DRAFT ON

MARKETING OF TEAK, SANDAL, AND RED SANDERS GROWN ON PRIVATE LANDS

SUBMITTED TO

CIPS, HYDERABAD

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Trade Models for Teak

Introduction:

Teak (***Tectona grandis***) is one of the world's premier hardwood timbers, with fine grain and durability**. It occurs naturally only in India**, **Myanmar, The Lao People's Democratic Republic, and Thailand**, and it is naturalized in Java, Indonesia, where it was probably introduced some 500 to 600 years ago.

In addition, it has been established throughout tropical Asia and in tropical African countries like Nigeria, Sierra Leone, the United Republic of Tanzania, and Togo. Teak has a strong presence in Latin American and Caribbean countries like Costa Rica, Colombia, Ecuador, El Salvador, Panama, Trinidad and Tobago, and Venezuela. Teak has also been introduced in countries like Papua New Guinea, Fiji, and the Solomon Islands, and in northern Australia on a trial basis.

India, has the richest genetic resource of Teak in the world, with about 9.0 million hacs of natural forests covered by Teak forests, teak plantations occupy around 1.7 million hacs, 1000 hacs of area is under Clonal Seed Orchards, and about 5000 hacs of forest land is covered by Teak Seed Production Areas.

Alarmed by the heavy exploitation of Teak trees for timber to make warships and for other uses, many foresters like **Dr. Wallich, Mr. Maingy, Mr Colvin, Mr. Blundell, Dr Helfer, Capt Tremenheere, Capt Guthrie, Dr. Falconer**, etc. showed their utmost concern and came up with lots of technical interventions in saving this species from being extinct.

Hugo Francis Andrew Wood, a forest officer of Scottish origin, started to raise successful teak plantations in the **Top Slip area of Annamalai Hills**, every day walking many miles with a walking stick, which he used for raking the

soil and putting teak seeds in it. Through this direct seed sowing, he created huge teak forests.

The history of commercial teak planting dates back to 1844 when the then Collector of Malabar, Mr. Conolly fore saw the shortage of teak likely to occur through the depletion of the natural forests (**Troup** 1924) and the planting of teak in a more systematic way was started in the year 1842.

The history of teak plantation in India goes like this: Collector Mr **Conolly** made a payment of Rs 8000.00 (mortgage amount of Rs 1000 and 7000 as an advance) to Thrikkalayur Devaswam and started to grow Teak plantations.

Many attempts ranging from direct seed sowing to planting of wildlings gave mixed results, mostly negative ones. So, he sought help from **Dr. Wight, Superintendent of the Cotton Seed Farms, and Monsieur Perottet, Superintendent of the Pondicherry Botanical Gardens**, but they failed.

The breakthrough in the germination of teak seeds is credited to Mr. **Bates**, Head Accountant in the Co1lector's office

Sub-Conservator, Mr. **Chathu Menon**, father of Neelambur plantations, attempted to treat the Teak Seeds (for breaking the hard seed coat) by three methods — (a) by putting the seeds under a heap of sand and watering the heap (b) by keeping the Teak seeds in conditioned fire and (c) by alternate soaking and drying under shade for 7 days. He was successful and able to grow Teak seedlings in larger numbers and established huge tracts under Teak plantation.

The story went on for some time and Ferguson is credited with introducing **the Stump Planting technique for Teak**. **T. F. Bourdillon**,

Conservator of Forests (he is originally a coffee planter) standardised the practice of Stump Cuttings, and it has been in practice since 1936.

In a pioneering work, **Boume** (1922) prepared **the first volume and money yield tables for Nilambur teak** which show not only the volume of the growing stock at different ages and the yield it also gives the value of such yields net of the extraction costs.

Innovations in Travancore made teak plantations even more attractive. They included the adoption of stump planting in Konni in 1878 (Moni, 1959), the method of planting in crowbar holes in 1879, and the adoption of the Taungya method in 1922 for planting and initial care of plantations (Jacob, 1933).

A Burmese term **Taungya-- Hill Cultivation** was coined in 1850, but was brought to the limelight by Brandis, through this he restored degraded teak forests and raised successful teak plantations. From there this concept migrated to areas like Chittagong and Sylhet in 1870, South Africa in 1887, Coorg in 1890, North Bengal in 1896, and for raising Sal in UP in 1923.

