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# **THE RELIGIOUS USE AND PROTECTION OF PLANTS AMONG THE BRAHMIN AND LIMBU PEOPLE OF ILAM, NEPAL.**

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Master of Science in Ecology

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## ABSTRACT

It is important to study if religious beliefs and practices in using sacred plants by different ethnic groups influence in the cultivation and protection of these plants. Such knowledge can be used to formulate sustainable management strategies. In spite of that, the study of the role of religious and cultural variation within indigenous groups of people in the use and management of natural resources has been given limited attention. This research was conducted on the major religious plants worshiped and used by the Brahmin and the Limbu people of Mangalbare and Siddithumka villages of Ilam district in eastern Nepal. The objective of this study is to explore if variation in religious beliefs and cultural practices between the Brahmin and the Limbu people influence abundance and distribution of religious plants. Sociocultural data of religious beliefs on sacred plants and their uses in the rituals were analyzed on the basis of the interview with the Brahmin and the Limbu priests from each village. The relative measure of the abundance and occurrence of religious plants in the two different villages was calculated using common ecological approaches of sampling such as quadrat, transect and relascope counts. The findings of the study reveal linkages between the religious beliefs and cultural practices of Brahmin and Limbu with the cultivation and the management practice of religious plants. These beliefs and practices are found effective in the cultivation and protection of sacred plants in the gardens and villages of Brahmin and Limbu. The most religious plants are strongly protected and actively planted by both Brahmin and Limbu. The number of plants utilized and managed by Brahmin and the Limbu is regulated by the difference in their religious beliefs and worship of their deities. **Among the Brahmin and Limbu, Brahmin worship more deities, have more rituals and use more religious plants than Limbu.** As a result, they cultivate and protect more religious plants in their gardens and villages in comparison to Limbu. The study and analysis of such diversity in the religious beliefs and practices are of critical value to understand the variation in the distribution of sacred plants in different localities. Such practices may be particularly important for some vulnerable plants (e.g. *Elaeocarpus sphaericus*) which are common in the Brahmin and Limbu villages. This disparate indigenous cultural knowledge can be integrated into the formulation of new local approaches of resource management.

**Keywords:** Brahmin, Limbu, Religion, Culture, Ritual, Ceremonies, Tradition, Sacred.

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## 1. Introduction

The relationship between cultural diversity and biodiversity impact the maintenance and loss of biodiversity (Maffi, 2007). It is important to apprehend how the diverse knowledge of culture and tradition of people affects the use and management of natural resources. Indigenous people and their cultural, spiritual practices and norms on biodiversity conservation have been recognized from the Earth Summit in Rio De Janerio in 1992, through Convention for Biological Diversity (Secretariat of the CBD, 2005). Due to their strong bonding with nature and its elements indigenous people have been acknowledged as the key actors in nature conservation (Sobrevila, 2008). The knowledge of local people in the ecology and management of useful plant species has the significant impact on the conservation of natural resources and is largely dependent on their co-operation in implementing the concepts of effective management and conservation strategies (Bhattarai, 1997). The religious belief of people has played a significant role in developing views of nature and defining relationships of the role of man in nature, creating a link between religious life and natural systems (SCB, 2008). Such beliefs and practices can contribute in rethinking and responding to the world's environment and the management of natural resources.

International agencies such as the World Wildlife Fund (WWF) in association with Equilibrium and the Alliance of Religions and Conservation (ARC) has reported a number of sacred trees with particular religious beliefs and importance from different countries (Nigel et al., 2005). For example, the *Gingko biloba* is worshiped by Buddhists people in China and Korea and planted as a temple tree. *Ficus benghalensis* is protected by Hindus in Nepal, India, and Sri Lanka as a sacred plant. *Ficus benghalensis* is also considered sacred by Buddhist as they believe that Buddha gained enlightenment under this tree (Nigel et al., 2005). *Adansonia spp.* is considered a holy plant in Madagascar and is protected even when the rest of the forest has been logged or cleared. *Taxus baccata* is sacred to the early Celtic and Nordic tribes in Europe. They believe it to be immortal and a symbol of everlasting life (Nigel et al., 2005).

Until recently, only a few studies have documented the status and use of religious flora in Nepal (Thapa, 2015). One of the major problem in linking such practices associated with tradition, religion, and culture as a tool for the conservation of biodiversity is the insufficient research in this field. Ethnobotany at present has become an important area of

research and development in resource management and conservation of biodiversity (D.C., 2011). The integration of such data into conservation planning should be incorporated in the management of natural resources.

This study focuses on practices related to religious traditions that regulate the use of ritual plants. In addition, how such traditions and rituals affect the cultivation and protection of religious plants. The use of plants in various rituals, their sacred value and religious beliefs of people on such sacred plants is a dynamic process. It is important to analyze the impact of such practices and beliefs in the conservation and management status of resources for which science and religion might be the partners in the field of conservation (Clements et al., 2009). The traditional belief system in plants and biodiversity is found to be an effective tool for the conservation and management of resources in different communities of Africa (Rim-Rukeh et al., 2013). Such beliefs are effective in the conservation of particular ecosystems as well as particular species. Sacred plants and animals are well preserved in the sacred groves which are the forest with rich diversity and protected by the local people from centuries before for their cultural and religious beliefs (Khan et al., 2008). Research on the local integrative practice of using ethnobotanical knowledge in resource management has been carried by the agencies WWF and UNESCO (Cunningham, 2001). Gloria and Anna (2007) in collaboration with IUCN revealed the sacred values of a number of plant and animal species in different countries which retain conservation significance.

This research was conducted on the major religious plants worshiped and used by the Bramhin of Mangalbare village and the Limbu people of Siddithumka village, in the Ilam district in eastern Nepal. Brahmin follow Hindu religion and Limbu follow Kirat religion. They believe in the existence of their deities as supernatural power dwelling in the universe with their roles in the creation, protection, and destruction (Halladay and Gilmour, 1995). Both the Brahmin and the Limbu worship some specific plant as a symbol of their god and deities and use their parts in the offering during their rituals. Specific plant and tree species are taken as the symbols of deities and other heavenly forces and are worshiped in different religions (Thapa, 2015). These plants, their flowers, fruits, and foliage are used in a number of rituals and are also believed to have great medicinal value (Majupuria and Joshi, 1988). There are differences in religious and ritual practices among the people. As a variation, we can observe the difference in the use of plants and other resources (Poudel, 2009). Individuals of the study population consist of different categories of people which include traditional

healers, religious and spiritual priests performing rituals and the common people using the resources. The special category of people who use plant species for specific purposes also has knowledge of the biology and ecology of these plants, which can be a useful tool in designing resource management (Ghimire et al., 2004). Such variation in knowledge is important to understand and compare the effectiveness of the resource management among culturally different groups of people.

The major objective of this study is to explore how religious and cultural practices affect the way religious plant species are understood, utilized and conserved by two religiously different group of people living in two separate villages. The specific objectives are; 1) to find out how the religious plants are worshiped and used by the Bramhin and Limbu people, 2) what religious plants are used for and 3) how the religious use of plants are reflected in the occurrence and abundance of religious plants in the two villages.

## 2. Study Population and Study site description

The study was carried out in the Mangalbare and the Siddithumka villages of Ilam district in eastern Nepal (Fig 1). Mangalbare is dominated by Bramhin people and Siddithumka is mainly inhabited by the Limbu people. The district lies in the Mechi Zone at the eastern boundary of Nepal. It lies within 26°40' to 27°80' latitude and 87°40' to 88°10' longitude, comprising an area of 1,703 km<sup>2</sup>. The elevation of the study sites ranges from 1600 to 2200 meter above sea level. Siddithumka is located in the southern part of Ilam and it is at the lower altitude and warmer than Mangalbare. The district headquarter of Ilam is Ilam bazaar. It has 48 administrative units called village development committees (VDCs) and the study sites are two of such units. The climate is sub-temperate where the mean monthly maximum temperature varies from 17.2°C to 26.2°C while mean monthly minimum temperature varies from 9.3°C to 19.9°C. The average annual rainfall is 1667 mm and the mean monthly rainfall reaches to the maximum 426 mm during the month of July. Mangalbare lies in the northwest part of Ilam with the population of 6692 people in 1506 households (NPHC, 2011). It has a multi-ethnic composition with 2303 of Bramhin population according to the census 2011 (CBS, 2011). They are also called the Aryan or Khas and are mostly found to occupy the hilly region from the eastern to western hills of Nepal. They speak the Nepali language which is an Indo-Aryan language (Bista, 1994). Siddithumka lies at the southern part of Ilam with the population of 3590 in 778 households (NPHC, 2011). Limbu population of this VDC is 504 and are mostly confined to ward number 6. They belong to the Mangol or Kirat tribe 'Kir' i.e. pig or boar (Lama, 2004). They are mongoloid people and speak Limbu language which is a Tibeto-Burman language. But in practice, Limbu are bilingual and speak both Nepali and Limbu.



