

ISSN: 2594-3421 (Print), 2773-8191 (Online)



# **BMC JOURNAL OF SCIENTIFIC RESEARCH**

A Multidisciplinary Peer Reviewed Research Journal

---

Volume 6

December 2023

---



**Published by:**  
**Research Management Cell**  
Birendra Multiple Campus  
Bharatpur, Chitwan, Nepal

## **Research Management Cell**

|   |   |             |
|---|---|-------------|
| Prof. Dr. Sita Ram Bahadur Thapa        | - | Coordinator |
| Prof. Dr. Harihar Paudyal               | - | Member      |
| Prof. Arun Kumar Shrestha               | - | Member      |
| Prof. Dr. Krishna Prasad Paudyal        | - | Member      |
| Assoc. Prof. Dr. Dhaneshwar Bhattarai   | - | Member      |
| Assoc. Prof. Dr. Manoj Kumar Lal Das    | - | Member      |
| Assoc. Prof. Dr. Krishna Prasad Sapkota | - | Member      |
| Assoc. Prof. Dr. Ek Narayan Paudyal     | - | Member      |
| Assoc. Prof. Dr. Ganga Raj Pokhrel      | - | Member      |

### **Publisher:**

#### **Research Management Cell**

Birendra Multiple Campus, Bharatpur, Chitwan, Nepal

E-mail: [rmcbirendra@gmail.com](mailto:rmcbirendra@gmail.com)

Copyright © 2023:

#### **Research Management Cell**

Birendra Multiple Campus, Bharatpur, Chitwan, Nepal

**ISSN: 2594-3421 (Print), 2773-8191 (Online)**

Reproduction of this publication for resale or other commercial purpose is prohibited without prior written permission of the copyright holder.

Printed in **Siddhababa Offset Press**, Bharatpur, Chitwan, Nepal, Contact: 9855050040

**Price : 200/-**

## Contents

1. **Quality of Life Among Elderly People in Chitwan District, Nepal** 1-15  
Jiwan Kumar Poudyal, Dhanendra Veer Shakya, Sumitra Parajuli,  
Govinda Prasad Dhungana
2. **Theoretical Investigation of the Thermodynamic Properties of Lead-free Ternary Alloys Sn-Sb-Bi and their Subsystems** 16-30  
Sanjay Kumar Sah, Indu Shekhar Jha, Ishwar Koirala
3. **Surface Tension of Liquids (Water, Chloroform and Acetone) by Capillary Rise Method** 31-36  
Dipak Raj Adhikari, Tek Bahadur Budha, Anup Basnet,  
Shesh Kant Adhikari, Shiva Pd. Baral
4. **Study of Fiber Yielding Plants of Devchuli Municipality Ward no.13, Nawalparasi** 37-45  
Pooja Pokharel and Manoj Kumar Lal Das
5. **Study of Quality and Damping Factor at First and Second Resonance of Closed Organ Pipe** 46-54  
S.K. Adhikari
6. **Ethnobotanical and Phytochemical Study of *Houttuynia cordata* Thunb: A Review** 55-62  
Hari Devi Sharma, Janardan Lamichhane, Smriti Gurung and Balkumari Oliya
7. **Impact of Mandatory Corporate Social Responsibility on Beneficiary Institutions Satisfaction in Nepal** 63-72  
Sudip Wagle
8. **University Students' Knowledge and Attitudes about Plagiarism: A Web-Based Cross-Sectional Study** 73-81  
Hari Prasad Upadhyay, Bijay Lal Pradhan, Prativa Sedain
9. **Social Biases and Equity Investment Decisions of Individual Investors: Behavior Finance Perspective** 82-96  
Mohan Prasad Sapkota, Shiva Bhandari
10. **Customers' Trust in E-payment : The Influence of Security and Privacy** 97-112  
Omkar Poudel1, Pradeep Acharya and Daya Simkhada
11. **ARIMA and Exponential Smoothing Model to Forecast Average Annual Precipitation in Bharatpur, Nepal** 113-125  
Sarad Chandra Kafle, Ekta Hooda
12. **Impact of Intellectual Capital on Firms' Performance: With Perspective of Commercial Banks in Chitwan** 126-135  
Udaya Kumar Shrestha