White (1991) mentioned that international provenance trials with teak seeds of different origins showed that the best all round performance concerning health, growth, and quality on a variety of sites was recorded by seeds of Konni (Kerala) origin and Bangsri (Indonesia). Trials in Australia also showed that teak provenance of Kerala origin showed the highest diameter and basal area growth among a range of international sources.

Introduction of teak in other countries:

D, Pandey, and C Brown in their paper titled **Teak: A global overview** mentioned that Teak planting in India began in 1600 (during the time of Shivaji –in Ratnagiri Dist of Maharashtra) but picked up from the 1840s and increased to significant levels from 1865 onwards.

In Thailand, pioneer plantations of teak were established in 1906. The first teak plantation was started in 1680 in **Sri Lanka**. In Myanmar, teak was introduced in the year 1700.

Teak was first introduced outside Asia in Nigeria in 1902, with seed brought from India and subsequently from Myanmar. Planting in what is now eastern Ghana (formerly Togoland) started around 1905.

The first teak plantation in tropical America was established in Trinidad and Tobago in 1913 with seeds from Myanmar. The planting of teak in Honduras, Panama, and Costa Rica started between 1927 and 1929.

In the Pacific region, teak was introduced by the Germans to Papua New Guinea in the early 1900s.

Policies and their impact on forests and production from them

In the 1894 policy, forestry was seen as a handmaid of agriculture, and as per this policy, the forest lands suitable for agriculture were to be released to agricultural use,

The 1952 policy disallowed the practice and even discontinued to fulfill the needs of the local agricultural population which was a priority earlier, was replaced with that of supply of forest raw materials for industries. The sustained supply of timber and other forest produce required for industries was included in the highest priority category with that of defense and communications. On the recommendation of **von Monroy, an FAO expert**, **a scheme for large-scale plantations of fast-growing species for the pulp industry was started in India**, Thus, this was the phase of Production Forestry in India. The Report of **the National Commission on Agriculture**, **1976** stressed the need to **adopt an industrial orientation of forestry**.

The Forest Conservation Act of 1980 radically changed the situation. Clear-fellings were stopped, and managing the Forests under Working plans

was made mandatory, this act made it mandatory to obtain Forest clearance from the Government of India before any forest land is diverted for non-forestry purposes.

The **National Forest Policy of 1988** revised the 1952 forest policy by radically changing the direction and priorities in the forest sector. A clear and definite shift towards conservation is indicated in the new policy. The earlier bias towards industries was changed and industries were asked to grow their raw material rather than depend on forests for production or expansion. The principal aim of the 1988 Forest Policy is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are Vital for the sustenance of all forms of life.

These policies (directly and indirectly) affected the availability of timber from Forests and promoted the mushrooming of plantation companies (some real most others fraudulent) engaged in growing timber on real estate.

Thus, even though India has a great history of teak and for the reasons mentioned above, we have become a major importer of Teak. **The following table gives the extent of imports over the last 10 years**:

Table-1

Export-Import of teak wood between 2011-12 to 2020-21				
Year	**Exports**		**Imports**	
	Quantity (CUM)	**Value (in lakhs)**	**Quantity (CUM)**	**Value (in lakhs)**
2011-12	8820	7293	1685800	361983
2012-13	10300	9300	1650320	437757
2013-14	30950	9980	1473560	456404
2014-15	6980	12808	1557330	444633
2015-16	4900	9382	1152850	334794

2016-17	2910	5185	1043040	305635
2017-18	2000	1501	1153610	315122
2018-19	1000	983	1211710	317037
2019-20	890	1069	1182130	310732
2020-21	660	918	965870	310732
Total	**69,410**	**58,419**	**1,30,76,220**	**35,94,829**

(Source: Trade of Teakwood in Indian Perspective by Ritesh Taylor and Rekha M)

Impact of Fraudulent companies on the teak sector:

