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## Survey and documentation of timber yielding plant species raised on farm lands of Bharangi Village, Sorab Taluk, Shivamogga district, Karnataka

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### Abstract

Trees are the essential component of the indigenous agricultural systems and they are preserved or managed to meet the immediate needs of the population. The present study was undertaken to document the timber yielding species and pattern of utilization in Bharangi village. The total of 35 timber yielding species belonging to 17 families was documented. Maximum number of farmers preferred to grow *Tectona grandis* (80.0%) and *Mangifera indica* (63.33%) on their farms lands. Among the total 35 timber yielding species, maximum number of species (25) was utilized for agricultural implements and fuel wood. followed by house construction (23), furniture (10) and least for ply wood and decorative articles (4). Hence, it's essential to raise the quality seedlings of most preferable species by the forest department nurseries and private nurseries for providing seedlings to farmers for planting purpose and in turn to reduce the pressure on forests and to conserve biodiversity.

**Keywords:** trees, timber, furniture, agricultural implements, utilization

### 1. Introduction

India is one of the world's 'mega diversity' country and ranks ninth in the world in terms of higher plant species richness. At the ecosystem level, India is also well-endowed, with ten distinct biogeography zones. It also contains four of the world's biodiversity hotspots, because of their extraordinarily high levels of species-richness and endemism, and threatened status. India is a mega diverse nation and land of around 10% of world's species. It also has a rich cultural heritage traced back to thousands of years. Much of Indian biodiversity is intricately related to the socio-cultural practices of the land. The total forest cover of the country is 712249 sq km which is 21.67% of the geographical area of the country. The tree cover of the country is estimated as 95027 sq km which is 2.89% of the geographical area. The total forest and tree cover of the country is 807276 sq km which is 24.56% of the geographical area of the country (Anon, 2019) [2]. As per national Forest Policy, 1952, India should maintain 33 per cent forest cover for maintaining ecological balance. But due to shortage of land area for establishment of forest, the alternative option is raising of forest trees along farm bunds and inclusion of trees as a part of farming systems.

Trees are the essential component of the indigenous agricultural systems. Most of these species are preserved or managed to meet the immediate needs of the population such as timber, food, medicines, income, agricultural materials and ecological needs. The role of trees in maintaining stability in ecosystem has come to the forefront in the each for solution to environmental degradation (Ajake and Anim, 2012) [1]. The integration of trees into farming system remains relevant in the on-farm biodiversity conservation strategy and the expansion of the production of many fruits, vegetables, medicinal plant and bush meat. Gregersen *et al.* (1989) [5] indicated that trees introduced into farming systems can help improve the productivity of farmlands by fixing nitrogen, providing green manure and reducing wind erosion and soil moisture loss especially when they are used in shelter belts or windbreaks. In some parts of the world, farmers have planted trees as hedgerows at intervals along the contour to transform a permanent cropping with increased yields and income. Therefore, trees in farming systems have significant role in the socio economic activities of the people and constitute the basis of forest resources management.

Since time immemorial human beings are depending on the plants for food, shelter and medicine. Wood/timber as a raw material offered precious services to man from the time of his