13. **Impact of GDP and Inflation on Stock Market in India:  
A Case Study of BSE Index** 136-148  
Satyendra Kushwaha, Sarad Chandra Kafle, Baburam Khanal
14. **Awareness of People on Functions of Local Government in Nepal** 149-161  
Lila Prasad Limbu
15. **Gender Based Knowledge on the Reservation System in Nepal** 162-171  
Purnima Shrestha
16. 'परमानन्द' महाकाव्यमा छन्दविधान 172-179  
दामोदर रिजाल
17. योद्धा उपन्यासमा वर्गपक्षधरता 180-191  
प्रभा मरहट्टा कोइराला
18. विश्वेश्वरप्रसाद कोइरालाको 'सान्नाती' कथामा प्रजाति 192-200  
राजेन्द्र गिरी



## Study of Fiber Yielding Plants of Devchuli Municipality Ward no.13, Nawalparasi

Pooja Pokharel\* and Manoj Kumar Lal Das

Department of Botany, Birendra Multiple Campus

\*Corresponding author: pokharelpooja15@gmail.com

Received: July 23, 2023, Accepted: Nov. 1, 2023

### Abstract

*Ethnobotany deals with the study of the use of plants by humans and the relation between humans and vegetations. The indigenous people around the world have established their own local knowledge on plant utility, management and conservation since time immemorial. It has attracted much attention in recent years. In Devchuli-13 (Daldale) area, local people depend on fiber yielding plants in their daily life because most of them do farming and rearing animals. These plants are mostly used while collecting fodder and dried tree branches from the near forest or pasture lands. The total of 52 fiber yielding plants species belonging to 45 genera and 24 families has been documented among them. Poaceae family with 17 species is largest. Large number of plant species found are herbs (about 39%) are herbs followed by trees, shrubs and climbers. Among these plant 21 species are mostly used by the local people. Most of these plants are used for making ropes baskets, mats followed by making brooms. The most common parts used are whole plant of herbs, stem/bark of trees (xylem, phloem, cortical fibers) while roots are very rarely used. Large number of highly valuable plants are reported which can improve the economic condition of people or creating the scope for small businesses. Documentation of ethnobotanical knowledge of traditional practices is gradually going to disappear from the elder to younger generations. So, proper documentation of fiber yielding plants with their economic value is very important. Addressing these set of skill is very important to eradicate the immerging problem of unemployment.*

**Keywords:** Fiber, Ethnobotany, indigenous, unemployment, families

### 1. Introduction

A fiber is a thin thread of natural or artificial substance especially one that is used to make clothes or ropes (Collins dictionary, 1822). Fiber cells present in all plants are of varied shapes, composition as well as length, colour, strength, durability and resistance to water. The process of polymerization and structure formation varies depending on plant resources (Ramawat and Ahuja, 2016). Fibers are also called the fabric of civilization and come after the requirement of food (Good et al., 2009).

Plant fibers are obtained from various parts of the plants, like from seeds (cotton, kapok, milkseed), stems (flax, jute, hemp, ramle, kenaf, bamboo), and leaves (Palm, Sal, manila, abaca), fruits (coir) and other grass fibers. fibers of these plants are totally renewable and bio degradable (Blackburn, 2005). In addition to these widely used fiber-yielding plants (FYPs), there are many other plants that are used in specific regions and cultures around the world. For example, raffia palm (*Raphia* spp.) is a major source of

fiber in Africa, and is used in the making of baskets, mats, and other crafts (Ukwuani & Ifeanyi-Obi, 2017). Ramie (*Boehmeria nivea*) is another fiber-bearing plant that is used in many parts of Asia, especially in China and Japan, and is used for the production of textiles, paper, and other items (Sui et al., 2019).

