Appendix-2

Sacred Trees in the Eco- Zone of the Great Himalayan National Park

Abstract

The conservation remains an important concept since ancient times. Tree as a symbol for various local communities reflects the historical reality that man is dependent on trees for his existence. The Community-Based Conservation such as sacred groves and sacred trees keep ecological process in a balanced state. The present study is carried out in the Eco- Zone of the Great Himalayan National Park (GHNP) to document sacred tree species which have been protected by the local people for their cultural and religious beliefs that deities reside in them and protect the villagers from various calamities since ancient times.

Keywords: Great Himalayan National Park, Sacred plants, Community Based Conservation**.**

1. Introduction

The Great Himalayan National Park has rich biodiversity. Around 90% of the population still lives in the villages. They speak dialect called “Pahari” which reflects the culture of the region. Plants are the ancient creation of the god on earth (Devi Kaushalya et., al. 2020). Plant have been worshipped since Vedic period (Bhatla et al. 1984) which is quite common in hilly regionsand are known to influence human culture, customs, myths and rituals.

In the Great Himalayan National Park (GHNP), many religious festivals are celebrated by the people which use one or several plants or plant p arts in their ceremonies. On the basis of ancient beliefs, a wide variety of plants like *Princepia utalis, Ocimum tenuiflorum* and *Cedrus deodara* etc. have divine qualities, hence are used in many religious activities and other ceremonies. Deodar (*Cedrus deodara*) is considered as “tree of god” and its wood is mixed with ghee and some other plants are burnt on the occasion of marriage, birth anddeath ceremonies.

Sacred plants are owned by the local deities and are managed by the Temple Committee. The Temple Committee consists of Kardar, Pujari, Bhandari and Gur. The Kardar manages the affair, Pujari performs worship and rituals, Bhandari looks

after the store and Gur is the spokesman of the deity and his orders are strictly followed by the local community. Inhabitants of the Great Himalayan National Park (GHNP) believe that the plant which are sacred to deities also have the medicinal potential and help to cure various diseases. So, probably this became the basis for the protection plants and might have started worshipping plants (Sharma & Joshi 2010, Mehra et al. 2014).

2. Material and Method

2.1 Study Area:

The present study was carried out in the Eco- zone of the Great Himalayan National Park (GHNP), District Kullu, Himachal Pradesh. GHNP is a protected area (PA) established in 1984, formally declared as a National Park in 1999.It has been inscribed on the list of UNESCO World Heritage Site on 23rdJune 2014 with an area of 1171 km^2. Geographically, the GHNP lies at 31°38′28" N to 31°51′58" N latitude and 77°20′11" E to 77°45′52" E longitude with an altitudinal range between 1,600-4,800meters. The Eco- Zone of the GHNP consists of seven Gram Panchayats (Nahonda, Pekhri, Tung, Mashiyar, Shilli, Kandi-dhar, and Shrikot) in the Tirthan valley. The present study has been conducted in 25 villages of these seven Gram Panchayats.

2.2 Methodology

For the assessment of Sacred Tree Species, various field tours were conducted in the villages of Eco- Zone of the Great Himalayan National Park (GHNP). Questionnaire was designed to gather the data which included details on name of deities, tree species, myths, and ideal location of the sacred tree. Photos were also collected during the field visits.

3. Terminology used for such trees

The Great Himalayan National Park region has a distinct mystique culture. The remote villages are characterized by the presence of deity, locally known as "Devta". Each deity has its own temple and community ground. Thereis a deity called "Pehradaar" on the outskirts of almost every village that protects the village and the villagers. These deities have been named locally by the villagers for ages as Jal Devta, Vansheera, Kadont, Damola, KhudaliVeer, Laxmi Narayan, Chaterkhand, Basuki Nag and BarkhadiJogani, etc.placed above and under the tree, which are

easily recognized by a trident (trishul), a redcloth (shalu), a moli (kalava thread) and an iron object (Fig3a,3b,3c).

Deities are worshiped for better rainfall, good agricultural yield and profitable economic activities. People going out of the village for business or job visit them and pray for their success and safety. They also make a vow, especially for health, harvest or birth of a child. Many festivals are celebrated collectively by the people worshiping these deities. Animals (mainly goats and sheep) and coconuts are sacrificed during rituals performed before these deities .Fruits and flowers are also offered at some places. It is believed that the deity looks after the well-being of the people and also protects the trees by punishingthe people engaged in felling of these trees.

Sacred trees help to define the cultural identity of the communities that respect and protect them. The enforcement of the rules for the management ofthe sacred trees is mainly through the religious beliefs of the villagers. Even though no separate body exists to enforce these rules or punish p eople. So, the Temple Management Committee plays an important role in this. There is a strong belief that the deities punish those people who violate the defined rules advocated by the Temple Management Committee.