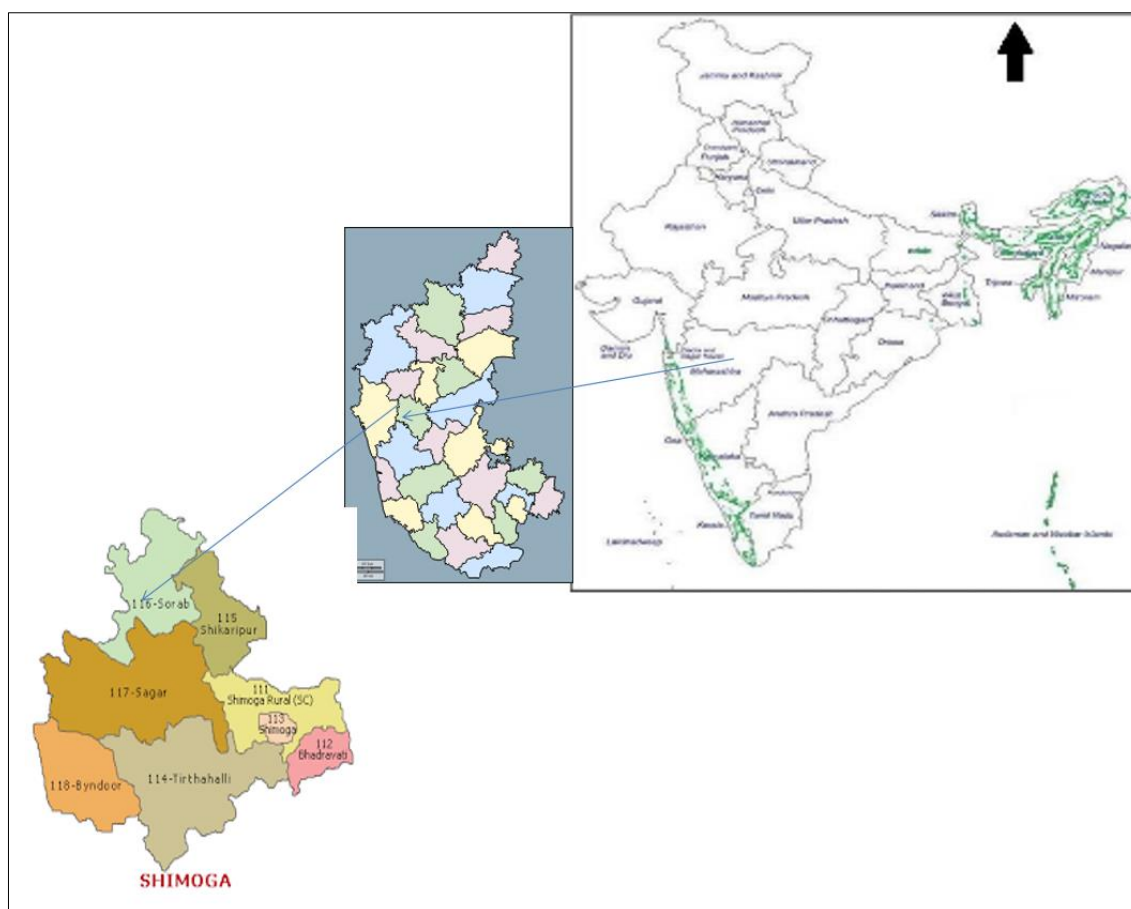
appearance on earth, and has decisively contributed to his survival and to the development of civilization. The list of present uses of wood/timber is very long. Aside from lumber for construction and furniture, poles, bridge timbers, wood is also manufactured into veneer, composite wood and used for fuel wood, agricultural implements, handicrafts, packing cases, toys, *etc* (Tsoumis, 1968) [10]. Hence, the present study was undertaken to create baseline information of different timber yielding species growing on farmlands and the purposes for which they are utilized by the local people.

## 2. Materials and Methods

The study was carried out in Bharangi village, Soraba taluk is located at 14°33'09" N 74°14'54" E in Shivamogga district of Karnataka, India. It has an average elevation of 580 m (Fig.1).

Sorbar taluk is embedded different forest types varying from dry deciduous to semi-evergreen forests with rich biodiversity. Most of the people living in the village belongs to farming community and depend on farm lands for food, income, timber, fuel wood, shelter, *etc*. But information regarding timber yielding plant species growing on farmlands and utilization of timber for various purposes is very limited.

This study was undertaken in Bharangi village of Soraba taluk during 2016-2017. About 30 families were sampled randomly based on size of land holding (Small, Medium and Large). Information regarding timber yielding plant species growing on farmlands and utilization of timber for various purposes and other relevant information was collected from different categories of families by participatory discussion method through the questioner survey (Hanumantha *et al.*, 2019; Doddabasawa *et al.*, 2018) [6, 3].



**Fig 1:** Location map of study area

## 3. Results and Discussion

During survey, 35 timber yielding species belonging to 17 families were documented and which are used for various purposes by the local farmers. The timber species growing on farmlands along with their families and purpose for which they were used are represented in Table 1. The major timber yielding species grown and utilized are *Tectona grandis*, *Mangifera indica*, *Azadirachta indica*, *Melia dubia*, *Pterocarpus marsupium*, *Pongamia pinnata*, *Artocarpus heterophyllus*, *Santalum album*, *Tamarindus indica* and *Acacia auriculiformis* and least are *Albizia odoratissima* and *sapindus mukorossi* (Fig 2). The major timber yielding species grown and utilized by the farmers were falling under families of Fabaceae (17%), Mimosaceae (17%), Moraceae (11%) and Meliaceae (9%) (Fig 3). *Tectona grandis*,

