

Original Research Article

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Study on Value Chain Analysis of Plywood in Western Tamil Nadu, India

P. Balaji^{1*}, R. Revathi² and V. Karthick¹

¹Directorate of CARDS, TNAU, Coimbatore-3, India

²Office of the COE, TNAU, Coimbatore-3, India

*Corresponding author

ABSTRACT

Plywood is the type of wood material consists of multiple layers of veneer sheet which are binded together. The present study carried out based on the specific objectives are i) To assess the demand and supply of wood for plywood industry in Coimbatore district, ii) To analyse the value chain of wood in Coimbatore district, iii) To identify the role and interaction among the various stakeholders in value chain. To identify the challenges and opportunities for the stakeholders in the value chain. Since the plywood industries are fragmented across the Coimbatore district, the sample case firm was selected based on the performance and surrounding environment such as Ambiply (Case firm 1), Asian plywood (case firm 2) and Sri ranga plywood(case firm 3). The chief raw materials used by these plywood manufacturing case firms were *Eucalyptus*, *Melia dubia* and *Dipterocarpus turbinatus*. The raw materials were sourced from 250 Kms of surrounding radius from the manufacturing unit. The Forest College and Research Institute has also been playing a vital role in bringing a tie-up between the Plywood Industries across the state and the farmers. In this study, the mapping of value chain and growth rate analysis was done. Challenges and opportunities of stakeholders in value chain were analyzed. The major challenges faced by the farmers were Price fluctuations followed by late return, long rotation and labour intensive production. The major challenges faced by industry are timely procurement of raw materials followed by seasonal variations, lower sales and bad debts. Lack of Raw Materials Supply, power shortage, Lack of Skilled Labour, machine maintenance, etc., are some of the constraints faced by the case firm. This paper also revealed about the demand and supply of raw materials for making plywood.

Keywords

Value chain mapping, Growth rate analysis, Challenges and raw materials

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Introduction

The production quantity of plywood in India is estimated at 2537(‘000m³) in 2018. The production quantity of plywood in world is estimated at 156343.61 (‘000m³) in 2018 (ITTO, 2018). India’s contribution in the world level for the production of plywood is

1.62 per cent only. Thus, India had very low share among the world in the production of plywood. Plywood is the type of wood material consists of multiple layers of veneer sheet which are banded together. There is wide opportunity for the plywood manufacturing players in India. Even though India had lowest contribution in the world, its

major markets were USA, UK, France, Switzerland, Canada and Netherlands. China, USA, Japan, UK, Italy, Germany and France mainly the sawn wood. The plywood demand was increased in domestic market and it had an opportunity for the foreign investors and manufacturers countries who are interested to investing in Indian domestic plywood market (Montiel, 2016). In the case of India, the country has recently experienced a rapid economic growth rate due mainly to economic liberalisation policies that have represented a steadily rising gross domestic product in the country (Ablett, 2007). Other researchers, such as Yadav and Basera (2013), forecasted the Indian forest product at national, regional and global level from 2011 to 2016 and assess the availability, export and import and production of Indian forest products at national, regional and global level. This study revealed the import significance in order to meet domestic production of wood products. On behalf of the Indian Plywood Industries Research and Training Institute - IPIRTI, Pandey and Rangaraju (2008) provided an overview of India's wood industry. Their study described the three categories of Indian wood-such as (sawn wood, composite wood panels and pulp wood based) and provided different recommendations to meet the demand of wood as raw material that involve the government, private sector and local institutions as the main key players.

The compound growth rate analysis was given in Table 1 to know the growth rate of plywood. The recent 19 years data which contains export and import quantity along with export and import value was collected for this analysis

From table 1, it could be inferred that both export (4.45%) and import quantity (14.08%) were increased per year. But import quantity was increased more than the export quantity. Likewise, both export (10.15%) and import

value (19.69%) were also increased per year. Even though both are increased, import value is more than that of export value. It clarified in graph 1 and it concluded that local demand was increased yearly at highest rate.

The specific objectives of the study includes to assess the demand and supply of wood for plywood industry in Coimbatore district and to analyze the value chain of wood in Coimbatore district and to identify the role and interaction among the various stakeholders in value chain and to identify the challenges and opportunities for the stakeholders in the value chain.

Materials and Methods

Primary and secondary data were collected in this study. Focus survey method was followed. Ambi plywood (case firm1), Asian plywood (case firm 2) and Sri Ranga plywood (case firm 3) were selected for this study. Compound growth rate was used in order to identify the growth rate. SWOT analysis was done to identify the opportunities, challenges and constraints faced by the case firm. Value chain was mapped with the help of data collected.