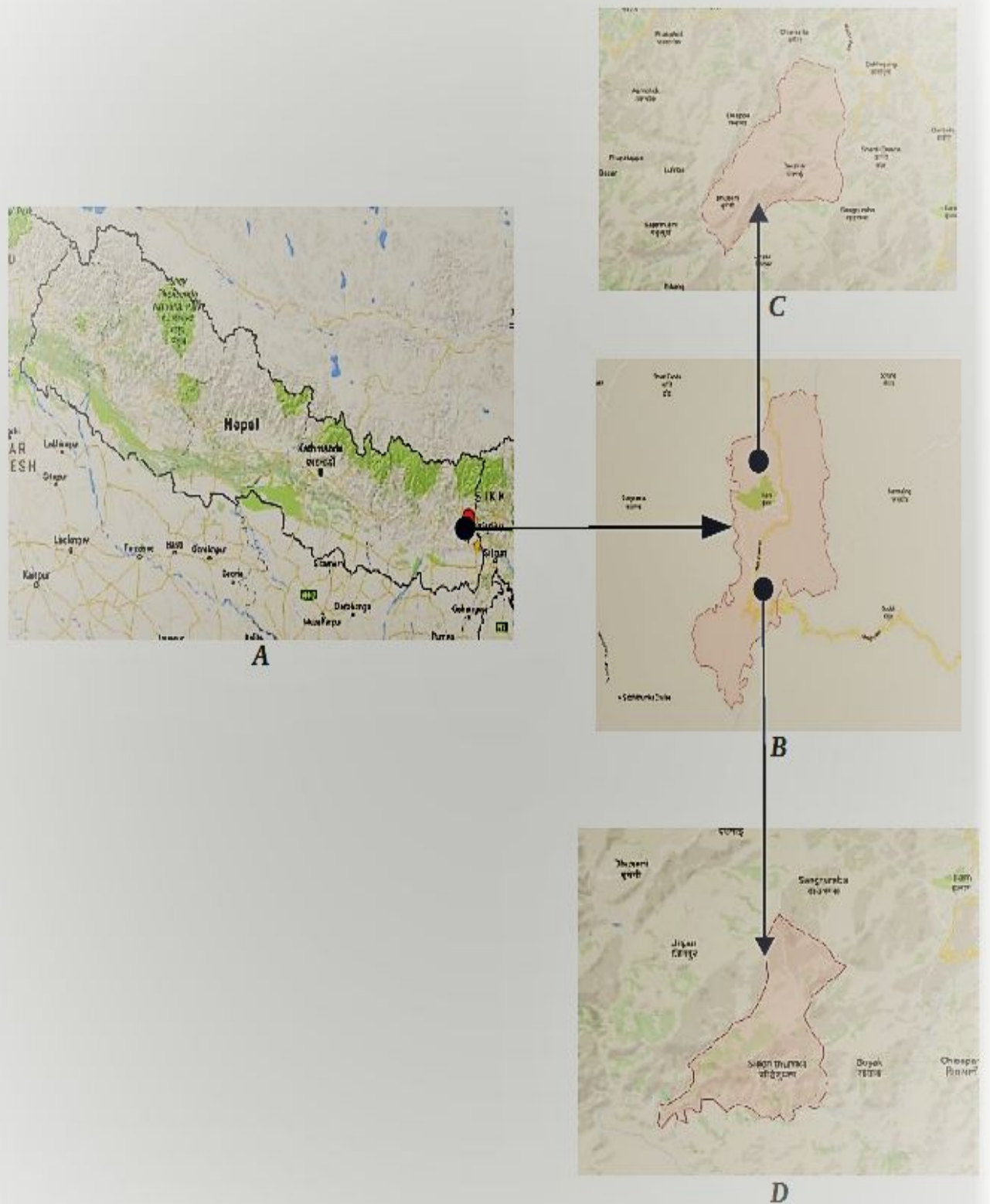


Fig 1. Map of the study area

A) Map of Nepal B) Ilam district C) Mangalbare D) Map of Siddithumka

The economy of both Bramhin and the Limbu people is based on agriculture as they are traditionally farmers. They mainly grow cash crops like broom grass (Amrisho), cardamom, ginger, tea, vegetables like potato and chili, food crops like millet, maize, and rice. They generate the income by selling these agricultural products. They also rear cattle, buffalo for milk, goat, chicken, and pig for meat and horse for transportation. Some people are engaged in other occupations like drivers, foreign employment services, business, and teaching. The agricultural products are exported to the nearest districts. Among them, tea is the major cash crop which is also exported to various countries.

The Bramhin and the Limbu people of the study site practice Hindu and Kirat religion, respectively and perform their rituals. Both of these groups of people perform regular Puja (Worshiping of god) with the required products as described in their religious texts. A series of life-cycle rituals are performed from birth to death at various stages of the life of an individual. Rituals are also conducted during certain festivals which are celebrated in the name of gods during the specific period of time annually. The priest performing the rituals in the Bramhin society is called Purohit or Pandit. Fedangba is the Limbu priest who performs the rituals in the Limbu community.

### 3. Methods

Fieldwork was conducted for two months during January and February of 2016. Both the ecological and sociocultural data were collected during the fieldwork. Sixteen plants were selected for this study on the basis of their religious value and use in the rituals described by the Brahmin and Limbu priests in their interview. Among them, ten plants *Ficus benghalensis*, *Aegle marmelos*, *Elaeocarpus sphaericus*, *F. religiosa*, *Acacia catechu*, *Desmostachya bipinnata*, *Areca catechu*, *Phyllanthus emblica*, *Ocimum sanctum*, *Nelumbium nucifera* were worshiped and used in the rituals on the basis of their religious beliefs and principles. The remaining six plants *Artemisia dubia*, *Juniperus indica*, *Thalictrum species*, *Prunus cerasoides*, *Hordeum vulgare* and *Tagetes erecta* were used in the rituals religious ceremonies.

#### i. Sociocultural data collection

The key informants from each group were the religious priests known as Pandit or Purohit of Bramhin and Fedangba of Limbu. An interview guide (Boyce and Neale, 2006) consisting of a set of simple questionnaires was prepared beforehand regarding their religious worship and beliefs on particular sacred plants, use of sacred plants and their parts in different rituals and religious performances, cultivation and harvesting practices of plants used in the rituals. Ten priests, five priests from each study group in two different study sites, were interviewed (Table 1). Interviews were conducted one at a time with the help of pre-prepared questionnaires (Appendix 1). The interviews including the field visits lasted between 60 minutes and 90 minutes. Field visits and observations were carried out along with the interview at a certain interval of time so as to tally their knowledge and predictions with the available species of religious plants and biodiversity. The field visit and sampling was made together with at least one of the priest at each site. During this visit, additional information associated with religious and cultural belief on sacred plants and the purpose of their uses and worship were also documented. The interviews were all audio recorded and brought back for full transcription, and thereafter for analysis. Photographic sample of the available religious plant species were collected.

**Table 1.** Priests interviewed from the two study sites according to profession age and gender

Site	Priests	Caste/ Ethnicity	Major profession	Age in Years	Gender
Mangalbare	Bed Prakash Rijal	Bramhin	Farmer	45	Male
Mangalbare	Ganga Prasad Rijal	Bramhin	Farmer	66	Male
Mangalbare	Purnachandra Khanal	Bramhin	Teacher	58	Male
Mangalbare	Prakashchandra Khanal	Bramhin	Teacher	59	Male
Mangalbare	Chandramani Acharya	Bramhin	Retired Teacher	64	Male
Siddithumka	Uttim Bahadur Limbu	Limbu	Farmer	62	Male
Siddithumka	Manaraj Limbu	Limbu	Farmer	68	Male
Siddithumka	Dirjahang Limbu	Limbu	Farmer	74	Male
Siddithumka	Buddabal Limbu	Limbu	Farmer	45	Male
Siddithumka	Harkabahadur Limbu	Limbu	Farmer	40	Male

## ii. Ecological data collection

Quadrat sampling was carried out in 25 randomly selected houses from each site to find out the occurrence of religious plants worshiped and used by each group in their rituals and ceremonies. The home garden is known as ‘Bagaincha’ in Nepali which differs in terms of area and diversity in plant composition in different houses. In each house, a front and a back garden were located for the sampling of religious plants. Grass, forbs, and shrubs are mostly planted in the front garden and trees in the back garden. Every Bramhin house has a special structure built for planting and worshiping *Ocimum spp*, along with flowers and other plants in their front garden. Similarly, the Limbu front garden also consists of a special place for worshiping their major deities. Back gardens commonly contain a small open field. Square quadrat frames of size 20 m x 20 m were marked randomly in the front and back gardens. Presence or absence of religious plants was recorded within the quadrat. The

occurrence of sacred plants and the plants used in the rituals were recorded from each quadrat. In total 50 such quadrat observations were made from each site of 25 houses (i.e. front garden and back garden from each house). Transect sampling was used to record the sacred plants protected and planted in the public places such as temples, sideways, forests, parks and schools in both the study areas. A line-transect was located passing through the village to estimate the abundance of sacred plant species that occurred outside the gardens. From the point of origin in a line-transect survey, the sacred plants detected along the line were recorded along with their numbers. The relative distance between the observations was estimated in reference to the distance marked pillars on road and the subways. A total of 8 observations were made at 8 locations in a total length of 4000 m. Average tree stem density per hectare of forest area in each forest of both the study sites was measured using a relascope. Observations with relascope were made at 20 different locations in each forest of Mangalbare and Siddithumka, respectively. The total number of tree stem viewed wider than the instrument sight were counted in one complete circular observation at each location.

Plants observed in the field were documented along with their local names, uses, and taxonomic groups. Each plant was identified to species level according to Polunin and Stainton (1984) and Press et al. (2000).

## 4. Results

### 4.1. Variation in the use of religious plants by the Bramhin and Limbu people

A total 69 plants from seven taxonomic groups belonging to 34 families and 57 genera were used in different rituals and religious ceremonies by the Bramhin people in Mangalbare and 44 plants from seven taxonomic groups belonging to 27 families and 40 genera were used in different rituals and religious ceremonies by the Limbu people in Siddithumka. Bramhin use 30 plants species during their rituals that were not used by the Limbu people, while only six species were exclusively used by the Limbu. The remaining 39 plant species were used in both the communities. Tree species are most commonly used in rituals and religious ceremonies (Fig 2). Among the two groups, Bramhin were found to utilize more trees and forbs compared to Limbu whereas Limbu utilize more grasses and climbers than Bramhin in their rituals.

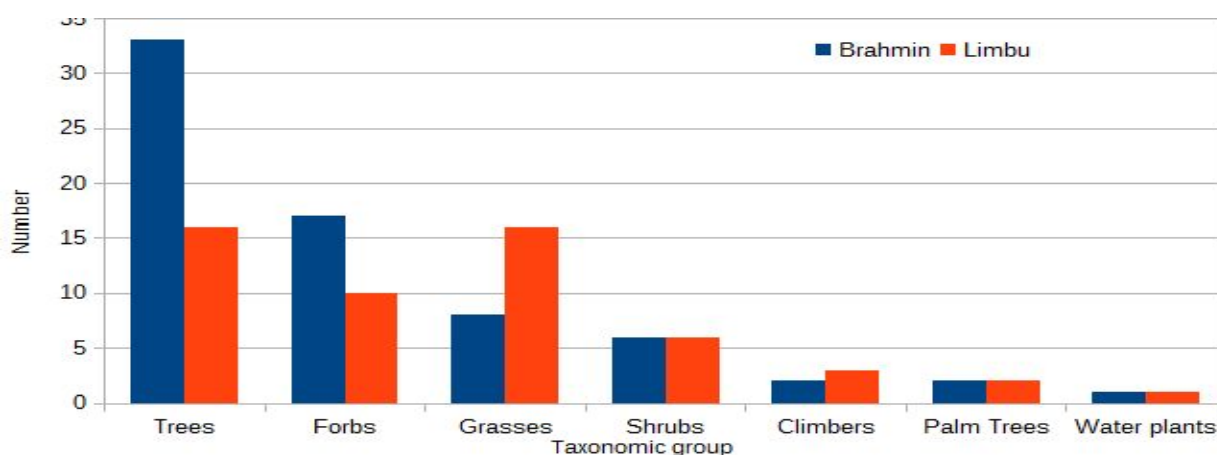


Fig 2. Taxonomic group of plants used in the rituals by the Bramhin and Limbu people.

