International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 07-06-2021, Accepted: 22-06-2021, Published: 09-07-2021
Volume 6, Issue 4, 2021, Page No. 106-116

Survey of some timber yielding plants of district Rampur UP, India with special reference to their commercial value

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Abstract
The present study is based on the preliminary survey on timber yielding plants of six tehseel of district Rampur during 2019-2020. The study reports on 27 timber yielding plants belonging to 48 species and 21 families, along with their utility. Among all families Moraceae is dominant with 10 species followed by Myrtaceae and Mimoceae with 5 and 4 species respectively. Peoples of this area possess good knowledge of plants used for different purposes, but their continuous exposure to modernization may result in extinction of the species. The survey of this study concluded that, all parts of plant including root, shoot, bark, leaves fruits etc. can be used for packaging, paneling, carriages, furniture, and carpentry of all kinds and traditional medicinal purpose which will promote forest conservation and plant diversity research through extensive survey, aforestation, reforestation and forest rehabilitation. Apart from this, in future, study will be utilized as a reference of plant species distribution and availability in Rampur District of Uttar Pradesh India.

Keywords: timber yielding plants, ethnobotany, woods, survey, taxonomy, ecology, district Rampur

Introduction

India is one of the 12th mega-biodiversity centers in the world and consists of 17,000 flowering plant species. It accounts for 8% of the global biodiversity with only 2.4 % of the total land area in the world (Reddy, 2008; Hajra and Mudgal, 1997). Some important forestry species that need immediate attention for conservation in India for human being (Kharkwal, 2009). The importance of plants as the source of wood, clothing and shelter is unchallenged. Timber is an important plant product which has been in the service of mankind since the dawn of civilization and has contributed much to its advancement. The primitive man used timber to construct his crude shelter as well as to design various implements, utensils and rough boats for his use. One of the most significant uses has been the construction of ships from wood and which has contributed immensely in the discovery of new continents and in shaping the history of the world.

Timber, the wood of commercial importance, is one of the most valuable and versatile raw materials used by the man. It plays a vital role in the economic and industrial development of a nation. Timber is relatively cheaper, light in weight and can be modified easily with various tools. It is tough, elastic and poor conductor of heat, electricity and moisture. These properties increase its utility in various industries. Besides, wood is also an important source of many other useful products. Properties of timber are determined by the kind and disposition of its cells, nature of the walls and structural configuration of the cells. Suitability of the wood for various purposes is determined on the basis of its qualities.

Rampur district is situated in the west-northen part of the Uttar Pradesh. The Rampur district is lying between 78.54' longitude East and 28.25' latitude North. The district is bounded on the North by Udhamsingh Nagar district of Uttrakhand, on the South by Bandaun district, on the East by Bareilly district and on the West by Moradabad district. The area of Rampur district is 2367 sq.km. The height from sea level is 192 Meter in north and 166.4 m in South. Situated on the national highway 24, the state capital is 302 km in East and national capital is 185 km in West. Rampur district have 06 tehseels namely Sadar Rampur, Milak, Swar, Tanda, Shahbad and Bilaspur. (Figure 1). During summer the temperature is usually from 31ºC to 35ºC and during winter it is from 25ºC to 5ºC

Timber had considerable importance in the livelihood of ancient people, use of wood in making several things such as agricultural implements, boat building, handicrafts, packing cages, toys, construction, furniture, instruments, turnery, carving, etc (Ambasta, 1992; Anonymous, 1948-1976; Asolkar, *et al*. 1992; Vijigiri Dinesh and Sharma. 2012). The timber obtained from plants is used mainly for the construction of house and making furniture. This wood is called as timber (Anonymous, 2020). Urbanization and industrial expansion all these reasons for the loss of timber in the Rampur district. Therefore an attempt has been made to document timber with their multi-use in the study area. The contribution of our interest are reported in the works of following scientists (Bose, *et al*., 1985; Chaudhary, *et al*., 2014; Maliya, 2011; Mishra and Pal, 2010).


