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Survey and documentation of wood utilization patterns and its value addition in carpenter and craft shop in Sirsi Taluk, Uttara Kannada District

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Abstract

Wood plays an important role in day-to-day life, as it acts as energy source and creates employment in wood industries. Global industrial roundwood timber consumption reached a new high of 2.2 billion m³ in 2018. The present study was undertaken to document the utilization pattern and its value addition of timber species in carpenter and crafts shops of Sirsi taluk of Uttara Kannada district. Information was collected from ten carpenter and ten crafts shops in and around Sirsi through semi structured questionnaire survey during 2022-23. During the survey, nineteen timber/wood species belonging to eight families were documented. Among the different species used in carpenter shop *Tectona grandis* (15.62%) followed by *Acacia hybrid* (15.62%), *Artocarpus heterophyllus* (12.5%), *Pterocarpus marsupium* (12.5 %) were the major timber species used; whereas *Balanitis aegyptiaca*, *Vitex altissima*, *Eucalyptus* spp. (1.56%); whereas, in crafts shops *Tectona grandis* (18.86%) followed by *Artocarpus heterophyllus* (15.9%), *Gmelina arborea* (15.9%), *Pterocarpus marsupium* (11.32%) are dominantly used over other species; but least used were *Xylia xylocarpa*, *Terminalia paniculata* and *Cedrus deodara* (1.88 %). Among the different products produced *Tectona grandis* is used for producing maximum number of products (13), followed by *Dalbergia latifolia* (Ten), *Pterocarpus marsupium* (Six), *Artocarpus heterophyllus* (Nine) and the species used for production of less number of products are *Vitex altissima*, *Cedrus deodar*, *Adenanthera avonina* and *Eucalyptus* spp. (one product). In carpenter shops doors, door frames, windows and sofa set are produced by all carpenters; whereas in craft shops only mantapa is produced by all the shops followed by idols and statue.

The average round wood price/cft of different timber species varied from Rs.500 to 9000; high priced species are *Santalum album* (Rs.9000), *Dalbergia latifolia* (Rs.6785), *Dalbergia sissoo* (Rs.6000), *Tectona grandis* (5264); while low priced are *Acacia nilotica* (Rs.700), *Eucalyptus* spp. (Rs.500). Waste generated in the carpenter and craft shops are mainly saw dust, waste-wood, wood chips and wood flakes; sawdust are pulverized and made into agarbatti, dhoop and also used as stuffing material in garlands production rest other wastes are used as firewood. Most of the firms sold their products in local market (56%), neighbourhood market (32%), on domestic market (10%) and remining for foreigners (2%). Majority of the experienced back pain (46 %), followed by breathing, eye problem, nasal problem and allergy problem. Among twenty respondents, 40 per cent have participated in informal training to become an artisan under the guidance of their family members, whereas only 35 per cent of the respondents have undergone formal training process of government. Hence, promotion of highly valued and demanding species in waste lands and agroforestry systems helps to meet the requirement of wood in sawmills and demand of the local people and reduction of pressure on natural forests.

Keywords: Wood, Carpenter shop, Craft shop, Questionnaire survey, Round wood, Western Ghats

Introduction

Wood has long been an indispensable resource in human history, serving as a cornerstone for survival, technological advancement, and economic growth. From its early uses in shelter and tools to its contemporary role in industrial applications, wood remains a vital raw material that drives multiple sectors of the global economy. Its versatility has made it central to industries ranging from construction and furniture to paper production and energy. As economies grow and industrial needs evolve, wood continues to be a critical resource, especially in developing

nations like India, where it plays a pivotal role in local craftsmanship and trade. Global economic trends have spurred increased demand for wood as a construction material, with the market for wood-based products and furniture dominating worldwide, including in India. In 2018, global industrial roundwood timber consumption reached 2.2 billion m³ (FAO). According to the FAO (2008), the contribution of wood products to global GDP increased from approximately US\$47 trillion in 2005 and is projected to approach US\$100 trillion by 2030.