As explained by their priests, among the total plants used by the Bramhin and the Limbu people, ten of them were particularly worshiped on the basis of their religious beliefs and specific parts were offered to specific gods and deities (Table 2). Out of them six plants *Acacia catechu* (Khayer), *Desmostachya bipinnata* (Kush), *Areca catechu* (Supari), *Phyllanthus emblica* (Amala), *Ocimum sanctum* (Tulasi) and *Nelumbium nucifera* (Kamal) were entirely worshiped by the Bramhin as the symbol of their respective gods and deities. The remaining four *Elaeocarpus sphaericus* (Rudraksha), *Ficus benghalensis* (Bar) *Aegle marmelos* (Bel) *Ficus religiosa* (Pipal) were mutually worshiped and offered to their

respective gods.

From the four mutually worshiped plants two of them *Ficus religiosa* and *Ficus benghalensis* were worshiped and offered to their own respective deities independently and the remaining two *Elaeocarpus sphaericus* and *Aegle marmelos* were offered mutually for the same god by both Bramhin and Limbu. Specific parts like leaves, flowers, and fruits from each of the sacred plants were extracted for using and offering during their rituals.

**Table 2.** Religious plants worshiped and offered by Bramhin and Limbu people to their gods and deities

Local name	Botanical name	Taxonomic Group	Parts used	Worshiped as / offered		IUCN status
				Bramhin God	Limbu God	
Bar	<i>Ficus benghalensis</i>	Tree	Leaves	Siva	Hangsangthewa	
Bel	<i>Aegle marmelos</i>	Tree	Leaves	Siva	Mahadeva or Siva	
Rudraksha	<i>Elaeocarpus sphaericus</i>	Tree	Fruits	Siva	Mahadeva or Siva	Vulnerable
Pipal	<i>Ficus religiosa</i>	Tree	Leaves	Vishnu	Yumasamang	
Khayer	<i>Acacia catechu</i>	Tree	Wood	Agni	x	Under threat
Kush	<i>Desmostachya bipinnata</i>	Grass	Leaves	Vishnu	x	
Supari	<i>Areca catechu</i>	Palm tree	Fruits	Ganesh	x	
Amala	<i>Phyllanthus emblica</i>	Tree	Fruits	Laxmi	x	
Tulasi	<i>Ocimum sanctum</i>	Herb	Leave/ Flower	Vishnu	x	
Kamal	<i>Nelumbium nucifera</i>	Water plant	Flower	Bramha/ Saraswati	x	

## 4.2 Religious values, beliefs, and practices in the use and worship of sacred plants

Religious values of each sacred plant species were found to vary among Bramhin and Limbu in terms of their beliefs, the procedure of worshipping as well as the practices of their uses during the religious events. Bramhin had single or multiple religious beliefs on most of the sacred plants, whereas Limbu do not have such multiple beliefs instead they worship and use the sacred plants with single beliefs and offer to their deities. Among the sacred plants used by the Bramhin, *Ocimum sanctum* was the most valued religious plant and used in every ceremonial practice. According to the priests, they worship this plant as “Tulasi Mata” (Mother god) and the reincarnation of god Vishnu. One of the key informants said:

*‘The lord will be in the soul of those who offers him with a Tulasi leaf and a palmful of water’* (priest Chandramani Acharya).

According to him, the leaves and the flowers of this plant are mandatory elements in every Bramhin ritual. Bramhins perform 27 rituals (Appendix 2) and *Ocimum sanctum* is used in all of them. They worship this plant every morning with the offering of clean water, flowers and color powder. Even after the death of this plant, they use the wood to carve sacred beads, which the devotees wear around their necks and use for chanting the name of their gods. The priests also explained the importance of this plant in association with its need and use in every life cycle rites and rituals from the birth until death.

Bramhin conduct the naming ceremony of a newly born baby in front of *Ocimum Sanctum* plant. One of the informants said:

*‘We believe that the baby will be blessed with good fortune and luck if the naming ceremony is conducted in front of this plant writing the name of the baby in a leaf of Ficus religiosa’* (Priest Ganga Prasad).

Another informant explained how rituals involving *Ocimum Sanctum* were conducted when a person was about to die:

*“Aatmako Baikuntha bas hos vanera (For the departed soul to rest in heaven) we put the individual at the critical stage of life near to this plant and feed a spoonful of water with its leaves”*. (Priest Rijal).



He also added:

*‘Any Bramhin house without this plant is religiously considered incomplete in our religious epics so it is planted in each Hindu Bramhin house’* (Priest Rijal).

*Desmotachya bipinnata* is the sacred plant essentially used in all the Bramhin rituals. They prepare all their symbolic gods from the dried leaves of *Desmostachya bipinnata* for worshipping during the ritual by offering flower and color powder. The house without this grass is believed to be “Apavitra” (impure), so they keep this plant after harvest and preserve it for use. During some disastrous accident if the dead body is not found then people make the symbolic dead body of the individual with this plant and conduct the funeral. Such funeral has recently been performed in Nepal after the ex-home minister named Madhav Ghimire died in an accident on 25 September 2016 and his dead body remained missing in the river. His family performed the final rites of him by making a body using *Desmostachya bipinnata* (Published on Saturday, October 1, 2016, in Himalayan Times).

*Ficus benghalensis* and *Ficus religiosa* are mutually worshiped plants by both the Bramhin and the Limbu people. Among Bramhin, these plants have multiple religious beliefs associated with their worship and use. *Ficus benghalensis* and *Ficus religiosa* are believed to be “Swargiya Briksha” (plants from the garden of heaven) and worshiped in different ways with different gods (Priest Purnachandra Khanal). Explaining their religious beliefs on *Ficus benghalensis* and *Ficus religiosa* Priest Khanal said:

*‘We also worship Ficus benghalensis and Ficus religiosa as symbolic husband and wife of god Mahadeva and his wife Parwati, respectively’.*

He also added:

*‘The worship and offering of these sacred plants will help us for the good health and well-being of the family members’.*

They worship the entire trees by offering water at their base every week, especially Saturday morning. Certain rituals like Shani stotra and Ashta Chiranjeevi puja and the ceremonies related to the god of *F. benghalensis* and *F. religiosa* are conducted under these trees. They keep the leaves of the plants in the Kalash (Small sacred water pot made of bronze or silver) in all the rituals.

Priest Khanal explained the need and use of *F. benghalensis* and *F. religiosa* during the funeral and said:

*'We carry the dead body around these heavenly plants and keep under these tree for some time while taking towards the place of cremation, it helps the departed soul to reach heaven and rest in peace'.*

He also said:

*'These plants are bestowed with the strong spiritual power and they are essential in every Bramhin rituals conducted from the birth to the funeral'.*

Limbu do not have such beliefs related to *F. benghalensis* and *F. religiosa*, they only use the leaves of these plants and offer to their major deities keeping them into two kalash. A limbu informant said;

*"We use the leaves of these plants in Kalash during all the rituals to please our Kul Dewata (Major deities of the clan)".* (Priest Uttim Bahadur)

He added:

*'If deities are pleased they will bless us to live a prosperous life and relieve us from the sins and sorrows as mentioned in our religious scripts'.*

Their "Dharma Guru" (Religious Priest or Preacher) planted *F. benghalensis* and *F. religiosa* in all places he reached and consequently they have high religious and spiritual significance in their culture ( Priest Limbu).

Along with the conspicuous disparity in the procedure of their use and belief *Elaeocarpus sphaericus* and *Aegle marmelos* were also used by both Bramhin and Limbu. The garland made from the seeds of *Elaeocarpus sphaericus* was offered to god Mahadeva. Unlike above-mentioned variations in the value and uses of sacred plants, it is more widely used by the Limbu. During each ritual, the Limbu priests, traditional healers (termed Bijuwa) and other clergies in their community wear the garland.

According to one of the priests, wearing this garland will help them in:

*"Aatma suddhikaran and adhyatmic safalta"* (cleaning of soul and gain spiritual success) (Priest Uttim Bahadur).

He also said:

*'Lord Mahadeva will be pleased by such offering and wearing and will relieve us from the sins of previous birth that cause difficulties in the present life'.*

They keep it together with "Trishul" (Three forked metallic tool) in every temple and the worshiping place of Limbu since these are the favorite tools of Mahadeva (Priest Dirjahang). They use *Elaeocarpus sphaericus* in all 21 rituals which they perform (Appendix 2), whereas Bramhin people use it during the two rituals performed for Siva as an offering. In addition to this offering, Bramhin Yogi and Monks use the garland of *Elaeocarpus sphaericus* with 108 beads during meditations ( Priest Prakash Chandra Khanal).

Regarding the purpose of using the garland priest khanal said:

*'Mahadeva is also known by the name "Ashutosh" (God of Anger) and wearing this garland will help to control anger and distractions during meditation'.*

It is considered as the most valuable spiritual tool of meditation for attaining peace.

Leaves of *Aegle marmelos* are used in the offerings to please lord Mahadeva by both the people with their own beliefs and values. It is used in two specific rituals of Limbu and three Bramhin rituals.

One of the Limbu informants explained about their religious belief of offering the leaves of *Aegle marmelos* and said :

*'Such offering will relieve us from the sins, bless with prosperity, helps to attain peace, and fulfill our wishes' (Priest Manaraj).*

They believe the god will be delighted by the offering and worship with his favorite elements and will bless his devotees. The leaves of *Aegle marmelos* are offered to Siva during "Sivaratri" (Festival to worship and celebrate the holiness of god Siva) and the Siva Puja (Ritual conducted for worshiping Siva). Brahmin offer the leaves of *Aegle marmelos* to their other gods too. About this religious beliefs and uses of *Aegle marmelos* one of the Brahmin informants said:

*'In addition to the offerings for the god Mahadeva we offer the trifoliolate leaves of Aegle marmelos representing gods Bramha, Vishnu and Mahadeva with each leaf' (Bed Prakash Rijal).*

They offer the leaves during the worship of Mahadeva for a whole month during July and August, particularly on Monday. Explaining the purpose of offering priest Rijal said:

*'Such offering of the leaves of Aegle marmelos with the milk of a cow to lord Siva will enable us to achieve religious credits and will bless for our wishes to come true'.*

Bramhin women offer the leaves along with other elements to worship Mahadeva for one month during January and February and stay fasting for this whole month called "Swasthani brata". Unmarried women conducting this ritual wish for the blessings with capable and competent husband whereas those married wish for the prosperity and long life of their family members and get relieved from the sins. Some devotees of Mahadeva offer the leaves of *Aegle marmelos* and worship every Monday along with his favorite elements and stay fasting (Without eating any food until sunset). This is regarded a compulsory element of rituals conducted for Mahadeva.