There are mostly two types of fibers i.e., natural and synthetic fibers. Both of them have their advantages and disadvantages, and the choice between the two depends on various factors such as cost, performance, and environmental and social impacts. Along with these factors, people in the study area are inclined towards the natural fiber also for religious purposes as they trust natural fibers more than the synthetic ones.

## 2. Study area

The study area was the Devchuli Municipality Ward no.13, Daldale, in Nawalparasi district, central Nepal. The area lies in the Gandaki province of Nepal. It is adjacent to Chitwan National Park, and serves as a gateway to the park. This area was chosen for the study because the people of this area still use fiber bearing plants for house bounding, building a foundation, making household as well as agricultural materials. According to 2011 CBS, Nepal, 475 household were reported.

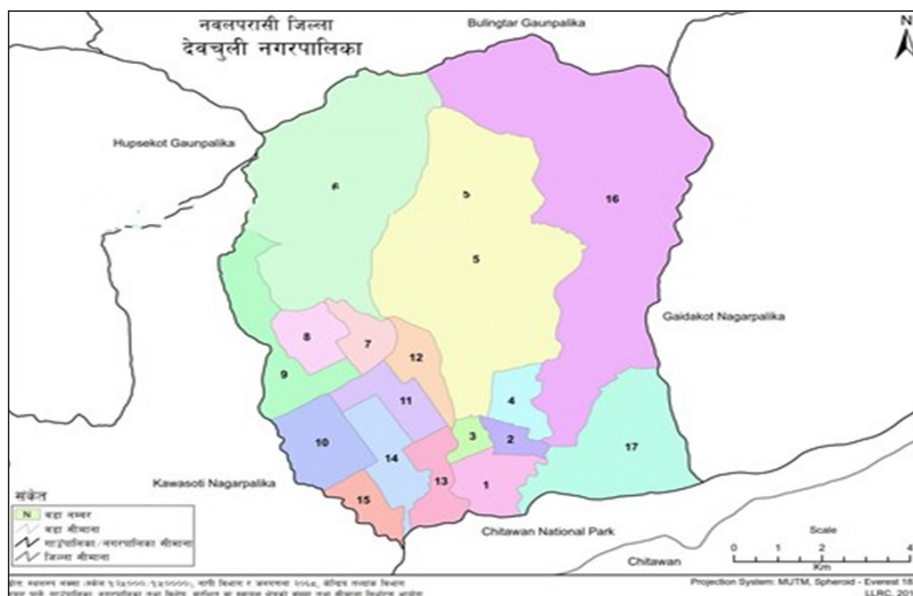


Figure 1: Location map of Devchuli Municipality

## 3. Methodology

Primary data was collected by group discussion, interviews, audio recording etc. Some research questions were pre prepared for the interviews (sample size is 218) while secondary data was collected by consulting different literatures (Ramawat and Ahuja, 2016, Pandey and Gupta, 2003; Good et al. 2009 and many more), books, websites, journals and experts. The herbaria were prepared for the identification and deposited in the Department of Botany, Birendra multiple campus.

#### 4. Results and discussion

A total of 52 plant species representing 45 genus and 24 families were reported to be in used as fiber yielding plants in the study area. Poaceae was the largest family which includes 17 plant species. Total of 21 plant species are reported to utilized by locals with their cultural method. Different parts of the plant are utilized to prepare the fibers. During study it is found that out of total plant species, 17 were wild, 19 cultivated and 16 from both wild and cultivated.

##### Plant categorizations

The ethnobotanically important plants reported during field study have been categorized under different subheads as follows:

##### Habit

Among 52 FY plant species used by the residents, 17 tree species, 12 shrubs, 2 climber, 20 herbs and 1 grass. From Figure below, we can conclude that herbs are more utilized than any other form of plants.

