



Performance and Comparative Advantage of Wood Products Trade from India

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Abstract: The export of total wood products from India is 0.40% of total production, though India is importing 7107 thousand m³ wood products. This indicates the huge demand of wood products in India. The export quantity and value of different wood products from India is less than the import which showed negative balance of trade for wood products. Therefore the present investigation was carried out with the objective to study the composition, percentage share of India in the world, growth, variability and comparative advantage of export and import of different wood products from India. Present investigation was based on secondary data collected from the official website of International Tropical Timber Organization for the period from 2001 to 2021. The quantity and value of export and import of total wood products raised during study period. Among the wood products exported from India, highest export quantity is in case of plywood and veneer while the percentage share of Industrial round wood and swan wood in total wood product export was less. The highest quantity and value of import from India was for industrial round where as it was less for plywood and veneer. The quantity of export and import of total wood products, plywood and veneer from India increased significantly where as the import of all the wood products. The export quantity of total wood product (47.72%) having higher variability than the import quantity of total wood products (32.81%). The higher variability in export and import quantity in veneer, plywood and swan wood. The values of revealed comparative advantage and revealed symmetric comparative advantage indicated that India had higher comparative advantage in export of veneer and plywood than the other wood products during the study period.

Keywords: Growth performance, Export, Comparative advantage, RCA

Wood is the important natural resource in the developing country like India. According to statistical database of International Tropical Timber Organization during the year 2001 the production of wood products in India was 55978.34 thousand m³ which grew by 47% and reach up to 82480.03 thousand m³ till 2021. Though various measures has been taken by the government to increase the forest cover in India, still India is deficit in wood production to cope up its increasing demand and meet its demand though importing the wood. Wood based industry is the fastest growing industry in India. The rapid growth in urbanization and increasing housing construction there is huge demand for wood and wood products. To meet these demand different wood products imported in India. The export of total wood products from India is 0.40% of total production, though India is importing 7107 thousand m³ wood products. This indicates the huge demand of wood products in India. The export quantity and value of different wood products from India is less than the import which showed negative balance of trade for wood products. As wood based industry is one of the most important part of economy, the study on status and growth in trade of wood product over the period of time which may useful in taking future decisions in relation to production and

trade of wood products. Therefore present investigation carried out to study composition of wood products export and import from India, variability in wood products export and import from India and comparative advantage of wood products export from India.

MATERIAL AND METHODS

The present investigation was carried by collecting the secondary data on quantity and value of export and import of different wood products from India from the statistical database given on the official website of International Tropical Timber Organization (ITTO) for the period from 2001 to 2021. The different wood products includes the industrial round wood, swan wood, veneer and plywood. Simple percentage was worked out to study the composition of wood products export and import from India.

Growth gate: To study the growth in quantity and value of export and import of wood products Compound Annual Growth Rate (CAGR) was estimated by fitting the exponential trend equation.

$$Y_t = ab^t$$

Where Y_t is the dependent variable for which growth rate estimated (the quantity and value of export and import during

the year 't'), a is the intercept, b is the slope of exponential trend equation and t is the year or time period.

The above equation transformed in to log linear form as below

$$\text{Log } Y = \text{log } a + t \text{ log } b$$

$$\text{Log } Y = A + Bt$$

Where A = log 'a' and B = log 'b'

The compound annual growth rate worked out as

$$\text{CAGR} = (\text{antilog } b - 1) \times 100$$

Variability: To determine the variability in quantity and value in export and import of wood products coefficient of variation was worked out.

$$\text{CV} = \frac{\sigma}{Y} \times 100$$

Where σ = Standard Deviation and Y = mean of quantity or value of export and import

Revealed comparative advantage (RCA): To measure comparative advantage in export of specific commodity Revealed Comparative Advantage Index was estimated. This method was formulated by Balassa (1965) and its mathematical expression given as

$$\text{RCA} = (X_{ij}/\sum X_{ik}) / (X_{wj}/\sum X_{wk})$$

Where,

X_{ij} = Exports of country 'i' of commodity 'j'

X_{ik} = Exports of country 'i' of all the commodities 'k'

X_{wj} = Exports of a world 'w' of commodity 'j', and

X_{wk} = Exports of a world 'w' of all the commodities 'k'