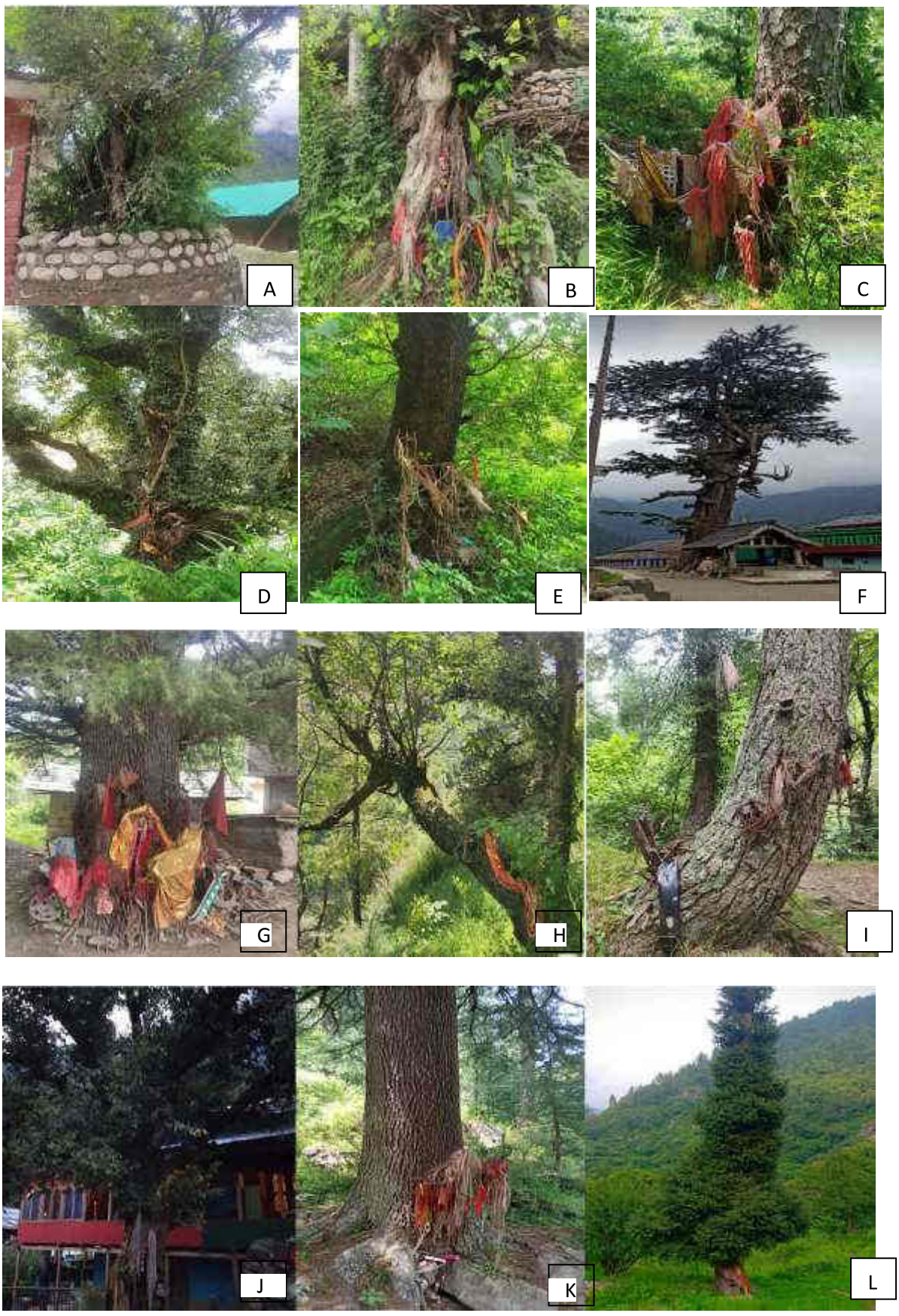

Fig.3 (a)Photo Plate of Deity

Fig.3 (b)Photo Plate of Deity

Fig.3 (c)Photo Plate of Deity

Abbreviation used; A=Jal Devta (*Zanthoxylum armatum, Prinsepia utilis, Berberis aristate)*; B= Shanghadi (*Morus alba*); C= Kadond; (*Pinus roxburghii*); D=Khudaliveer (*Quercus leucotrichophora*); E= Choi Devta (*Pistacia integerrima*);F=SheshNag (*Cedrus deodara*); G= Jal Devta(*Cedrus deodara*);H=Matloda(*Morus alba*);I=ChaladuDevta (*Pinus wallichiana*); J=Chaterkhand (*Celtis australis*); K= Damola (*Pinus roxburghii*); L=Baski Nag (*Piceasmithiana*); M=Koonh Devta (*Cotoneaster acuminatus*); N= Shiv (*Pinus roxburghii*); O=Khudali Veer; P= Rondu Narayan (*Ilex aquifolium*);Q=Narayan (*Morus alba*); R=BakhadiJogani (*Quercus semecapriflolia*);S=Panchveer (*Quercus semecapriflolia*);T=Kadond (*Prunus cornuta*); U=Shirdu (*Celtis australis, Ficus palmata*);V= Jal Devta (*Cedrus deodara*); W=BhareduDevta (*Morus alba*); X=DrakshaDevta(*Morus alba*); Y=Khudali(*Morus alba*); Z=Kadond (*Cedrus deodara*); 1=Kadond (*Morus alba*); 2=Chaterkhand (*Morus alba*); 3= Nag Devta (*Pyrus communis*) 4= Utam (*Morus alba*); 5= Luxmi Narayan (*Morus alba*);6=Luxmi Narayan (*Ficus palmata*);7=Choral Nag (*Taxus baccata*); 8=Damola (*Pinus roxburghii*); 9= BharyaduDevta (*Prunus cornuta*); 10= Doent Devta (*Quercus floribunda*).

4. Sacred Tree Species

In the GHNP, the traditional worshipping has protectedand conserve many plants from deforestationwhich also have tremendous medicinal value and made them as sacred. Sacred Species, including trees and shrubs are under the protection of the reigning deity of that village. Cutting of trees, even removal of dead parts of the tree is a taboobecause of the fear of deity. For this reason, the impact on exploitation of the natural resources by the human being is also very limited. A total of 21 sacred plants species were recorded which are worshipped by the local residents in many rituals and religious ceremonies. These sacred plant species which includes 17 tree species and 4 shrub species has been documented as sacred in the Eco- Zone of the GHNP (Table1).

Table1: Sacred plants in Eco Zone of the GHNP

Sr. No.	Botanical Name	Local Name	Family	LF	Medicinal Value
1	*Aesculus indica*	Khanor	Sapindaceae	T	Stomach pain and menstrual problems

2	*Berberis aristata*	Kashmal	Berberidaceae	S	Piles, Antidote to snake bite,
3	*Cedrus deodara*	Devdaar	Pinaceae	T	Lameness and itching in sheep and goat, decoction of wood is used to cure urinary disease, piles, kidney stone, diabetes, and fever.
4	*Celtis australis*	Khadik	Cannabaceae	T	Amenorrhoea
5	*Cotoneaster acuminatus*	Riush	Rosaceae	S	Rheumatism, arthritis, tooth cleaning, scabies.
6	*Ficus palmata*	Fagu	Moraceae	T	Digestive disorders, Stem latex is applied to extract spines and thorns deeply lodged in the flesh.
7	*Ilex aquifolium*	kalucha	Aquifoliaceae	T	Veterinary disease.
8	*Morus alba*	Cheemu	Moraceae	T	Stomach disorders.
9	*Piceasmithiana*	Rai	Pinaceae	T	-
10	*Pinus roxburghii*	Chil	Pinaceae	T	Boils, sprains
11	*Pinus wallichiana*	Kail	Pinaceae	T	Bone fracture in Sheep and Goat
12	*Pistacia integerrima*	Kakad-Singhi	Anacardiaceae	T	Cough Vomiting, asthma, fever, pulmonary disease, vomiting and Diarrhoea.
13	*Prinsepia utilis*	Bhekhal	Rosaceae	S	Rheumatic pain, wound, cut, burns and Boils.
14	*Prunus cornuta*	Jamun	Rosaceae	T	Stomach pain and fever.
15	*Pyrus communis*	Naashpati	Rosaceae	T	Antioxidant and antibacterial

16	*Pyrus pashaia*	Shegal		T	Fruits used in digestive problem and pterygium disease to cure affected eyes of cattle.
17	*Quercus floribunda*	Mohru	Fagaceae	T	Indigestion
18	*Quercus leucotrichophora*	Ban	Fagaceae	T	Asthma and diarrhea
19	*Quercus semecapriflolia*	Kharshu	Fagaceae	T	Astringent, tooth-ache and gum problems
20	*Taxus baccata*	Rakhal	Taxaceae	T	Common cold, cough, asthma, fever and bark used for cancer.
21	*Zanthoxylum armatum*	Tirmir	Rutaceae	S	Seed used for toothache and twigs for brushing teeth. Fruit paste is useful for scabies.

Abbreviation used; LH= Life from, S = Shrub, T = Tree,

5. Religious Belief

Footwear, leather accessories and tobacco products are not permitted near these trees or within the circumference of these groves. Women and girls who wear red dresses and those having in menstrual phase/period are not allowed

5.1 Taboo/Religious Beliefs on prohibition of felling of trees

Local people preserve and protect trees because of their religious beliefs and custom associated with them. It is believed that happiness and prosperity of the community depends upon the blessings of the gods and goddesses residing in these trees. People of the village believe that deities reside within these sacred trees. So, it is worshiped and protected in its natural state. Besides, no one is permitted to cut it down. It is the duty of every resident to protect not only the sacred trees but also the sacred groves located around them which signify their expression and relationship with divine p owers or nature. Local people of the communities

also believe that life of these trees is directly correlated to life of the people". If they turn against the tree and try to destroy it, people will suffer a lot and their power will also be lost.

The forest deities are very fierce. All the plants that flourish within the sacred grove, including shrubs and vines, live in the shelter of the forest deity who resides there. Any sort of destructive work is prohibited within the circumference of these sacred groves. As per tradition, only worship of the deity is performed here from time to time. There is a strict complete ban on felling of trees within the perimeter. Any person daring to violate the prescribed rules has to face serious consequences which may even lead to the death of that offender. The local people believe that any interference within the perimeter will offend the local deity. The consequences of such interference include disease epidemic, natural calamity or damage to crops. People consider these deities as "the abode of the protector" that protects the people and animals of the entire village from various calamities.

Sacredness offers protection to the sacred groves and sacred species. In the biodiversity rich areas of the valley, these sacred trees are very important for maintaining the ecosystem and also plays a significant role in promoting conservation and sustainable utilization of biodiversity of the region.

6. Ideal Location of such Sacred Trees

Sacred Tree is found near the village, water stream and road side area where accidents happen quite frequently.

Table: 2. Sacred trees associated with God and Goddess distributed in Eco zone of The Great Himalayan National Park.

