grower Schemes, enabling farmers to grow industrial tree species under buy-back agreements with industries, ensuring both economic security and raw material availability.

Looking ahead, CIAF envisions becoming a national model for promoting agroforestry-led rural industrialization. By ensuring farmer profitability, increasing green cover, and supporting clean development mechanisms, CIAF is laying the groundwork for environmentally sustainable and economically viable agroforestry systems. The consortium's success offers a replicable model for other regions aiming to integrate policy, research, industry, and farmers under a unified agroforestry framework.


EDII-METTUPALAYAM AGROFORESTRY BUSINESS INCUBATION FORUM
FOREST COLLEGE AND RESEARCH INSTITUTE, TAMIL NADU AGRICULTURAL UNIVERSITY, METTUPALAYAM-641 301
EDII-TN
Entrepreneurship
NABARD
AGROFORESTRY FACILITATION CENTRE
EDII-MAFBIF
HUB OFFORESTRYINNOVATIONS
ESTABLISHMENT OF LINKAGES
CAPACITY BUILDING PROGRAM
SKILL DEVELOPMENT PROGRAM
START-UP CREATION
MAFBIF TECHNOLOGIES
BIOMASS BRIQUETTES AND PELLETS
MINI CLONAL TECHNOLOGY
ACTIVATED CARBON & CHARCOAL
WOOD SEASONING & PRESERVATION
ESSENTIAL OILS & RESINS WOOD
WOOD VALUE ADDITION
ITK VALIDATION
NATURAL DYES & GUMS
NON WOOD FOREST PRODUCTS
SUPPORT SERVICES
INFRASTRUCTURE
CAPACITY BUILDING
CONSULTANCY SERVICES
BUSINESS & TECHNICAL MENTORING
REGULATORY & ADVISORY SERVICES
PRODUCT & SERVICE DEVELOPMENT
IPR FACILITATION
NETWORKING
FUNDING
TARGET BENEFICIARIES
FARMERS & INDIVIDUALS WITH BUSINESS IDEA
INVENTORS & INNOVATORS
STARTUPs & MSMEs
WOOD & NON WOOD BASED INDUSTRIES
SELF HELP GROUPs & FPOs
INSTITUTIONS & ORGANIZATIONS
IMPORTERS & EXPORTERS
CO INCUBATION & PARTNERSHIP
INVESTORS & FUNDING AGENCIES
STRATEGY
Technology Validation
Technology Adoption & Commercialization
Creating Entrepreneurial Skills
Networking & Collaboration
Technology Licensing
INCUBATEE ENROLLMENT
Students 12%
Women Entrepre. 11%
MSMEs 22%
Farmers 21%
FPC-NGO 4%
Corporates 7%
Mentor 23%
2% Entrepreneurs
BENEFICIARIES
INSTITUTIONAL PARTNERS
WWF
ECOSYSTEM PARTNER
StartupTN
CONSULTANCY PROJECTS
IOCL Funded:
Establishment of Micro Forest at Secretariat Park, Chennai
NLC Funded:
Preparation of DPR for Deer Parks in NLC
ITC Funded:
Dendro Biomass Energy Resources
Members 215+
Product Launched 19
Consultancy Projects 04
IVP –Voucher A 17
IVP –Voucher B 02
Seed Grant Disbursed 42 Lakhs
Financial Assistance 30 Lakhs
Technology Commercialized 13
Programs Organized 300+
Beneficiaries 18000+
MoA Signed 20
IP filed 05

Mettupalayam Agroforestry Business Incubation Forum

The EDII–Mettupalayam Agroforestry Business Incubation Forum (MAFBIF), housed at the Forest College and Research Institute (FC&RI) of Tamil Nadu Agricultural University (TNAU), represents a pioneering initiative in the field of agroforestry-based entrepreneurship in India. Established in 2018 with funding from the Entrepreneurship Development and Innovation Institute (EDII), Government of Tamil Nadu, MAFBIF is the first agroforestry-specific business incubator in the country. It was incorporated as a Section 8 company to create a robust business ecosystem that transforms research-driven technologies into viable commercial enterprises. The primary objective of the forum is to inspire and nurture entrepreneurship among a wide array of stakeholders, including farmers, students, rural youth, women, MSMEs, and start-ups, thereby promoting self-reliance, employment, and sustainable rural development.

