

ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED IN MAKARFI LOCAL GOVERNMENT AREA OF KADUNA STATE

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ABSTRACT

Medicinal plants have been essentially utilized by all societies as a wellspring of medicine. This ethnobotanical survey was carried out to explore and document the medicinal plants used in Makarfi Local Government Area of Kaduna state for the treatment various human diseases. Data was collected with the use of questionnaires. A total of 59 plants belonging to 25 families were reported to be used in the treatment of different ailments. Members of the family Fabaceae (25.4%) had the highest number of species used in traditional healing followed by family Combretaceae (8.5%). The plant part most frequently used were the leaves (30%) followed by barks with 27%. The study revealed that 80% of the plants used for treating ailments were sourced from the wild, while 20% were cultivated. Most of the traditional healers obtained their extracts by boiling the medicinal plants and administered them orally. Some medically important plants that drastically reduced in supply over time were also identified. Public and private involvement in management and utilization of medicinal plants by sustainable use is essential to preserve some of these valuable natural resources

Keywords: Ailments, Ethnobotanical, Medicinal, Plants, Phytochemicals.

INTRODUCTION

Plant is an important source of medicine and plays a key role in world health (Sandberg and Corrigan, 2001). Medicinal plants are plants containing inherent active ingredients used to cure disease or relieve pain (Okigbo *et al.*, 2008). These inherent active ingredients are known as phytochemicals. Ethno botany is the scientific study concerned with the study of relationship between plants and man, in particular, how people in a region use traditional knowledge with respect to utilization of plant resources for their wellbeing (Prasshith, 2019). The plants found in various regions differ as a result of the climate, topography, soil type and other factors and so does the peoples' use for those plants vary; it is therefore important to gather this varying information which could be of utmost importance in a lots of fields especially medicine. Pharmaceutical industries make use

of knowledge about plants with active substances gathered through ethno-botany for production of drugs. The use of folk beliefs and knowledge of traditional healers is a shortcut to the discovery and isolation of pharmacologically active compound (Holland, 1994).

Traditional medicine based on the WHO strategy was defined as the sum total of the knowledge, skill and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness (<http://www.who.int/medicines/areas/traditional>). It is sometimes called herbal, complementary or alternative medicine. Medicinal plants are the "backbone" of traditional medicine, which means more than 3.3 billion people in the less developed countries

utilize medicinal plants on a regular basis (Davidson-Hunt, 2000).

Indigenous medicine is usually handed down orally from generation to generation and such knowledge is at risk of being lost (Kaido *et al.*, 1997). Ethnobotany is viewed as a source for identification of bio-active agents in plants that can be used in the preparation of synthetic medicine. This study aimed at collecting and documenting medicinal plants that are available in Makarfi Local Government Area of Kaduna state. Furthermore, the documentation of this survey seeks to promote sustainable use, ecological control and forest conservation amongst many others as many medicinal plants are exploited at an unprecedented rate and are threatened with extinction (Hawkins, 2008)

MATERIALS AND METHODS

Study Area

Makarfi is a local government area in Kaduna state which was created from the defunct Ikara local Government Area in 1991. It has an estimated population of about 146,259 at the 2006 census and an area of 541km square. It is located on latitude 11°2'N and longitude 7°40'E and bounded to the north by Kano, to the east by Ikara local government, to the south by Soba Local Government and to the west by Kudan Local Government.

Method of Information Collection

The ethno-medicinal survey was carried out between September and October 2019. Participants were sought with the assistance of a community liaison, and all participants gave their informed consent. The method of questioning used is the semi-structured interview method (Bernard, 1988) and information such as the vernacular name of the plant, plant parts used, method of preparation and administration, disease or ailment being treated, dosage, duration of treatment, etc. was

sought for from participants using questionnaires during personal interviews. The target populations (respondents) were mostly traditional medical practitioners (TMPs) and community elders within the Local Government Area. Inquiries were made in their local language (Hausa) using field interview and market survey which involved going to farms or forests, home gardens and markets.

Collection and Identification of Plant Specimen

Plant specimens of medicinal plants were collected from the farms or forest and home gardens with the help of local knowledgeable persons and traditional healers selected among the respondents. Collections were made using wooden press, newspapers, polythene bags, masking tape and secateurs. Photographs of the specimens were also taken at the collection point. Identification of the surveyed plants was done at the herbarium of the Department of Botany, Ahmadu Bello University Zaria, Nigeria.