The formula for CAGR is:

$$\text{CAGR} = (EV / SV)^{1/n} - 1$$

where:

EV = Investment's ending value
SV = Investment's starting value
n = Number of investment periods (months, years, etc.).

Results and Discussion

Demand and supply of raw materials for making plywood, Mapping of value chain which was followed in case firm, Role and Interaction among stakeholders in the firm,

Sourcing of raw materials, Opportunities and Challenges of Stakeholders in Plywood Value Chain and Constraints faced by the case firms were discussed below.

Table 2 gives the information about demand and supply of raw materials for making plywood by the case firms (Ambi plywood, Asian plywood and sri ranga plywood).

From the above table, it could be inferred that Case firm 1 (Ambi plywood) plays a major role in procurement of raw materials and supply of finished goods followed by case firm 2 (Asian plywood) and case firm 3 (Sri ranga plywood) it also clarified in diagram 1.

Analysis of value chain Map of Plywood case firm 1

Mapping the value chain of various woods from procurement to marketing for case firm 1 were given below

Melia dubia

Farmers-----> felling groups-----> industry---->whole sale->consumers
Farmers-----> felling groups-----> industry---->dealers—>retailers----> consumers

Farmers-----> felling groups-----> industry-----> consumers (few cases)

Eucalyptus

Forest department-----> Industry----->Retailers-----> consumers

Analysis of value chain map of plywood case firm 2

Mapping the value chain of various woods from procurement to marketing for case firm 2 were given below

Melia dubia

Farmers----> merchant----> industry---->retailers----> consumers

Eucalyptus

Private owners----> industry----> retailers----> consumers

Forest department----> industry----> retailers---> consumers

Private owners----> industry----> industry own outlet----> consumers

Silver oak

Forest department----->Industry----->Retailers-----> consumers

From the analysis of value chain of both the firms given above, it could be cleared that woods may transferred across various stages of intermediaries and value addition may done in each stage. There is no direct relationship between producer and consumer.

Role and Interaction among the various stakeholders in the value chain

Forest department ↔ farmers
Tamil Nadu Agricultural university ↔ farmers
FC&RI ↔ farmers
TNAU ↔ Marketing channel
Agriculture department ↔ farmers

The technical guidance was requested from forest college and research institute, TNAU, Mettupalayam. FCRI has conceived a comprehensive collaborative research programme coupled with contract tree farming model to promote Meliadubia based plywood farming in Tamil Nadu. Through this model Ambiply has assured a minimum support price of Rs.7500 per ton of wood for the *Meliadubia* which is first of its kind in the

country and attracted several farmers. The varieties developed by TNAU for *Meliadubia* is promoted through this collaboration which

attracted many farmers and other stake holders towards tree husbandry.

Table.1 Compound growth rate analysis of plywood

Year	Export quantity (1000 m ³)	Import quantity (1000 m ³)	Export value (1000 \$)	Import value (1000 \$)
2000	23.56	28.71	7340.78	6389.63
2001	29.79	42.25	4695.22	8241.26
2002	43.75	15.45	8342.65	7862.96
2003	14.83	16.84	9571.34	8573.42
2004	28.9	18.1	18258.58	8707.79
2005	32.71	15.88	20784.24	9450.87
2006	41.09	31.42	25114.15	15553.65
2007	106.23	57.56	28791.66	30261.79
2008	70.09	90.35	26033.56	51566.39
2009	66.7	82.67	16420.44	53522.26
2010	57.55	169.86	27455.27	76978.05
2011	49.18	200.09	18680.21	106733.7
2012	55.97	128.34	25536.77	80918.33
2013	32.58	115.67	22547.78	76485.63
2014	97.03	121.32	56703.02	76755.59
2015	63.9	113.75	34512.55	77975.44
2016	75.63	118.08	52295.22	77572.23
2017	51.43	141.47	35663.82	96652.16
2018	31.54	151.06	31642.29	120138.6
CGR(%)	4.45	14.08	10.15	19.69

(Source ITTO, 2018)

Table.2 Demand and Supply Raw Material for making plywood by the Case Firms

Industries	Procurement of raw material (in tonne/month)	Demand of raw material (in tonne/month)	Supply of finished products (in tonne/month)	Production capacity (lakh sq.ft/ annual)
Case Firm 1	600	600	300	5.00
Case Firm 2	390	405	180	2.92
Case Firm 3	165	255	90	1.67