*Mangifera indica*, *Azadirachta indica*, *Melia dubia* species are mainly preferred by farmers due to its timber value, fast growing nature, multiple uses and their better performance in Bharangi village. These results are similar to the study conducted by Hanumantha *et al.* (2018) [7]. They documented timber species utilization pattern in Siddapur taluk of Karnataka and reported *Artocarpus heterophyllus*, *Calophyllum apetalum* and *Acacia auriculiformis* are the major species used by the local people and falling under families of Clusiaceae, Combretaceae and Mimosaceae. Harish Kumar and Kiran (2016) [8] during their survey and documentation reported 27 timber yielding species falling under 13 families in Bhadravathi taluk, Karnataka. Major timber yielding species recorded were *Acacia auriculiformis*, *Azadirachta indica*, *Pongamia pinnata* and *Tectona grandis*.

In this study, maximum number of farmers preferred *Tectona grandis* (80.0%) followed by *Mangifera indica* (63.33%), *Azadirachta indica* (60.0%) and *Melia dubia* (50.0%) on their farms lands and least preferred are *Albizia odoratissima* (10%) and *Sapindus mukorossi* (10%) (Table 2 and Fig 2). *Tectona grandis* and *Melia dubia* is mainly preferred due to its fast growing nature, good timber properties and market price; whereas mango and neem are grown for multiple uses such as fruits, shade, timber since olden days. These results are similar with the study conducted by Shivanna *et al.* (2005) [9]. They reported 31 to 39 per cent of the farmers in Gadag district prefer *Azadirachta indica* on their farmlands followed by *Acacia nilotica* (28 to 31%). Among the total 35 timber yielding species, maximum number of species (25) were utilized for agricultural

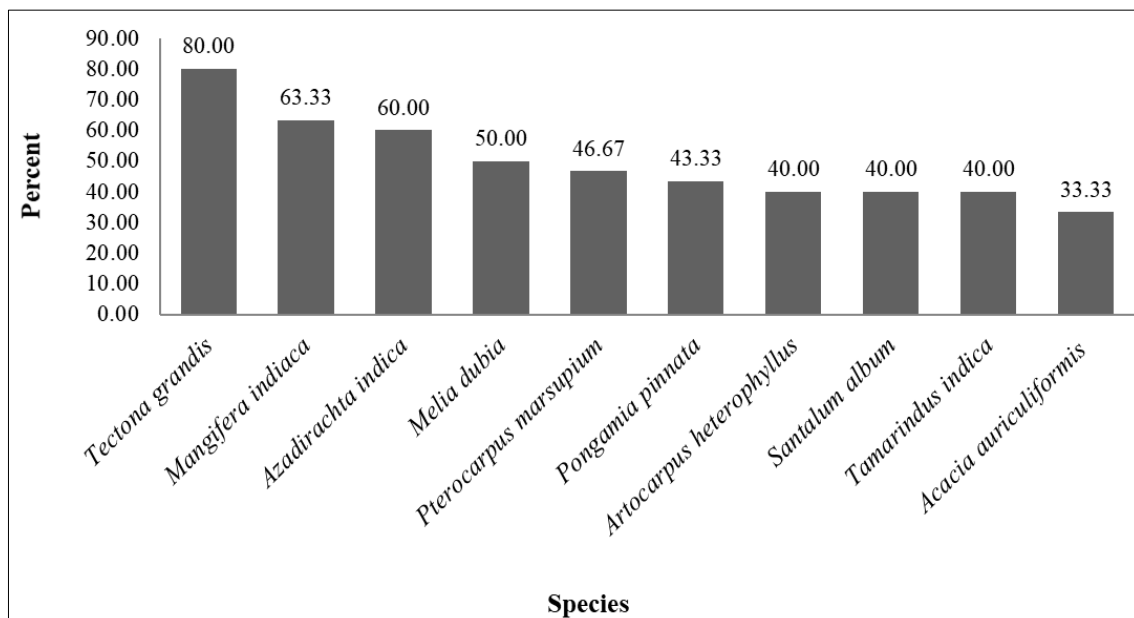
implements and fuel wood followed by house construction (23), furniture (10) and least for ply wood and decorative articles (4) (Fig 4). Majority of the timber species are used for more than three purposes except *Sapindus mukorossi*, *Pongamia pinnata*, *Areca catechu*, *Cocos nucifera*, *Gliricidia sepium* and *Cordia myxa* because of its other uses. A similar study of documentation of traditional wood consumption pattern in Anaocha, Nigeria was done by Emeka *et al.* (2016) [4]. In this study they reported that timber yielding species are mainly used for house construction, furniture, musical instruments and for fuel wood. Hanumantha *et al.* (2018) [7] reported utilization of timber yielding species by the rural people for furniture's, wooden articles, doors and windows, agricultural implements, fencing and construction purpose in Siddapur village, Karnataka.