Similarly, the fruits and the leaves of *Phyllanthus emblica* has the religious significance among Bramhin and is used in one of their rituals. Laxmi is their goddess of wealth. They believe to be blessed with the wealth after she is pleased with the offerings and worship with fruits and the leaves of *Phyllanthus emblica* (Priest Chandramani). *Areca catechu* is an important religious plant and is essentially used in all Bramhin rituals. They believe that if it is offered to lord Ganesh in the beginning of every ritual they would overcome the barriers and hurdles of life easily (Priest Prakash Chandra). During their major life events and rituals like engagement and marriage, the fruit of *Areca catechu* and the sacred thread called "Janai" is exchanged between the bride and the groom to ensure the good start of their life events which is locally called "Janai Supari". The flower of *Nelumbium nucifera* is offered to goddess Saraswati during Saraswati puja. According to the priests, the devotees of goddess Saraswati will be successful in the field of art and academics. They also offer this flower to their god Brahma who is believed to create the universe and the creatures. *Acacia catechu* is an essential element during the firework (Ritual of offering religious elements in consecrated fire, Locally called Homa or Yagya of Bramhin rituals. Firework is organized to clear the obstacles and barriers of life facilitating with blessings of victory.

### 4.3. Cultivation, protection and harvesting of sacred plants.

The Brahmin and the Limbu people practice different cultivation, protection, and harvesting of each sacred plant. According to the Brahmin priests, planting *Ocimum sanctum* is religiously an important part of their culture. They plant this species on a special day called 'Thulo Ekadasi' which normally lies on the eleventh lunar day in June-July. They celebrate it by fasting (Stay without eating food until sunset), worshiping and planting *Ocimum sanctum*. They plant some newly growing plants germinated from the seeds of the older species from the previous year in a specific place built in their garden (Appendix 3). They harvest the required parts of the plant selectively and safely from the matured plants and use during the rituals. There is an occasion known as 'Kushe Aunsi' (Ritual for harvesting and delivering sacred Kusha i.e *Desmostachya bipinnata* in the month of August/September).

One of the informants said:

*'Every year in Kushe Aunsi, we (priests) deliver a small bundle of Desmostachya bipinnata after harvest to each of the houses where we conduct the rituals'* (Priest Ganga Prasad).

They harvest the plant from above the ground, leaving the rhizomes and the plants to regenerate to be ready for harvest during the monsoon next year.

There is no specific occasion of planting *Ficus benghalensis* and *Ficus religiosa* but they are planted by the people for religious credit. People cultivate and celebrate these species in their garden or in public places for their common religious worship and use. People even organize the marriage between *Ficus benghalensis* and *Ficus religiosa* (Priest Purnachandra Khanal). The marriage is organized with the same ritual process as followed in the social marriage *Ficus benghalensis* as Siva and *Ficus religiosa* as Parvati. People do not climb over these trees and their leaves are harvested using cutting tools from the ground. They harvest the required amount of leaves from these plants on the same morning as the ritual day. During the field work in Mangalbare, a big tree of *Ficus religiosa* was growing just adjacent to the road. It was told me that during road construction, the tree was left untouched on the side of the road, while the road was narrowed just at that point (Fig 3). When asked about it my informant said:

*'Cutting and destroying this plant is sinful according to our religious principle so unless there is no extreme harm caused by the plant it is left untouched and protected'* (Priest Khanal).



**Fig 3.** *Ficus religiosa* tree on the roadside in Mangalbare. The tree was left untouched despite the construction of a wider road.

Regarding the cultivation and protection of *Ficus benghalensis* and *Ficus religiosa* in the Limbu village one of the informant priest said:

*'We do not have special ceremonies conducted for Ficus benghalensis and Ficus religiosa but we protect these sacred plants and use during our rituals'* (Priest Uttim Bahadur).

They only harvest the leaves from the matured plants of *Ficus benghalensis* and *Ficus religiosa* and use in their rituals. *Aegle marmelos* was not found in any of the study areas.

When asked about how do they manage it the priests said:

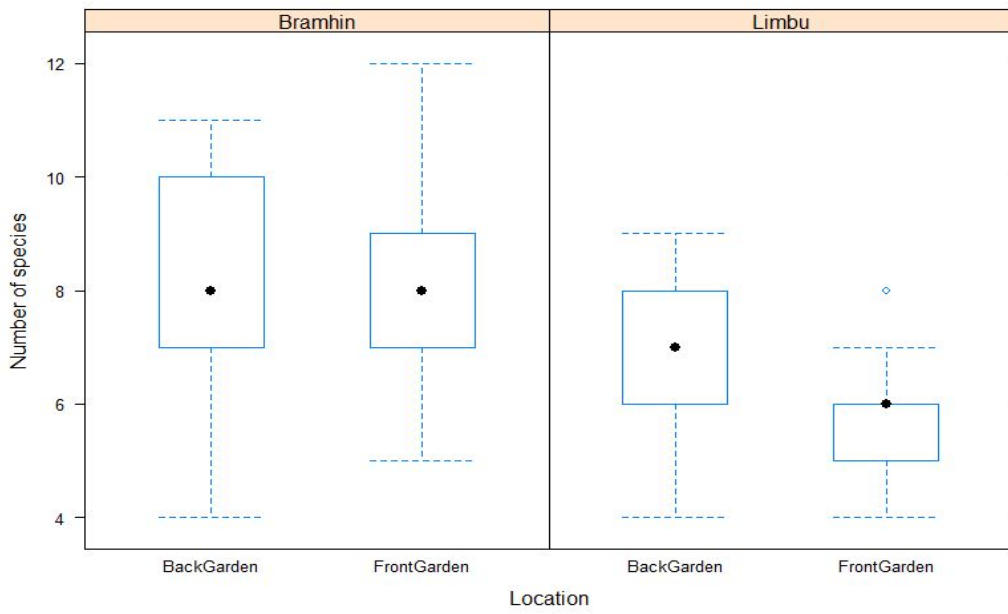
*'Leaves of Aegle marmelos is an important offering element in the rituals and there is no alternative use of other species, so people must collect the required parts from the area where it is found'* (Priests Bed Prakash and Manaraj).

They harvest the small branches from the matured tree and collect the leaves. The amount and the frequency of harvest depend on the number of associated rituals and ceremonies conducted by each of the group.

Fruits of *Elaeocarpus sphaericus* are harvested annually during the months of April and May. Seed of this plant was introduced by one of the Late priest named Manbir Limbu before a century from India. Besides its religious and cultural importance, seeds of this plant have good economic value. Because of the religious and the economic value, it is not cut. Instead, it is cultivated and protected by the people with good care and effort (Dirjahang Limbu). The fruits of *Areca catechu* are harvested annually and dried and kept for using in the rituals. *Areca catechu* is planted in the garden and field and is not destroyed or cut down until it produces fruits. *Phyllanthus emblica* is a terrestrial plant of medium size. Fruits of this plant are harvested for use in their rituals and the plant is protected. Besides its religious significance, the fruit of *Phyllanthus emblica* also have medicinal uses. Due to its multiple values people do not cut or destroy this plan and is planted and protected both in the forest as well in their field and garden. Similarly, the flower of *Nelumbo nucifera* is harvested and used in rituals. According to the priests from both the study areas, people who have to organize the rituals frequently have the knowledge of the required parts of sacred plants to be used in the rituals and they harvest it accordingly. In the case of those who do not have such knowledge of the required plants and their parts then the priests will instruct about the uses and harvesting process.

#### **4.4. Variation in the occurrence and abundance of religious plants used by Bramhin and Limbu.**

Among the two groups, Bramhin were found to grow more religious plants than Limbu (Table 3, Fig 4). While the similar number of species are grown in the front and back gardens by Bramhin, a marginally significant interaction show that Limbu grow more species in their back gardens (Fig 4).



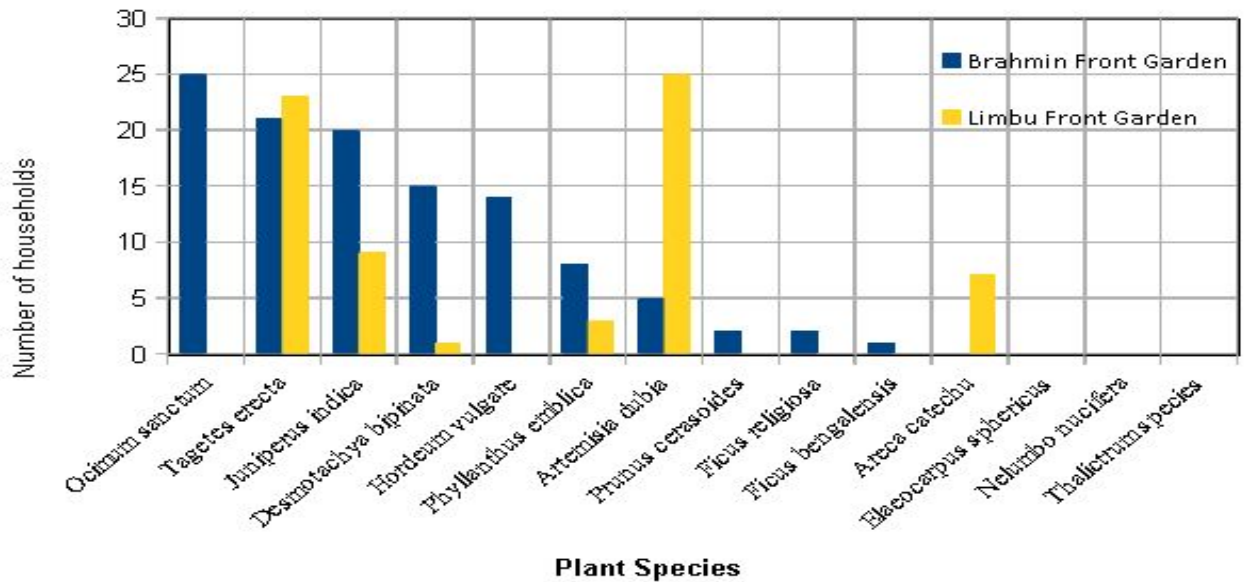
**Fig 4.** Box plot showing the relative measure of religious plants grown in two gardens of Bramhin and Limbu houses.