(Source: Primary data collection from case firms)

Table.3 Sourcing of raw materials for plywood

Sourcing place and portfolio	<i>Meliadubia</i> ¹ (Malai Vembu)	<i>Eucalyptus</i> ² (Thaila maram)	Kurjan ³	Jungle wood ⁴
Erode and Coimbatore district from mainly from felling groups/Farmers(Few)	✓			
Vaalparai, Kodaikkanal and Kerala Mostly Govt godown and coffee/ Tea plantation		✓		
Kerala/Imported from Foreign countries (Direct import/Traders)			✓	
Kerala state and Traders				✓

Table.4

Stake holders	Opportunities	Challenges
Farmer	Assured price for the produce Assured supply of quality inputs Better remunerative price due to absence of middlemen Timely and free technical guidance minimum care and management	price fluctuations Labour intensive production Long rotation Late return
Industry	Assured quality in the raw material Protection from market price fluctuations Enables long term planning Assured and dedicated supplier base Uninterrupted and regular supply of raw material	Timely procurement of raw materials Seasonal variation Lower primary sales Bad debts
Middlemen	Non perishable good No investment	Seasonal variation Bad debts

Table.5

Sl. No	Constraints faced	Rank
1	Lack of Raw Materials Supply	I
2	Power Shortage	II
3	Lack of Skilled Labour	III
4	Machine maintenance	IV
5	Less plantation of semi hard wood species	V
6	Cutting order problem from forest department	VI
7	Low arrivals in rainy season	VII
8	Lack of labours will results low arrival of wood	VIII
9	Early cutting of trees will results poor arrivals for plywood industry	IX
10	Less plantation in the sourcing area	X

(Source: Primary data collection from case firms)

Fig.1

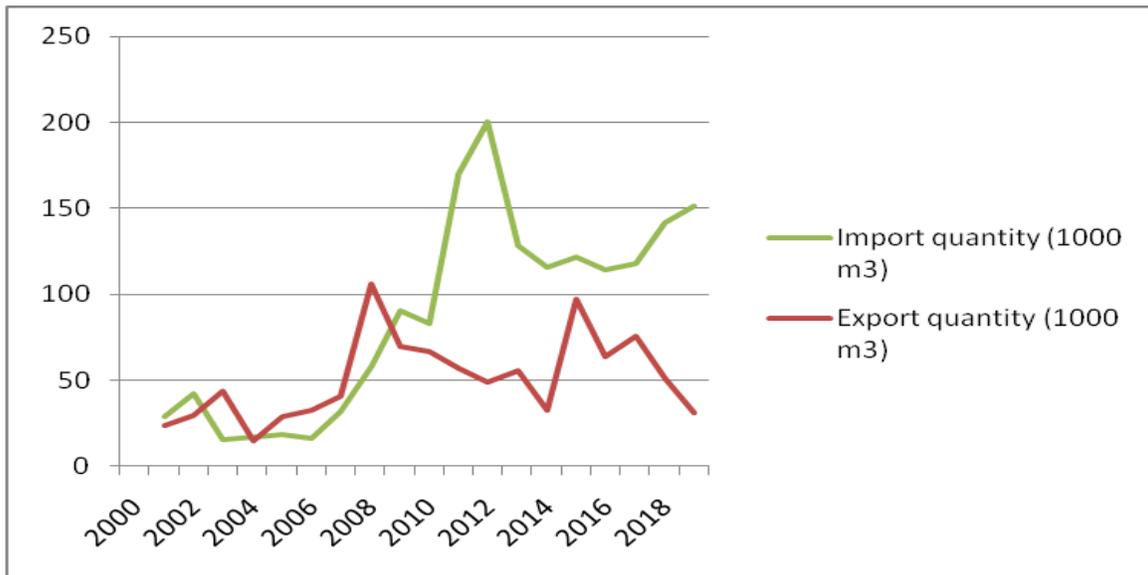
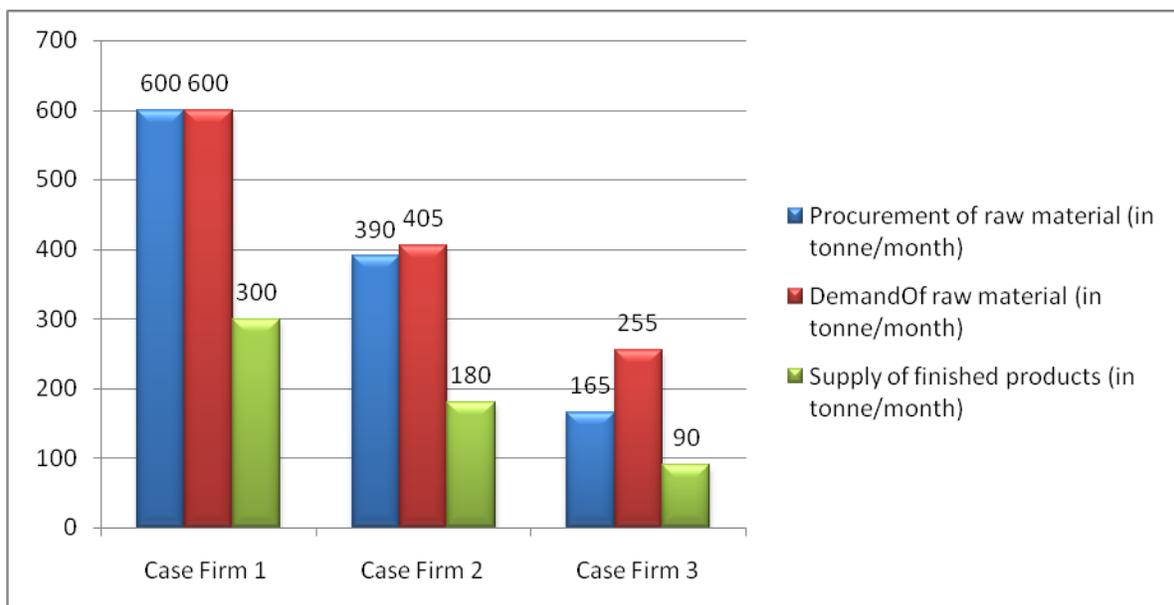