**Table 1:** Important timber yielding species raised on farmland in Bharangi village, Soraba taluk, Shimoga district

Sl. No.	Scientific Name	Common Name	Family Name	Purpose for which the timber of the species is used
1	<i>Acacia auriculiformis</i>	Acacia	Mimosaceae	House construction, Furniture, Fuel wood
2	<i>Acacia farnesiana</i>	Sanna Jali	Mimosaceae	Agricultural implements, Cart parts, Fence, Fuel wood
3	<i>Acacia nilotica</i>	Jaali	Mimosaceae	Agricultural implements, House construction, Fence, fuel wood
4	<i>Albizia lebbek</i>	Bage mara	Mimosaceae	Agricultural implements, House construction, Fuel wood
5	<i>Albizia odoratissima</i>	Bilwara	Mimosaceae	Agricultural implements, House construction, Furniture
6	<i>Albizia procera</i>	Bili Bage	Mimosaceae	Agricultural implements, House construction, Fuel wood
7	<i>Areca catechu</i>	Arecanet	Arecaceae/Palmae	House construction
8	<i>Artocarpus heterophyllus</i>	Halasu	Moraceae	Agricultural implements, House construction, Mantapa
9	<i>Artocarpus hirsitus</i>	Hebbalasu	Moraceae	House construction, Furniture, Fire wood, Cots
10	<i>Azadirachta indica</i>	Neem	Meliaceae	Agricultural implements, House construction, Fuel wood
11	<i>Bambusa arundinacea</i>	Hebbiduru	Poaceae/Graminae	House construction, Ladder, Poles, Chairs, Baskets
12	<i>Butea monosperma</i>	Muttuga	Fabaceae	Agricultural implements, Planks, Fuel wood
13	<i>Casuarina equisetifolia</i>	Galimara	Casuarinaceae	Agricultural implements, Poles, Planks, Fuel wood
14	<i>Chukrasia tabularis</i>	Garige	Meliaceae	Agricultural implements, Fuel wood, House construction
15	<i>Cocos nucifera</i>	Coconut	Arecaceae/Palmae	House construction, Fuel wood
16	<i>Cordia myxa</i>	Hasirugonne	Boraginaceae	House construction, Fuel wood
17	<i>Dalbergia sissoo</i>	Sissoo	Fabaceae	Agriculture implements, Furniture, Ply wood, Fuel wood
18	<i>Eucalyptus tereticornis</i>	Neelagiri	Myrtaceae	Agriculture implements, House construction, Poles, Fuel wood
19	<i>Ficus racemosa</i>	Attigida	Moraceae	Agriculture implements, House construction, Poles, Fuel wood
20	<i>Ficus religiosa</i>	Arali	Moraceae	Furniture, Packing cases, Fuel wood
21	<i>Gliricidia sepium</i>	Gobbarada gida	Fabaceae	Fuel wood, Poles
22	<i>Grevillea robusta</i>	Silver Oak	Proteaceae	Agricultural implements, Poles, Ply wood
23	<i>Grewia tilifolia</i>	Tadasalu	Tiliaceae	Agricultural implements, Fuel wood
24	<i>Holoptelia integrifolia</i>	Tapasi	Ulmaceae	Agricultural implements, House construction, Boxes, Cart parts
25	<i>Lannea coromandelica</i>	Gojjalu	Anacardiaceae	House construction, Furniture, Decorative articles
26	<i>Mangifera indiaca</i>	Mango	Anacardiaceae	Agricultural implements, House construction, Fuel wood, Plywood
27	<i>Melia dubia</i>	Hebbevu	Meliaceae	Agricultural implements, Boxes, Packing caes, Poles, Ply wood
28	<i>Pongamia pinnata</i>	Honge	Fabaceae	Agricultural implements, Fuel wood
29	<i>Pterocarpus marsupium</i>	Honne	Fabaceae	Agricultural implements, House construction, Furniture, Fuel wood
30	<i>Santalum album</i>	Sandal/Sreegandha	Santalaceae	Jewel cases, God idols, Decorative articles, Small chariot
31	<i>Sapindus mukorossi</i>	Soapnut	Sapindaceae	Agricultural implements, Fuel wood,
32	<i>Syzygium cumini</i>	Nerale	Myrtaceae	Agricultural implements, House construction, Cart parts, Fuel wood
33	<i>Tamarindus indica</i>	Hunase	Fabaceae	Agricultural implements, House construction, Wells frame, Fuel wood
34	<i>Tectona grandis</i>	Teak/Sagavani	Verbenaceae	House construction, Furniture, Decorative articles
35	<i>Terminalia paniculata</i>	Kindal	Combretaceae	Agricultural implements, House construction, Furniture, Fuel wood