Name of Village	Sacred Tree	Associated localdeities	Latitude	Longitude
Nohanda Panchayat				
Dingcha	*Quercus semecapriflolia*	Panchveer	31°38′15.3” N	77°28′26.4” E
	Quercus semecapriflolia	Bakhari Mata	31°37′45.3” N	77°28′48.9” E
Tinder	*Celtis australis*	Chatarkhand	31°38′47.8” N	77°26′59.4” E
Kauncha	*Pyrus pashia*	Rondu Narayan	31°39’09.1’’ N	77°27’16.6’’ E
	Ilex aquifolium	Rondu Narayan	31°39’27.4’’ N	77°27’32.0’’ E
Baldhar	*Pinus wallichiana*	Doent	31°38’ 0” N	77°26’2’’ E
Kharungcha	*Picea smithiana*	Baski Nag	31°39’ 54” N	77°28’10’’ E
Kandhidhar Panchayat				
Dari	*Zanthoxylum armatum,* *Prinsepia utilis, Berberis aristata*	Jal Devta	31°38′27” N	77°23′41” E
	Morus alba	Shangadi	31°38′27” N	77°23′41” E
Chamani	*Pistacia integerrima*	Shirdu	31°38′36” N	77°24′30” E
Tung Panchayat				
Tung	*Pinus roxburghii*	Damola	31°36′17” N	77°28′42” E
Faryadi	*Celtis australis, Ficus palmata*	Shirdu	31°37′33.5” N	77°26′13.3” E

Chadhari	*Pyrus communis*	Beer Devta	31°38′17” N	77°25′52” E
Bathad	*Cedrus deodara* *Pinus wallichiana*	Jal Devta Chaladu	31°36′21” N 31°36′40” N	77°28′16” E 77°27′11” E
Chipani	*Morus alba* *Morus alba*	Luxmi Narayan Khudali	31°36′22.8” N 31°37′13” N	77°28′34.0” E 77°28′14” E
Barnagi	*Pyrus communis*	Nag Devta	31°36′41” N	77°27′33” E
Dhara Shalinga	*Morus alba*	Kadond	31°37′44.3” N	77°26′08.1” E
Pekhri Panchayat				
Pekhri	*Morus alba* *Morus alba*	Narayan Bhredu	31°38′914” N 31°38′367” N	77°25′77” E 77°26′114” E
Ludar	*Morus alba*	Chatarkhand	31°38′974” N	77°25′662” E
Nahin	*Cedrus deodara* *Morus alba*	Jal Devta Dharaksha	31°39′26.8” N 31°39′26.8” N	77°26′40” E 77°26′38” E
Manhar	*Morus alba*	Matloda	31°38′41” N	77°26′21” E
Dhar	*Morus alba*	Utam Devta	31°40′29.3” N	77°28′12.0” E
Shilli Panchayat				
Shill	*Cedrus deodara* *Taxus baccata* *Pinus roxburghii*	Shesh Nag Choraal Nag Damola	31°35′49” N 31°35′ 52” N 31°36′24” N	77°27′30” E 77°27′32” E 77°27′23” E
Parwari	*Cedrus deodara* *Prunus cornuta* *Cotoneaster acuminatus*	Kadond Kadond KunhDevta	31°36′9” N 31°36′10” N 31°36′21” N	77°26′53” E 77°26′41” E 77°26′29” E
Garuli	*Aesculus indica*	Kadond	31°36′10” N	77°26′41” E

Sharunger	*Aesculus indica*	Jal	31°35′53” N	77°27′58” E
		Devta&Jogani		
Mashiyar Panchayat				
Ghaliyad	*Quercus floribunda*	Doent	31°36′24” N	77°29′34” E
Shrikot Panchayat				
Anah	*Prunus cornuta*	BharyaduDevta	31°40′3” N	77°24′295” E
Kalwari Panchayat				
Dehuri	*Pinus wallichiana*	Shiv	31°38′46” N	77°22′50” E

Conclusion:

The religious activities play an important role in conservation of the biodiversity. All the plants which have been declared as sacred by our ancestors have medicinal values too. Hence, it is mandatory to encourage and p reserve these aesthetic values to conserve the nature and biodiversity. The limited traditional knowledge about sacred plants and their valuable uses have been passed on from generation to generation. So, there is an urgent need for p roperdocumentation.

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Annexure-VI

Traditional uses of medicinal plant in Great Himalayan National Park of Himachal Pradesh, North Western Himalaya, India

Abstract

The Indian Himalayan region (HRI) supports huge variety of medicinal plant. Still, there has been little authentication on medicinal plant in several protected areas of IHR. Great Himalayan National Park (GHNP) is a world heritages site, harbours a wide variety of medicinal plants. The present study is an attempt to assess the medicinal plant diversity of Great Himalayan National Park. A total of 152 species of medicinal plants belonging 63 different families were used by local people to cure different diseases. Out of these, most of plant species were have leaves as medicinal value followed by roots, fruits, rhizomes, and seed. All these medicinal plants species were identified to cure human disease except 10 medicinal plant species which were used by local inhabitants for the treatment of veterinary ailments. Local People, especially older age group, including women heavily use these traditionally available medicinal plants as a primary health care. Maximum species were used for wound healing (31), followed by cough (25), dysentery (21), cold (20) and stomach- ache (18). Due to grassing, over exploitation and habitat degradation the population of many medicinal plants species is decreasing day by day.

Key words: Great Himalayan National Park, world Heritage site, Medicinal plant, disease, local communities.

1. Introduction

The use of plants to cure disease is as old as humanity. Human society throughout the entire world gathers indigenous knowledge on medicinal plant and their uses. The countries like Sri Lanka, China, Cuba, Thailand and India have certified the official use of traditional system of medicines in their health care Programme. For example, the Indian system of medicine homeopathy such as Sindha, Unani and Ayurveda depend on plant extract or their derivatives for treatment of human illness (Prajapati et al., 2003). The Tibetan system of medicine is also depending upon Himalayan plant species (Samant et al., 1998). The preparation of traditionally available medicinal plants is essential part of health care for human, especially for population living in rural areas mostly depend upon nature, because of lack of instant

medical facilities and high prices of synthetic medicine. The forests area is the main source of medicinal plants since the time human realized the curative and preventive properties of plants and started using them for human and animal ailment. The Indian Systems of Medicine (ISM), is an ancient traditional medicine practices known to the entire world, and derives maximal formulations from plants and extracts of plant that exist in the forests area.

Great Himalayan National Park (GHNP) fallin North Western Himalaya which supports a large variety of Biodiversity elements including endangered, native, endemic medicinal plant.Vegetation in GHNP is subtropical, temperate, subalpine and alpine.The alpine vegetation is dominated by large number (>24)of herbaceous communities (Singh, 1999). Despite its remoteness and status as a park, GHNP is not free from human interference (Kala et al., 2002). An inhabitant of the GHNP is mostly poor and largely depends upon nature to fulfil their day to day needs. For the primary health care inhabitant depends upon medicinal plant prescribed by the local Vaidya's or local healers.

The exploitation of medicinal plants and grazing by sheep herds in meadows poses great riskof extinction of medicinal plant. About 20,000 sheep and goat are known to graze in the alpine zone of GHNP during the summer month (Singh, 1999 May – September)

1.1 **Review of Literature**

The 80% population of advance countries still use indigenous medicines extract from plants for the treatment of human illness (de Silva 1997). India has oldest, abundant and most diverse traditional cultural associated with the uses of medicinal plants in the form of traditional systems of medicine (GOI, 2000). Various studies have been done on the medicinal plant in IHR (Jain, 1991; Samant et al., 1998; Samant et al., 2001; Semwal et al., 2007; Pant et al., 2009; Lone et al., 2014; Malik et al., 2015; Sharma et al., 2015; Panday et al., 2017). Uttarakhand region has highest number (946) of medicinal and aromatic plant species (Kala, 2000) followed by Himachal Pradesh (643) Sikkim (707) and North Bengal (Samant et al., 1998, 2007). There are around 3470 species in the Himalaya which are considered exclusively endemic. The extreme anthropogenic pressure has been identified as the main reason of decline in medicinal plant population and availability in the Himalayan region (Samant et al., 1998). The majority of the population live in village and mainly

depends upon the Biodiversity for their daily needs such as religious purpose, fodder, food, fuel, agriculture tools, timber, fibre and medicines for different aliments (Samant et al., 1998, 2007, 2011).

Documentation of traditional knowledge of using medicinal plant provided several important drugs to the modern world (Fabricant and Farnsworth, 2001). The continuous transmission of traditional knowledge is under threat from the old generations to younger generation (Kargioglu et al., 2008). Therefore, traditional knowledge documentation is important for the biological resources utilization and conservation (Muthu et al., 2006). Large number of studies have been also done on medicinal plants in the Himachal Pradesh by many workers (Rai and Sharma, 1994; Negi and Bhalla, 2002; Chauhan, 2003; Samant et al., 2007a, b; Subramani et al., 2007; Singh et al., 2009; Negi and Chauhan 2009; Rana and Samant 2011; Vidyarthi et al., 2013; Sharma et al., 2014; Kumae et al., 2015; Rana et al., 2015; Thakur et al., 2016; Sharma et al.,). However, a review of the literature revealed that very few studies are available on the medicinal plant of the protective zone of the state (Subramani et al., 2007: Singh, et al., 2009; Rana and Samant, 2011; Lal and Samant 2015; Sharma et al., 2017). Thus, documentation has been attempted on the medicinal plant diversity of Great Himalayan National Park.