**Table 3.** The total number of religious plants as response of ethnic group, location (i.e. back garden, front garden).

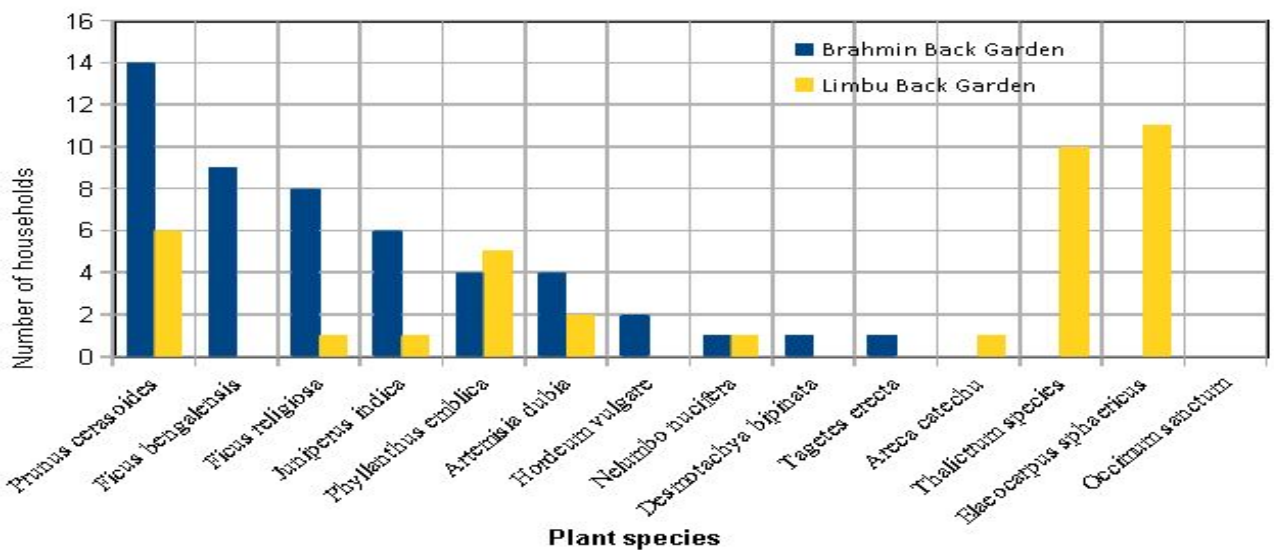
Coefficients	Estimate	Std. Error	t value	P
Intercept	2.09	0.04	51.75	<2e-16
Limbu (vs Bramhin)	-0.15	0.05	-2.56	0.01
Front Garden (vs Back Garden)	-0.02	0.05	-0.51	0.60
Ethnic group Limbu x Location Front Garden	-0.14	0.08	-1.66	0.09



Observation of religious plants used in rituals from the gardens of Bramhin and Limbu houses showed a distinct variation in their occurrence and abundance. Out of the 16 plants three of them were planted only in the garden of Bramhin houses, three were found planted only in the gardens of Limbu house, eight of them were recorded from the garden of both the Bramhin and Limbu houses and the remaining two species were not recorded from any of the Bramhin and Limbu houses (Fig 5, Fig 6).



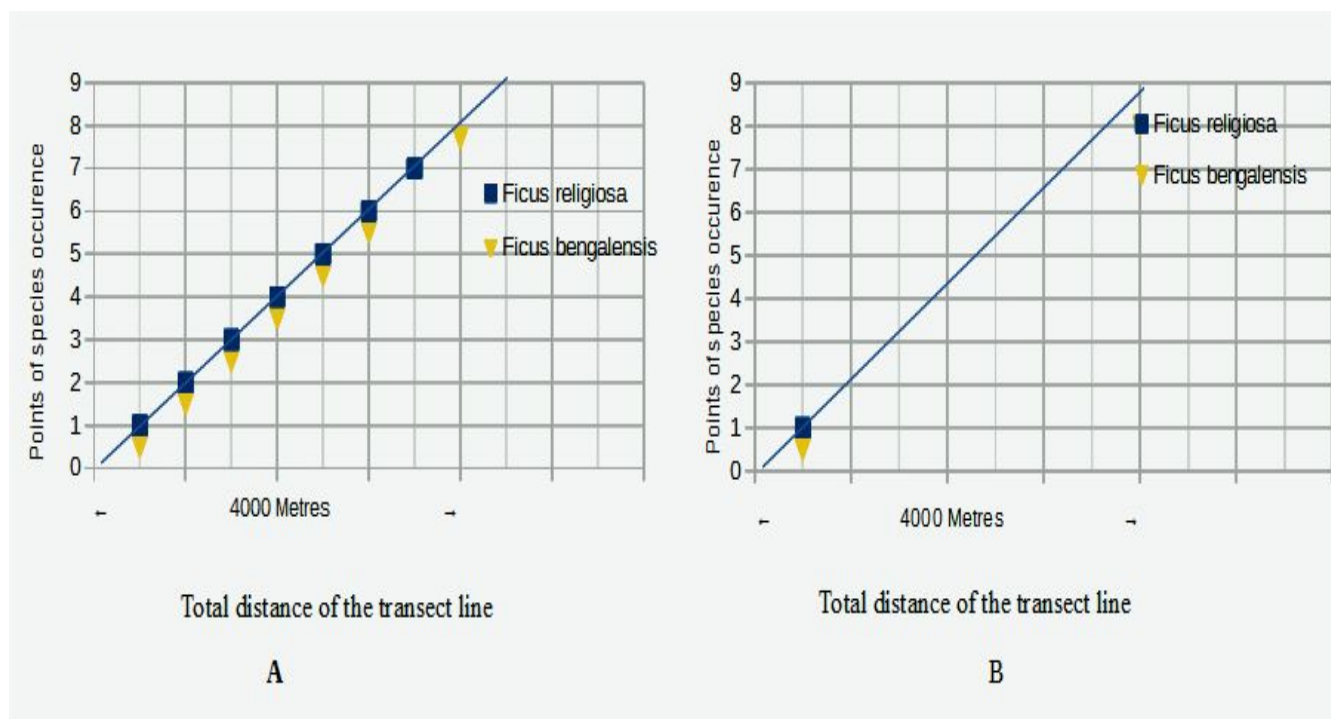
**Fig 5.** Occurrence of major religious plants in the front garden of Bramhin and Limbu houses.



**Fig 6.** Occurrence of major religious plants in the back gardens of Bramhin and Limbu houses.

Among these plants, *Ocimum sanctum* was the most regularly occurring religious species planted in the garden of all 25 Bramhin houses whereas the plant *Artemisia dubia* was the species found planted in all the gardens of 25 Limbu houses. *Nelumbo nucifera* was the least occurring plant species recorded from the gardens of Both Bramhin and the Limbu houses and *Tagetes erecta* was the most frequently occurring species found among the commonly used plants in the gardens of both Bramhin and Limbu houses. *Ocimum sanctum*, *Hordeum vulgare* and *Ficus benghalensis* were found to occur only in the Bramhin gardens and *Elaeocarpus sphaericus*, *Areca catechu* and *Thalictrum species* were occurring only in the Limbu gardens. Grasses and forbs were mainly planted in their front garden, while trees were mostly planted in the back garden of both Bramhin and Limbu houses.

There was a remarkable difference in the occurrence of *Ficus benghalensis* and *Ficus religiosa* outside the home garden in the public places of Mangalbare and Siddithumka (Fig 7).

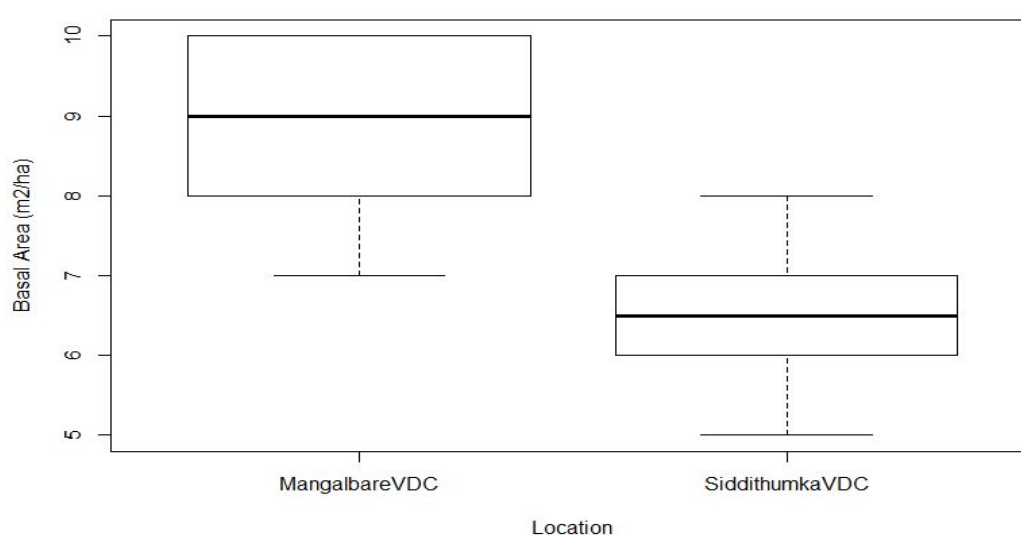


**Fig 7.** Occurrence of *Ficus religiosa* and *Ficus benghalensis* in public places of A) Mangalbare and B) Siddithumka

(Transect sampling for the record of *Ficus religiosa* and *Ficus benghalensis*, Y-axis with the number of locations where the species were recorded and X- axis showing the total distance of the transect line)

These trees were recorded from eight locations in a line transect, where *Ficus benghalensis* and *Ficus religiosa* were found planted at seven locations in Brahmin village of Mangalbare (Fig 7 A). But both the *Ficus benghalensis* and *Ficus religiosa* were recorded from only one location in Limbu village of Siddithumka (Fig 7 B).

The tree stem density per hectare of land ( $m^2/ha$ ) in community forest of Mangalbare was relatively higher than in Siddithumka community forests (Table 4, Fig 8).