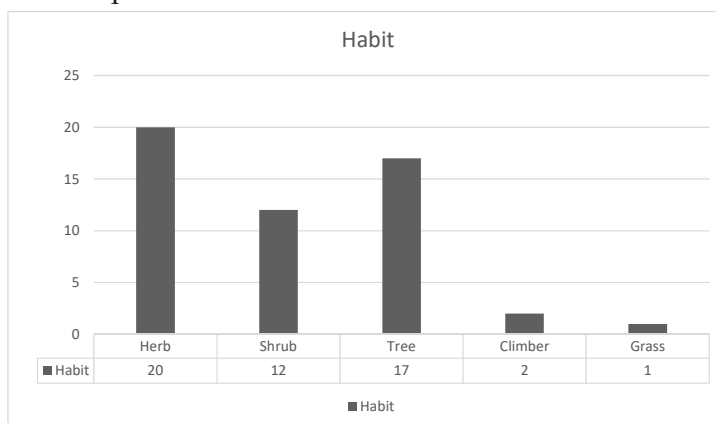


Figure 2: Habit of plants

##### Sources of Availability

Local people use both cultivated and wild plant species according to their need and suitability of season. The utilization of FY plants also based on time available to locals and their purpose. During study the researcher found that out of total plant species 17 (33%) were wild, 19 (36%) cultivated and 16 (31%) from both wild and cultivated.

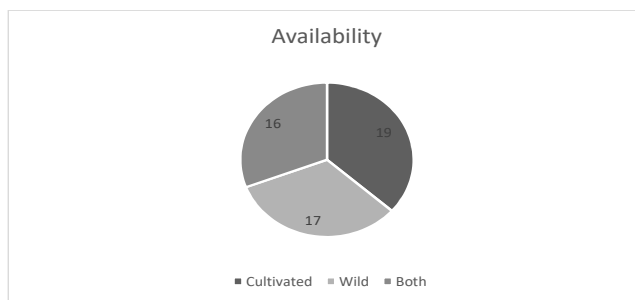


Figure 3: Source of availability of plants

### Plant parts used

Different parts of the plant are utilized to extract fibers. The plant part used based on season of collection and abundance. Generally, stem, leaves, shoots, fruit, latex, bark, whole plants etc. are utilized by locals of study area. The most common parts are whole plants of herb, roots and leaves and common things made are ropes and baskets. People use stems in most of the making of items.

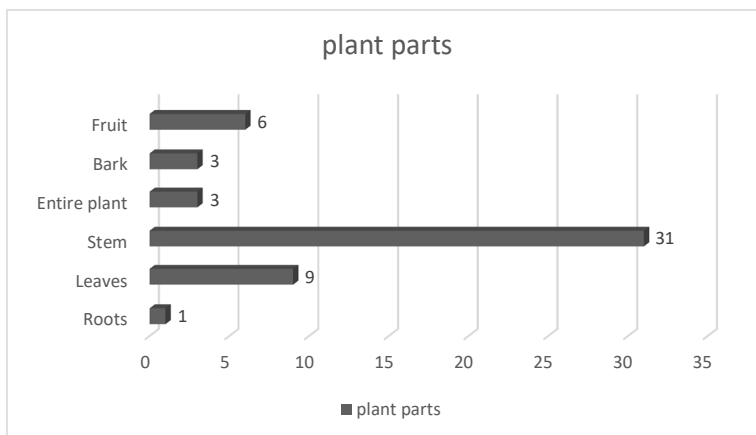


Figure 4: Plant parts used

### Purpose of uses of fiber yielding plants

Different types of plants are used to make different items. Same plants may be utilized in creating various types of products. From present study, we can conclude that total of 18 plants were utilized for making ropes, 17 for making baskets, 19 for weaving mats also called as “Gundri” in common language, 8 thatching, 3 for making sweeping materials or brooms, and 13 plant species for making other types of items such as making clothes, screening, containers, papers, composite materials etc (Figure no. 5). Among the total plants used most of the plants are seen to be utilized to make ropes followed by mats or Gundri. The plant utility patterns resemble almost every place of Nepal.