In India, wood utilization is deeply embedded in traditional crafts, particularly in carpentry and craft shops, which serve as hubs of both creativity and economic activity. Carpentry, a skill that has flourished over centuries, not only provides essential infrastructure materials like doors, windows, and furniture but also fosters a thriving local industry that sustains livelihoods and contributes to urban and rural economies. The industry uses both indigenous and imported woods, with popular species including teak, sandalwood, ebony, walnut, sal, red cedar, and rosewood (Sseremba, 2005)^[6]. Craft shops, on the other hand, represent a fusion of traditional and modern woodworking, offering intricate handmade wooden items that add cultural value while stimulating the economy. The increasing demand for wood-based products, both domestically and internationally, has positioned wood as a key player in India's economic landscape, despite the challenges posed by sustainability and resource

management. The information regarding the utilization of different timber species and the products produced in wood workshop/carpenter shop and crafts shop is lacking in India. Hence the present study was taken to explore wood utilization in carpenter and crafts shop

Material and Methods

Study area

Sirsi taluk is located in Uttara Kannada district of Western Ghats region. Sirsi is located at 14.6 °N, 74.8 °E. It has an average elevation of 611 meters (2200 feet), and is situated in the heart of the Western Ghats. Sirsi taluk is embedded different types of forest types with rich biodiversity. Most of the people living in village depend on forests for food, fuel, wood, etc. But information regarding value addition in carpenter and crafts shop is very limited.

Data collection

This study was undertaken in 20 carpenter and craft shop in Sirsi taluk during July 2022 to October 2022. Information on timber/wood species used, their utilization pattern and other relevant information were collected from carpenter and crafts shop in sirsi by participatory discussion method through the questioner surveys (Semi structured survey).

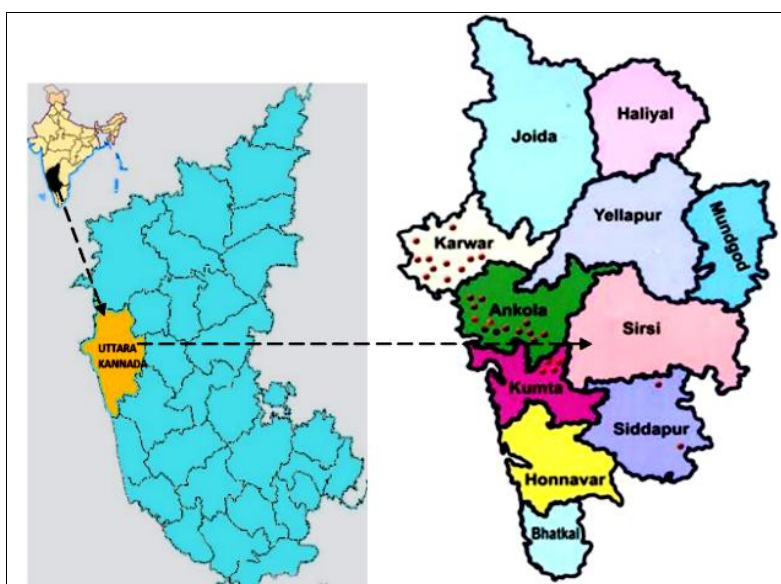


Fig 1: Map of study area

Results and Discussion

Different types of timber species used by Carpenter and crafts shop

The indigenous knowledge on the use of wood is unique to a given culture of a human society around the world. Wood is generally used for building work, furniture, antique wooden object, idols, mantapa, agriculture implements etc. During survey, 19 timber/wood species belonging to 8 families are documented which are used for various purposes by the carpenter and crafts shop. The major wood species utilized are *Tectona grandis*, *Acacia hybrid*, *Pterocarpus marsupium*, *Artocarpus heterophyllus*, *Terminalia tomentosa*, *Terminalia paniculata*, *Dalbergia latifolia* and the least used are *Vitex altissima* and *Xylia xylocarpa*. The major wood species falling

under families of Fabaceae, Combretaceae, Moraceae, Verbenaceae (Table 1). Distribution of *Tectona grandis*, *Pterocarpus marsupium*, *Acacia hybrid* and *Terminalia tomentosa* is very high in this region due to the suitability of locality factors to these species. These results are in line with the studies conducted by Hanumantha *et.al.* (2018)^[3]; they documented on wood utilization pattern in Siddapur taluk. They found that 22 tree species belonging to 14 families used by the local people for different purpose was documented. The major wood species utilized were *Artocarpus heterophyllus*, *Acacia spp*, *Tectona grandis* and least used are *Albizia odoratissima* and *Gmelina arborea*. The major timber species utilized by local people are falling under families of Moraceae, Verbenaceae, Mimosaceae.