**Fig 8.** Box plot showing the median tree stem density per hectare of land in Brahmin village of Mangalbare and Limbu village of Siddithumka community forests

**Table 4.** Summary of the model with Basal area as response and forest location as predictor

Coefficients	Estimate	Std. Error	t value	P
Intercept	2.19	0.02	103.41	< 2e-16
Siddithumka (vs Mangalbare)	-0.31	0.03	-9.78	6.15e-12

## 5. Discussions

There are differences in the religious values, beliefs, utilization and management of sacred plants among the Brahmin and Limbu people. Brahmin worship more plants as a symbol of their gods and goddesses and conduct more rituals as compared to the Limbu people. These differences are clearly reflected in the cultivation and the protection practices of religious plants by the Brahmin and Limbu in their gardens and surrounding village. Brahmins cultivate and protect more religious plants in their gardens and in the surrounding village than Limbu.

Each sacred plant used by Brahmin and Limbu have a particular story of the divine as explained by their priests based on their religious philosophies and myths. Brahmin and the Limbu worship their deities offering with a particular sacred plant or its parts regarding as their deities. Both of them worship one or more deities during their rituals and ceremonies according to their religious scripts described by their priests (Ingles 1994). The number of plants utilized and managed by Brahmin and the Limbu is regulated by the number of deities worshiped and the number of rituals conducted by Brahmin and Limbu.

The sacred plants *Ocimum sanctum* and *Desmostachya bipinnata* were worshiped and planted only by the Brahmin people. Every Brahmin family is found to plant *Ocimum sanctum* in their gardens. *Desmostachya bipinnata* is planted and protected in most of the Brahmin gardens and field. Whereas *Ocimum sanctum* was not found planted in any of the Limbu gardens. Limbu does not plant *Desmostachya bipinnata* but protect it if do grow in their gardens. In Hindu theology, specific plant species are believed to be incarnations of deities and are worshipped as holy plants (Majupuria and Joshi, 1988). *Ocimum sanctum* and *Desmostachya bipinnata* are among those holy species which are worshiped as incarnations of their god Vishnu. There is no alternative plant for use in absence of these plants and they are essentially used in every Brahmin ritual from birth until death. The plant *Ocimum sanctum* is highly sacred and is planted with respect in every house in Mishing Hindu communities (Gam and Nath, 2012). They use the leaves of *Ocimum sanctum* in the offerings to their gods. Similarly, the leaves of *Mangifera indica* and *Anacardiaceae Kedi* are used during the marriage ceremony and Durga puja (Gam and Nath, 2012). The plants *Aegle marmelos*, *Ocimum sanctum*, *Areca catechu*, *Ficus religiosa* are also worshiped and used in

their rituals by Bodo people in India (Sanjib et al., 2014). They offer the leaves of *Aegle marmelos* to lord Siva, leaves of *Ocimum sanctum* is used in holy water during worship and offering to their gods, *Areca catechu* is considered as holy fruits and used in offering to gods and goddess. They worship their god under *Ficus religiosa* tree, which they regard as a plant of lord Krishna (Sanjib et al. 2014). Such traditional customs and rituals are found to play a vital role in conservation associating plants and biodiversity with religious rites and beliefs for conservation (Thapa, 2015).

Among the mutually worshipped sacred plants the occurrence and abundance *Ficus religiosa* and *ficus benghalensis* were more common in the Bramhin gardens and in their village whereas *Elaeocarpus sphaericus* was only planted in the Limbu gardens and in their village. *Ficus religiosa* and *ficus benghalensis* are found associated with the life cycle rites and rituals of Bramhin from the birth until death. They are necessarily used in every Brahmin rituals as mandatory elements. They possess multiple religious beliefs among the Brahmin people and are worshiped with different names of god. They worship these tree as incarnations of their god with the offerings on the regular basis at the place of their cultivation. Such beliefs and practices of their uses have been principal factors to increase their motivations in planting and protecting these species at home or in the surrounding area for the religious purposes thus increasing their occurrence and abundance in their locality. At the same time Limbu people use the leaves of *Ficus religiosa* and *ficus benghalensis* and offer as a compulsory element to please their deities but the tree worship is not common among them. Limbu collects the leaves of these from the available place to use in their rituals. They do not have more than one religious belief of god to worship *Ficus religiosa* and *ficus benghalensis* as Brahmin. So relatively, there is less occurrence of *Ficus religiosa* and *Ficus benghalensis* in the Limbu gardens and in their village. The need and importance of *Elaeocarpus sphaericus* is different in the Brahmin and Limbu rituals. Brahmin use *Elaeocarpus sphaericus* occasionally in their rituals whereas Limbu priest uses it in every ritual and is a necessary element of worshipping their deities. As a result, *Elaeocarpus sphaericus* is found planted only in the Limbu gardens and in their village. *Artemisia dubia* was planted in the gardens of every Limbu house whereas it was planted only in the few Brahmin gardens. *Thalictrum species* was found planted only in the Limbu gardens and was not found planted in any of the Brahmin gardens. Similarly, *Juniperus indica* and *Prunus*

*cerasoides* were planted in more in the Brahmin gardens whereas they were planted relatively in few Limbu gardens. This variation in cultivation can be explained with the need and use of specific plants in particular rituals of Brahmin and Limbu. *Artemisia dubia* is essentially used as an incense and *Thalictrum species* is used during the firework of Limbu rituals whereas Brahmin use *Juniperus indica* as incense and *Acacia catechu* and *Prunus cerasoides* in their firework of rituals.

Tree worshiping and uses in the rituals is also common in India since the Vedic period (Pandey and Pandey, 2016). The most common forms of tree worship involve *Ficus religiosa*, *Acacia ferruginea*, *Aegle marmelos*, and *Ficus glomerata* (Halladay and Gilmour, 1995). On the basis of ancient scriptures, a wide variety of plants like *Ficus religiosa*, *Azadirachta indica*, *Ocimum sanctum* are believed to possess the divine qualities, therefore used in a number of religious activities, marriage and other ceremonies. Hindu people believe specific plant and tree species as their symbolic gods and deities (Majupuria and Joshi, 1988). This has resulted in the cultivation and management of sacred tree species as people have planted and protected them for the performance of religious rituals. African people have unique indigenous religious beliefs and practices which is commonly called African traditional religion (Lugira, 2009). They believe in the religious significance of a particular animal or plants which are worshiped and are conserved due to their religious and cultural values and are used during rituals (Sussy et al., 2012). The landscapes with *Pentaclethra macrophylla* (Okpagma) tree have a high cultural significance among the people in the delta state of Nigeria (Rim-Rukeh et al., 2013). Their deity Aziza is believed to have enlightenment under the Okpagma tree. The place of its growth is regarded as a sacred place and is strictly protected in the community, which has provided a natural shelter for a number of plants and animals to survive without human interference.

There is also variation in the occurrence of religious plants on the basis of sacredness in the gardens of Brahmin and Limbu houses. Sacred plants which are worshiped and required on the regular basis are planted more commonly than the less sacred plants. Brahmins were found to prioritize the cultivation and protection of *Ocimum sanctum*, *Desmostachya bipinnata*, *Ficus benghalensis* and *Ficus religiosa* more in their gardens and the surroundings whereas *Elaeocarpus sphaericus* and *Thalictrum species* were relatively grown more in the Limbu gardens and villages. The cultivation and management of sacred

plants by the Brahmins is also influenced from their religious epics and myths. Their ancient religious literature Vedas and Upanishad mention the interrelation between living species and the environment (Sharma, 2015). The religious significance and the holiness of *Ocimum sanctum*, *Desmostachya bipinnata*, *Ficus benghalensis*, *Ficus religiosa* and *Elaeocarpus sphaericus* are mentioned in the epic Hindu literature Manusmriti, Ramayana, Mahabharat and Vedas (Sharma, 2015).

Along with growth and protection of the sacred plants, Limbu also grow the plants which are worshiped by Brahmin. *Areca catechu* and *phyllanthus emblica* are the plants which are planted and protected by the Limbu in their gardens despite their occasional use in their rituals. Besides its use in the rituals, *Phyllanthus emblica* has a great medicinal value and it is used in many traditional medicinal systems. It is used as the natural source of vitamin C and digestive tonic (Sankaran et al., 2013).

The Brahmin village had a higher tree density than the Limbu village, both in gardens and in the surrounding areas. Brahmins have strong religious beliefs and practices with specific socio-religious norms for the protection of sacred plants. Due to their multiple religious beliefs in each sacred plant, they closely adhere to their sacred values and principles. Their epic Rig veda mention about plants “*Everything we get is from plants, they lead us to our happiness and success so they are our mothers they are our goddess*” (Metz, 2010). Planting the sacred trees and their worshipping is an important religious culture of Brahmin. Destruction, cutting, and removal of sacred plants is considered a sinful act and against their religious principle since they are regarded as incarnation or symbol of their gods. Due to their religious principles, *Ficus benghalensis* and *Ficus religiosa* as well as *Ocimum sanctum* and *Desmostachya bipinnata*, are duly respected and not touched by legs. These species are extensively planted, and never cut, but instead left to die naturally. Besides these sacred plants, they use a number of plants such as *Butea monosperma*, *Phyllanthus emblica*, *Prunus cerasoides*, *Mangifera indica*, *Ficus glomerata*, *Ficus benamina*, *Ficus glaberrima*, *Rhododendron arboreum* for making the essential tools of rituals and to prepare the place for conducting the rituals. Without such preparations, it is impossible to conduct their rituals and ceremonies. So together with the holy trees they also plant and protect these trees which are essential for conducting their rituals. This has resulted in the plantation and protection of more number of trees along with sacred tree species in their surroundings,

public places of the village and in the forests as well. Higher tree density in the Brahmin village than the Limbu village, both in gardens and in the surrounding areas are the result of such cultivation and protection.