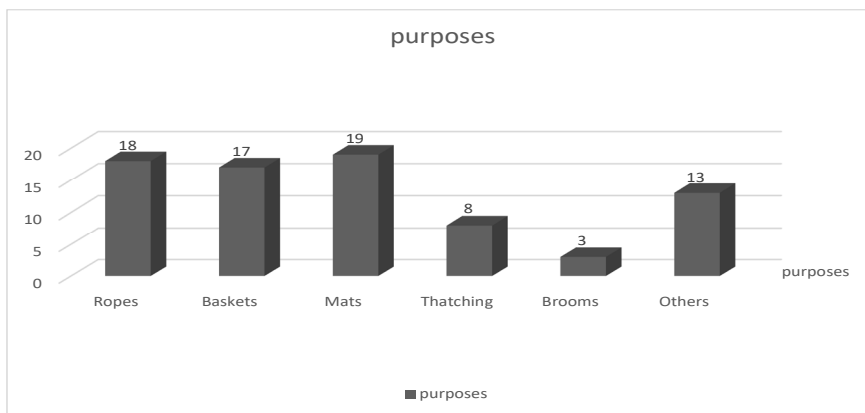


Figure 5: Purpose of uses of FYP



## Harvesting/collecting season of fiber yielding plants

Harvesting season can be influenced by factors such as climate, local agricultural practices and the desired quality of fibers. Most of the fibers are generated when the plant becomes fully mature. According to the data collected in the reports most of the fibers can be collected or harvested throughout the year 2079 BS and least are harvested in summer or autumn season.

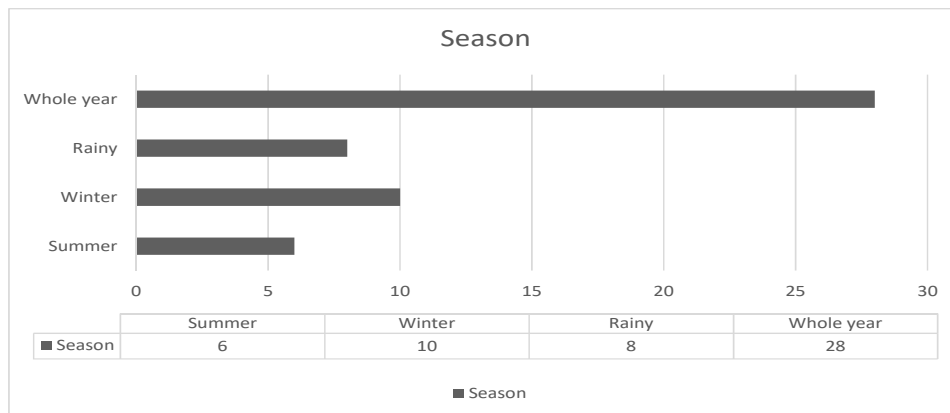


Figure 6: Harvesting/ Collecting season

## 5. Conclusion and recommendation

Present result indicated that people in the study area prefer the homemade fiber items than the synthetic ones. Despite of the easy access to the modern fibers or items. They used fiber yielding plants in their daily to day activities and some of them are also traded in local markets for further refining and use. All the plant parts i.e., roots and shoots are equally valuable based on the nature of plant. The most common part used to generate fiber is the shoot part of the plant.

There are altogether of 52 species belonging to 45 genera and 24 families has been documented, among them Poaceae with 17 species is largest. Among these plants 21 species were mostly seen to be used by the locals.

Traditional Practices on fiber yielding is still well counted among these indigenous community in which the older person or practitioners of community with plant knowledge is consulted by village people. This vast knowledge is poorly handed over to the younger generation or documentation of these knowledge is neglected. This may be due to young generation does not cares and belief in these things and documentation of such knowledge is only dependent on others from another community.

Following recommendations have been made based on field study and observations of the present study.

- Due to high chances of finding new natural products with potential applications, intensive and organized researches of ethnobotanical plants used by indigenous people have been recorded.
- Provide expertise help & training for local people to promote preservation and

conservation of fiber bearing plants for their sustainable use.

- Orientation about all the useful plants should be given to people of young generation by expert time to time.
- Local practitioners are also not well profited by their occupation. Therefore, they are to be encouraged and some subsidy should be provided to them.