Kulbhushan Balooni in his paper published by UNISYLVA of FAO, titled- Teak investment programs: an Indian perspective mentions that the first attempt to promote private investment in teak plantations began in 1991, when Sanghi Plantations, based in Hyderabad, started its Teak Plantations and **offered them as an investment scheme** to the private investors. Very soon other companies like Sterling Tree Magnum (India) Limited, Cochin Anubhav Plantations, Madras, Jubilee Plantation of Madhya Pradesh, Green Everest of Hyderabad, the Bombay-based company Desert Gold India Irrigation Ltd, SPG Green Gold Plantation Ltd, Delhi etc followed suit with the same business model. Teak plantations mushroomed in southern India; 40 such companies were registered in Madras and eight in Bangalore from January to September 1992 (Kakkar,1994). **As of today, there are 12862 plantation companies registered on the e-portal of the Ministry of Corporate Affairs**, **don't know the credentials of these companies.**

According to Aiyar (1998), in a petition in the Delhi High Court, the Forum of Investors of Agro-Forestry Companies urged that the Securities

and Exchange Board be asked to prepare **a comprehensive package to salvage Rs 25 000 million invested in plantation companies**.

Fraudulent practices adopted by these companies severely dented the image of plantation forestry. As a curative measure, the Government of India has brought this sector under the purview of SEBI and MRTP Commission. An in-depth analysis of such **Ponzi companies** and schemes was done by an inter-departmental committee headed by Mr PB Gangopadhyay of ICFRE and submitted their report to the Government.

Now, this sector is gradually coming out of this crisis. There is a good market for the produce (teak wood) that is coming from the farmer's land.

Understanding Markets and Marketing:

A few definitions of markets are:

- Market is the sphere within which price-determining forces operate.
- A market is an area within which the forces of demand and supply converge to establish a single price.
- The term market means not a particular marketplace in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the prices of the same goods tend to equality, easily and quickly.
- A Market is a social institution that performs activities and provides facilities for exchanging commodities between buyers and sellers.
- Economically interpreted, the term market refers, not to a place but to a commodity or commodities and buyers and sellers who are in free intercourse with one another

Marketing:

The science called marketing has evolved from a series of other behavioural sciences including **psychology, social psychology, sociology, communications, and economics**. While it may seem simple to define, the term “marketing” is both broad and complex, with many possible interpretations. As the field of marketing develops, so does its definition. **Early definitions were centered on the concept of the transaction, while today, definitions of marketing typically involve relationships; and elements of social and environmental responsibili**ty.

Some important definitions of Marketing:

- Marketing is the business process by which products are matched with markets and through which transfer of ownership is affected (Richard R. Cundiff, Edward W. And Still Basic Marketing: Concepts, Environment, and Decisions)
- Marketing is a total system of business activities designed to plan, price, promote, and distribute want-satisfying goods and services to present and potential customers (Stanton, W. J. Fundamentals of Marketing.)
- Marketing is human activity directed at satisfying needs and wants through the exchange process, while also aspiring to achieve the market's objectives
- Marketing is a social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others. (Kotler, P., & Bloom, P. H. Marketing professional services)

- Marketing is the function that assesses consumer needs and then satisfies them by creating an effective demand for, and providing, the goods and services at a profit.
- Marketing is the business function that identifies customers' needs and wants, determines which target markets the organization can serve best, and designs appropriate products, services, and programs to serve, these markets.

After having understood the concept of markets and marketing let us discuss the marketing strategies and forces that govern marketing.

Forces that are influencing the Marketing of Teakwood:

To understand the factors/ forces that affect the timber industry (as such for any industry), tools like PEST analysis, SWOT analysis, TOWS Matrix, etc are to be conducted.

Marco Environmental Analysis (PEST analysis)

Politico–Legal Analysis

There are restrictions on the harvesting of wood from the traditional forests of India, as now the forests are primarily managed on the principles of Sustainability. Hence, the gap in demand and supply is primarily met through imports and wood from the trees from outside the forests (TOFs). Previously there were restrictions on harvesting, and transporting wood derived from the patta lands. Now the restrictions are eased out and a farmer-friendly atmosphere is being created. Governments and private institutions are promoting agroforestry in a big way.

Thus, the Politico-legal environment is now suitable for raising Teak plantations by interested people and farmers.

