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

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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.

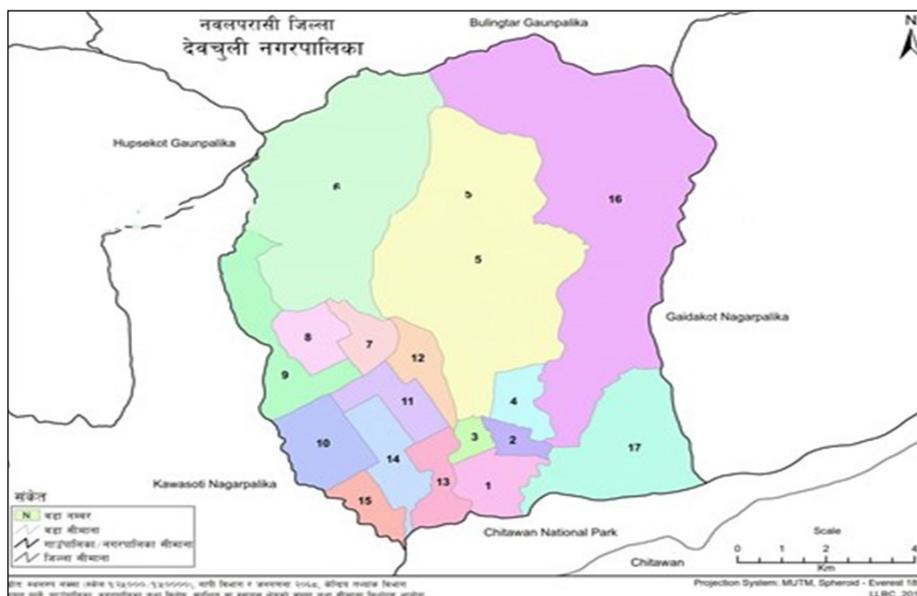


Figure 1: Location map of Devchuli Municipality

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.

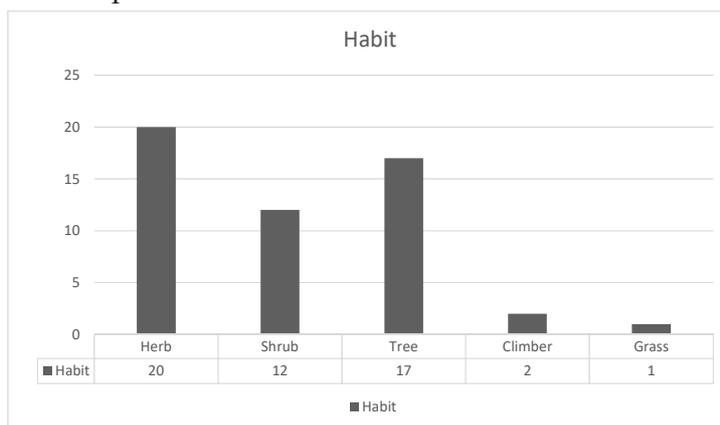


Figure 2: Habit of plants

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.

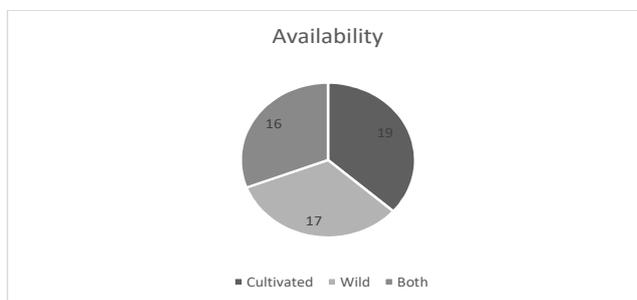


Figure 3: Source of availability of plants

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.