MAFBIF has developed dedicated infrastructure over two acres, with a 5,000 sq. ft. administrative building, housing facilities for incubatees, a value addition unit, and additional space for enterprise development. With the capacity to support up to 25 incubatees at a time, the forum provides critical services such as technology development and transfer, financial and branding support, skill development, and business networking. Since its inception, the incubator has nurtured 68 incubatees and collaborated with over 20 mentors. It has facilitated the commercialization of several innovative technologies, including mini-clonal propagation of high-yielding forestry clones, biomass briquetting, wood seasoning and preservation, activated carbon and charcoal production, essential oil extraction, cocoon craft product development, and multifunctional agroforestry systems. These technologies have addressed real-world challenges such as post-harvest losses, low value addition, and lack of standardized planting material.

Beyond technology facilitation, MAFBIF has successfully extended financial support to start-ups through EDII's Innovation Voucher Programme, granting ₹2 lakhs per enterprise to develop and validate prototypes. The incubator's intervention has led to the establishment of profitable ventures producing items such as herbal wellness products, wood antiques, moringa soup powder, and value-added honey. On average, incubatees have reported annual revenue increases of ₹3–5 lakhs and collectively generated over 2,500 man-days of employment each year. In addition, the incubator has organized more than 75 skill-building programs and business development workshops, reaching nearly 1,000 beneficiaries annually across different regions and backgrounds.

MAFBIF's revenue generation model supports long-term sustainability through diversified sources such as membership fees, licensing, consultancy, training services, and corporate social responsibility (CSR) partnerships. As of March 2021, the incubator had generated ₹24.05 lakhs in revenue. Its effective governance structure, supported by a Project Monitoring and Review Committee (PMRC), ensures operational transparency and strategic oversight. Through innovative incubation practices, MAFBIF has succeeded in integrating forestry-based livelihoods with structured business support mechanisms, thus expanding opportunities in previously underexplored segments of the rural economy.

In a country where the forestry sector is often limited by regulatory and market barriers, MAFBIF has emerged as a vital institutional model to bridge the gap between scientific innovation and commercial viability. Its approach is rooted in participatory development, technical empowerment, and market linkage facilitation. The initiative has attracted the attention of state departments, wood-based industries, tribal communities, and unemployed youth, demonstrating that agroforestry can be a driver of inclusive growth. As the forum continues to scale its operations, it presents a replicable model for other states and nations seeking to leverage agroforestry for rural enterprise development and ecological sustainability. MAFBIF is not only transforming the way agroforestry is perceived but also reinforcing its role as a dynamic sector capable of contributing to India's green economy and entrepreneurial ecosystem.

References

Department of Economics and Statistics, Government of Tamil Nadu, 2022. https://des.tn.gov.in/sites/default/files/2023-05/agriculture_0.pdf. Accessed on 4 July 2024.

DHPC (Department of Horticulture and Plantation Crops), 2024. Government of Tamil Nadu. https://www.tnhorticulture.tn.gov.in/plantation. Accessed on 4 July 2024.

Environment and Forest Department, 2009. Tamil Nadu Agricultural University Agritech Portal. https://agritech.tnau.ac.in/. Accessed on 2 July 2024.

ENVIS Tamil Nadu, 2024. Tamil Nadu State Council for Science, Technology and Environment, Ministry of Environment, Forests & Climate Change, Government t of India. https://tnenvis.nic.in/Database/SoilResources_1171.aspx. Accessed on 3 July 2024.