Table 1: Different types of wood species and its products produced in carpenter and crafts shop in Sirsi taluk

Sl. No	Scientific name	Common name	Family	Purpose of use
1	<i>Acacia hybrid</i>	Acacia	Fabaceae	sofa, cot, shutters, chairs, doors and frames
2	<i>Acacia nilotica</i>	Babul	Fabaceae	Doors
3	<i>Adenantharpavonina</i>	Gojallu	Fabaceae	Doors, toys
4	<i>Albizia odoratissima</i>	Bilkambi	Fabaceae	Cot, shutters, chairs, doors and frames
5	<i>Artocarpus heterophyllus</i>	Halasu	Moraceae	Doors, shutters, cot, tables, chairs, temple ceiling.
6	<i>Artocarpus hirsutus</i>	Hebbalasu	Moraceae	Doors , shutters, cot, tables, chairs
7	<i>Balanitis aegyptiaca</i>	Dadaslu	Zygophyllaceae	Doors, toys
8	<i>Cedrus deodar</i>	Devdari	Pinaceae	Mantapa, toys
9	<i>Dalbergia latifolia</i>	Beete	Fabaceae	sofa, cot, shutters, chairs, dinning set, doors and frames
10	<i>Dalbergia sisoo</i>	Shisam	Fabaceae	sofa, cot, shutters, chairs, dinning set, doors and frames
11	<i>Eucalyptus hybrid</i>	Nilgiri	Myrtaceae	Roofing
12	<i>Gmelina arborea</i>	Shivani	Verbenaceae	Idols, statue, mantapa, doors, temple ceiling, toys
13	<i>Pterocarpus marsupium</i>	Honne	Fabaceae	Mantapa, doors, chairs, show case, shutters, temple ceiling.
14	<i>Santalum album</i>	Shrigandha	Santalaceae	Mantapa, Garlands, statue, idols, jewel box
15	<i>Tectona grandis</i>	Teak	Verbenaceae	Mantapa, temple ceiling, idols, chaurang, furniture
16	<i>Terminalia paniculata</i>	Honagal/Kindal	Combretaceae	Roofing, buliding work, furniture
17	<i>Terminalia tomentosa</i>	Matti	Combretaceae	Doors , shutters, cot, tables, chairs
18	<i>Vitex altissima</i>	Baranige	Verbenaceae	Doors and windows
19	<i>Xylixycarpa</i>	Jambe	Fabaceae	Doors , frames, chairs , table

Utilization of timber species for different products

Timber/wood species were used for manufacturing furniture, buliding work, mantapa, idols, antique wooden show piece and garlands. Among different species, *Tectona grandis* is used for manufacturing (thirteen products; mantapa, idols, temple ceiling, chaurang, sofa, cot, dinning set, book stand, wooden stairs, shutters, chairs, doors and frames), *Dalbergia latifolia* (eight products; Mantapa, sofa, cot, shutters, chairs, dinning set, doors and frames), *Pterocarpus marsupium* (six products; mantapa, doors, chairs, show case, shutters, temple ceiling), *Artocarpus heterophyllus* (six products; doors, shutters, cot, tables, chairs, temple ceiling.), *Terminalia tomentosa* (five products; doors , shutters, cot, tables, chairs), followed by *Santalum album* (five product; Mantapa, Garlands, statue, idols, jewel box), *Xylixycarpa* (four products; Doors, frames, chairs, tabel) and contributes about 14.89, 10.63, 9.57, 6.38, 7.44, 6.38, 3.19 per cent respectively to the total products (Table 2 and Fig 1).

These results are in line with the studies conducted by Okonkwo *et al.* (2016), studied traditional aspects of wood consumption in Anaocha, Nigeria. They reported that hardwoods such as *Azelaia africana*, *Milicia excelsa*, *Elaeis guineensis*, *Diospyros* spp. are being used for architectural works such as roofing of houses, wooden doors, windows, wooden floors, musical instruments. Softwood such as *Ravulfia vomitoria*, *Alba feminea*, *C. pentendra* are used for wood carving.