## References

- Blackburn, R.S.(Ed.). (2005). Biodegradable and sustainable fibres. Woodhead Publishing Series in Textiles: 47, The Textile Institute.
- Collins dictionary. 1822. Fiber. Retrived from <https://www.collinsdictionary.com/dictionary/english/fiber>
- Good, I. L., Kenoyer, J.M., and Meadow. R.H. (2009). New evidence for early silk in the Indus civilization. *Archaeometry* 51,(3): 457–466
- Pandey A, Gupta R (2003) Fiber yielding plants of India, genetic resources, perspectives for 336 collection and utilization. *Nat Prod Radianc* 2(4):194–204
- Poudel, M. R., & Baral, S. R. (2013). Ethnobotanical study of fiber yielding plants of Makawanpur district, central Nepal. *Our Nature*, 11(1), 27-34.
- Poudel, M. R., Subedi, S., Subedi, A., & Rimal, B. (2018). Local knowledge and use of nettle fiber (Allo) in central Nepal: Insights for sustainable production and marketing. *Ethnobotany Research and Applications*, 17, 1-17.
- Ramawat, K., & Ahuja, M. (2016). Fiber Plants: An Overview. DOI: 10.1007/978-3-319-44570-0\_1.
- Sui, G., Liu, Y., Liu, Y., Wang, X., Li, Q., & Wang, Q. (2019). Recent advances in the utilization of ramie fiber-reinforced composites: A review. *Polymers*, 11(7), 1136.
- Thapa, N., Poudel, B. S., Oli, B. R., & Chaudhary, R. P. (2019). Traditional uses and management of bamboo in the Tamur Valley of eastern Nepal. *Journal of Forestry Research*, 30(1), 359-369.
- Ukwuani, A. N., & Ifeanyi-Obi, C. C. (2017). Ethnobotanical survey of Raffia palm (*Raphia* spp.) in Njaba Local Government Area, Imo State, Nigeria. *Ethnobotany Research and Applications*, 16, 529-544

## Appendix

Table 1: List of FY plants found in the study area

| SN | Scientific name                             | Family       | Habit | Plant parts used | Collecting season | Purposes   |
|----|---|--------------|-------|------------------|-------------------|--|
| 1  | <i>Abelmoschus esculentus</i><br>Ln. bhindi | Malvaceae    | Shrub | Stem             | Summer            | Make textiles and paper  |
| 2  | <i>Acacia catechu</i><br>Ln. khayar         | Fabaceae     | Tree  | Leaves           | Whole year        | Making barrels and other containers. (Initially)* It is protected plant now. |
| 3  | <i>Aegle marmelos</i><br>Ln. bel            | Rutaceae     | Tree  | Bark             | Whole year        | Ropes, baskets, and mats   |
| 4  | <i>Agave americana</i><br>Cn. century plant | Asparagaceae | Herb  | Leaves           | Whole year        | Paper production, construction materials, making ropes and mats.             |