RESULTS AND DISCUSSION

The communities within Makarfi Local Government have diverse flora population which they use to prevent and treat various ailments. A total of twelve (12) informants were interviewed; ten (10) were men while only two (2) were women. Their ages ranged from 25 to 80 years. They had various occupations which include 58% herbalists, 25% farmers and 17% civil servants. Most of the informants were uneducated as only one had a degree certificate, only three (3) have secondary school leaving certificate, the other eight (8) do not have any form of formal education.

The survey reported that plant species were predominantly trees with a percentage of 42% which is higher than other plant forms. Climbers

recorded the least species with 5%, while shrub species had 34% and herbs 19%. Out of the species reported from the survey, about 80% of them are wild (grown spontaneously) while 20% of them are cultivated and domesticated for other uses. The result obtained shows that about 50 % of the plants are decocted and taken orally when treating various diseases; the other methods include soaking and drinking, application of plant part extract to affected organs, inhalation of steam after boiling, gagging and spitting out, etc. Water is the main solvent used in drug preparation but other materials such as pap, mineral soda, honey, zobo drink, potash solution, etc. The most reported plant species are used in the treatment of pile, ulcer, jaundice, malaria and typhoid confirmed the most prevalence of these diseases in tropical Africa.

are of medicinal importance to the population. This is the primary source of health care for the rural population as it is easily accessible, affordable and effective. 59 plant species distributed across 25 families were identified. The most dominant family is the family Fabaceae with 15 plant species. This can be explained by the fact that the most species belonging to the fabaceae family are mostly found throughout the seasons because they are adapted to withstand the adverse effects of Sahel savanna (Sulaiman, 2015). It agrees with the findings of (Mudansiruet *al.*, 2016) on ethnomedicinal survey of some plants used for the treatment of various ailments in Gumel town, Jigawa state where the fabaceae family had the highest representation. The second largest family is the family Combretaceae with 5 species followed by families Moraceae, Anacardaceae, Rubiaceae and Myrtaceae.

The survey showed that Makarfi local government area has diverse plant species that

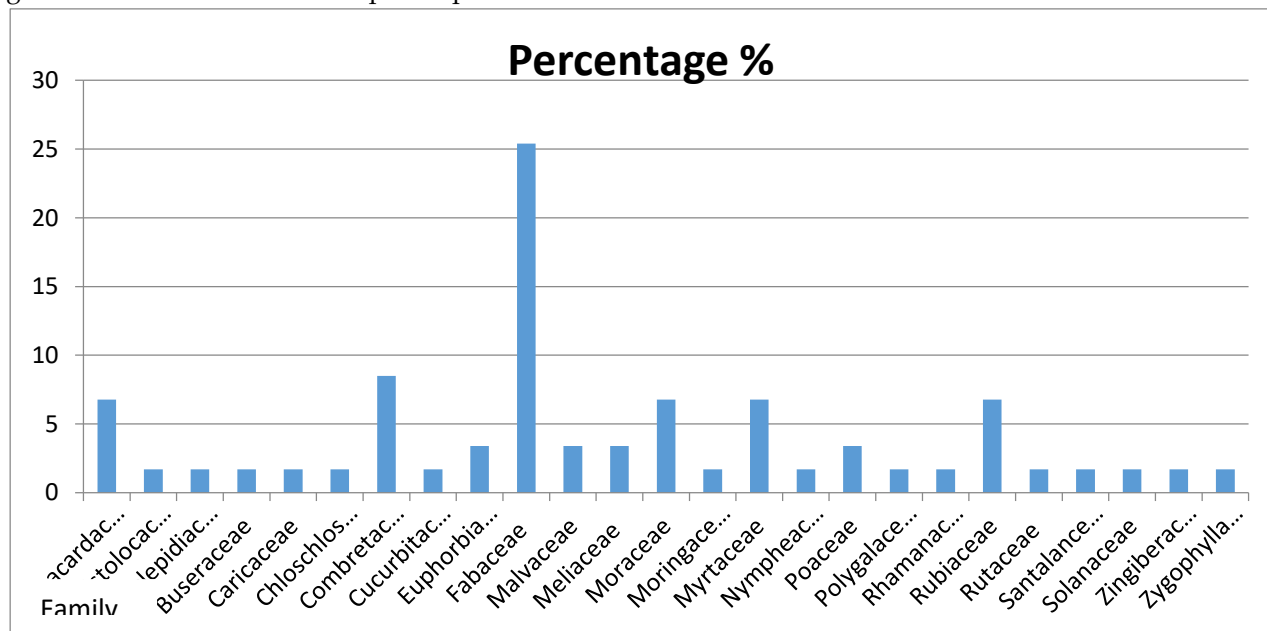


Fig. 1: Bar chart showing the percentage of plant species in each family:

Fig.2: Pie chart showing percentage of various plant parts used.

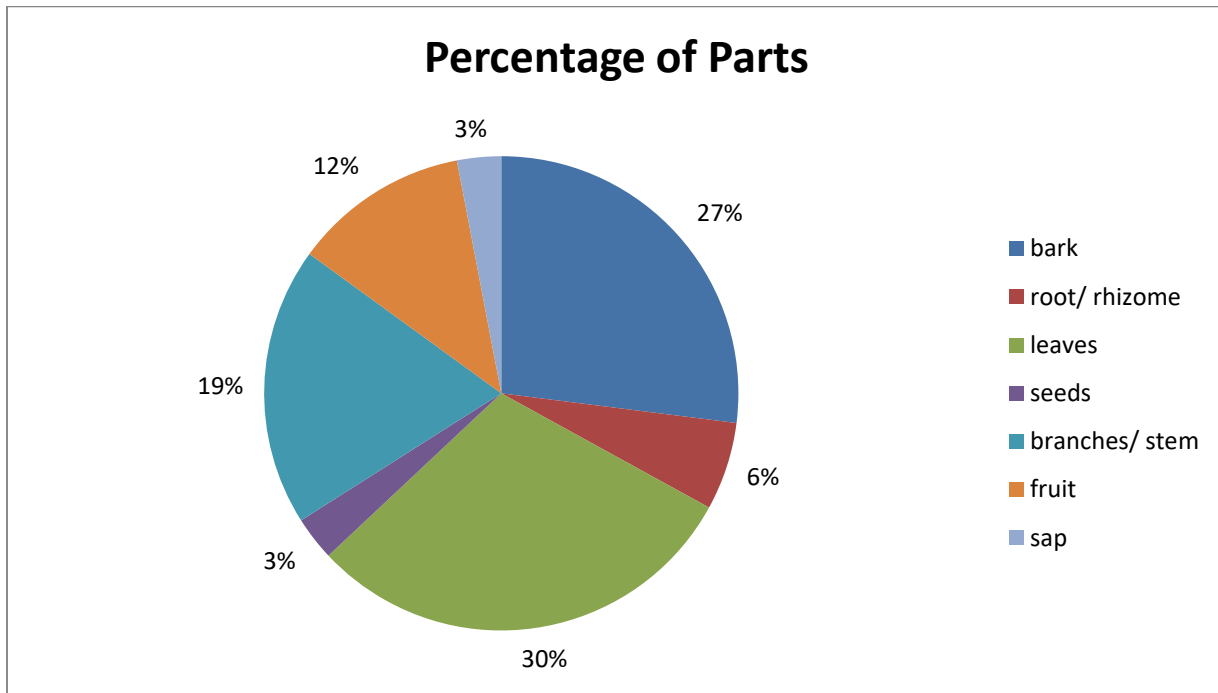


Table 1: Enumeration of surveyed plants used for medicinal purpose by the people of Makarfi Local Government Area of Kaduna State, Nigeria

S/N	Local name	Scientific name	Family name	Part used	Habit	Disease treated	Status of the plant	Method of preparation
1	Danya	<i>Sclerocarya birrea</i>	Anacardaceae	Bark	Tree	Pile	Wild	Boil and drink
2	Kashu	<i>Anacardium occidentale</i>	Anacardaceae	Leaves	Tree	Body weakness	Cultivated	Take steam bath with water of boiled leaves.
3	Mangoro	<i>Mangifera indica</i>	Anacardaceae	Bark	Tree	Constipation, pile	Cultivated	Drink or bath with decoction
4	Tsada	<i>Sponcliamobian</i>	Anacardaceae	Bark	Shrub	Stomach ache	Wild	Powder is drunk in pap or water
5	Katala	<i>Aristolochia elegans</i>	Aristolocaceae	Branches	Vine/ climber	Ulcer	Wild	Pound and drink with fresh cow milk
6	Tumpapiya	<i>Calotropis procera</i>	Asclepidiaceae	Fruit Sap	Shrub	Eye problems	Wild	Hairs in the fruit are rubbed on the eyes Heat the sap in a pan until it chars then apply in the eye like eye pencil