These results are in line with the studies conducted by Hanumantha *et. al.* (2018) [3]; they documented on wood utilization pattern in Siddapur taluk. Among different species *Pterocarpus marsupium* (Six), *Tectona grandis* (Four) and *Artocarpus heterophyllus*, *Lagerstroemia lanceolata*, *Dalbergia latifolia*, *Calophyllum inophyllum* (Three) were used for making more number of products as compare to other species.

Average Roundwood prices of different timber species

Results revealed that the average price (per cubic feet) of *Tectona grandis*, *Dalbergia latifolia*, *Dalbergia sisoo*, *Artocarpus heterophyllus*, *Pterocarpus marsupium*, *Terminalia tomentosa*, *Terminalia paniculata* are high i.e., Rs. 5264, Rs. 6785, Rs. 6000, Rs. 3316, Rs. 2658, Rs. 1794, Rs. 1400 respectively; while the cost of *Artocarpus hirsutus*, *Xylixycarpa*, *Acacia nilotica*, *Eucalyptus* spp, are low i.e., Rs. 1000, Rs.1000, Rs. 700, Rs. 500 respectively. (Table 3).

Respondents Undergone Training on Wood Carving:

Occupational training can be received through two ways such as

formal and informal means in which formal training is given through specific training institute such as District Industrial Centre (DIC), Industrial training Institute (ITI) and few others (Dak). On the other hand, Informal training is considered as an informal way like no institution are involved in this type of training and people get training from their family members, relatives and other persons who are skilled in this profession. In this context, the artisans usually learn the skills of wood carving by just observing and working with the elders in their families or others at an early age. It is also clear from the sample that as 40 per cent of respondents have said that they have participated in informal training to become artisans under the guidance or supervision of his Ustaad (master craftsman) or family member, whereas only 35 per cent of the respondents have undergone formal training process of government. There were very less number of artisans who have been trained from formal training institutions (Fig.2). With respect to health status Forty six per cent of respondents experienced back pain, 20 per cent of breathing problem, 18 per cent of eye problem, 9 per cent nasal problem and 7 per cent allergy problem (Fig. 3).

These results are in line with the studies conducted by Verma and Gupta (2017). They reported that 91 per cent of respondents have participated in informal training, whereas only 9 per cent of the respondents have undergone formal training process of government. There were very less number of artisans who have been trained from formal training institutions. They also reported that, respondents also experienced several health problems back pain (43%), eye and back pain (11%), breathing and eye (14%) and no health problem (13%).

Waste generated and its value addition in carpenter and crafts shop

The major waste generated from carpenter and crafts shop are saw dust (100%) and waste-wood (95%), wood chips (95%), wood flakes (75%) respectively; in which sawdusts are pulverized and made into agarbatti, dhoop and it is also used as a stuffing material in manufacturing of garlands were as waste wood, wood chips, wood flakes are packed in 50kg bag and disposed by selling them as firewood for Rs. 35 (Table 7 and Fig. 4). These results are in line with the studies of Pandey (2022); they reported waste production from different wood-based industries and its effective utilization in Nepal. Wood chips, bark, saw dust, shavings, slabs and edgings were the major waste produced and it is effectively used for energy, wood pellets, briquettes, stand board, particle board, medium density board, mulch, animal bedding, *etc.*

Choice of market for sales of furniture and crafts products

Most of the products produced from carpenter and craft shops were sold their product on the local market (56%), neighbourhood market (32%) and on domestic market (10%)

and remaining to foreigners (2%) (Fig 5). These results are in line with the studies conducted by Antwi-Boasiako and Boadu (2016) ^[1]; they reported that 93 per cent of the products were sold at domestic market and remaining 7 per cent is exported.