UTTAR PRADESH
DISTRICT MAP
UTTARAKHAND
CHINA (TIBET)
NEPAL
HARYANA
RAJASTHAN
MADHYA PRADESH
BIHAR
JHARKHAND
CHHATTISGARH
Lucknow
LEGEND
International Boundary
State/UT Boundary
District Boundary
State Capital
District Headquarter
Map not to Scale
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INDIA
States and Union Territories
TAJIKISTAN
AFGHANISTAN
PAKISTAN
CHINA (TIBET)
NEPAL
BHUTAN
BANGLADESH
MYANMAR (BURMA)
SRI LANKA
LADAKH
Srinagar
Leh
JAMMU & KASHMIR
Jammu
HIMACHAL PRADESH
Shimla
PUNJAB
Chandigarh
Dehradun
UTTARAKHAND
HARYANA
DELHI
New Delhi
UTTAR PRADESH
Lucknow
Jaipur
RAJASTHAN
SIKKIM
Gangtok
Itanagar
ARUNACHAL PRADESH
Dispur
ASSAM
NAGALAND
Kohima
Shillong
MEGHALAYA
Imphal
MANIPUR
Agartala
TRIPURA
Aizawl
MIZORAM
BIHAR
Patna
JHARKHAND
Ranchi
WEST BENGAL
Kolkata
Gandhinagar
GUJARAT
Bhopal
MADHYA PRADESH
Raipur
CHHATTISGARH
ODISHA
Bhubaneswar
BAY OF BENGAL
Daman
Silvassa
DAMAN & DIU
DADRA & NAGAR HAVELI
MAHARASHTRA
Mumbai
TELANGANA
Hyderabad
Amaravati
Yanam (Puducherry)
ARABIAN SEA
Panaji
GOA
KARNATAKA
ANDHRA PRADESH
Bengaluru
Chennai
PUDUCHERRY
Mahe (Puducherry)
TAMIL NADU
Karaikal (Puducherry)
KERALA
LAKSHADWEEP (INDIA)
Kavaratti
Thiruvananthapuram
Palk Strait
ANDAMAN & NICOBAR ISLANDS (INDIA)
Port Blair
International Boundary
State/UT Boundary
Country Capital
State/UT Capital
Map not to Scale
INDIAN OCEAN
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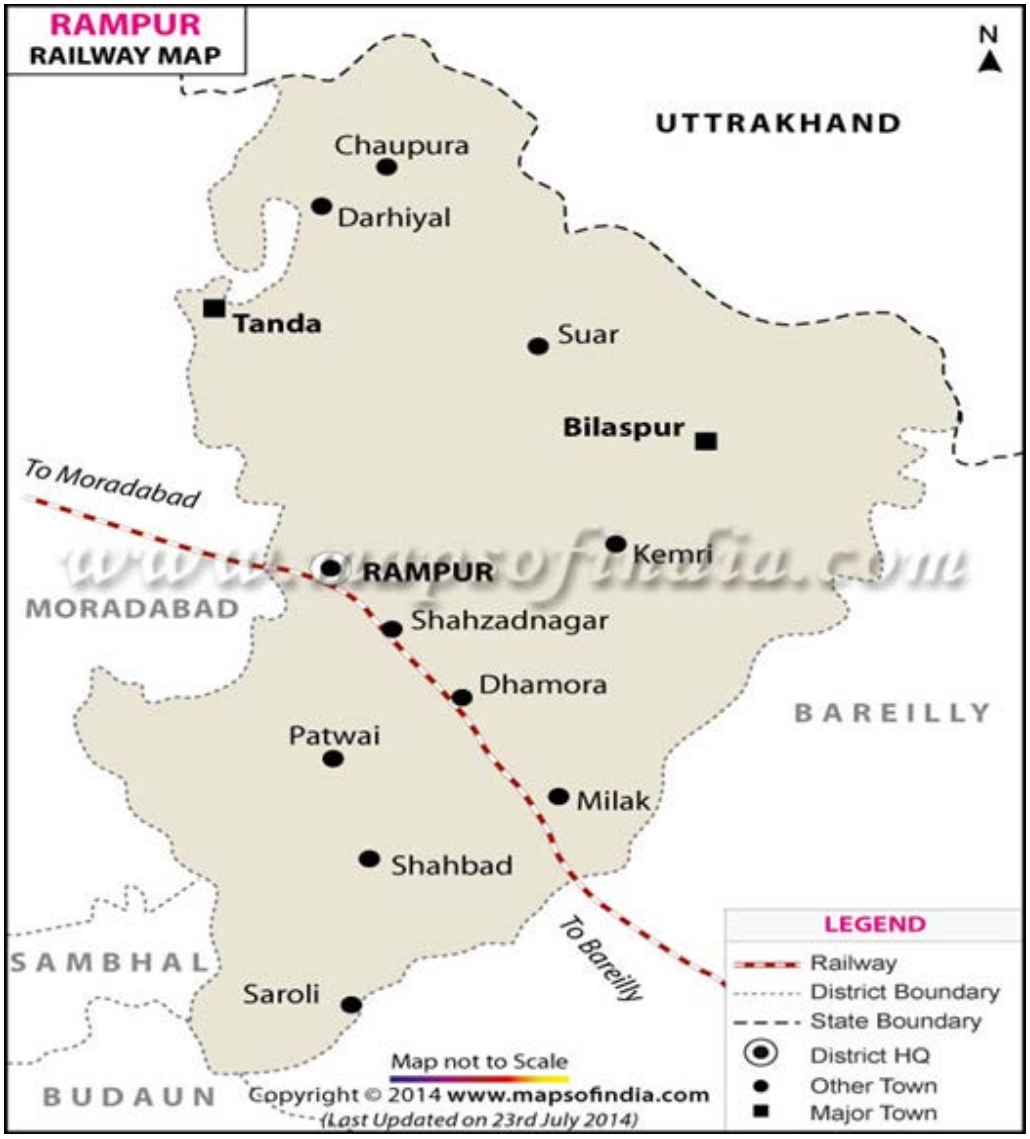