1.2 Justification and objectives of research

To consider the importance of wealth of medicinal plant and gradually decline in traditional knowledge, an attempt has been made to assess (i) Medicinal plant diversity and distribution patterns in Great Himalayan National Park. (ii) Document traditional uses and practices and (iii) Suggest strategy for conservation and management.

2. Material and Methodology

2.1 Study Area

The present study was carried out in some interior eco- zone areas of Great Himalayan National Park (GHNP). GHNP is a protected areas (PAs) located in the Kullu District of Himachal Pradesh, established in 1984, formally declared as National park in 1999 and inscribed in to the list of UNESCO world Heritage Site on 23 June 2014 with an area of 1171Sq. km. The GHNP lies at 31°38′28”N to 31°51′58” N latitude and 77°20′11” E to 77°45′52” E longitude with an altitude range

between 1,600- 4,800m.Most of the population (15000- 16000 people) in the Ecozone are poor and dependent on natural resources for their livelihood. The study area supports lager variety of biodiversity elements. The uniqueness and representativeness of biodiversity has attracted huge attention of the people of entire globe.

2.2 Methodology

For the assessment of medicinal plant Field surveys were conducted in various interior villages of Great Himalayan National Park. Vaidya's and local knowledgeable people especially, older age group were interviewed because collection of medicinal plant from the forest area is done by these people. Questionnaire was designed to gather the data. The local language was used during the interviewed. Details about local names of plants, valuable part and their uses to curer different diseases were recorded. The specimens were collected from their natural habitat and identified with the help of local people and consulting regional flora, and literature.

3. Results

Trend of using traditionally available medicine to cure diseaseis decreasing day by day, but still lost of the people especially who live in the rural areas realize the importance of these medicines obtained from different types of forest areas. There are various medicinal plant used by local community to cure both animal and human disease. It is more viable to promote traditional system of medicine as primary health care in rural area of the state due to lack of proper medical facilities.

Rural communities, especially, older age people heavily use these medicinal plant species for improvement of health and believe that these plants are easily available, less expensive, and have no side effects on the body. The trends of using these traditionally available medicinal plants were found more in older age class as compared to younger age. Older people including Vaidya's accurately diagnosis the symptom of the disease as compares with the modern medical practices. It is also observed that, the Vaidya's are hesitant to disclose this knowledge in the presence of other villagers, as this knowledge provide them respect and recognition in the society, they are more open when interviewed in separately (Fig.1**).**

3.1 Diversity

Local community used 152 species (Angiosperms: 141; Gymnosperms: 5; Pteridophytes: 6) of medicinal plants for cure of various ailments. These medicinal plant species belong to 69 different families. Out of these 20 species were trees, 24 Shrubs, 95 herbs, 7 Climbers and 5 ferns (Table 1). Rosaceae (14 Spp.), Astreaceae (11 Spp.), Lamiaceae (9 Spp.), were dominant families. Roots, barks, leaves, flowers, fruit, and rhizomes are used as a medicine value. Among the plant parts, use of leaf is most common, followed by roots and fruits. Resin and tuber are rarely used (Fig. 2)

3.2 Utilization pattern and Traditional uses

The medicinal plants species available in the area of GHNP have been used for the treatment of various ailments. The Maximum species were used for wound healing followed by cough, dysentery cold, boils, and stomach- ache (Table 2).

Figure 1: Interviews of local Inhabitants and Vaidyas in GHNP

Table 1: Taxonomic description of medicinal plant in GHNP

Taxonomic Group	Families	Species	Tree	Shrub	Herbs	Climbers	ferns
Angiosperm	59	141	15	24	95	7	-
Gymnosperm	2	5	5	-	-	-	-
Pteridophytes	5	6	-	-	-	-	6
Total	**66**	**152**	20	24	95	7	6

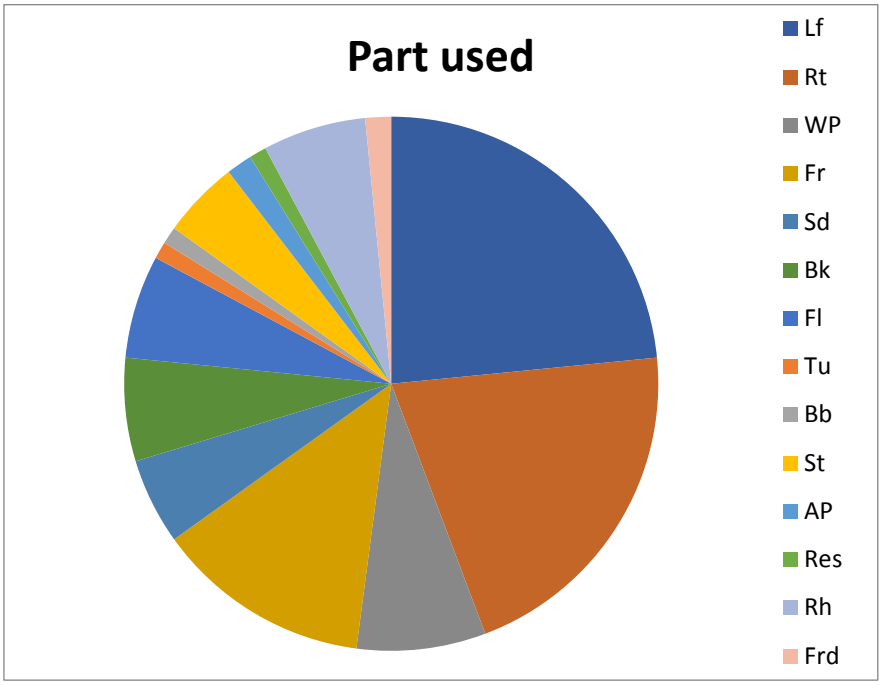


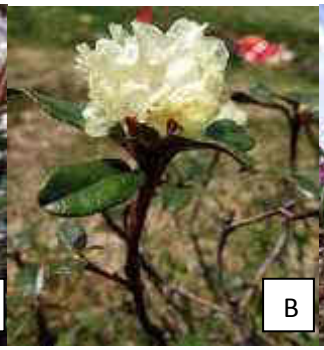
Fig. 2 Part of plant having medicinal value

Table 2: Utilization pattern of medicinal plant for the treatment of various diseases

Sr. No.	Disease	No. of Species	Sr. No.	Disease	No. of Species
1	Anti- cancerous	1	28	Leucorrhoea	3
2	Antiseptic	6	29	Liver problem	5
3	Asthma	13	30	Measles.	1
4	Astringent	5	31	Menorrhoea	2
	Abdominal pain	6	32	Menstrual	4
5	Blood purification	3	33	Nervous Disorder	3

6	Boils	17	34	Nose bleeding	1
7	Bone fracture	3	35	Pulmonary	1
8	Burns	5	36	Piles	3
9	cold	20	37	Rheumatism	9
10	Constipation	3	38	Stomach-ache	18
11	Cough	25	39	Skin Problem	17
12	Cuts	13	40	Sprain	5
13	Diabetes	3	41	Toothache	8
14	Diarrhoea	5	42	Tuberculosis	2
15	Digestive Disorder	10	43	Ulcer	3
16	Diuretic	1	44	Urinary problem	5
17	Dysentery	21	45	Vomiting	5
18	Ear -ache	3	46	Snake bite	4
19	Eye diseases	7	47	Veterinary	10
20	Fever	17	48	Whooping cough	2
21	Gastric	6	49	Wound	31
22	Hair problem	4			
23	Highblood pressure	2			
24	Headache	10			
25	Insect bit	4			
26	Jaundice	4			
27	Kidney,bladder stone	2			