**Table 2:** Percent of farmers raising different timber yielding species on their farmlands in the Bharangi village, Soraba taluk

SL No.	Scientific Name	No. of farmers raised on farmlands	Per cent of farmers raised on farmlands
1	<i>Acacia auriculiformis</i>	10	33.33
2	<i>Acacia farnesiana</i>	5	16.67
3	<i>Acacia nilotica</i>	9	30.00
4	<i>Albizia lebbek</i>	6	20.00
5	<i>Albizia odoratissima</i>	3	10.00
6	<i>Albizia procera</i>	6	20.00
7	<i>Areca catechu</i>	4	13.33
8	<i>Artocarpus heterophyllus</i>	12	40.00
9	<i>Artocarpus hirsutus</i>	4	13.33
10	<i>Azadirachta indica</i>	18	60.00
11	<i>Bambusa arundinacea</i>	6	20.00
12	<i>Butea monosperma</i>	5	16.67
13	<i>Casuarina equisetifolia</i>	7	23.33
14	<i>Chukrasia tabularis</i>	5	16.67
15	<i>Cocos nucifera</i>	7	23.33
16	<i>Cordia myxa</i>	4	13.33
17	<i>Dalbergia sissoo</i>	8	26.67
18	<i>Eucalyptus tereticornis</i>	8	26.67
19	<i>Ficus racemosa</i>	4	13.33
20	<i>Ficus religiosa</i>	5	16.67
21	<i>Gliricidia sepium</i>	7	23.33
22	<i>Grevillea robusta</i>	4	13.33
23	<i>Grewia tilifolia</i>	4	13.33
24	<i>Holoptelia integrifolia</i>	4	13.33
25	<i>Lanea coromandelica</i>	3	10.00
26	<i>Mangifera indica</i>	19	63.33
27	<i>Melia dubia</i>	15	50.00
28	<i>Pongamia pinnata</i>	13	43.33
29	<i>Pterocarpus marsupium</i>	14	46.67
30	<i>Santalum album</i>	12	40.00
31	<i>Sapindus mukorossi</i>	3	10.00
32	<i>Syzygium cumini</i>	7	23.33
33	<i>Tamarindus indica</i>	12	40.00
34	<i>Tectona grandis</i>	24	80.00
35	<i>Terminalia paniculata</i>	10	33.33

**Fig 2:** Percent of farmers raising different timber yielding species (top 10) on their farmlands in Bharangi village, Soraba taluk