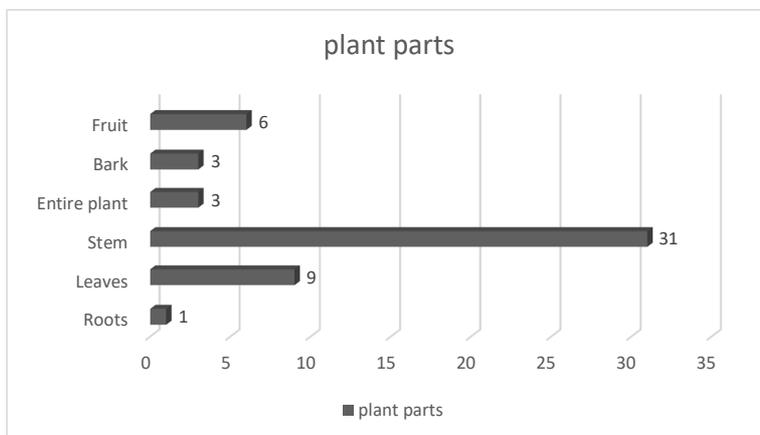


Figure 4: Plant parts used

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.

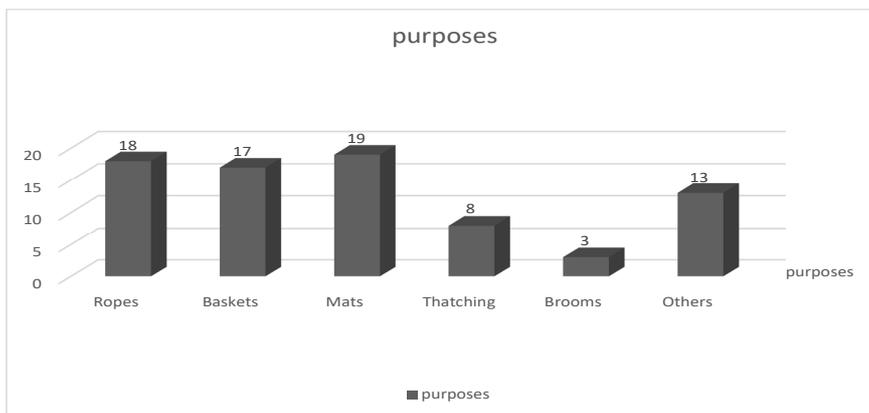


Figure 5: Purpose of uses of FYP

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.

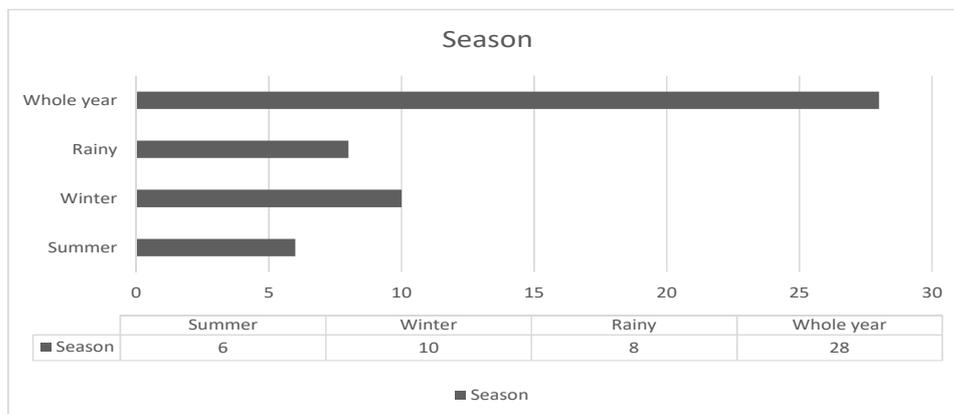


Figure 6: Harvesting/ Collecting season

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.

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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> Ln. bhindi	Malvaceae	Shrub	Stem	Summer	Make textiles and paper
2	<i>Acacia catechu</i> Ln. khayar	Fabaceae	Tree	Leaves	Whole year	Making barrels and other containers. (Initially)* It is protected plant now.
3	<i>Aegle marmelos</i> Ln. bel	Rutaceae	Tree	Bark	Whole year	Ropes, baskets, and mats
4	<i>Agave americana</i> Cn. century plant	Asparagaceae	Herb	Leaves	Whole year	Paper production, construction materials, making ropes and mats.

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

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

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