A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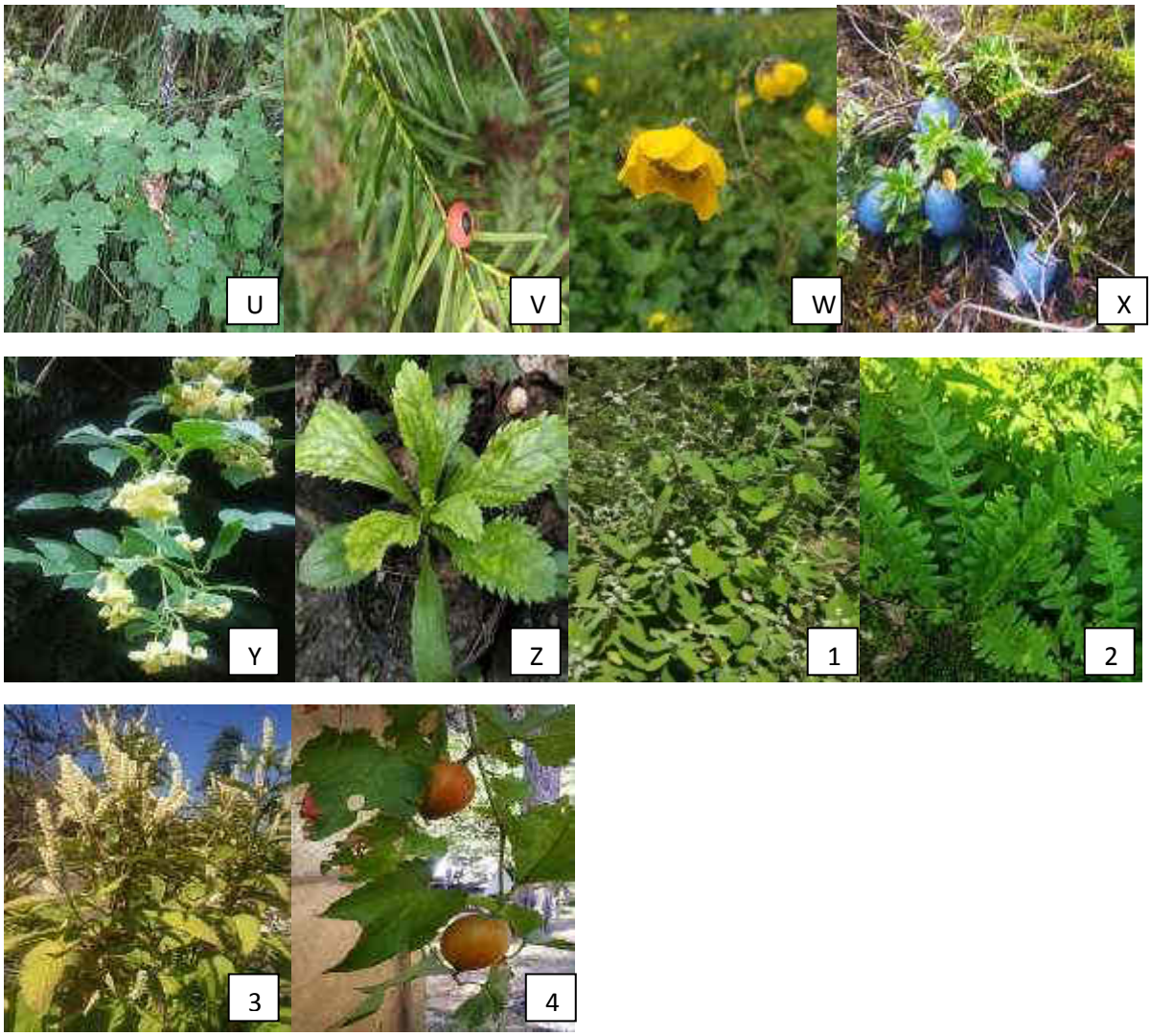

Fig. 3: Photo plates of medicinal plants

Abbreviations used; A= *Rhododendron companulatum*; B= *Rhododendron anthopogon*; C= *Rhododendron lapidotum*; D**=** *Bergenia ligulata*; E= *Fritillaria roylei*; F= *Hydychium spicatum*; G= *Trillitiumgovanianum*; H= *Jurineadolomiaea*; I= *Podophyllum hexandrum*; J= *Rheum austral*; K= *Dioscoreadeltoidea*; L= *Dactylorhizahatagirea*; M= *Morinalongifolia*; N= *Berberis aristata*; O= *Zanthoxylumarmatum*; P= *Rosa brunonii*; Q= *Phytolaccaacinosa*; R= *Juniperuscommunis;* S= *Delphinium brunonianum*; T= *Viola serpens*; U= *Thalictrum foliolosum*; V= *Taxus baccata*; W= *Geum elatum*; X= *Gaultheria trichophylla*; Y= *Clematis buchananiana*; Z= *Picrorhiza kurroa*; 1= *Plectranthus rugosus*; 2= *Asplenium dalhousiae*; 3= *Elsholtzia fruticosa;* 4= *Trichosanthes tricuspidata*;

Figure 4: Photo plates of valuable dried part of medicinal plants

Abbreviations used; a=*Aconitum heterophyllum*; b= *Picrorhiza kurroa*; c= *Rhododendron companulatum*; d= *Saussurea graminifolia*; e= *Arnebia benthamii*; f= *Nardostachys grandiflora*

Appendix: Traditional uses of Medicinal Plant in GHNP of Himachal Pradesh

S.No.	Botanical Name	Local Name	AR (m)	Habitat/s	Part Used	LF	Uses
	Angiosperm						
	Amaranthaceae						
1	*Amaranthus viridis L.*	Sariyara	1600-2300	1,10	Sd	H	Seed used for measles, digestion.
2	*Cyathula capitata* Moq.		1600-2200	2,5	Lf, St	H	Decoction is given in emetic
3	*Cyathula tomentosa* (Roth.) Moq.	Kathural	800-2700	1,3	Rt	H	Used for boils, skin disease.
	Alliaceae						
4	*Allium humile* Kunth.*	Farn	2500-3400	2,5	Fl	H	Digestion and flavour
	Anacardiaceae						
5	*Pistacia integrrima* Stew.	Kakar-	600-	1,3	Lf	T	Cough Vomiting, asthma,

		singhi	2500				fever, pulmonary disease, vomiting and Diarrhoea.
	Apiaceae						
6	*Angelica glauca* Edgew. **	Chora	2000-3000	2	Rt	H	Stomach pain, gastric complaints, vomiting, Dysentery and are used as a condiments & spices.
7	*Bupleurum falcatum* L.	Ban ajwain	1600-3000	2,3,5	Rt	H	Stomach acidity, Abdominal pain, inflammation, liver complaints
8	*Centella asiatica* (L.) Urb	Brahmi	900-1800	1,5	Lf	H	Brain relaxation and memory enhancer
9	*Pleurospermum densiflorum*	Losser	3000-4000	1,3,4, 5	Lf	H	Leaves used for massage with ghee on joint pain, stomach-ache.
	Araceae						
10	*Acorus calamus* L.	Bach	800-2200	4	Rh, St, Lf	H	Cough, cold, abdominal pain, asthma, cut, dysentery, Fever, skin disease, stomach-ache, snake bite, veterinary disease,
11	*Arisaema tortuosum* (Wall.) Schott	Bushar	1500-2200	1,2,3, 4,5	Sd, Rt	H	Veterinary disease, skin disease.
	Araliaceae						
12	*Hedera nepalensis* Koch.		800-2500	1,2,3, 4,8	Lf	S	Skin disease, cold, cough, rheumatism.
	Asteraceae						
13	*Ainsliaea optera* DC.*		1200-3600	1,2,3	Rt	H	Stomach-ache flower are edible
14	*Artemisia nilagirica* (Cl.) Pamp.		800-2700	1,2,3, 5	Lf, Rt	H	Asthma, skin disease, ear problems, headache, stomach-ache, wound.
15	*Artemisia parviflora* Roxb. Ex Besser**	Jhao	1600-2700	1,2,5	Lf	H	Used for Skin cut, throat problem.
16	*Cirsium falconeri* (Hk.f.) Petr.		1900-3400	1,2,3	Rt	H	High blood pressure
17	*Cirsium wallichii* DC.**	Bhusha	1600-3000	1,2,3, 4.5,9	Rt	H	Used of gastric problems, headache, Swelling.
18	*Galinsoga parviflora* Cav.	Pipulu ghas	1000-2000	4,5	Fl, St Lf	H	Nettle stings, blood coagulation of fresh cut and wound.
19	*Gerbera gossypina* (Royle) Beauv.**	Kopra	1600-2500	1,2,3, 4	Lf	H	Gastric problem.
20	*Jurinea macrocephala* DC.	Guggal dhup	2500-3600	2,3	Rt	H	Antiseptic, fever and incense.
21	*Saussurea graminifolia*	Googae	4000-5000		WP	H	Used for Whooping cough.
22	*Saussurea obvallata* (DC,) Edgew.	Brahm kamal	3000-4800	1,2,5	Rt	H	Wound, cuts, liver disorder, cough, boils and Skin disease.
23	*Taraxacum officinalis* Weber		1700-3000	1,2	WP	H	Blisters and wounds.
	Aquifoliaceae						
24	*Ilex aquifolium*	Kalucha	1500-2600	1,2	Lf	S	Veterinary disease.
	Balsaminaceae						