A small group of religious trees or in the form of extended religious forests exists in the rural area of Nepal (Ingles, 1994). Sacred trees are prohibited from cutting and until the wood is needed for the religious purposes like construction and repair of temple buildings or in cases like worshipping, death ceremonies and temple rituals (Kandari et al., 2014). The religious custom is also an effective tool to protect the part of the forest where deities reside and the area protected as a sacred grove (Adhikary and Adhikary, 2007). Religious performances and rituals are locally conducted in the Forests. "Particularly, the lineage god, the forest god and certain evil spirits are worshiped in the forests throughout the hill regions of Nepal" (Halladay and Gilmour 1995). This gives rise to the establishment of religious trees and forests and institutions and organizations concerned with the protection and management of religious forests. Small closed-canopy forests are found near human settlements throughout Ghana which are the sacred groves forests protected for local socio-cultural and religious purposes. The Malshegu sacred grove is one of such sacred site in Ghana near to its northern capital Tamale where trees, stones, streams, lagoons, forests are traditionally believed as the sacred places of god and the ancestral spirits (Dorm et al., 1991). This site is left undisturbed and only visited for important life cycle ceremonies, religious rituals, or secret society meetings. 'Kpalevorgu' is Malshegu's community god and is worshiped for the prosperity, fertility, and lineage stability. The forest has become a natural home for a large variety of fauna and flora and a site of numerous native species that has been protected and managed by villagers for nearly three centuries. Among the plants used in the Brahmin and the Limbu rituals, some are under the different category of IUCN list. *Elaeocarpus sphaericus* is a vulnerable species, *Acacia catechu* is species under threat and *Butea monosperma* and *Michelia champaca* are endangered species. Among these species, *Elaeocarpus sphaericus* was found planted by the Limbu people in the considerable number of houses as well as protected in their community forests. Such assessment of plants with traditional and religious purposes is also of critical value in formulating strategies for their conservation which help to find out their current status. Similar use and protection of sacred plant *Pterocarpus santalinus* under the endangered category of IUCN list has been reported



by Debabrata et al. (2014) from the tribal-dominated Koraput district of Odisha in India. They also documented the plant *Pterocarpus santalinus* under the endangered category of IUCN list. The practices of using the plants in the rituals have served in the conservation of unique biodiversity composition in different countries. Such places of the forest have not been only protecting the sacred plants but also have been holding a number of threatened species. Shah et al. (2012) reported vegetation to be protected from all human interference, by declaring them as sacred forest in Kurd Sharif and Sho districts in Pakistan. These forests constitute the mixed tree species of *Monothecha buxifolia* and *Acacia modesta* which exists nowhere else in Pakistan. People practicing different religions and culture are found to have different priority of conservation and ultimately large number species are conserved (Shrestha et al., 2010). The religious beliefs of the Brahmin and Limbu have special significance in the conservation of sacred plants in their gardens and villages. This increased apprehension regarding the cultural and religious significance of the biodiversity from any prospect would be helpful in the management of plants and biodiversity.

The findings of the study has clearly shown that, the religious beliefs and practices in using sacred plants by Brahmin and Limbu influence in the cultivation and protection of these plants. Brahmins utilize 69 plants in 27 rituals and Limbu utilize 44 plants in 21 rituals. The most religious plants are strongly protected and actively planted by both Brahmin and Limbu. Brahmins have a stronger religious culture and utilize more plants in their rituals, resulting in more plantings and higher protection of existing forest. Such practices may be particularly important for some vulnerable plants (e.g. *Elaeocarpus sphaericus*) which are common in the Limbu and Brahmin villages. These social, cultural and spiritual dimensions of plants and their uses have been less studied and documented in Nepal. Therefore, a comprehensive understanding of the status of sacred plants is essential to find out the potential role of religious beliefs and socio-cultural practices in the protection and conservation of a large number of plant species. The involvement of indigenous people and communities can enhance the cultural way of managing and protecting natural vegetation.

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## **Appendix 1. Checklists**

### **General information of the key informant**

1. Name:      2. Gender:    3. Locality:    4. Occupation:

### **Major Research questions and sub-ordinal Research questions based on the objectives of the research plan.**

#### **1). What are the religious plants used by the Brahmin and Limbu people? What are they used for?**

- a. Which religion do most of the people in this community follow?
- b. Do people perform the rituals? Since how long been you are performing the rituals as a priest?
- c. Which plants and parts do you/people use in each ritual? What are they used for?

#### **2. How do the religious value of sacred plants and the practice of their use and worship differ between Brahmin and the Limbu?**

- a. Are there any special religious belief in the worship of religious plants? What are they?
- b. How do people worship them and how do they use in their rituals?
- c. Do you/people in the community know about the species used in the process?
- d. Is it possible conducting the rituals without the prescribed plant species or its parts?
- e. Is there alternative use of other plants in absence of prescribed plant species ?
- f. Are the plants used for religious purposes used for any other purposes?
- g. Is there any religious forest with religious and cultural beliefs?
- h. Are there any social or cultural rules that limit in the harvesting of religious plants?
- i. Are there any people or group of people who do not use such species during their rituals?
- j. Are there any social beliefs/rules limiting the cutting and destruction of religious plants? What are they?

**3. Are there any local cultivation and management practices of these plant species in the gardens and the surrounding village?**

- a. Are there any social or religious functions of cultivating sacred plants? If yes, What are they? How do you/they do it?
- b. How do people harvest the required parts of a sacred plant? Is there any specific procedure or season for it?
- c. What kind of non-religious species of plants are found in the forests and how are they used and conserved?
- d. Do you think the religious use has effect in the management and protection of such plants?

**4. How do the occurrence and abundance of religious plants differ between the two villages?**

- a. How do you/ people collect the parts to be used in each ritual? Where do you/they collect from?
- b. Where is the specific plant found and which taxonomic group of the plant is it?
- c. Are these plants used in the rituals easily accessible or difficult to find?
- d. Are any of these religious plants found in the forests?
- e. Are these species protected for use in the forest too, if found?
- f. Do people plant or protect these species? How do they do it and where do they do it?



## Appendix 2. Tables

Table A2.1 Rituals conducted by the Bramhin and the Limbu people

S.N.	Brahmin Rituals	Purpose of the ritual	Limbu Rituals	Prupose of the ritual
1.	Nwaran	Naming a newly born baby	Nwaran	Naming a newly born baby
2.	Pasni	Weaning ceremony of the baby	Bivaha	Marriage
3.	Chudakarma	Hair shaving ceremony of the child	Mrityu Sanskar	Funeral
4.	Bratabanda	Sacred thread wearing ceremony	Yawa puja / Yakthumba Puja	Puja and worship of gods, Sani puja
5.	Bivaha	Marriage	Kul dewata Puja	Puja and worship of their major deities
6.	Astachiranjivi Puja	Puja for the long life of an individual	Lunmang Puja	Puja with the clans and the nearest friends.
7.	Mrityusanskar	Funeral	Dewi Puja	Puja and worship of Dewi
8.	Sradda	Annual ritual in the memory of passed parents/grand parents	Goth Puja	Puja and worship of the place for the animals
9.	Vishnu Puja	Puja and worship of god Puja and worship of Vishnu	Aitabare Puja	Puja and worship of Dewi and hunting god
10.	Siva Puja	Puja and worship of god Siva	Maharani Puja	Puja and worship of Maharani
11.	Durga Puja	Puja and worship of god Durga	Ban Puja	Puja and worship of forests
12.	Krishna Astami	Puja and worship of god Krishna	Pani Puja	Puja and worship of water
13.	Bijaya Dashami	Puja and worship of god Durga	Nawagraha Puja	Puja and worship of all planets
14.	Yamapanchak/ Tihar	Puja and worship of god Yama and Laxmi and other belonging gods	Udhouli Ubhouli	Puja and worship of sun

15.	Swasthani Puja	Puja and worship of god Siva and Parwati	Saune Sakranti	Puja and worship of nature and their gods
16.	Ram Nawami	Puja and worship of god Rama	Maghe Sakranti	Puja and worship of gods as the start of new year
17.	Sivaratri	Puja and worship of god Siva	Chaite Dashain	Dewi puja and worship
18.	Bhagawat Puja	Puja and worship of Narayana	Shrap bagaune	Puja and worship to get relieved from the sins and unwanted acts.
19.	Laghu Rudri	Recitation of Rudri	Sivaratri	Puja and worship of god Siva
20.	Satyanarayan Puja	Puja and worship of god Vishnu	Mangenna,	Puja for being free from all the accuses and raise the head
21.	Rishipanchami	Worshiping Rishis (Ancient holy priests)	Newagi	Puja and worship of god and offering made before harvest of crops
22.	Ganesh Chaturdashi	Puja and worship of god Ganesh		
23.	Saraswati Puja	Puja and worship of god Saraswati		
24.	Thulo Ekadashi	Ritual of planting Tulasi ( <i>Ocimum sanctum</i> )		
25.	Kushe aunshi	Ritual to deliver sacred Kush ( <i>Desmostachya bipinata</i> ) by the priest		
26.	Janai Purnima/ Rakshya Bandhan	Ritual of wearing Janai and Rakshya Bandhan (The sacred threads)		
27.	Sani Puja	Worship of god Sani		

Table A2.2 Plants and their parts used in Brahmin rituals

S.N	Local name	Botanical name	Taxonomic group	Rituals used	Parts used	Mentioned by	IUCN status
1.	Aduwa	<i>Zingiber officinale</i>	Herb	All	Roots	5 Priest	
2.	Anp	<i>Mangifera indica</i>	Tree	Heavenly plant	Leaves	5 Priest	
3.	Babiyo	<i>Eulaliopsis binata</i>	Herb	Graha Puja	Leaves	4 Priest	
4.	Bans	<i>Bambusa nutans</i>	Grass	All	Stem	5 Priest	
5.	Ghantiful	<i>Hibiscus rosasinensis</i>	Shrub	All	Flower	5 Priest	
6.	Jou	<i>Hordeum vulgare</i>	Herb	All	Seeds	5 Priest	
7.	Besar	<i>Curcuma longa</i>	Herb	Nwaran/ All	Tuber	5 Priest	
8.	Bhalayo	<i>Rhus succedanea</i>	Tree	Nwaran	Wood	3 Priest	
9.	Titepati	<i>Artemisia dubia</i>	Herb	All	Leaves	2 Priest	
10.	Kagati	<i>Citrus aurantifolia</i>	Tree	Kartik Mahatma	Fruit	4 Priest	
11.	Bhringaraj	<i>Eclipta prostrata</i>	Herb	Funeral	Whole plant	4 Priest	
12.	Bimiro	<i>Citrus medica</i>	Tree	Tihar	Fruit	4 Priest	
13.	Chandan	<i>Santalum album</i>	Tree	Daily Puja	Incense	5 Priest	
14.	Chyuri	<i>Diploknema butyracea</i>	Tree	Marriage/ All rituals	Seeds/ Leaves	4 Priest	
15.	Dhatura	<i>Datura stramonium</i>	Herb	Sivaratri	Fruit	3 Priest	
16.	Faledo	<i>Erythrina arborescens</i>	Tree	All	Flower	3 Priest	
17.	Godawari	<i>Chrysanthemum spp</i>	Herb	All	Flower	3 Priest	
18.	Gulaf	<i>Rosa spp</i>	Shrub	All	Flower	2 Priest	