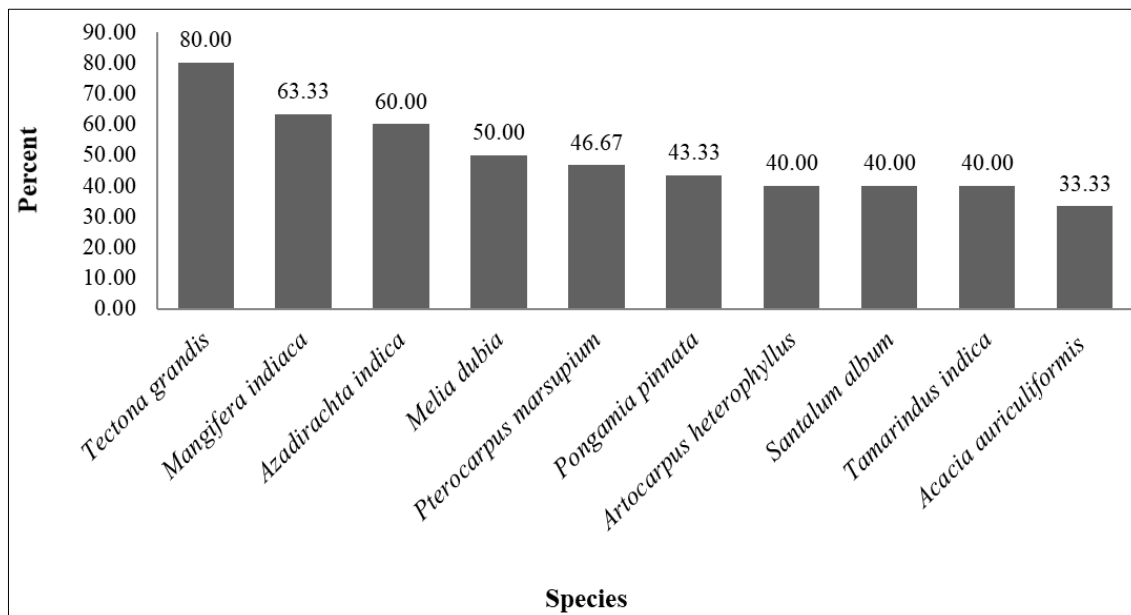


Fig 3: Per cent of timber yielding species falling under different families

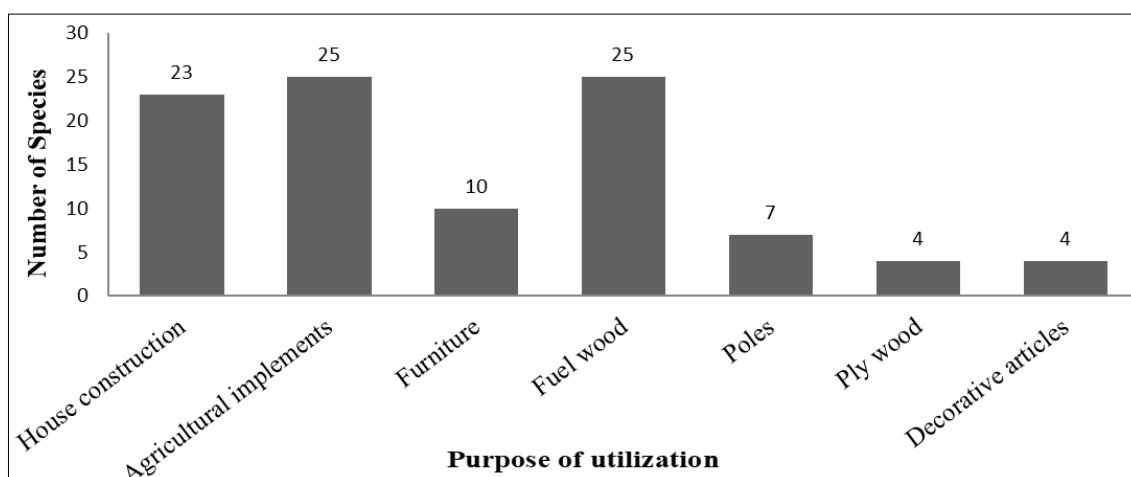


Fig 4: Number of timber yielding species utilized for different purposes

#### 4. Conclusion

The present study was undertaken to document the timber yielding species raised in farm lands and pattern of timber utilization in Bharangi village of Soraba taluk, Shivamogga district. The total of 35 timber yielding species belonging to 17 families is documented and which are used for various purposes by the local farmers for their livelihood. From this study it is observed that the major timber yielding species grown and utilized are *Tectona grandis*, *Mangifera indica*, *Azadirachta indica*, *Melia dubia* and *Pterocarpus marsupium*. The maximum number of species falling under families of Fabaceae (17%), Mimosaceae (17%), Moraceae (11%) and Meliaceae (9%). Among the total 35 timber yielding species, maximum number of species (25) were utilized for agricultural implements and fuel wood. Hence, it is essential to raise the quality seedlings for providing to farmers by the forest department and private nurseries for planting and establishment plant resources. It helps in reducing the pressure on forests, conservation of biodiversity, storing carbon for long term and to reduce the impact of climate change on the environment. Creation of awareness is essential among local people regarding the multiple uses, and utilization pattern of lesser known species to control of over harvesting of selected/preferred species.

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