25	*Impatiens scabrida* DC.**		1200-3600	1,2,3, 4		H	Stomach pain.
	Berberidaceae						
26	*Berberis aristata* DC.**	Kashmal	1800-3000	1,2,5, 8	Rt	S	Piles, Antidote to snake bite,
27	*Berberis lyceum* Royle**	Kashmal	800-2200	1,2,3, 4	Rt, Fr	S	Decoction of root with honey is used to cure jaundice, eye disease.
	Betulaceae						
28	*Alnus nitida* (Spach) Endl*	Koish	1600-2500	4	Lf, St	T	Stomach pain, cuts and wound.
29	*Betula utilis* D. Don	Bhojpatra	3500-4500	2,3	Bk	T	Used for Sprain, wound cleaning, cut, burn, jaundice, veterinary ailments, ear complaint.
	Boraginaceae						
30	*Arnebia benthamii* (Wall.ex G.Don) I.M. Johnst.	Ratanjot	3000-4300	4,10, 11	Rt	H	Boils, ulcer, wounds, and hair tonic.
	Cannabaceae						
31	*Cannabis sativa L.*	Bhang	1200-3000	1,2,5, 9,10	WP, Fr	H	Analgesic, narcotics, cold, skin pigmentation, sleep pills, sores and sting of *Urticadioca*.
	Caprifoliaceae						
32	*Morina longifolia*	Bhushi	3000-4000		Rt	H	Used for Cough and Asthma
33	*Viburnum cotinifolium*	Tanahna	1900-3100	1,2,3, 11		S	Menorrhoea.
	Caryophyllaceae						
34	*Silene vulgaris*	Kapu-gha	1600-3300	2,3	Lf	H	Asthma and vegetables.
35	*Stellaria media* (L.) Vill.		1900-3000	2,8	WP	H	Itching, cough.
	Chenopodium						
36	*Chenopodium album* L.	Dhanger	1600-2600	2,5,9	Lf	S	Skin disease, urine complaint.
	Cornaceae						
37	*Cornus macrophylla* Wall.	Kachun	1600-2700	2,8	Lf, Bk, Fr	T	Used for Dysentery.
	Cucurbitaceae						
38	*Solena heterophylla*	Galakdi	1600-2500		Fr	C	Gastrointestinal disease.
39	*Trichosanthes tricuspidata* Lour.			1,2	Rt	C	Veterinary disease
	Cupressaceae						
40	*Juniperus communis*	Bittal	3000-4000		Lf	S	Used for incense and offering to God.
	Cuscutaceae						
41	*Cuscuta reflexa* Roxb.	Minjali/ Amar bel	1600-2600	1,3,4, 5,9	WP	H	Wound ,burn and hair fall
	Dioscoreaceae						
42	*Dioscorea deltoidea* Wall. ex Kunth	Singli-Mingli	1500-2500	1,2,5	Rh	C	Dysentery, pile, and dyeing purpose.

	Dipsacacea						
43	*Dipsacus inermis* Wall.	Tori	2200-3000	1,2,5	Lf	H	Decoction is used in swollen body part to cure swellings, ache.
	Ericaceae						
44	*Gaultheria trichophylla* Royle		2600-3400	2,3,4, 5	Lf, Fr	H	Cough, cold and leaf oil is used for swelling.
45	*Lyonia ovalifolia* (Wall.) Drude	Arain	1500-3000	1,2,3, 4	Lf, Sd	T	Seed paste applied on Boils, pimples and wounds, Young leaves poisonous to cattle.
46	*Rhododendron anthopogon* D.Don*	Talsi	3000-3400	5	Lf	S	Cough, cold.
47	*Rhododendron arboreum* Sm.	Buransh	1600-2700	1,2,3, 4	Fl	S	Flowers juice used for nose bleeding, Dysentery, headache, wound and fever
48	*Rhododendron companulatum D. Don**	Tangal	2800-3400	2,5,8	Fl, Lf	S	Skin Disease, cold, cough, headache, fever and Tangal ka Tallish is used for the Boils Treatment. Leaves are poisonous to sheep and goat if eaten.
49	*Rhododendron lapidotum* Wall.	Talsi	2700-3800	2,5,11	Lf	S	Cold and cough
	Fabaceae						
50	*Desmodium elegans* DC.	Kathi	1600-3000	1,2,3, 4,8,10	Rt, Lf ,St	S	Root juice is used for joint pain and stem prevent teeth form decaying.
51	*Indigofera heterantha* Wall. ex Brandis	Kali Kathi	1600-3000	1,2,3	Rt	S	Used for dysentery pain.
52	*Trifolium repens* L.		1600-3400	2,9,11		H	Astringent.
	Gentianaceae						
53	*Swertia chirata*	Charayta	2500	1,2	Lf	H	Skin irritation and itching.
	Geraniaceae						
54	*Geranium nepalense Sw.*	Ghass	1500-3000	1,2,3, 5,9	Rt	H	Rheumatic problem.
	Juglandaceae						
55	*Juglans regia* L.*	Akhrot	1000-2000	1,2,3	Bk, Lf, Fr	T	Antiseptic, Toothache, tooth decay, mosquito replant and Hair fall.
	Lamiaceae						
56	*Elsholtzia fruticosa* (Don) Rehd.	Pothi	1500-2400	1,2,5	Sd	H	Gastric and flavouring foodstuff.
57	*Elsholtzia flava* (Benth.) Benth.	Pothi	1500-2400	1,2,5	Lf	H	Stomach-ache
58	*Mentha longifolia* L.	Pudina	1600-3000	2,7	Lf	H	Carminative and Antiseptic
59	*Ocimum sanctum*	Tulsi			Lf	H	Cold and cough.
60	*Plectranthus rugosus*	Chichri	2000	1,	Lf	H	Used for digestive disorders.
61	*Salvia mukerjeei* Bennet &Raizada**		800-2200	1,2,3, 5	Rt	H	Cough
62	*Salvia moorcroftiana* Wall.ex Benth.**	Thuth	1500-2700	1,5,11	Lf	H	Astringent, and carminative