Fig 1: Map of study area district Rampur U.P

Material and Methodology

The plant Twigs collected from the different part of the district and preservation was done with the help of alcohol and $HgCl_2$. The preserved plant twig pasted on the herbarium sheets with the help of "Glue" and after it stretching is done on the Herbarium Sheets and then preserved in the Herbarium of Mohammad Ali Jauhar University Rampur, U.P India. The identification of timber species have been done with the help of regional floras and existing literature (Brandis, 1906; Chakraverty and Jain, 1984; Krishen, 2006; Newton and Oldfield, 2008; Prasanna, *et al*., 2012; Santapu, 2008;) different online databases such as The International Plant Name Index (Anonymous, 2020). The values and multipurpose use of the particular species have been assessed by interviewing the local persons as well as from published work from the area (Bose, *et al*., 1985; Chaudhary, *et al*., 2014; Maliya, 2011; Mishra and Pal, 2010).

Results and Discussion

The results of present study was shown by Table-1 and Table-2 (Plate-1 and Plate-2). It is observed that 48 Angiospermic timber yielding plants belong to 21 families. All families and number of plants which were mentioned here according to the serial number. The detailed family wise distribution of timber yielding plants species were presented by Figure 2. The highest number of timber yielding plants was recorded in families Moraceae which contains 10 plants (Figure 2). The results of the present study shown many families of timber yielding plants arranged according to the number of plant in decreasing order (Figure 2). Moraceae (10 spp.), Myrtaceae (5 spp.), Mimosaceae (4 spp.), Caesalpiniaceae, & Meliaceae (3 spp. Each.), Papilionaceae, Rutaceae, Annonaceae, Rubiaceae, Sapotaceae, Lamiaceae & Rosaceae (2 spp. each.) and Boraginaceae, Bombaceae, Casuarinaceae, Ulmaceae, Moringaceae, Anacardiaceae, Rhamnaceae, Combretaceae, &, Phyllanthaceae, (1 spp. Each). Detailed chart according to plant vegetation type is show in Figure 3. From the present result, the highest number of timber yielding plants was deciduous type. Number / percentage of allied vegetation type of deciduous plants were recorded as (26/54%), evergreen (13/27%), semi-deciduous (7/15%), semi-evergreen (2/4%), (Figure 3).