Government of Tamil Nadu, 2024. https://www.tn.gov.in/tamilnadustate Accessed on 2 July 2024

Government of Tamil Nadu, 2024. Land Use Pattern in Tamil Nadu. https://www.tn.gov.in/crop/landusepattern.pdf. Accessed on 3 July 2024.

ICFRE (Indian Council of Forestry Research and Education) 2020. Agroforestry Models Developed by Indian Council of Forestry Research and Education (A compilation). https://hindi.icfre.gov.in/UserFiles/File/Books/Agroforestry%20Models%20Developed%20by%20ICFRE.pdf. Accessed on 8 July 2024.

ISFR (Indian State of Forest Report), 2021. Forest survey of India, Ministry of Environment, Forest and Climate change. https://fsi.nic.in/forest-report-2021. Accessed on 2 July 2024.

Kuttimani, R., Raviraj, A., & Pandian, B. J. (2017). An overview of water profile in Tamil Nadu. Agriculture Update, 12, 287-295.

Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Government of India, 2019. https://dahd.nic.in/sites/default/filess/Key%20Results%2BAnnexure%2018.10.2019.pdf. Accessed on 8 July 2024.

NCDC(National Centre for Disease Control), 2024. Tamil Nadu- National Centre for Disease Control. https://ncdc.mohfw.gov.in/wp-content/uploads/2024/05/23.SAPCCHH-VERSION-1-Tamil-Nadu.pdf. Accessed on 2 July 2024.

Physical Geography of Tamil Nadu, 2020. https://tnpsc.academy/wp-content/uploads/2020/02/27-2-9-OLD-GEO-Physiography-of-Tamil-Nadu-A4_redacted.pdf. Accessed on 4 July 2024.

Tamil Nadu at a Glance, 2023. Government of Tamil Nadu. https://des.tn.gov.in/sites/default/files/2024-01/At_a_glance_%2029_12_2023.pdf. Accessed on 4 July 2024.

TNAU (Tamil Nadu Agricultural University), 2024. https://tnau.ac.in/tamil-nadu-agro-climatic-zones/. Accessed on 4 July 2024.

TNBB (Tamil Nadu Biodiversity Board), 2024. https://tnbb.tn.gov.in/tnbb.php. Accessed on 3 July 2024.

Water resources of Tamil Nadu, 2024. Tamil Nadu Government portal, https://environment.tn.gov.in/assets/soe/0eb2df6317f71b5ef15f55cd8e8132fb.pdf. Accessed on 4 July 2024.

Notes

Agroforestry Business Incubation Centre

ABiC

Institute Technology Management Unit (ITMU) of CAFRI facilitates incubation of new startup/entrepreneurs and enterprises for innovation technologies by providing need based physical, technical, business and networking support, facilities and services to test and validate business ventures of the incubates in agroforestry-based enterprises. Also, the IP/deemed IP are commercialized for creating an ecosystem for entrepreneurship. ABiC activities includes thematic areas like are plant nursery; semi-processed items like juice, jam, pulp, gum & resin, etc.; tree seed marketing; timber and wood-based products; fibre and flosses; biofuels and briquettes; essential oils; mini-clonal technology and agroforestry models.

Promoting Agroforestry based Business Opportunities and Creating an Ecosystem for Entrepreneurship

Published by
Director
ICAR-Central Agroforestry Research Institute
Jhansi-284003, Uttar Pradesh, India

+91-510-2730214 **director.cafri@icar.org.in** **http://cafri.res.in**
@IcarCafri **@ICAR-CAFRI JHANSI** **@icar.cafri** **@ICAR-CAFRI.jhansi** **@icar.cafrijhansi2384**

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

Agriesearch with a human touch
CENTRAL AGROFORESTRY RESEARCH INSTITUTE
"AGROFORESTRY PATHWAY FOR RESTORATION OF DEGRADED LANDS"