63	*Salvia nubicola* Wall.**		2100-4300	1	Lf, Rt	H	Cough, cold and wound
64	*Thymus serphyllum*	Ban Ajwain	1800-4500	5	WP	H	Antiseptic and digestion etc.
	Liliaceae						
65	*Fritillaria roylei* Hk.*	Van Lahasun	2700-4000	2,11	Bb	H	Digestive disorders.
66	*Polygonatum verticillatum*	Salam mishri	1600-3300	1,2,3	Rt	H	Used for spermatorrhoea and piles
	Malvaceae						
67	*Malva verticillata* L.		800-2000	1,2,9, 11	WP	H	Fever
	Meliaceae						
68	*Toona ciliate M. Roem.*	Daral	1600-2200	2,4,13	Bk	T	Dysentery, fever, wounds and gastric problems.
	Menispermaceae						
69	*Tinospora cordifolia*			1,2	St	H	Used for constipation.
70	**Moraceae**						
71	*Ficus Palmata* Forssk.	Fagu	600-2700	1,2	Fr	T	Used for Digestive disorders, Stem latex is applied to extract spines and thorns deeply lodged in the flesh.
72	*Ficus pumila* L.			1,2	Lf	C	Stomach ache, digestion
73	*Morus himalayana*	Chimu		2,4	Fr	T	Stomach disorders.
	Orchidaceae						
74	*Dactylorhiza hatagirea* (D. Don) Soo.	Hathpanja	3000-4200	5,11	Rt	H	Anti-coagulant bone fracture, and Wound healing.
75	*Goodyera repens* (L.) R. Br.		2200-3300	1,2	Lf	H	Stomach problem, antidote of snake bite, blood purifier.
76	*Platanthera edgeworthii* Hk.f. ex Collett		2500-3000	1,2,3, 8	Tu	H	Blood purifier.
	Oxalidaceae						
77	*Oxalis corniculata* L.	Mili-Molori	300-3000	1,2,4	WP	H	Stomach-ache, coughs, cold, cut, dysentery, fever, swelling, jaundice and skin disease.
78	*Oxalis latifolia* Kunth.	Molori	1900-3200	1,5,8, 11	WP	H	Cuts, insect bite, dysentery, stomach ache, skin disease, fever.
	Papaveraceae						
79	*Meconopsis aculeata*	Poppy	3000-3800		Rt	H	Analgesic, bone fracture.
	Phytolaccaceae						
80	*Phytolacca acinosa* Roxb.	Jharki	1500-3000	3,8	Rt	H	Root used for boils, body pain, young leaves as vegetables, Berries are poisonous.
	Plantaginaceae						
81	*Plantago himalaica Pilg.***	Isabgol	2500-3000	2,5,9	Sd	H	Dysentery, cough, cold
82	*Plantago lanceolata* L.	Isabgol	1600-3000	2,4,5	Lf	H	Boils.
	Poaceae						
83	*Cynodon Dactylon* (D) Pers.	Dhrubghas	1600-2200	1,2,4	WP	H	Headache, Menstrual problem, dysentery, sores, urinary

							complaint.
84	*Saccharum spontaneum* L.	Philoo	1500-2000	1,2,3, 5	Lf	H	Diarrhoea, asthma.
	Podophyllaceae						
85	*Podophyllum hexandrum* Royle.	Ban Kakri	2600-4500	2,3,4, 8	Rh, Rt	H	Blood purifier, cough, cut, wound, gastric, skin disease and kidney problems.
	Polygonaceae						
86	*Fagopyrum esculentum* Moench	Diha	800-2000	2,5	Lf,St	H	Leaves and shoot of flowering plant are used internally for the high blood pressure.
87	*Persicaria amplexicaulis* (D.Don) Ronse Decr.	Dora	2500-3000	1,2,3, 5,9	Rh, Rt, Lf	H	Boil, cough, dysentery and healing wound.
88	*Persicaria capitata* (Buch-Ham. Ex D.Don) Gross		1600-2400	1,2,3, 4,5,9		H	Insect sting
89	*Rheum australe* D.Don*	Chunkhri	3300-5200		Rh, Rt	H	Used in Boils, asthma, fever, abdominal pain, cuts, skin disease, dysentery, liver disorder, sprain, ulcer, swelling, eye disease.
90	*Rumex dentatus*	Bhed malora	1500-2700	2,4		H	
91	*Rumex hastatus*	Khatee-Mithee	700-2500	1,2,5	Lf	H	Bloody dysentery and wounds dizziness.
92	*Rumex nepalensis* Spr.	Malora	1300-2500	2,4	Lf	H	Crushed leaves are applied on wounds.
	Primulaceae						
93	*Androsace rotundifolia*		1500-3600	5	Rt	H	Eye disease.
94	*Primula denticulate* Sm.		2200-4300	2	Fl, Lf	H	Urinary ailments.
	Punicaceae						
95	*Punica granatum* L.	Daru	1600-2200	1,2,8	Fr	S	Stomach pain, vomiting.
	Ranunculaceae						
96	*Aconitum heterophyllum* Wall. ex Royle*	Patish	2800-4500	2,5	Rt	H	Fever, cough, Digestive complaints, vomiting and diarrhoea.
97	*Anemone obtusiloba* D.Don**		2500-3800	1,2,9	Rt	H	Cuts, burns.
98	*Anemone rivularis* Buch-Ham. Ex DC.	Carbini-mimiri	2200-3500	1,2,5	WP	H	Vomiting
99	*Clematis buchananiana*	Belwala Safed	1800-3300	2	Rt, Lf	C	Used for Toothache, cut, wound, skin disease, swelling due to inflammation, poisonous to cattle.
100	*Delphinium brunonianum*	Dudhi Mahura	4300-5500	2,3,4	Rt	H	Used for Boils and kill maggots in sheep wound.
101	*Delphinium denudatum* Wall. ex Hk. F. & Th.**		2700-3000	2,5,9	Rt	H	Root powder is used for toothache, ulcer.
102	*Thalictrum foliolosum* DC. **	Breugha	1500-2600	1,2,3	Rt	H	Indigestion, abdominal pain, blood purifier, luecoderma, boils, eye disease.

	Rosaceae						
103	*Agrimonia pilosa* Ledeb.		1600-2800	1,2,3, 4,5	Rt, Lf	H	Dysentery, abdominal pains, crushed leaves used for wound.
104	*Cotoneaster bacillaris* Wall.ex Lindl.**	Riush	2000-3000	1,2	Ft, st	S	Rheumatism, arthritis, tooth cleaning, scabies.
105	*Fragaria nubicola*	Bhumfer /Himalayan strawberry	1800-3800	2	fr	H	Digestion.
106	*Geum elatum* Wall. ex G.Don**		2200-3400	1,2,4	Rt	H	Dysentery, earache
107	*Potentilla argyrophylla* Wall. ex Lehm.		2000-3400	1,2,3	AP	H	Analgesic
108	*Prinsepia utilis* Royle	Bhekal	1200-2700	1,2,4	Sd Bk	S	Rheumatic pain, wound, cut, burns and Boils,.
109	*Prunus armeniaca* L.	Shadi Khumani	1000-2200	2,4	Fr,Sd	T	Fruit extract for Liver problem, seed oil is used for joint pain, hypothermia.
110	*Prunus cerasoides*	Paja	1200-2400	3	St, Bk	T	Used in Arthritis.
111	*Prunus cornuta*	Jamu	2100-3500	2	Fr	T	Stomach pain and fever.
112	*Pyrus pashaia*	Shegal	750-2600	12	Fr	T	Fruits used in digestive problem and pterygium disease to cure affected eyes of cattle.
113	*Rosa brunonii* Lindl.	Kujja	900-2500	5	Lf, Fl	S	Diarrhoea and wound.
114	*Rosa macrophylla* Lindl.**	Jangli Gulab	2400-3600	2,5	Fl	S	Stomach-ache, cough and cold.
115	*Rubus ellipticus* Don	Akhe	1200-1800	2,11	Rt, fr	S	Roots used in burn and wounds. Fruit is edible
116	*Rubus fruticosus*	Blackberry	1600	2,3	Fr, Lf	S	Intestinal pain and diabetes.
	Rubiaceae						
117	*Galium rotundifolium* L.		2200-3000	2,3,4. 5.11	AP	H	Insect sting
118	*Rubia manjith* Roxb. Ex Fleming	Kasoos	1200-2400	1,2	Rt, St	C	Leaf past is used to cure wounds and cuts.
	Rutaceae						
119	*Boenninghausenia albiflora* (Hk.) Reichb.	Pessumar	2000-2900	1,2,3, 4,5	Rt	H	Dysentery, cuts, wound.
120	*Skimmia laureola* (DC.) Zucc.**	Ner	2500-3500	1,2,5	Lf	S	Toothache and offering to God
121	*Zanthoxylum armatum* DC.	Timber	700-2400	1,5,8	Fr, Sd	S	Seed used for toothache and twigs for brushing teeth. Fruit paste is useful for scabies.
	Sapindaceae						
122	*Aesculus indica*	Khanor	900-3000	3	Fr	T	Stomach pain and menstrual problems.
123	*Sapindus mukorosii* Gaertn.	Ritha/ Khuaar	200-1500	6,9,10	Sd	T	Seed past is used for Tonsil and hair treatment.