Table 2: Percent and number of wood products produced from different wood species

Sl. No.	Species	Percentage	Products
1	<i>Tectona grandis</i>	14.89	13
2	<i>Dalbergia latifolia</i>	10.63	10
3	<i>Artocarpus heterophyllus</i>	9.57	09
4	<i>Terminalia tomentosa</i>	7.44	07
5	<i>Terminalia paniculate</i>	7.44	07
6	<i>Acacia hybrid</i>	7.44	07
7	<i>Acacia nilotica</i>	1.06	01
8	<i>Albizia odoratissima</i>	7.44	07
9	<i>Gmelina arborea</i>	6.38	06
10	<i>Santalum album</i>	6.38	06
11	<i>Pterocarpus marsupium</i>	6.38	06
12	<i>Dalbergia sisoo</i>	3.19	03
13	<i>Xylocarpus</i>	3.19	03
14	<i>Balanitis aegyptiaca</i>	2.12	02
15	<i>Artocarpus hirsutus</i>	2.12	02
16	<i>Vitex altissima</i>	1.06	01
17	<i>Cedrus deodar</i>	1.06	01
18	<i>Eucalyptus</i>	1.06	01
19	<i>Adenanthera pavonine</i>	1.06	01

Table 3: Average round wood price of different Wood Species

Sl. No.	Scientific name	Price/cft
1	<i>Santalum album</i>	9000
2	<i>Dalbergia latifolia</i>	6785
3	<i>Dalbergia sissoo</i>	6000
4	<i>Tectona grandis</i>	5264
5	<i>Adenanthera pavonine</i>	3500
6	<i>Artocarpus heterophyllus</i>	3316
7	<i>Vitex altissima</i>	3000
8	<i>Cedrus deodara</i>	2900
9	<i>Gmelina arborea</i>	2800
10	<i>Pterocarpus marsupium</i>	2658
11	<i>Terminalia tomentosa</i>	1794
12	<i>Albizia odoratissima</i>	1700
13	<i>Acacia hybrid</i>	1445
14	<i>Balanitis aegyptiaca</i>	1400
15	<i>Terminalia paniculate</i>	1400
16	<i>Xylocarpus</i>	1000
17	<i>Artocarpus hirsutus</i>	1000
18	<i>Acacia nilotica</i>	700
19	<i>Eucalyptus spp</i>	500