From the present result, analysis on origin status of the flora of district Rampur reveals that 29 (60.42%) timber yielding plants were represented by the Native species, while 19 (39.58%) plant species were represented by exotic type. Detailed chart according to plants origin status (ecological parameters) was shown in Figure 4.

The utility of plants were shown by Table-2. It is observed that 48 Angiospermic timber yielding plants arranged according to their utilities. Detailed chart according to plant Utility is show in Figure 5. From the present result it is revealed that, the highest utility of timber were recorded in house construction and minimum in packing boxes.

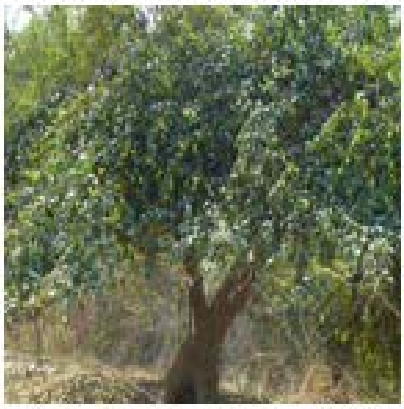
Number / percentage of allied utility are given as follows House Construction (43/89.58%), Furniture (40/83.33), Pole and Sticks (25/52.08), Agriculture Implements (19/39.58), Packing Boxes (16/33.33).

(10) *Azadirachta indica* A. Juss.

(11) *Aegle marmelos* (L.) Corr.

(12) *Mangifera indica L.*

(13) *Melia azedarach L.*



(14) *Ziziphus jujuba Mill.*

(15) *Toona ciliata* M. Roem.

(16) *Terminalia arjuna* W & A.

(17) *Tectona grandis* L.f.

(18) *Syzygium cumini* (L.) S.

(19) *Tamarindus indica L.*

(20) *Polyalthia longifolia*

(21) *Morus nigra L.*


(22) *Cassia fistula L.*


(23) *Ficus carica L.*


(24) *Acacia farnesiana* (L.)

Plate 1 showing common medicinal plant of district Rampur


(1) *Ficus religiosa L*


(2) *Ficus virens* Aiton


(3) *Ficus racemosa L.*


(4) *Ficus benghalensis L.*


(5)*Eucalyptus globulus Labill.*


(6) *Dalbergia sissoo (Roxb.)*


(7) *Mangifera indica L.*


(8) *Melia azedarach L.*


(9) *Ziziphus jujuba Mill.*

Plate 2

Table 1: Some timber yielding plant in district Rampur U.P India

S. No.	Botanical Name	Family	Local Name	Origin status	Vegetation Type
1	*Ficus religiosa L.*	Moraceae	Pipal	Native	Deciduous
2	*Ficus virens* Aiton	Moraceae	Pakad	Native	Deciduous
3	*Ficus racemosa L.*	Moraceae	Goolar	Native	Semi-Deciduous
4	*Ficus elastica* Roxb. ex Hornem.	Moraceae	Rubber tree	Native	Evergreen
5	*Ficus benghalensis L.*	Moraceae	Bargad	Native	Evergreen
6	*Ficus carica L.*	Moraceae	Anjeer	Exotic	Semi-Deciduous
7	*Eucalyptus globulus Labill.*	Myrtaceae	Safeda	Exotic	Deciduous
8	*Eucalyptus camaldulensis Dehnh.*	Myrtaceae	Safeda	Exotic	Deciduous
9	*Cordia dichotoma* G. Forst.	Boraginaceae	Lassora	Native	Deciduous
10	*Dalbergia sissoo (Roxb.)*	Papilionaceae	Shisham	Native	Deciduous
11	*Delonix regia* (Hook.) Raf.	Caesalpiniaceae	Gulmohur	Exotic	Deciduous
12	*Bombax ceiba L.*	Bombacaceae	Semal	Native	Deciduous
13	*Butea monosperma* (Lam.) Taub.	Papilionaceae	Dhak	Native	Deciduous
14	*Cassia fistula L.*	Caesalpiniaceae	Amaltas	Native	Deciduous
15	*Casuarina equisetifolia L.*	Casuarinaceae	Jangli Saru	Exotic	Evergreen
16	*Callistemon viminalis* (Sol. ex Gaertn.) G. Don	Myrtaceae	Bottle Brush	Exotic	Evergreen
17	*Citrus maxima* (Burm.) Merr.	Rutaceae	Chakotara	Exotic	Semi-Deciduous
18	*Albizia lebbeck* (L.) Benth.	Mimosaceae	Siris	Native	Deciduous
19	*Artocarpus heterophyllus* Lam.	Moraceae	Kathal	Native	Evergreen