Here 'i' refers to India, 'j' means the export quantity of particular wood product, 'w' means World and 'k' refers to total quantity of export of all the wood products. If the RCA index for a particular wood product estimated to greater than 1, indicated that the country has a revealed comparative advantage in the exports of that particular wood product and vice-versa. However RCA having the limitation of asymmetry, therefore to make RCA symmetric the another method was suggested by Dalum et al (1998) called as Revealed Symmetric Comparative Advantage (RSCA) was used. This index also adopted by Burange and Sheetal (2008), Shinoj

and Mathur (2008) and Kerobim et al (2014) in their studies. Mathematically it is expressed as

$$\text{RSCA} = \{ (X_{ij}/\sum X_{ik}) / (X_{wj}/\sum X_{wk}) + 1 \}$$

The value of RSCA index range between +1 and -1. If the value of RSCA index is positive then it indicated that the country had comparative advantage in export of that specific commodity and vice-versa.

RESULTS AND DISCUSSION

Composition of wood products export and import: The quantity and value of wood product export from India raised during the study period (Table 1). During the year 2001 the quantity of export and value of total wood product was 49.28 thousand m³ and 16848.47 thousand US\$ which raised to 327.74 thousand m³ and 133296.50 thousand US\$ during the year 2021, respectively. The quantity and value of export of Industrial round wood and swan wood decreased whereas it was increased in case of veneer and plywood during the period 2001 to 2021. Among the wood products exported from India the highest export quantity and value was of plywood which was 75.58 and 43.56% during the year 2021, respectively followed by veneer wood. The percentage share of Industrial round wood and swan wood in total wood product export was found less as compared to the percentage share of veneer wood and plywood export.

The quantity and value of wood product import from India raised during the study period (Table 2). During the year 2001 the quantity of import and value of total wood product was 2868 thousand m³ and 529121.3 thousand US\$ which raised to 7210.57 thousand m³ and 2115774 thousand US\$ during the year 2011 and to 7107.25 thousand m³ and 1822212 thousand US\$ during the year 2021, respectively. Among all the wood products the highest quantity and value of import from India in industrial round wood which was 67.75 and 57.04% of total wood products import during the year 2021 whereas less quantity and was in case of plywood followed by veneer. The import of industrial round wood from India in terms of quantity increased from 2784.76 thousand m³ during

Table 1. Composition of wood product export from India

(Quantity in 1000 m³ and Value in 1000US\$)

Wood product	2001		2011		2021	
	Quantity	Value	Quantity	Value	Quantity	Value
Ind. Round wood	5.41 (10.98)	1085.65 (6.44)	12.87 (9.40)	2538.37 (4.60)	7.22 (2.20)	33349.86 (25.02)
Swan wood	12.00 (24.35)	5876.58 (34.88)	61.99 (45.26)	15514.92 (28.11)	12.45 (3.80)	9828.17 (7.37)
Veneer	2.08 (4.22)	5191.02 (30.81)	12.92 (9.43)	18466.61 (33.45)	60.35 (18.41)	32058.25 (24.05)
Plywood	29.79 (60.45)	4695.22 (27.87)	49.18 (35.91)	18680.21 (33.84)	247.72 (75.58)	58060.22 (43.56)
Total wood products	49.28 (100)	16848.47 (100)	136.96 (100)	55200.11 (100)	327.74 (100)	133296.50 (100)

Source: Statistical database of The International Tropical Timber Organization
Figure in parenthesis indicate percentage to total wood product

year 2001 to 4815.24 thousand m³ during the year 2021 but in terms of percentage of total wood products import declined from 97.10 to 67.75% during the year 2021. In terms of percentage of total wood products the quantity of swan wood import from India increased from 1.33% during the year 2001 to 23.22% during 2021.

World total export and import: The percentage share of India in world total wood products export increased over the period of time (Table 3). During the year 2001, India had 0.02% share in quantity of world total wood products export which increased up to 0.10 % during the year 2021. Among the wood products the quantity and value of veneer and plywood export from India recorded increasing share in world veneer and plywood export. The quantity of veneer and plywood export from India had 0.07% and 0.14% share in world veneer and plywood export during the year 2001 which raised to 0.87% and 0.81% during the year 2021. The share

Industrial round wood and swan wood export from India in world total industrial round wood and swan wood export was very less and declined over the study period.