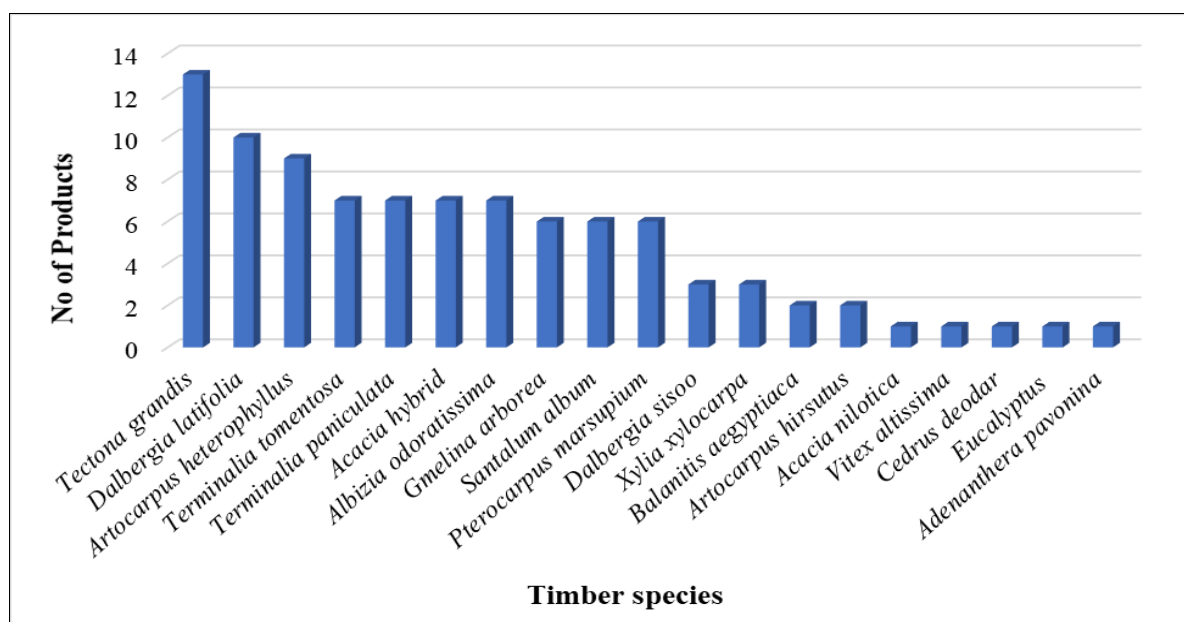


Fig 2: Number of wood products manufactured from different Wood species

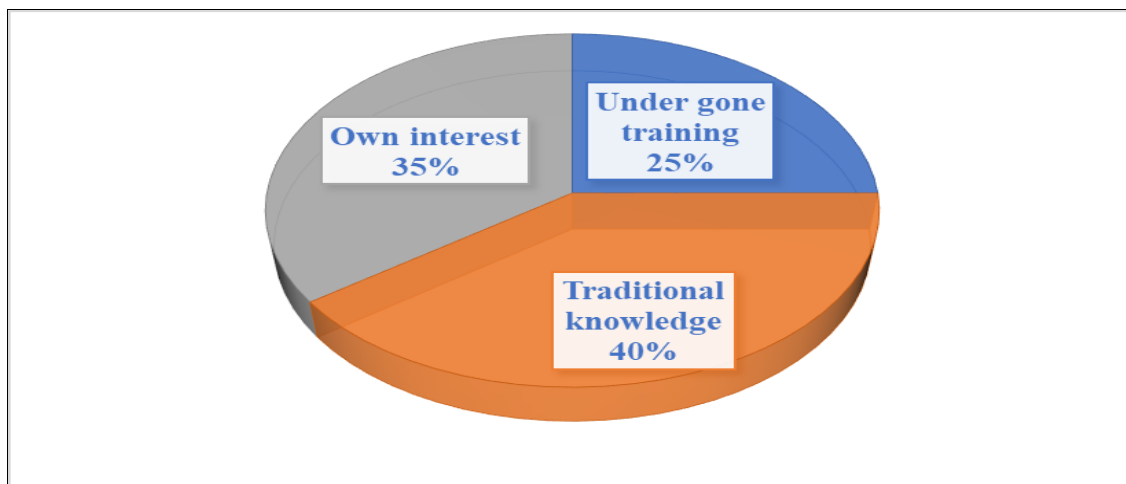


Fig 3: Distribution of artisans according to training taken for wood carvings

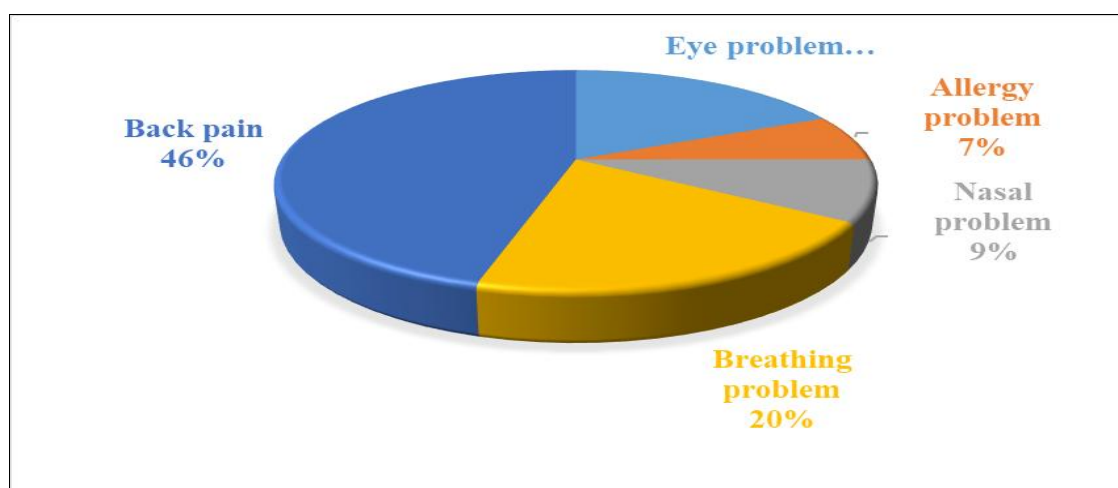


Fig 4: Health problems faced by artisans due to their occupation

Table 4: Major waste generated and its utilization in carpenter and crafts shop

Sl. No.	Waste produced	No of Carpenter and Craft shop	Utilization/value addition
1	Sawdust	20	Garlands, pellets, agarbathi, dhoop
2	Waste wood	19	Firewood
3	wood chips	19	Firewood
4	wood flakes	15	Firewood, garlands