20	*Annona squamosa L.*	Annonaceae	Sharifa	Exotic	Semi-Deciduous
21	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Native	Semi-Deciduous
22	*Artocarpus lacucha* Buch.-Ham.	Moraceae	Barhal	Native	Semi-Evergreen
23	*Acacia nilotica* (L.) Delile	Mimosaceae	Babool	Exotic	Deciduous
24	*Acacia farnesiana* (L.) Willd.	Mimosaceae	Babool	Exotic	Deciduous
25	*Aegle marmelos* (L.) Corr.	Rutaceae	Bel	Native	Semi-Evergreen
26	*Haldina cordifolia* (Roxb.) Ridsdale	Rubiaceae	Haldu	Native	Deciduous
27	*Holoptelea integrifolia* (Roxb.) Planch.	Ulmaceae	Chilbil	Native	Deciduous
28	*Morus nigra L.*	Moraceae	Shatoot	Exotic	Deciduous
29	*Morus alba L.*	Moraceae	Shatoot	Exotic	Deciduous
30	*Moringa oleifera* Lam.	Moringaceae	Sahjan	Exotic	Deciduous
31	*Mitragyna parvifolia* (Roxb.) Korth.	Rubiaceae	Kaim	Native	Deciduous
32	*Madhuca longifolia* (J. Konig) J.F. Macbr.	Sapotaceae	Mahua	Native	Deciduous
33	*Mangifera indica L.*	Anacardiaceae	Aam	Native	Evergreen
34	*Melia azedarach L.*	Meliaceae	Bakain	Native	Semi-Deciduous
35	*Mimusops elengi L.*	Sapotaceae	Maulsari	Exotic	Evergreen
36	*Ziziphus jujuba Mill.*	Rhamnaceae	Ber	Native	Evergreen
37	*Toona ciliata* M. Roem.	Meliaceae	Toon	Native	Semi-Deciduous
38	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	Combretaceae	Arjun	Native	Evergreen
39	*Tectona grandis* L.f.	Lamiaceae	Sagaun	Native	Deciduous
40	*Syzygium cumini* (L.) Skeels.	Myrtaceae	Jamun	Native	Evergreen
41	*Tamarindus indica L.*	Caesalpiniaceae	Imli	Exotic	Evergreen
42	*Pyrus communis L.*	Rosaceae	Naspati	Exotic	Deciduous
43	*Polyalthia longifolia* (Sonn.) Thwaites	Annonaeace	Ashok	Native	Evergreen
44	*Prunus persica* (L.) Batsch	Rosaceae	Adoo	Exotic	Deciduous
45	*Psidium guajava L.*	Myrtaceae	Amrood	Exotic	Deciduous
46	*Pithecellobium dulce* (Roxb.) Benth.	Mimosaceae	Jangal Jalebi	Exotic	Evergreen
47	*Gmelina arborea* Roxb.	Lamiaceae	Gamari	Native	Deciduous
48	*Phyllanthus emblica L.*	Phyllanthaceae	Amala	Native	Deciduous