Economic Analysis

The overall take-home salary of the citizens is on the rise. Jobs offered by the IT industry in places like Hyderabad give good salaries to its employees. The growth of GDP is on the rise. Loan processing has become less cumbersome and the Interest rates are down/ affordable. The urge to have their own house by the youngsters is commonly seen. The purchase of additional houses is regarded as an extra source of Income and investment opportunity. During 2022, over 43000 residential units were launched in the city of Hyderabad by the builders, which is a significant increase compared to the previous year's unit launches by 23%. In 2022, post covid in India, about 4.02 lakh housing units were completed. A very big figure by any standards.

So, due to these favorable economic conditions, the market for teak wood is on the rise.

Socio-Cultural Analysis

India is the most populous country in the world, with one-sixth of the world's population residing in the Country. As per the 2021 census, the Age structure in India is depicted below:

Younger People

(0-14 years) – pre-working age (not a significant source of demand). They constitute 25.68% of the total population

Medium Age People

(15-64 years) –this age group includes the people who fall into the categories like- inexperienced working age, prime working age, and older working age (this age group perhaps has more disposable income). They constitute 67.49% of the total population, a potential segment that spends

money on housing and other activities related to the consumption of Wood in India.

Older people

(65 and above) They constitute 6.83% of the total population.

Socially, the families in India are gradually shifting from the Joint family concept to the nucleus family concept. The urge to have their own house by the youngsters is commonly seen. The purchase of additional houses is regarded as an extra source of Income and investment opportunity by the people of India.

Technological Analysis

Evolving technology in making affordable houses, is another factor, that is attracting people. The innovative designs and long-lasting teak wood furniture are also attracting more and more people.

Marketing strategies

Marketing strategies are composed of definitions of products to be produced, customers to be served, and core competencies to be pursued. **Marketing structures** (e.g., marketing organization, marketing channels, and information systems) facilitate necessary relationships as well as the planning and implementation of marketing. **Marketing functions** are the tools and activities used to execute marketing strategies. After proper planning, marketing is simply the execution of the strategic marketing plan.

In the timber industry sector, the marketing philosophies changed with time. The transition of the changed marketing philosophies are depicted below:

From	To
Production Orientation	Marketing Orientation
Product Orientation	Customer Orientation
Volume Orientation	Value Orientation
Capital Investments	Know-how Investments
Mechanistic Modes	Innovative Modes
Shareholder Value	Stakeholder Value
Economic Responsibility	Social Responsibility

While devising a strategy for the marketing of teakwood produced from the farmlands, SWOT analysis and TOWS matrix are prepared, which are mentioned below

Marketing of Teak Wood from Private Lands:

SWOT analysis:

Strengths:

1. Teakwood has a lot of domestic market, and our production is not able to match the consumption rates. Teakwood from the traditional forests is not coming in an expected quantity. The other sources, the social forestry areas, and the private plantations are not able to supplement the gaps, so our dependency on imports for teakwood is growing at alarming rates year after year. So, the growers of teak in their private lands are expected to get good returns in the coming 40-50 years,
2. Teak trees can be cultivated with ease on bunds, or as a mixture with other crops
3. Can employ Precision Silviculture for the plants grown in Agro-forestry ecosystems

4. Quality Planting Materials (QPMs) are available from Maharashtra Forest Development Corporation,
5. The rules in Telangana for growing, logging, transporting, and marketing teak logs have been simplified and the farmers are also well acquainted with the rules,

Weaknesses:

The major weaknesses are

1. The farmers who are growing teak, are mostly medium and marginal farmers, who can't wait for the teak trees to reach their rotation periods. These farmers generally go for financial rotation rather than physical rotation.
2. Due to a lack of understanding of market mechanisms and as they are not backed up by the organized sector, these farmers may end up in losses (may not get expected returns) by selling the Juvenile teak logs (logs of teak obtained from say 7-8 years old teak plantations)
3. The farmers may not be able to get QPMs
4. Lack of regional inventories and wood-flow plans

Opportunities:

1. There is a ready market available in Hyderabad and other major cities of Telangana and other Southern States, where there is a boom in the construction industry.
2. Urban Affairs Ministry, Government of India banned the use of Timber by CPWD in the year 1993. But now, after a gap of about 27 years, in 2020, it lifted the ban on the use of Timber by CPWD. This

step will boost the sales of teakwood. **This decision was taken by the Government hoping that the increase in the demand would pulverize the Agro-forestry sector and help more and more farmers grow profitable species like Teak in their agricultural fields and in their fallow lands** and it, in turn, will help to combat ill effects of greenhouse gases and **help in the creation of an additional sink of 2.5 to 3 billion MT of CO2 equivalent through additional forest and tree cover by 2030**.