Fig.2



After this association, Ambiply have obtained around 20% of raw materials directly from the farmers during the last one year. Simultaneously, the industry in association with FCRI to identify alternate plywood species which would be promoted through agro and farm forestry. The institute has conducted research trials for over a decade

and promoted the species in a large portion of farm lands

The various sources of raw materials for making plywood are given in the table below

From the above table, it could be cleared that the raw material *Melia dubia* was procured by

the case firms from Erode and Coimbatore district, Eucalyptus from Vaalparai, Kodaikkanal and Kerala Mostly Govt godown and coffee/ Tea plantation, Kurjan from Kerala/Imported from Foreign countries (Direct import/Traders) and jungle wood from Kerala state and Traders for making plywood.

Opportunities and challenges for the stakeholders in the plywood value chain

Opportunities and challenges faced by the stakeholders such as Farmer, Industry and Middlemen in the plywood value chain were analyzed below (Table 4).

Constraints faced by the case firms

Some of the major constraints faced by the case firms during plywood manufacturing process which was collected from primary source are given below (Table 5).

From the table, it could be inferred that case firms faced the major constraints such as lack of raw materials supply followed by power shortage, lack of skilled labour, machine maintenance, less plantation of semi hard wood species, Cutting order problem from forest department, Low arrival in rainy season, Lack of labours will results low arrival of wood, Early cutting of trees will results poor arrivals for plywood industry and Less plantation in the sourcing area.

Conclusion of the study is as follows:

As per compound growth rate analysis, Export (4.45%) and import quantity (14.08%) were increased per year. But import quantity was increased more than the export quantity. Likewise, both export (10.15%) and import value (19.69%) were also increased per year. Even though both are increased, import value is more than that of export value. It concluded that local demand was increased yearly at highest rate. Case firm 1 (Ambi plywood)

plays a major role in procurement of raw materials and supply of finished goods. There is no direct relationship between producer and consumer. Raw material *Melia dubia* was procured by the case firms from Erode and Coimbatore district, Eucalyptus from Vaalparai, Kodaikkanal and Kerala Mostly Govt godown and coffee/ Tea plantation, Kurjan from Kerala/Imported from Foreign countries (Direct import/Traders) and jungle wood from Kerala state and Traders for making plywood. The major challenges faced by the farmers were Price fluctuations followed by late return, long rotation and labour intensive production. The major challenges faced by industry are timely procurement of raw materials followed by seasonal variations, lower sales and bad debts. Lack of Raw Materials Supply, power shortage, Lack of Skilled Labour, machine maintenance, etc., are some of the constraints faced by the case firm. From the study, it is cleared that Even though the challenges, opportunities and constraints are more, there is a lot of opportunity for plywood industries in India

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