During 2001, the percentage share of quantity of total wood products from India in world wood product export was 1.12% which increased to 2.70% during 2011 and then declined to 2.11% during 2021 (Table 4). During the year 2001 the percentage share of total wood products from India in world wood product export was 1.24% which increased to 3.11% during 2011 and then declined to 1.87% during 2021. The share of quantity and value of veneer import from India in world total veneer import found increased over the study period.

Growth and variability in export and import: The compound annual growth rate of export and import of different wood product from India during the period 2001-2021 is given in Table 5. The quantity and value of export and

Table 2. Composition of wood product import from India

Wood product	2001		2011		2021	
	Quantity	Value	Quantity	Value	Quantity	Value
Ind. Round wood	2784.76	509815.8 (96.35)	6341.35 (87.95)	1803056 (85.22)	4815.24 (67.75)	1039367 (57.04)
Swan wood	38.11 (1.33)	8541.14 (1.61)	591.81 (8.21)	159917.8 (7.56)	1650.35 (23.22)	387053.9 (21.24)
Veneer	2.88 (0.10)	2523.14 (0.48)	77.32 (1.07)	46066.58 (2.18)	452.46 (6.37)	294843.3 (16.18)
Plywood	42.25 (1.47)	8241.26 (1.56)	200.09 (2.77)	106733.7 (5.04)	189.2 (2.66)	100947.4 (5.54)
Total Wood Products	2868 (100)	529121.3 (100)	7210.57 (100)	2115774 (100)	7107.25 (100)	1822212 (100)

Source: Statistical database of The International Tropical Timber Organization
Figure in parenthesis indicate percentage to total wood product

Table 3. Percentage share of India in world total export of wood products

Wood product	2001		2011		2021	
	Quantity	Value	Quantity	Value	Quantity	Value
Ind. Round wood	0.00	0.01	0.01	0.02	0.00	0.20
Swan wood	0.01	0.03	0.05	0.05	0.01	0.02
Veneer	0.07	0.22	0.48	0.62	0.87	0.72
Plywood	0.14	0.07	0.19	0.13	0.81	0.31
Total wood products	0.02	0.01	0.05	0.02	0.10	0.01

Table 4. Percentage share of India in world total import of wood product

Wood product	2001		2011		2021	
	Quantity	Value	Quantity	Value	Quantity	Value
Ind. Round wood	2.37	5.53	5.24	9.89	3.31	5.56
Swan wood	0.03	0.04	0.50	0.47	1.08	0.70
Veneer	0.10	0.10	2.75	1.44	6.09	6.39
Plywood	0.20	0.11	0.80	0.83	0.61	0.53
Total wood products	1.12	1.24	2.70	3.11	2.11	1.87

Table 5. Growth rate of export and import of wood products from India

Wood product	Export		Import	
	Quantity	Value	Quantity	Value
Ind. Round wood	0.51	17.77***	2.64**	3.41**
Swan wood	1.01	5.14**	21.62***	23.77***
Veneer	5.10*	5.08***	30.86***	28.86***
Plywood	6.71***	8.58***	13.98***	15.68***
Total wood products	5.23***	8.85***	4.80***	6.67***

Note: *, ** and *** indicates significant at 10%, 5% and 1% level of probability

Table 6. Variability in export and import of wood products from India (%)

Wood product	Export		Import	
	Quantity	Value	Quantity	Value
Ind. Round wood	44.27	42.24	30.64	158.65
Swan wood	69.32	94.62	95.51	62.68
Veneer	85.16	109.14	106.56	37.19
Plywood	71.63	63.54	67.44	51.65
Total wood products	47.72	42.08	32.81	52.46

import of total wood products increased over the period of time increased significantly by 5.23 and 4.80% per annum whereas the value of export and import of total wood products increased by 8.85 and 6.67% per annum during the period from 2001 to 2021, respectively. The highest significant positive compound growth rate in quantity and value of export from India recorded in plywood export (6.71 and 8.58% per annum, respectively) which was followed by veneer export. This implied that the export quantity and value of plywood and veneer from India increased significantly during the study period. In case of industrial round wood and swan wood significant positive growth recorded in export only. The highest significant compound annual growth rate for import quantity was in Veneer (30.86%) followed by Swan wood (21.62%) and plywood (13.98%) whereas for import value it was highest for veneer (28.86%) followed by swan wood and plywood. This indicated that the import quantity and value of veneer, swan wood and plywood increased significantly in India. The growth in import quantity of industrial round wood, swan wood, veneer and plywood was higher than the growth rate of export quantity of these commodities implied that the import was higher than the export of these wood products in