7	Ararabi	<i>Boswellia dalzielii</i>	Buseraceae	Bark	Tree	Cold, arthritis, pile	Wild	Powder is taken with pap or water
8	Gwanda	<i>Carica papaya</i>	Caricaceae	Leaves	Tree	Ulcer	Cultivated	Macerate and drink solution
9	Rawaya	<i>Cochlospermum tinctorium</i>	Chloschlospemaceae	Branches	Herb	Jaundice	Wild	Decoction is taken orally
10	Itachen umbrella	<i>Terminalia catappa</i>	Combretaceae	Leaves Bark	Tree	Typhoid Body weakness	Cultivated	Red leaves are pounded and added to potash solution. Inhale steam of decoction.
11	Kantakara	<i>Combretum hypopilinum</i>	Combretaceae	Branches	Tree	Menstrual disorder	Wild	Soak in potash solution and drink
12	Kwandari	<i>Terminalia macropatera</i>	Combretaceae	Branches	Tree	Menstrual disorder	Wild	Powder is taken with milk
13	Marke	<i>Anogeissus leiocarpus</i>	Combretaceae	Leaves	Tree	Ulcer	Wild	Powdered dry leaves are taken with water or milk
14	Sabara	<i>Guiera senegalensis</i>	Combretaceae	Leaves	Shrub	Body itching	Wild	Powdered dry leaves taken with pap or

15	Kankana	<i>Citrullus lanatus</i>	Cucurbitaceae	Fruit	Vine	Blood pressure	Cultivated	milk Dry and pound fruit peel and take with honey
16	Bini da zugu	<i>Jatropha curcas</i>	Euphorbiaceae	Branches	Shrub	Gonorrhoea	Wild	Boil and drink in potash solution
17	Sassami	<i>Alchornea cordifolia</i>	Euphorbiaceae	Bark	Shrub	Breast milk enhancement	Wild	Pound and drink with water
18	Bagaruwa	<i>Acacia nilotica</i>	Fabaceae	Fruit	Shrub	Ulcer	Wild	Pounded dry fruits should be taken with milk or pap
19	Farabiyarrana	<i>Crotalaria retusa</i>	Fabaceae	Leaves	Herb	Cold and rheumatism	Wild	Powdered leaves to be taken with fresh milk
20	Gyada	<i>Arachishypogaea</i>	Fabaceae	Seeds	Seeds	Breast milk enhancement	cultivated	Chew a handful of raw seeds
21	Kargo	<i>Piliostigmathonningii</i>	Fabaceae	Leaves	Shrub	Ulcer	Wild	Dry powder is taken with water
22	Kawo	<i>Afzeliaafricana</i>	Fabaceae	Bark	Tree	Constipation malaria	Wild	Boil and drink
23	Kirya	<i>Prosopisafricana</i>	Fabaceae	Bark	Tree	Cancer Pile	Wild	Decoction is taken orally
24	Makarho	<i>Afrormosialaxiflora</i>	Fabaceae	Bark	Tree	Constipation	Wild	Decoction

				Root				is taken orally
25	Marga	<i>Sennasieberiana</i>	Fabaceae	Branches	Tree	Stomach ache	Wild	Boil and drink
26	Minjirya	<i>Erythrinasenegalensis</i>	Fabaceae	Bark	Tree	Jaundice	Wild	Soak and drink
27								Squeeze leaves and add to food
	Raidore	<i>Sennaoccidentalis</i>	Fabaceae	Leaves	Shrub	Rheumatism Fever	Wild	preferably fried egg
28	Taura	<i>Detariummicrocarpum</i>	Fabaceae	Fruit	Shrub	Kidney diseases	Wild	Eat about 7 fruits weekly
29	Tsamiya	<i>Tamarindusindica</i>	Fabaceae	Bark	Tree	Oral rashes	Wild	Boil with potash solution and gaggle
30								Boil in water and bath or add powdered leaves to pomade and rub
	Tsatsagi	<i>Bauhinia rufescens</i>	Fabaceae	Leaves	Shrub	Body itching	Wild	Sprinkle powdered bark on honey comb and chew
31								
	Tuwonbiri	<i>Dialiumguineense</i>	Fabaceae	Bark	tree	Heart diseases	Wild	
32				Leaves		Diarrhea,		Decoction
33	Aguwa	<i>Gossypiumhirsutum</i>	Malvaceae	Branches	shrub	Menstrual disorder	Cultivate d	is taken orally