	Scrophulariaceae						
124	*Picrorhiza kurroa* Benth.	Karoo	3000-4000	4	Rt, Rh	H	Anti- inflammatory, Anti-oxidant and digestion problems.
125	*Verbascum thapsus* L.	Ban tambaku	1200-2500	1,2,5	Sd	H	Leucoderma snake bite, leaves paste is used for boils and Veterinary disease.
	Sexifragaceae						
126	*Bergenia ligulata* Wall	Pashanbhed	1800-2800	2,5	Rh	H	Kidney and bladder stone problems.
	Smilacaceae						
127	*Smilax aspera* L.		1600-2600	1,2,8	Fr	C	Skin scabies, fever, stomach-ache
	Solanaceae						
128	*Nicotiana tabacum* L.		800-1800	5,8	WP	H	Wound, itching, toothache, veterinary disease
129	*Solanum nigrum*		1600-2400	2	Lf, Fr	H	Boils, wound, skin disease, toothache.
120	*Solanum virginianum* L Sch. & Wendl.	Kantakari	800-2000	1,2,5	Rt, Fr	H	Arthritis, Cough and fever.
	Thymelaeaceae						
131	*Daphne papyracea* Wall. ex Stued.**		1800-2800	1,2,3,	Lf	S	Fever
	Trilliaceae						
132	*Trillitium govanianum* Wall. ex D. Don**	Nag Chatri	2500-4000	2	Rh	H	Dysentery, inflammation, menstrual, boils antiseptic and wound healing.
	Umbellifereae						
133	*Selinum vaginatum*	Bhutkeshi	1800-3200	11	Rt	H	Analgesic, hypertension, wound healing, Toothache and rhizomes are used for fumigation to ward off ghost and spirits.
	Urticaceae						
134	*Pilea umbrosa* Blume		1800-2600	2,8	Lf	H	Wound.
135	*Urtica dioica* Jacq. ex Wedd.	Kungsh	800-2500	1,2,5	Rt, Lf	S	Roots in Boils, constipation and Leucorrhoea, headache, Sprain.
	Valerianaceae						
136	*Nardostachys grandiflora* DC.	Jatamansi	3000-4500	2,5	Rh	H	Stomach pain and Toothache.
137	*Valeriana hardwickii* Wall.	Nahanru	2000-3000	1,2,8	WP	H	Boils.
138	*Valerina jatamansi* Jones	Mushq-wala	1600-3600	1,2,3, 4	Rt	H	Head-ache boils cosmetic.
	Violaceae						
139	*Viola biflora* L.	Banaksha	2800-3000	2,8	Lf, Fl	H	Indigestion.
140	*Viola serpens*	Banaksha	800-2000	2	Lf, Fl	H	Flower and leaf are used for fever and wound.
	Zingiberaceae						
141	*Hydychium spicatum*Buch.-Ham. Ex Sm**	Ban Haldi	1500-2800	1,2,3, 4,5,8	Rh	H	Cough asthma, diarrhoea and dysentery, blood purification.
	Gymnosperms						

	Pinaceae						
142	*Abies pindrow* (Royle ex D. Don) Royle**	Tosh	2200-3000	1,2,3	Lf	T	Needles decoction is used to treat asthma, cough
143	*Cedrus deodara* G.Don	Deodar	1500-3200	1,2,3, 4	Bk, Wd	T	Lameness and itching in sheep and goat, decoction of wood is used to cure urinary disease, piles, kidney stone, diabetes, and fever.
144	*Pinus roxburghii* Sarg.**	Chil	800-2300	1,2,3, 4,5	Res	T	Boils, sprains
145	*Pinus wallichiana*	Kail	1200-3000	2,12	Bk	T	Bone fracture in Sheep and Goat
	Taxaceae						
146	*Taxus baccta* Linn. **	Rakahl	2500-3500	1,2,3	Bk, Lf	T	Common cold, cough, asthma, fever and bark used for cancer.
	Pteridophytes						
	Adiantaceae						
147	*Adiantum capillus*- veneris L.		800-2200	1,2,3, 5	Lf	H	Boils.
148	*Adiantum incisun*	fern	1300-2000	3,5	Lf	F n	Used for cough and cold.
	Aspleniaceae						
149	*Asplenium dalhousiae* (Hook.)		1300-2000	2,3	Lf	F n	Used for skin burn.
	Athyriaceae						
150	*Diplazium esculentum* (Retz.) Sw.	Lingad	1600-2700	1,2,5	Frd	F n	Constipation.
	Equistetaceae						
151	*Equisetum arvense* L.	Keltaghas	1800-3000	2,4	WP	F n	Bleeding wound.
	Pteridaceae						
152	*Pteris biaurita*	Baran	1600-2000	2,3,8		F n	Wound.

Abbreviations used: AR= Altitude Range, LF= Life Form, 1= Dry Forest 2= Shady moist forest, 3= Riverine, 4= Bouldary, 5= Rockey, 6= Land slide, 7= water coarse, 8= Camping site, 9= Degraded, 10= Alpine dry slope, 11= Alpine moist slope, 12= Shrubberies, H = Herb, S = Shrub, T = Tree, C = Climber, Fn = Fern, P= Parasite, Wd= Wood, Res= Resin, Lf= Leaf, Rt= Root, Sd= Seed, Fr= Fruit, Frd= Frond, AP= Arial Part, WP= Whole Part, Bk= Bark, St= Stem, Fl= Flower, Bulb= Bb, Tu= Tuber.

Discussion and Conclusion

In present study 152 species of Medicinal plant were reported from the Great Himalayan National Park. *Picrorhiza kurrooa* is most traditionally used medicinal plant species by the local peoples of the area for the stomach problems and leucoderma in Ayurveda. In Unani *Picrorhiza kurrooa* is used for treatment of leucoderma and piles (Kritikar and Basu, 1981). The recorded medicinal plant species are valuable for various ailments namely Stomach-ache, Fever, Piles, skin disease, cut, wound, boils, kidney and bladder stone, Asthma and other various disease. Over exploitation of Flowers, fruits, seeds, Barks, roots and tubers of most of plant species may lead to early extinction from the area. Therefore there is a need to make proper policy for the conservation. The most important thing is awareness

and training for local people for sustainable exploitation of medicinal plant and encouraged them to cultivate medicinal plant in their own land.

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Appendix 3

List of Trainings/ Workshops/Awareness Programs with details of beneficiaries

प्रशिक्षण कार्यक्रम (Training Programme)

नैशनल मिशन हिमालयन स्टडीज द्वारा ग्रेट हिमालयन नैशनल पार्क में नेचर लर्निंग सैन्टर कार्यक्रम के अर्न्तगत तीर्थन घाटी में टुअर गाइडस, युवाओं एवंअन्य क्षेत्रीय लोगों के विभिन्न प्रशिक्षण प्रदान किया गया है जिसमें कि ट्रेनिंग के साथ–साथ लाइव प्रदर्शन एव विस्तृत व्याख्यान भी किया गया।सभी प्रशिक्षण भाग लेने वाले उम्मीदवारों के लिए भविष्य में उपयोगी होगें।

S#	Name of Training	Stakeholder/ Participants
1.	Nature Guide Training	29 + 13
2.	Skill Development Training for communication skill, body language, etiquettes, role of tour guide.	30
3.	About World Heritage Site	30
4.	Forest Protection and Conservation	25
5.	Eco-tourism, Forest Protection and Conservation	22
6.	Forest Fire Management	32
	Total	**168**

जागरूकता कार्यक्रम (Awareness Programme) - Schools

नैशनल मिशन हिमालयन स्टडीज द्वारा ग्रेट हिमालय ननैशनल पार्क में नेचर लर्निंग सैन्टर कार्यक्रम के अर्न्तगत तीर्थन घाटी में विभिन्न संस्थानों में पर्यावरण संरक्षण एवं पार्कमेंपाए जाने वाले जीव जंतुओं के बारे में जागरूक किया गया । जिससे कि बच्चों एव अन्य लोगों मे भी पर्यावरण संरक्षण एव जीव–जतुओं के बारे मे रूचि एवं जानकारी भी प्राप्त हो सकें।संस्थान वार ब्यौरा निम्न प्रकार से हैः–

S#	Subject of Awareness	Place of Awareness School/Villages	Participants
1.	Polythene	GMS DoghriRopa	50