3. Properly organized farmers can benefit from schemes like Carbon credit mechanisms, as the Carbon Sequestration Potential of agricultural land can be enhanced by the integration of trees, still allowing for the growing of crops.
4. The Agro-Forestry systems with teak as an economic species integrated, can improve the financial status of farmers as the farm income gets diversified,
5. The deep-rooted trees do **Biomining** that helps the soil to hold the soil moisture, breathe better, and the physical and chemical character of the soil gets better,
6. Denuded/ degraded lands get restored by way of a process called **dendroremediation**

Threats:

The major threats can be

1. Distorted/ unfair markets for the wood and Market forces (Middlemen) operating in these markets
2. Lack of transparent pricing,

3. The impact of clonal forestry may be predicted as a threat to the agroforestry systems, The monoculture of a selected few high-yielding clones, susceptible to many insect pests is a serious problem when such breakouts occur on a large scale, devastating the entire area where such clones are grown and another limiting factor for successful introduction of new tree species is that, insect-pests of trees can find its alternate host as crops.
4. Lack of a farm forestry culture and no coherence amongst the participating sectors,
5. Lack of supporting knowledge systems
6. Long-term risks and uncertainty of markets
7. Wood-based Industries are changing their investments (like relying on imports, as now, import of wood is placed under Open General Licence, Technology is also changing the investment patterns)

Strategic Planning Matrix

TOWS Matrix

The **TOWS Matrix** is an acronym for Threats, Opportunities, Weaknesses, and Strengths. The matrix is a variation on the SWOT Analysis, and it seeks to address criticisms of the SWOT Analysis regarding its inability to show relationships between the various categories.

TOWS Matrix can be defined as the tool to analyze, generate, compare, and select the business strategies to attain the overall goals and objectives. TOWS Matrix is the tool for strategy generation and selection.

Limitations of TOWS Matrix:

- It doesn't follow the real steps that are mandatory to follow and achieve a competitive advantage in the market.

- Many a time, the analytical approach of TOWS Matrix does not consider the changing competitive environment that is one of the biggest threats to the business in attaining its objectives of higher sales, elevated profits, and enhanced brand value.
- It doesn't show and highlight the interrelationship between the internal and external factors that affect business operations and strategies

Internal / External	Strengths	Weaknesses
	• Teakwood has a good domestic market and it is ever increasing • Teak trees can be cultivated with ease • Precision Silviculture can be followed • Quality Planting Materials (QPMs) are available • Rules on Harvesting, transport, etc are getting simplified	• Medium and marginal farmers can't wait till the teak trees reach their rotation period, which is generally long (50-60 years) • lack of understanding of market mechanisms • Growers are not organized • Some farmers may not be able to get QPMs • Lack of regional inventories and wood-flow plans.
Opportunities • Ready market available • Boom in the construction industry • CPWD is allowed to use wood in their construction • Trees grown on farmlands improve the soil characteristics • Processes like Dendroremediation, and Biomining help the soil.	**SO Strategies** • Take full advantage of the short supply of teakwood in the market and grow more wood in the AF Systems. • Precision silviculture will help in the amelioration of soils, • Farmers will get extra income from their fields. • Relaxed felling and transport regimes will help in exploring new markets, from where the farmers can get more money for their produce.	**WO Strategies** • Studies done on Juvenile teakwood showed that the teakwood extracted from short rotations also has its niche market and farmers can get good prices, • Organized growers can demand and get QPMs, remunerative prices for their goods • Having regional inventories and wood-flow plans helps in better understanding of the forces of market and can forecast wood availability in the coming years and accordingly planning can be made.