34	Zobo	<i>Hibiscus sabdariffa</i>	Malvaceae	Fruit	Herb	Constipation	cultivated	Boil and drink
35	Dalbergia	<i>Azadirachtaindica</i>	Meliaceae	Leaves	Tree	Jaundice	Wild	Take decoction orally
36	Madachi	<i>Khayasenegalensis</i>	Meliaceae	Leaves	Tree	Stomach ache Anaemia	Wild	Pound leaves and drink
37	Baure	<i>Ficussycomorus</i>	Moraceae	Bark	Tree	Chest pain Jaundice	Wild	Pound and drink with pap or milk
38	Chediya	<i>Ficusthonningi</i>	Moraceae	Leaves	Tree	Jaundice	Wild	Boil and drink
39	Gamji	<i>Ficusplatyphylla</i>	Moraceae	Bark	Tree	Anaemia constipaion	Wild	Decoction is added to water or zobo drink
40	Kawuri	<i>Ficusglumosa</i>	Moraceae	Bark	Tree	Malaria	Wild	Dry powder is taken with a mineral soda
41	Zogale	<i>Moringaoleifera</i>	Moringaceae	Leaves	Shrub	Tooth ache	Cultivate d	Add water to fresh pounded leaves, gaggle water repeatedly until there's relief
42	dogonyaro	<i>Eucalyptus citriodora</i>	Myrtaceae	Leaves	Tree	Body weakness	Wild	Inhalation of steam from boiled

43	Malmo	<i>Eugenia jambolana</i>	Myrtaceae	Leaves	tree	Vaginal yeast infection	Wild	leaves Leaves are boiled and taken with fresh cow milk
44	Mangul	<i>Maytenussenegalensis</i>	Myrtaceae	Leaves	Shrub	Vaginal yeast infection	Wild	Boil and drink with milk
45	Turare	<i>Eucalyptus cameldulensis</i>	Myrtaceae	Bark	Tree	Stomach ache	Wild	Decoction is taken orally
46	Bado	<i>Nymphaea lotus</i>	Nymphaeaceae	Fruit	Aquatic herb	Diabetes	Wild	Dry powder is taken with pap
47	Burgu	<i>Vossiacuspidata</i>	Poaceae	Stem	Grass/ herb	Dysmenorrhea	Wild	Soak in potash solution and drink
48	Jema	<i>Urelytrumgiganteum</i>	Poaceae	Branches	herb	Snake bite	Wild	Boil and drink
49	Kurna	<i>Zyziphusabyssinica</i>	Rhamanaceae	Fruit	Shrub	Heart diseases	Wild	Powder is drunk with water
50	Sanya	<i>Securidacalongependuncula ta</i>	Polygalaceae	Leaves and roots	Shrub	Jaundice, headache	Wild	Soak in water and drink
51	Giyayya	<i>Mitraginainermis</i>	Rubiaceae	branch	Shrub	Dysmenorrhea	Wild	Soak in potash solution and drink
52	Gogamasu	<i>Mitracarpusscaber</i>	Rubiaceae	Leaves	Herb	Measles	Wild	Boil and bath with water
53	Karyagarma	<i>Borreriaverticilata</i>	Rubiaceae	Bark	Shrub	Stomach ache	Wild	Boil and