Table 7. RCA and RSCA of wood product export from India

Year	Ind. Round wood		Swan wood		Veneer		Plywood	
	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA
2001	0.24	-0.61	0.54	-0.30	3.77	0.58	7.41	0.76
2002	0.31	-0.53	0.38	-0.45	5.44	0.69	7.60	0.77
2003	0.49	-0.34	0.91	-0.05	8.36	0.79	3.29	0.53
2004	0.15	-0.74	0.52	-0.32	22.34	0.91	4.86	0.66
2005	0.23	-0.62	0.40	-0.43	25.55	0.92	4.71	0.65
2006	0.41	-0.42	0.40	-0.42	20.67	0.91	4.35	0.63
2007	0.13	-0.77	0.31	-0.52	15.92	0.88	6.34	0.73
2008	0.13	-0.77	0.74	-0.15	21.00	0.91	3.89	0.59
2009	0.15	-0.73	0.48	-0.35	20.67	0.91	5.21	0.68
2010	0.09	-0.83	0.54	-0.30	8.15	0.78	6.72	0.74
2011	0.21	-0.65	1.02	0.01	9.31	0.81	3.78	0.58
2012	0.19	-0.68	1.12	0.05	6.07	0.72	3.39	0.54
2013	0.10	-0.81	1.40	0.17	5.93	0.71	2.82	0.48
2014	0.16	-0.73	0.56	-0.28	3.53	0.56	7.26	0.76
2015	0.23	-0.63	0.55	-0.29	5.71	0.70	6.19	0.72
2016	0.32	-0.52	0.41	-0.42	5.06	0.67	6.65	0.74
2017	0.38	-0.45	0.58	-0.26	4.93	0.66	5.30	0.68
2018	0.13	-0.76	0.58	-0.27	10.15	0.82	5.86	0.71
2019	0.11	-0.80	0.68	-0.19	6.77	0.74	6.06	0.72
2020	0.11	-0.80	0.06	-0.88	17.30	0.89	7.71	0.77
2021	0.05	-0.90	0.08	-0.85	9.09	0.80	8.44	0.79

India. This may be due to higher domestic demand of these wood products in the country. Kant and Nautiyal (2022) reported that due to the growing middle-class population, increasing urbanization and rising disposable incomes boost the furniture industry to grow considerably which demand higher quantity of wood.

The export quantity of total wood product (47.72%) having higher variability than the import quantity of total wood products (32.81%) which indicated that there were variation in export quantity of total wood products from India over the study period. The highest variability in export quantity was in veneer (85.16%) followed by plywood and swan wood where as in case of import quantity the highest variability was for veneer (106.56%) followed by swan wood and plywood (63.54%) indicated that there was instability in export and import quantity of these wood products over the period of time in India. The higher variation in import quantity of veneer may be due to higher significant positive growth in import quantity of veneer in India. Among the wood products the highest variation for export value was in veneer (109.14%) where as the highest variation for import value found in case of industrial round wood (158.65%) during the study period (Table 6).

Revealed comparative advantage and revealed symmetric comparative advantage: In case of industrial round wood and swan wood the values of RCA were less than one and values of RSCA were negative implied that India had mostly comparative disadvantage in export of these wood products (Table 7). The RCA was greater than one and values of RSCA worked out to positive for export of veneer and plywood from India indicated that India had enjoyed higher comparative advantage in export of these commodities than the other wood products during the study period.

CONCLUSION

The quantity and value of export and import of total wood products raised during study period. Among the wood products exported from India the highest export quantity and

value was in plywood and veneer while the percentage share of industrial round wood and swan wood in total wood product export was less. The highest quantity and value of import from India found for industrial round where as it was less for plywood and veneer. The share of quantity and value of veneer import by India in world total veneer import increased over the study period. The quantity of export and import of total wood products, plywood and veneer from India increased significantly where as the import of all the wood products was higher than the export during the study period. The export quantity of total wood product (47.72%) having higher variability than the import quantity of total wood products (32.81%). The higher variability in export and import quantity in veneer, plywood and swan wood. The values of RCA and RSCA indicated that India had higher comparative advantage in export of veneer and plywood than the other wood products during the study period.

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