Threats	ST Strategies	WT Strategies
• Distorted/ unfair markets for the wood • Lack of transparent pricing, • Lack of a farm forestry culture • Lack of supporting knowledge systems • Long-term risks and uncertainty of markets • changing investment patterns	• Organized Growers' Association will help in getting better prices for their produce, • Success stories will make other farmers venture into this sector • Changing the mindset of growers will help in opting for long rotations. Making the farmers compare the long rotation activity to their Fixed deposits. • Market research trends in the industry will help in overcoming the uncertainties related to future market and profitability	• Organized Growers' Association will help in understanding and countering the forces of the market

Acts and Rules that govern the trade of Teakwood:

1. Exhaustive **Guidelines for the Harvest and Disposal of Timber from Patta Lands** were issued by the combined State of AP, in the year 2003, and the same was adopted by the State of Telangana also. The said guidelines are annexed as **Annexure 1.**
2. An act that has more relevance to this sector is "***The Andhra Pradesh Forest Produce (Fixation of Selling Prices) Act 1989" and the rules framed under this act***

   The rules prescribe a blended approach of cost, competition, and customer-**based approaches coupled with past**

trends for fixing the price of Eucalyptus pulpwood. A similar kind of mechanism can be adopted in other species, that includes, teakwood too.

The pricing mechanism is based on

- The **selling price is fixed using the discounted cash flow (DCF)** method to arrive at the present value (**cost-based pricing**).
- The **price fixed should not be below the market value of the product at the point of supply** (**competition-based pricing**).
- The **rates obtained by the forest corporation in auctions will be a guiding factor** for deciding the rate (**customer-based pricing**).
- The **general trend in the prices of the forest produce** also should be taken into account before fixing of rates. (**competition-based pricing**).
- When auctions don't happen in the state, then auction prices of the forest corporations of adjacent states are to be considered.
- The selling price shall be fixed for each year based on market situation. The selling price so fixed will be based on the recommendation of an independent consultant appointed by the government.

If such a mechanism exists in a truer spirit, then Farmers will get proper returns and it will help in the promotion of Agroforestry in a big way.

Marketing of Juvenile Teakwood

A study on different characteristics of such **Juvenile Teak Wood** from Indonesia was conducted as per the study

1. The Physical properties of 9-year-old teak wood were inferior to those of mature (conventional) teak wood, as the juvenile wood has a higher moisture content of around 84% and lower density. In addition, the density of its heartwood was higher than its sapwood.
2. However, dimensional stability test results carried out by investigating its volumetric shrinkage were similar to those for the conventional, mature wood.
3. The tests of acoustic properties of 9-year-old teak wood, based on all parameters, showed that 9-year-old teak is a good material for musical instruments. This wood is characterized by a relatively high velocity of ultrasound wave, high damping of radiation attenuation, and low acoustic resistance.
4. Regarding the mechanical properties of 9-year-old teak wood, its MOEs value was lower than that of conventional teak wood. On the other hand, MOR and compression strength values were similar with the conventional one. The examined mechanical properties (MOEs, MOR, compression strength and Brinell hardness) are correlated with wood density.
5. The Brinell hardness on the longitudinal sections of juvenile teak wood is significantly lower than that of mature teak wood. This makes its use rather because of the high proportion of sapwood in the 9-year-old teak trunk. The type of damage to the samples after testing also indicates the worse mechanical properties of sapwood.

Thus, juvenile teakwood has its limitations, but still has a market value- may not be for major construction purposes, but for other purposes like in the making of handicrafts, as a small timber (used in the furniture industry),

in the plywood industry, in making of veneers, and MDF, etc. **This has its own niche market.**

Role to be played by TSFDC

A lot is being discussed on the different aspects of AF Systems in the write-ups submitted by CIPS, Hyderabad

For **making the concepts of AF, Successful, Sustainable, Repetitive, Adoptable, and, Ameliorative**, in my opinion, the following issues are to be discussed in length, and maybe some kind of mechanism is to be developed, so that, the concept of AF becomes a big success, and with it, the Indian Society will keep on getting the much-required Wood and Wood Products from our Agroforestry systems, which in the long run will ease the pressure on our traditional forests and help in reducing the burden on the precious exchequer.

S. No	Component of Agro-Forestry	Issues involved	What TSFDC can do
1	Lack of a farm forestry culture in many parts of the country and no coherence among the participating sectors	Participating Sectors: Farmers, agricultural and Forestry Professions, State Agencies and Industry	Create a center of Excellence, develop a kind of interactive mechanism like a consortium, and have a continuous and fruitful dialogue with the stakeholders.