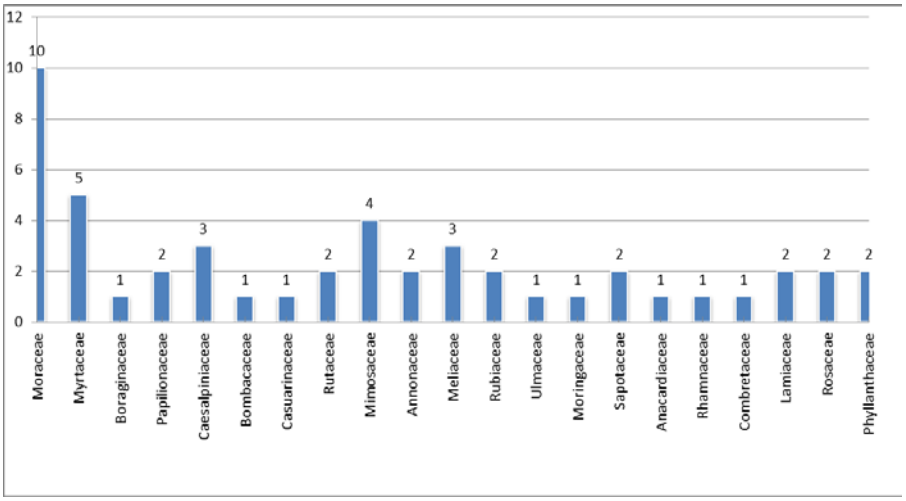


Fig 2: Family wise distribution of timber yielding plant

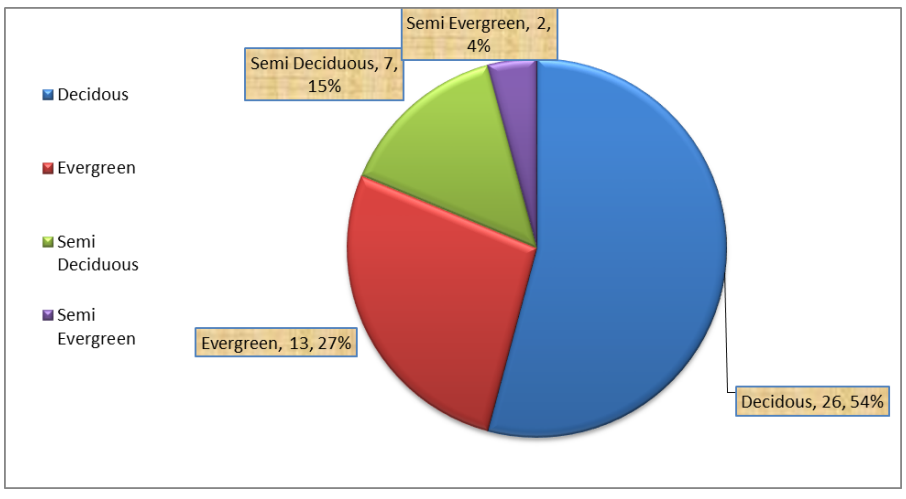


Fig 3: Vegetation type wise distribution of timber yielding plant

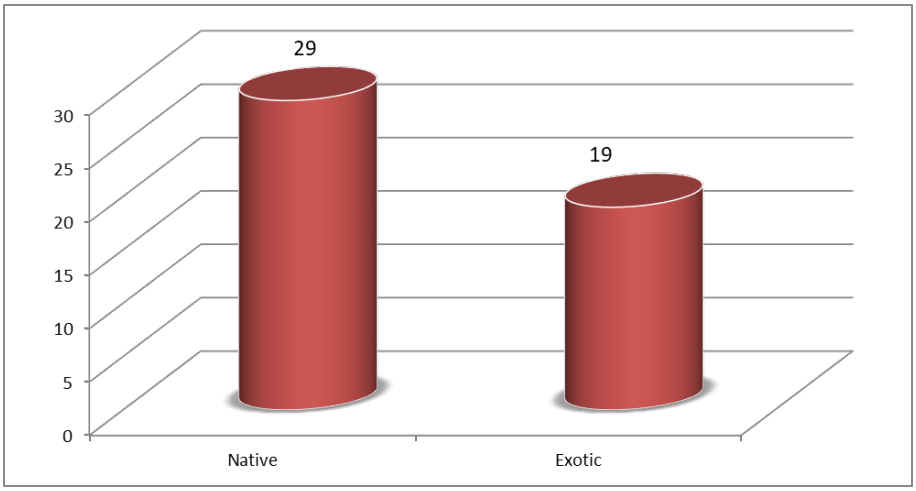


Fig 4: Origin status type wise distribution of timber yielding plant

Table 2: Timber Resources and their utility of trees found in District Rampur U.P India

Sr.No.	Botanical Name	Agriculture Uses	Furniture Implements	House Construction	Poles & Sticks	Packing Boxes
1	*Ficus religiosa L.*	✓	✓	✓	-	✓
2	*Ficus virens* Aiton	-	✓	✓	-	✓
3	*Ficus racemosa L.*	✓	✓	✓	-	✓
4	*Ficus elastica* Roxb. ex Hornem.	-	-	-	-	✓
5	*Ficus benghalensis L.*	-	✓	-	-	✓
6	*Ficus carica L.*	-	✓	✓	-	-
7	*Eucalyptus globulus Labill.*	✓	✓	✓	✓	-
8	*Eucalyptus camaldulensis Dehnh.*	✓	✓	✓	✓	-
9	*Cordia dichotoma* G. Forst.	-	✓	✓	-	✓
10	*Dalbergia sissoo (Roxb.)*	✓	✓	✓	✓	-
11	*Delonix regia* (Hook.) Raf.	✓	✓	✓	-	-
12	*Bombax ceiba L.*	✓	✓	✓	-	-
13	*Butea monosperma* (Lam.) Taub.	-	-	-	✓	✓
14	*Cassia fistula L.*	-	✓	✓	✓	-
15	*Casuarina equisetifolia L.*	-	✓	✓	-	-
16	*Callistemon viminalis* (Sol. ex Gaertn.) G. Don	-	-	-	✓	✓