19.	Gurans	<i>Rhododendron arboreum</i>	Tree	All	Flower	4 Priest	
20.	Kabro	<i>Ficus infectoria</i>	Tree	Funeral	Leaves	5 Priest	
21.	Kapas	<i>Gossypium arboreum</i>	Shrub	All	Fruit	5 Priest	
22.	Kapoor	<i>Cinnamomum camphora</i>	Tree	All	Leaves	5 Priest	
23.	Kera	<i>Musa paradisiaca</i>	Herb	All	Leaves	5 Priest	
24.	Lalupate	<i>Euphorbia pulcherrima</i>	Shrub	All	Flower	3 Priest	
25.	Makhamali phool	<i>Gomphrena globosa</i>	Herb	Tihar / All	Flower	4 Priest	
26.	Mans	<i>Phaseolus mungo</i>	Herbs	All	Seeds	5 Priest	
27.	Nariwal	<i>Cocos nucifera</i>	Palm Tree	All	Fruit	5 Priest	
28.	Nibaro	<i>Ficus. spp</i>	Tree	All	Leaves	4 Priest	
29.	Okhar	<i>Juglans regia</i>	Tree	Tihar	Fruit	5 Priest	Bark banned for export
30.	Painyu	<i>Prunus cerasoides</i>	Tree	All	Branch	5 Priest	
31.	Pakhari	<i>Ficus globerrimata</i>	Tree	Vishnu Puja	Leaves	5 Priest	
32.	Pan	<i>Piper betel</i>	Climber	Teej/Tihar	Leaves	5 Priest	
33.	Dhupi	<i>Juniperus indica</i>	Tree	All	Wood/Leaves	4 Priest	
34.	Rice	<i>Oryza sativa</i>	Herb	All	Seeds	5 Priest	
35.	Sayapatri	<i>Tagetes erecta</i>	Herb	Tihar/All	Flower	5 Priest	
36.	Til	<i>Sesamum indicum</i>	Herb	All	Seeds	5 Priest	
37.	Tori	<i>Brassica campestris</i>	Herb	All	Seeds	5 Priest	
38.	Ukhu	<i>Saccharum officinarum</i>	Herb	All	Stem	5 Priest	
39.	Chap	<i>Michelia champaca</i>	Tree	Nwaran	Wood	3 Priest	Endangered

40.	Pate Bar	<i>Ficus species</i>	Tree	All	Leaves	5 Priest	
41.	Ainselu	<i>Rubus ellipticus</i>	Shrub	Funeral	Branch	3 Priest	
42.	Makai	<i>Zea maize</i>	Crop	Dashain	Seeds	5 Priest	
43.	Apamarga	<i>Achyranthes aspera</i>	Herb	Rishipuja	Leaves	5 Priest	
44.	Ambok	<i>Psidium guajava</i>	Tree	All	Fruit	4 Priest	
45.	Suntala	<i>Citrus tangerina</i>	Tree	All	Fruit	5 Priest	
46.	Naspati	<i>Pyrus comunnis</i>	Tree	All	Fruit	5 Priest	
47.	Alainchi	<i>Amomum subulatum</i>	Herb	Nwaran	Seeds	4 Priest	
48.	Dudhilo	<i>Ficus nemoralis</i>	Tree	Funeral	Branch/Leaves	4 Priest	
49.	Lwang	<i>Syzygium aromaticum</i>	Herb	All	Fruit	5 Priest	
50.	Marich	<i>Piper nigrum</i>	Creeper	All	Fruit	5 Priest	
51.	Aaru	<i>Prunus persica</i>	Tree	All	Fruit	3 Priest	
52.	Mewa	<i>Carica papaya</i>	Tree	All	Fruit	5 Priest	
53.	Tanki	<i>bauhinia purpurea</i>	Tree	All	Leaves	5 Priest	
54.	Bhang	<i>Cannabis sativa</i>	Herb	Siva Puja	Leaves/Seeds	4 Priest	
55.	Dubo	<i>Cynodon dactylon</i>	Grass	All	Whole plant	5 Priest	
56.	Dumri	<i>Ficus glomerata</i>	Tree	Heavenly Plant	Leaves	5 Priest	
57.	Sami	<i>Ficus benjamina</i>	Tree	Heavenly Plant	Leaves	5 Priest	
58.	Aank	<i>Calotropis gigantea</i>	Shrub	Heavenly Plant	Leaves/Flower	4 Priest	
59.	Palash	<i>Butea monosperma</i>	Tree	Heavenly Plant	Branch	5 Priest	Endangered Species

Table A2.3 Plants and their parts used in Limbu rituals

S.N	Local name	Botanical name	Taxonomic group	Ritual/used for	Parts used	Mentioned by	IUCN status
1.	Tarul	<i>Dioscorea alata</i>	Climber	All Puja / offering	Rhizome	5 priest	
2.	Bans	<i>Bambusa nutans</i>	Grass	All / Making tools	Stem	5 priest	
3.	Titepati	<i>Artemisia dubia</i>	Herb	All rituals / Incent	Leaves	5 priest	
4.	Chandan	<i>Santalum album</i>	Tree	All rituals	Wood	5 priest	
5.	Chyuri	<i>Diploknema butyracea</i>	Tree	All / Making tools	Leaves	5 priest	
6.	Kapas	<i>Gossypium arboreum</i>	Shrub	All / Offering	Fruit	5 priest	
7.	Kapoor	<i>Cinnamomum camphora</i>	Tree	Funeral / Offering	All parts	4 priest	
8.	Kera	<i>Musa paradisiaca</i>	Herb	All / Making tools	Leaves	5 priest	
9.	Painyu	<i>Prunus cerasoides</i>	Tree	Puja/ Making ritual place	Branch	4 priest	
10.	Darimpate	<i>Thalictrum species</i>	Tree	Yagya / Fire offering	Wood	5 priest	
11.	Simali	<i>Vitex negundo</i>	Shrub	Udhauli/ Ubhauli / Making tools	Branch / Leaves	4 priest	
12.	Pate Bar	<i>Ficus species</i>	Tree	All / Making tools	Leaves	5 priest	
13.	Lwang	<i>Syzygium aromaticum</i>	Herb	Marriage/ Puja/ Naming / Offering	Fruit	3 priest	
14.	Marich	<i>Piper nigrum</i>	Creeper	Marriage/ Puja/ Naming / Offering	Fruit	3 priest	
15.	Jou	<i>Hordeum vulgare</i>	Herb	All / Offering	Seeds	4 priest	
16.	Pan	<i>Piper betel</i>	Climber	Banko Puja / Offering	Leaves	3 priest	
17.	Rice	<i>Oryza sativa</i>	Herb	All / Offering	Seeds	5 priest	
18.	Makai	<i>Zea maize</i>	Grain	Puja / Offering	Seeds	3 priest	
19.	Til	<i>Sesamum indicum</i>	Herb	All / Offering	Seeds	4 priest	

20.	Tori	<i>Brassica campestris</i>	Herb	All / Offering	Seeds	4 priest
21.	Supari	<i>Areca catechu</i>	Palm tree	All / Offering	Fruit	5 priest
22.	Nariwal	<i>Cocos nucifera</i>	Palm tree	All Puja / Offering	Fruit	5 priest
23.	Ukhu	<i>Saccharum officinarum</i>	Herb	All Puja / Offering	Stem	5 priest
24.	Ambok	<i>Psidium guajava</i>	Tree	All Puja / Offering	Fruit	5 priest
25.	Suntala	<i>Citrus tangerina</i>	Tree	All Puja / Offering	Fruit	5 priest
26.	Naspati	<i>Pyrus communis</i>	Tree	All Puja / Offering	Fruit	5 priest
27.	Sayapatri	<i>Tagetes erecta</i>	Herb	All Puja /Tihar	Flower	5 priest
28.	Lotus	<i>Nelumbium nucifera</i>	Water plant	Puja / Offering	Flower	3 priest
29.	Makhamali phool	<i>Gomphrena globosa</i>	Herb	All / Tihar	Flower	5 priest
30.	Lalupate	<i>Euphorbia pulcherrima</i>	Shrub	Puja/ Offering	Flower	5 priest
31.	Godawari	<i>Chrysanthemum spp</i>	Herb	All/ Offering	Flower	5 priest
32.	Gulaf	<i>Rosa species</i>	Shrub	All/ Offering	Flower	4 priest
33.	Ghantiful	<i>Hibiscus rosa sinensis</i>	Shrub	All/ Offering	Flower	5 priest
34.	Aduwa	<i>Zingiber officinale</i>	Herb	Funeral/ Offering	Rhizome	5 priest
35.	Kush	<i>Desmostachya bipinata</i>	Grass	Puja	Leaves	4 priest
36.	Malato	<i>Macaranga pustulata</i>	Tree	All/ Making tools	Leaves	5 priest
37.	Unyu	<i>Dryopteris species</i>	Herb	Puja/ Offering	Leaves	3 priest
38.	Amala	<i>Phyllanthus emblica</i>	Tree	Marriage/ Offering	Fruit	3 priest
39.	Anp	<i>Mangifera indica</i>	Tree	Puja/ Offering	Leaves	5 priest
40.	Kaulo	<i>Machilus odoratissima</i>	Shrub	Funeral/ Offering	Stem/ Leaves	3 priest

### Appendix 3. Pictures

Pictures taken in the Brahmin gardens and village in Mangalbare.



Priest Ganga Prasad Rijal



Priest Bed Prakash Rijal



Priest Prakashchandra Khanal with the author



Priest Purnachandra Khanal



Priest Chandramani Acharya with the author



*Ocimum sanctum* in a special place of mud



*Desmostachya bipinata*



*F. religiosa* planted in the garden



*Hordeum vulgare* planted with *Ocimum sanctum*



Recording plants from a quadrat



*Prunus cerasoides*



*F. benghalensis* and *F. religiosa* on the side of the street



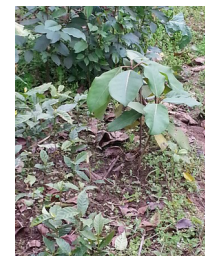
*Juniperus indica*



*Emblica officinalis*



Forests in Brahmin village Mangalbare



*F. benghalensis* planted in the garden



Pictures taken in the Limbu gardens and village in Siddithumka.



Priest Buddabal Limbu in the middle



Priest Uttim Bahadur Limbu



Priest Dirjahang Limbu



Priest Manaraj Limbu



Priest Harka Bahadur Limbu



*Elaeocarpus sphaericus*



*Thalictrum species*



Recording plants from a quadrat



Place of worshipping the Majordeities of Limbu



*Elaeocarpus sphaericus* offered to god of Limbu



*Areca catechu*



*Artemisia dubia*



Making a traditional musical instrument from the wood of *Gmelina arborea*



Forest in Siddithumka



*F. religiosa* protected in a public area



*Musa paradisiaca*



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