|    |   |              |       |                  |            |   |
|----|---|--------------|-------|------------------|------------|---|
| 5  | <i>Aloe vera</i><br>Ln. gheu kumari             | Liliaceae    | Shrub | Leaves           | Whole year | Dispels virus and other fungicidal elements from our skin.        |
| 6  | <i>Ananas comosus</i><br>Ln. bhuikatahar        | Bromeliaceae | Shrub | Leaves           | Whole year | To make baskets, bags and other containers.                       |
| 7  | <i>Annona squamosa</i><br>Ln. sitaphal/ sarifa  | Annonaceae   | Tree  | Bark/<br>leaves  | Whole year | Making baskets and mats   |
| 8  | <i>Anthocephalus cadamba</i><br>Ln. kadam       | Rubiaceae    | Tree  | Stem             | Whole year | Making paper and pulp.  |
| 9  | <i>Artemisia vulgaris</i><br>Ln. titepati       | Asteraceae   | Herb  | Stem             | Whole year | Traditional Nepali paper, handi crafts and weaving baskets, mats. |
| 10 | <i>Azadirachta indica</i><br>Ln neem            | Meliaceae    | Tree  | Stem             | Whole year | Ropes and twin  |
| 11 | <i>Bambusa tulda</i><br>Ln. bas                 | Poaceae      | Tree  | Stem             | Whole year | Thatching, Screening, Making basket mats and furniture            |
| 12 | <i>Bombax ceiba</i><br>Ln. Simal                | Malvaceae    | Tree  | Stem/ fruit      | Whole year | Making Ropes and Mats   |
| 13 | <i>Cannabis sativa</i><br>Ln. Ganja             | Cannabiaceae | Herb  | Stem             | Whole year | For clothing, making paper, ropes, sailcloth                      |
| 14 | <i>Cephalostachyum pergracile</i><br>Ln. Taprej | Poaceae      | Tree  | Stem             | Whole year | Making Basket, mats and furniture                                 |
| 15 | <i>Chrysopogon aciculatus</i><br>Ln. Kuro       | Poaceae      | Herb  | Whole plant      | Rainy      | Thatching, making brooms, basket and ropes                        |
| 16 | <i>Cocos nucifera</i><br>Ln. Naribal (Coconut)  | Areaceae     | Tree  | Fruit (mesocarp) | Whole year | Basket, Mats and other containers                                 |
| 17 | <i>Colocasia esculenta</i><br>Ln. Karkalo       | Araceae      | Herb  | Stem             | Rainy      | Making ropes and mats   |
| 18 | <i>Crotolaria junace</i><br>Cn. Sunn hemp       | Fabaceae     | Shrub | Stem             | Whole year | Sacking and packaging, mainly composite materials.                |
| 19 | <i>Cymbopogon flexuosus</i><br>Cn. Lemon grass  | Poaceae      | Herb  | Stem             | Whole year | Making Traditional incense and weaving baskets                    |
| 20 | <i>Cyperus compressus</i>                       | Cyperaceae   | Herb  | Entire Plant     | Rainy      | Making ropes  |
| 21 | <i>Cyperus rotundus</i><br>Ln. Mothe            | Cyperaceae   | Herb  | Whole Plant      | Rainy      | Making Mats   |
| 22 | <i>Dendrocalamus gigantus</i><br>Ln. Bans       | Poaceae      | Tree  | Stem             | Whole year | Basket, mats and furniture  |