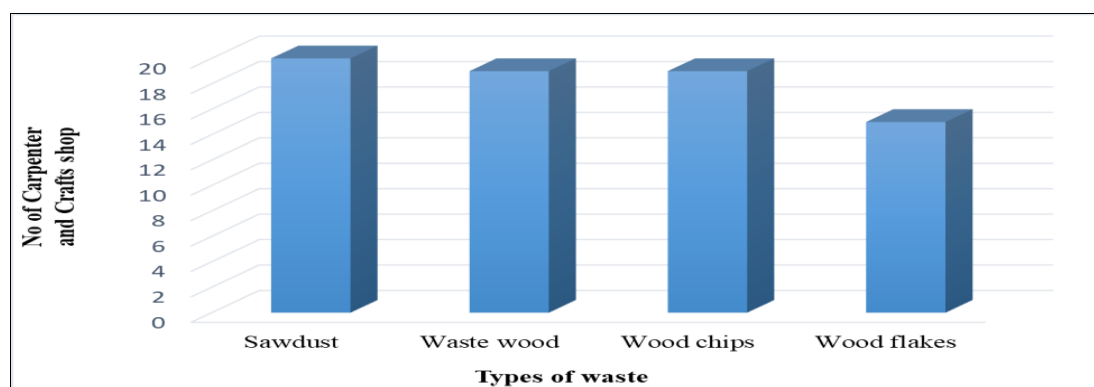


Fig 5: Major waste produced in carpenter and crafts shop

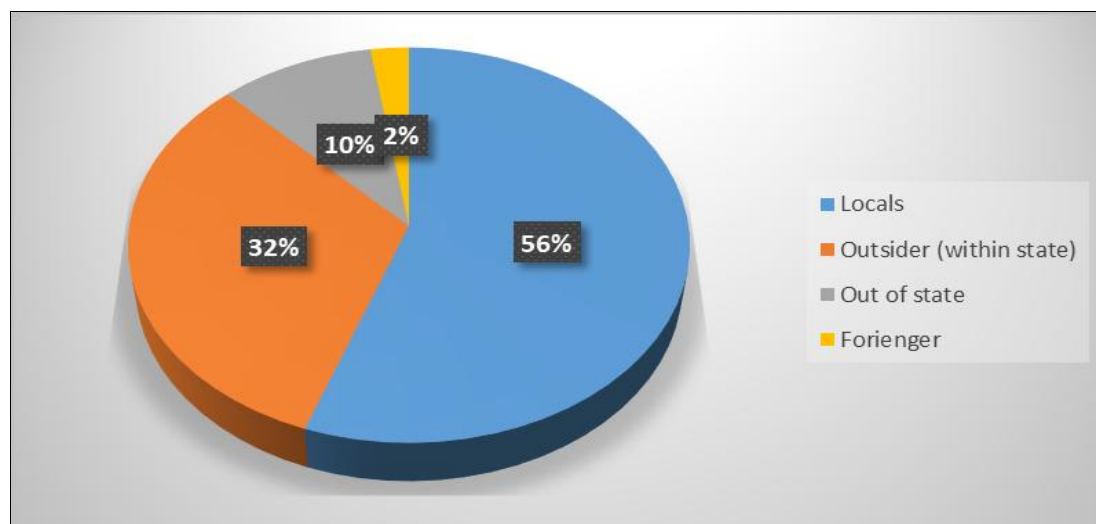


Fig 6: Major marketing firms

Table 5: Different wood products produced in carpenter unit

Sl. No.	Products	Percentage	Number of carpenter shop
1	Doors	16.6	10
2	Door Frames	16.6	10
3	Windows	16.6	10
4	Sofa set	16.6	10
5	Dinning set	13.3	08
6	Cot	15	09
7	Roofing	3.33	02
8	Book Stand	1.66	01