17	*Citrus maxima* (Burm.) Merr.	-	✓	✓	-	-
18	*Albizia lebbeck* (L.) Benth.	✓	✓	✓	✓	-
19	*Artocarpus heterophyllus* Lam.	-	-	✓	-	✓
20	*Annona squamosa L.*	-	-	-	-	✓
21	*Azadirachta indica* A. Juss.	✓	✓	✓	✓	-
22	*Artocarpus lacucha* Buch.-Ham.	-	✓	✓	-	✓
23	*Acacia nilotica* (L.) Delile	✓	✓	✓	✓	-
24	*Acacia farnesiana* (L.) Willd.	✓	✓	✓	✓	-
25	*Aegle marmelos* (L.) Corr.	✓	✓	✓	✓	-
26	*Haldina cordifolia* (Roxb.) Ridsdale	-	✓	✓	-	-
27	*Holoptelea integrifolia* (Roxb.) Planch.	-	✓	✓	-	-
28	*Morus nigra L.*	✓	✓	✓	✓	-
29	*Morus alba L.*	✓	✓	✓	✓	-
30	*Moringa oleifera* Lam.	-	✓	✓	-	-
31	*Mitragyna parvifolia* (Roxb.) Korth.	-	✓	✓	✓	-
32	*Madhuca longifolia* (J. Konig) J.F. Macbr.	-	✓	✓	-	✓
33	*Mangifera indica L.*	✓	✓	✓	-	✓
34	*Melia azedarach L.*	✓	✓	✓	✓	-
35	*Mimusops elengi L.*	-	✓	✓	-	-
36	*Ziziphus jujuba Mill.*	-	✓	✓	✓	-
37	*Toona ciliata* M. Roem.	✓	✓	✓	✓	-
38	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	✓	✓	✓	✓	-
39	*Tectona grandis* L.f.	✓	✓	✓	✓	-
40	*Syzygium cumini* (L.) Skeels.	-	✓	✓	✓	-
41	*Tamarindus indica L.*	-	✓	✓	✓	-
42	*Pyrus communis L.*	-	-	✓	✓	✓
43	*Polyalthia longifolia* (Sonn.) Thwaites	-	✓	✓	✓	-
44	*Prunus persica* (L.) Batsch	-	-	✓	-	✓