|    |   |               |         |        |            |   |
|----|---|---------------|---------|--------|------------|---|
| 23 | <i>Drepanostachyum falcatum</i><br>Ln. Nigalo       | Poaceae       | Shrub   | Stem   | Whole year | Thatching, making baskets                   |
| 24 | <i>Elaeagnus latifolia</i><br>Ln. Aiselu            | Elaeagnaceae  | Shrub   | Bark   | Whole year | Making ropes, basket and mats               |
| 25 | <i>Eulaliopsis binata</i><br>Ln. Babiyo             | Poaceae       | Herb    | Leaves | Rainy      | Making Basket, ropes and mats               |
| 26 | <i>Gossypium arboretum</i><br>Ln. Kapas             | Malvaceae     | Tree    | Fruit  | Winter     | Clothing, paper and ropes manufacturing     |
| 27 | <i>Gossypium hisutum</i><br>Ln. Kapas               | Malvaceae     | Tree    | Fruit  | Winter     | Clothing, paper and ropes manufacturing     |
| 28 | <i>Hibiscus cannabifolius</i><br>Ln. Vhang          | Malvaceae     | Herb    | Stem   | Whole year | Making Ropes, basket and mats               |
| 29 | <i>Hibiscus rosa-sinensis</i><br>Ln. Ghantiful      | Malvaceae     | Shrub   | Stem   | Summer     | Making Paper and Textiles                   |
| 30 | <i>Imperata cylindrica</i><br>Ln. Siru              | Poaceae       | Herb    | Stem   | Rainy      | Thatching, making brooms, baskets and ropes |
| 31 | <i>Lagenaria siceraria</i><br>Ln. Lauka             | Cucurbitaceae | Climber | Fruits | Summer     | Making container and musical instruments    |
| 32 | <i>Linum usitatissimum</i><br>Ln. Alas (Flax seeds) | Linaceae      | Herb    | Stem   | Winter     | Making linen clothing, paper and brooms     |
| 33 | <i>Luffa cylindrica</i><br>Ln. Ghiramla             | Cucurbitaceae | Climber | Fruits | Summer     | Making scrubbers and bath products          |
| 34 | <i>Mangifera indica</i><br>Ln. Aap (Mango)          | Anacardiaceae | Tree    | Stem   | Whole year | Making Containers                           |
| 35 | <i>Melia azedarach</i><br>Ln. Bakaino               | Meliaceae     | Tree    | Stem   | Whole year | Making Basket and Furniture                 |
| 36 | <i>Murraya koenigii</i><br>Ln. Asare (Curry Leaves) | Rutaceae      | Shrub   | Stem   | Whole year | Making basket and mats                      |
| 37 | <i>Musa acuminata</i><br>Ln. Kera (Red Banana)      | Musaceae      | Tree    | Bark   | Whole year | Basket, mats and handy crafts               |
| 38 | <i>Musa paradisiaca</i><br>Ln. Kera                 | Musaceae      | Tree    | Stem   | Whole year | Ropes and mats                              |
| 39 | <i>Nyctanthes arborescens</i><br>Ln. parijat        | Oleaceae      | Shrub   | Bark   | Whole year | Making ropes and Twine                      |
| 40 | <i>Ocimum tenuiflorum</i><br>Ln. Tulsi              | Lamiaceae     | Herb    | Stem   | Winter     | Ropes and mats                              |
| 41 | <i>Oryza sativa</i><br>Ln. Dhan                     | Poaceae       | Herb    | Leaves | Winter     | Used to make ropes and mats (Gundri)        |

|    |  |                  |       |                  |            |  |
|----|--|------------------|-------|------------------|------------|--|
| 42 | <i>Saccharum arundinaceum</i><br>Ln. Seto Khar       | Poaceae          | Herb  | Stem             | Rainy      | Thatching, making ropes and roofs                                |
| 43 | <i>Saccharum munja</i><br>Ln. Munj                   | Poaceae          | Herb  | Stem             | Winter     | Woven into ropes, mats, baskets, and other handicrafts.          |
| 44 | <i>Saccharum officinarum</i><br>Ln. Ukhu (Sugarcane) | Poaceae          | Grass | Stem             | Winter     | Make Paper and textiles  |
| 45 | <i>Saccharum spontaneum</i><br>Ln. Kans              | Poaceae          | Herb  | Stem             | Rainy      | Thatching roofs and fence  |
| 46 | <i>Shorea robusta</i><br>Ln. Sal                     | Dipterocarpaceae | Tree  | Stem/<br>leaves  | Whole year | Making Textile, furniture and Traditional plates called "Tapari" |
| 47 | <i>Sida acuta</i><br>Ln. Kharato                     | Malvaceae        | Shrub | Stem             | Summer     | Making Brooms  |
| 48 | <i>Thysanolaena maxima</i><br>Ln. Amriso             | Poaceae          | Shrub | Stem             | Summer     | Making Brooms  |
| 49 | <i>Triplidium bengalense</i><br>Ln. Baruwa Ghas      | Poaceae          | Shrub | Stem/<br>Leaves  | Winter     | Thatching, making baskets and mats                               |
| 50 | <i>Triticum aestivum</i><br>Ln. Gahu (Wheat)         | Poaceae          | Herb  | Stem             | Winter     | Textile and papers   |
| 51 | <i>Urtica dioica</i><br>Ln. Sisnu                    | Urticaceae       | Herb  | Entire Plant     | Whole year | Making Baskets and Containers                                    |
| 52 | <i>Vetiveria zizaniodes</i><br>Ln. Kus               | Poaceae          | Herb  | Leaves/<br>roots | winter     | Mats, screening and thatching, weaving and crafting              |