54	Tapashiya	<i>Nauclealatifolia</i>	Rubiaceae	Root	Shrub	Typhoid	Wild	drink Decoction is taken twice a day
55	Lemuntsami	<i>Citrus aurantifolia</i>	Rutaceaea	Fruit	Shrub	Typhoid	Cultivate d	Cut and boil about 8 fruits in water and drink
56	Tagargada	<i>Thesiumviride</i>	Santalanceae	Branches	Herb	Typhoid	Wild	Boil and drink
57	Dandana	<i>Schwenkiaamericana</i>	Solanaceae	Stem	herb	Dysmenorrh a	Wild	Soak in potash solution and drink
58	Chitta	<i>Zingiberofficinale</i>	Zingiberaceae	Rhizome s	Herb	Cold	cultivated	Boil and drink
59	Aduwa	<i>Balanitesaegyptica</i>	Zygophyllaceae	Sap	shrub	Eczema, ringworm	Wild	Rub on infected area

Most (80%) of the medicinal plants in this survey were sourced from the wild i.e. growing spontaneously while the cultivated species are 20%. This corresponds to the findings of Goleret *al.* (2017) in which about 86.59% of the medicinal plants used in Nasarawa state were collected from the wild. According to studies done by Obute and Osuji (2002), for herbal practitioners to mystify their trade, collection is done from the wild and cultivation is discouraged. With the increase in population, there is higher pressure on these plants, especially the wild species - this in turn leads to overharvesting and species go extinct over time. Informants identified some plants which have drastically reduced in supply over the last few years in Makarfi LGA, some of which include; *Bosweliadalzielii*, *Securidacalolongependunculata*, *Sclerocaryabiriea* and *Prosopisafricana*. The extinction of these plants should be checked by cultivating wild species or creating regional medicinal plant gardens.

Various parts of plants are used in preparation of medicine and this depends on the species of the plant. For this study, the parts used include; sap (3%), seeds (3%), roots/ rhizomes (6%), fruit (12%), stems/ branches (19%), barks (27%) and leaves (30%) which is the most commonly used part. This goes in line with the report on ethnobotanical survey of medicinal plants used for traditional maternal healthcare in Katsina state by Sulaiman, (2015) which records leaves as the most used part. The most prevalent diseases include pile, jaundice, ulcer, cold, rheumatism, malaria and typhoid and plant species that were cited frequently were used for their treatment.

The most common methods of preparation were decoction (an extraction of something obtained by boiling it down) and infusion (soaking) and oral administration was the most reported mode of administration because they are effective for extraction of phytochemical. This corresponds with the documentation of herbal medicines used for the treatment and management of

human diseases by some communities in Southern Ghana by Augustine and Alex(2017) where decoction was the most common preparation method used. More than one plant species have been reported to be used by healers in remedy preparation for various ailments. This could be due to the additions or synergetic effect that they could have during the treatment (Haile and Delenasaw, 2007) while some plants are prepared singly.

The research shows that the younger generation does not possess traditional knowledge of medicinal plants as the ages of the informants ranged from 25 to 80 years with most (41.6%) of the correspondents being being 60 years and above. It goes in line with the survey of Shabnamet *al.*(2017) on knowledge of medicinal plants for children diseases in the environs of district Bannu, Khyber Pakhtoonkhwa, India where most(30.7%) of the informants were 60 years and above. This could be attributed to the fact that young men and women are more concerned with getting western education and moving to the cities to look for white collar jobs.

It also shows that only about 17% of the informants are females hence, indigenous medicinal knowledge is dominated by the male gender and it agrees with the findings of Kolaet *al.*(2011) in the ethno medicinal survey of plants used by the indigenes of Rivers state of Nigeria where only 30% of the informants were females. This is because of gender roles in local communities where the men provide all that is needed and women are usually housewives taking care of the home and children; there is no time for them to learn and identify plant or take up herbal practice as an occupation. Most of the informants have also never received any form or formal education.

CONCLUSION

Makarfi local government area possesses a great diversity of plants with medicinal properties to treat various human diseases. This is of great importance as the population has a low

standard of living and orthodox medicinal care is not easily accessible or affordable. The harvesting of these medicinal plants is however not done in a moderate or sustainable way (overharvesting). The pressure that is put on the plants has already endangered some species and if nothing is done to control this habit, plants of great medicinal value might become extinct. The increase of human population in recent times has also caused an increase in the demand for land; forests are cleared to create industrial areas, residential areas, road, farmlands, etc. and in the process, medicinal plants and their habitats are destroyed. The documentation of such ethno-botanical knowledge will help in creating awareness about the existence of plants and the threat they are faced with; this will in turn contribute to policy formulation for conservation and protection of biological diversity.

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