2	Lack of supporting knowledge systems, and poor knowledge of many potential farm forestry species	Despite the concept of Farm Forestry, very old in India, still we are unable to standardize (a) the species suitable for different agronomic zones of India, (b) Suitable for local industry, (c) the ill effects (allelopathic effects) of the timber plants on the productivity of the agriculture crops, etc	Center for excellence can take care of this issue
3	Public agencies / private companies?	Serious questions on the role played like 1, Government as Investor, Grower and Regulator? 2. Private as Investor, Grower, Supplier and End-user?	The roles of different stakeholders are to be well-defined
4	Distorted or unfair markets for wood	Farmers are not able to get the expected rates of return.	TSFDC can help in getting a suitable Governmental intervention, organizing the producers under a single umbrella, developing e-platforms for the sake of products

5	Period of rotation	Requirements of the Industry, Individual Growers, and Market Forces are making the Rotation Periods for different species highly flexible. Most of the farmers are preferring small rotations, which is not in tune with the concept of sustainability	TSFDC through dialogue can try to change the mental set-up of growers
6	The poor reputation of forestry investment companies	As per the information displayed on the website of the Ministry of Corporate Affairs (MCA), there are 12,862 registered Plantation companies (the information runs in 350 pages) in India. Most of them are with dubious distinction, eroding the credibility of the concept of Farm Forestry.	The Government of India has already taken corrective steps in this regard. TSFDC can help in decimating the information.
7	Lack of transparent pricing	Self-explained	Maybe a kind of MSP, developing e-platforms help the growers
8	The difference in scale between small independent growers and industrial Processors	Self-explained	Bringing more and more areas under agroforestry is the solution.

9	Middlemen	Another set of people who are responsible for the farmers getting disgruntled with the concept of AF. Industries like ITC, have done some credible work in this field (getting rid of middlemen)	Developing e-platforms help the growers
10	Lack of regional inventories and wood-flow plans	Lack of market related information is not helping the AF sector to grow and flourish.	TSFDC/ TSFD can think of preparing such plans. States are trying to get to know about the availability of wood (through Wood Availability Surveys), but lots of work is still to be done in this field.
11	Long-term risk and uncertainty of markets	Market research is very important, and it should be done as a collaborative effort by the Industry, Plant Growers, Universities, Government Departments and Institutes like IPRITI, etc	Center of Excellency can help in this regard
12	Industrial forestry companies changing their investments	Companies are always Strongly market driven; thus, they always focus on Value Addition, New Product Development, Quality Enhancement,	Here comes the importance of the system being in

		and Sustainability backed by strong R&D, Marketing, and technical teams. Thus, the companies change their investments and with it, their requirement of wood also changes. That affects the expected returns of farmers adversely.	tune with the most recent and future developments concerning the industry. Market research plays an important role and TSFDC can help in undertaking market research.
13	Lack of markets for environmental services	There are no takers for Carbon credits at present. May be time to devise a mechanism adopted (I think now it is discontinued) by the Forest Department of Maharashtra, wherein they have devised their system of credits for growing trees successfully in their fallow lands, which can be reimbursed while making payments towards the purchase of fertilizers, pesticides, making the payments for their energy bills, etc	Now with concepts like Green Credit Rules, 2023, ACA, etc in place, TSFDC can take a proactive role in getting these concepts implemented.
14	No insurance for farm forests	Some companies are offering insurance,	TSFDC can take a proactive role in

			getting the AF farmers organized
15	No buy-back policies	Such a mechanism can be thought off	
16	Contract Farming	Now with the new Agro laws, it is possible in the future.	

TSFDC can think of **developing yield tables** for the important timber species grown on Farm Lands. One such example, with which the farmers are getting benefits is the Department of Silviculture Forest College and Research Institute, Tamil Nadu Agricultural University, Mettupalayam, had come out with a 63-page booklet titled: Developing Yield table for Few Tree Species Grown in Farm Settings. This book represents all important farm forestry species grown on patta lands representing different Agroecological regions of Tamil Nadu.

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