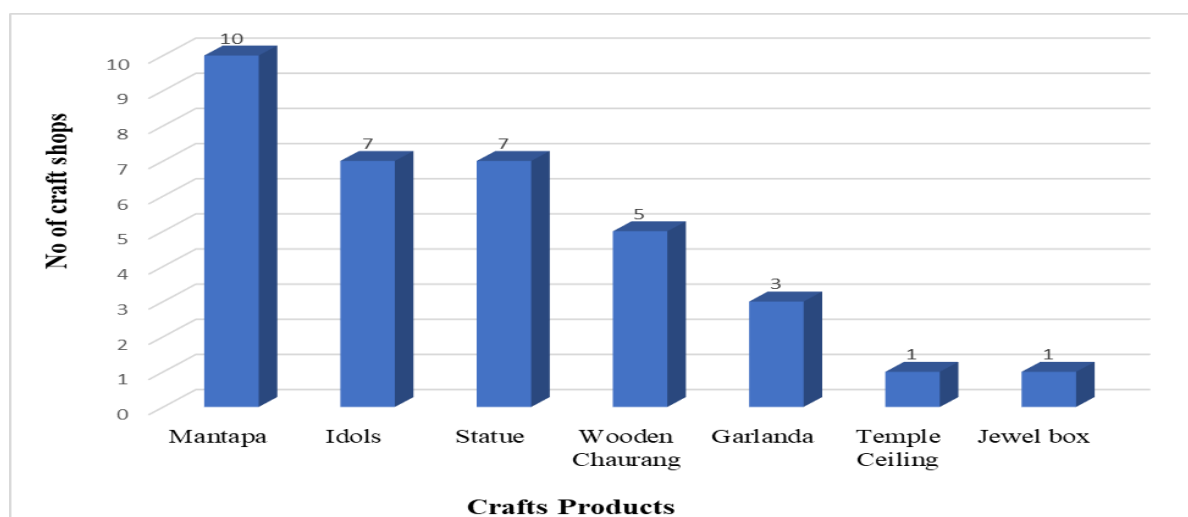


Fig 7: Different Wood products produced in crafts shop

Summary and Conclusion

The present investigation was undertaken to assess the pattern of wood utilization and its value addition in Sirsi taluk of Uttar Kannada district of Western Ghat region. The total of 19 trees species belonging to 8 families used by the carpenter and crafts shop for different purposes was documented. Among the different products manufactured, *Tectona grandis* is used to produce maximum number of products (Thirteen) followed by *Dalbergia latifolia* (Ten), *Artocarpus heterophyllus* (Nine) and *Terminalia tomentosa*, *Terminalia paniculata*, *Acaciasps* (Seven). Waste generated in the carpenter and craft shops are saw dust (100%), waste-wood (95%), wood chips (95%) and wood flakes (75%); sawdust are pulverized and made into agarbatti, dhoop and also used as stuffing material in garlands

production rest other wastes are used as firewood. The average roundwood price (per cubic feet) of *Tectonagrandis*, *Dalbergia latifolia*, *Dalbergia sisoo*, *Artocarpus heterophyllus*, *Pterocarpus marsupium*, *Terminalia tomentosa*, *Terminalia paniculata* are high (> Rs. 1400); whereas, the price of *Artocarpus hirsutus*, *Xylia xylocarpa*, *Acacia nilotica*, *Eucalyptus* spp. is low. Most of the firms sold their product on the local market (56%), neighbourhood market (32%), on domestic market (10%) and remaining for foreigners (2%). Among workers who involved in carpentry works, 46 per cent are experienced back pain, 20 per cent of breathing problem, 18 per cent of eye problem, 9 per cent nasal problem and 7 per cent allergy problem. Among twenty respondents, 40 per cent have participated in informal training to become an artisan under the

guidance of the family members; whereas, only 35 per cent of the respondents have undergone formal training process of government. From this study it is concluded the *Tectona grandis*, *Pterocarpus marsupium*, *Acacia hybrid*, *Terminalia tomentosa* and *Terminalia paniculata* were highly demanding species by the local people and in the market.

Hence, the recommendation can be made to the forest department for raising these species in huge quantity and to the farmers to raise these species in their farmlands to meet the demand and also to increase their income; so that we can reduce the pressure on natural forests and also helps in conservation of our vast biodiversity. Least utilized species such as *Vitex altissima*, *Xylia xylocarpa*, *Acacia nilotica*, *Eucalyptus* spp. and *Artocarpus hirsutus* must be promoted by describing their utilitarian value among the people.

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