45	*Psidium guajava L.*	-	-	✓	✓	-
46	*Pithecellobium dulce* (Roxb.) Benth.	-	✓	✓	✓	-
47	*Gmelina arborea* Roxb.	-	✓	✓	-	-
48	*Phyllanthus emblica L.*	-	✓	✓	-	✓

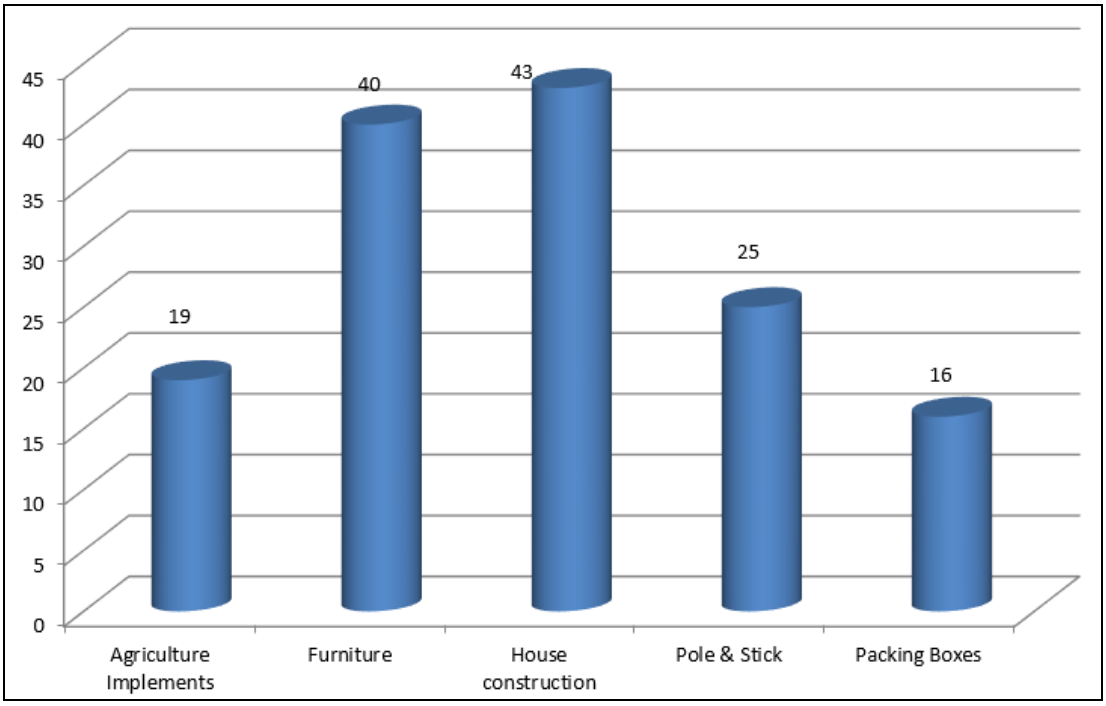


Fig 5: Timber yielding plants used for Different Purposes

Conclusion

The study provides the basic information about the timber yielding plants species, which are currently found in the district Rampur UP India. These plants species are important for the human being and sustenance of life. We observed that in timber yielding plants Native species are more than Exotic species in district Rampur. People of these area possess good information of plants used for different purposes, but their continuous exposure to modernization may result in extinction of species in future.

Acknowledgement

I am highly indebeted to “Dr. Gul Afshan”and “Dr. Farha Rehman” (Department of Botany, Mohammad Ali Jauhar University, Rampur U.P.), who appreciate me for sending this research paper. I would like to express my gratitude towards my parents, thanks to my younger brother for giving me such attention and time. My thanks and appreciations also go to my university.

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