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Conservation practices of local inhabitants from the selected sites of Hadoti Region from South-eastern Rajasthan, India

NK Rathore, VK Yadav and SP Mehra

Abstract
Nature has ample of services for infinite time to fulfil the needs of human. *Bharatvarsh*, known as India in the present context, has great history related to the nature. The eco-cultural aspects are evident from the eco-principles of ancient Indian literature such as "*Aranya Sanskriti*" (Forest Culture), "*Prakriti Purush*" (Natural Human) and "*Vasudhaiv Kutumbkam*" (Earth as one Family). The present investigation is an attempt to document the ethnobotanical approach of the local inhabitants from the south-eastern parts of Rajasthan (India) especially related to the eco-customary practices of conserving natural heritage. The general surveys were conducted for field observations on the existing sites of conservation practices. Local interview-based data collection was carried out from the local inhabitants. Near about thirty-four sites of sacredness were identified and analysed. A total of 65 plant species were used for religious purposes. The sacred groves were getting the protection due to the auspiciousness but simultaneously many of them were also getting deteriorated which need immediate attention. Overall, customary practices were giving due protection to the indigenous plant species of ecological importance.

Keywords: Local inhabitants, ecological importance, getting deteriorated

Introduction
Nature has ample of services for infinite time to fulfil the needs of human. The ancient Indian Human Society recognized the importance of the natural resources. The ecological concept is base for all the ancient Indian texts. *Bharatvarsh*, known as India in the present context, has great history related to the nature. The umbilical cord exists between the nature and the human, it was well recognized in the ancient *Vedic Culture*. The eco-cultural aspects are evident from the eco-principles of ancient Indian literature such as "*Aranya Sanskriti*" (Forest Culture), "*Prakriti Purush*" (Natural Human) and "*Vasudhaiv Kutumbkam*" (Earth as one Family). Our ancestors had given due reverence not only to all the life-forms but also given due respect to all the abiotic components of the universe. It is projected that over 5,000 villages spreading across India have the forest dominated habitats. The ethnic communities all around the globe knew the bonding of humans with nature and learnt to utilize the surrounding natural resources sustainably. They have emotional and sentimental attachments with their natural heritage. In the form of Sacred Groves, the spiritual connection with the indigenous vegetation could be seen all over globes especially in India. With the pace of development, the modern human society overlooked the harmonious bonding and invited the survival of different life forms including human itself (Rathore *et al*. 2021) [6]. In view of this grievous condition, the biologists are working towards documentation and conservation of the natural wealth. The present investigation is an attempt to document the ethnobotanical approach of the local inhabitants from the south-eastern parts of Rajasthan (India) especially related to the eco-customary practices of conserving natural heritage.

Methodology
Study Area
Rajasthan is the largest state of India covering 11% of the total geographical area of country with a forest cover of ~9%. The south-eastern parts comprise of Kota Division (Hadoti Region) which include Baran and Jhalawar districts. The district Jhalawar lies in the South-east corner of Rajasthan at the edge of the Malwa plateau between 23°45'20" N to 24°52'17" N latitudes and 75°27'35" E to 76°56'48" E longitudes. It is one of the rainiest parts of the state of Rajasthan where the average annual rainfall is 35 inches which keeps it cool and gentle

breezes ward off the stifling humidity. Distrcit Baran is situated at 25° 15' 40" North latitudes, 76° 30' 33" East longitudes. Different sites of four major sites and their nearby villages of Jhalawar-Baran districts were investigated.

Method

The general surveys were conducted for field observations on the existing sites of conservation practices. Local interview-based data collection was carried out from the local inhabitants. The target respondents were mostly the tribal population, in general, and traditional healers, *vaidhya, bhopa, ojha*, etc., in specific. Questionnaire exercises were conducted at selected sites especially at the forest periphery for the information regarding non-timber forest products collection by the locals. Information regarding duration of collection, method of harvesting, quality, quantity, seasonality of plant products, their mode of consumption and trade related information were collected. The number of days taken to collect the produce their methods of harvesting, reasonability and trade related information was also recorded. The specimens collected from selected sites were photographed and kept preserved in herbarium for record. The specimens were taxonomically identified with the help of floral keys like Hooker (1872-1897) [3], Sharma and Tyagi (1979) [9], Singh and Shetty (1987-1993) [10], Bhandari (1990) [1], Gupta and Tandon (2004) [2], Jain (1991), Kirtikar and Basu (1981) [5], Singh (1978) [11], Tyagi and Aery (2007) [12] and plant taxonomists as well as experts' opinion from different department and research centers within the state of Rajasthan and India.

Observations

Tables 1(a) and 1(b) enlist the plant species having the presence at sacred sites which were treated as the groves of sacredness. Tables 2 and 3 summarize the species of ethnobotanical interest.

Bagher Area (Jhalawar)

Amjhar Mata Temple, Baori and Bodha Math are famous sacred places of Bagher area with *Anogeissus pendula* Edgew., *Madhuca indica* (Koen). Macb, *Tamarindus indica* L., *Lannea coromandelica* (Houtt.), *Diospyros melanoxylon* Roxb., *Sterculia urens Roxb*. were common tree species. Other species with few individuals *Acacia leucophloea (*Roxb.), *Anogeissus latifolia*, (Roxb. Ex.DC.) *Acacia nilotica* (L.), *Acacia Senegal* (L.), *Wrightia tomentosa* Roem., *Aegle marmelos* (L.), *Boswellia serrata* Roxb. Ex Colebr., *Madhuca indica Balanites aegyptiaca* (L.), *Schleichera oleosa* (Lour.) and *Butea monosperma* (Lam.) were observed.

Bijlia Bharak Area or Jhirniya (Jhalawar)

Jhirniya is kept protected under supervision of the forest department. Shiv Temple, Hanuman Temple with common tree species *Anogeissus pendula* Edgew., *Diospyros melanoxylon* Roxb., *Lannea coromandelica* (Houtt.) and *Sterculia urens* Roxb. *Syzygium jambos* L b. and a few individuals of *Terminalia arjuna* (Roxb. Ex Dc.), *Guazuma ulmifolia* Lam., *Terminalia bellerica* (Gaertn.), *Ficus benghalensis* L., *Ficus religiosa* Linn., *Aegle marmelos* (L.), *Azadirachta indica* A. Juss., *Tectona grandis* L.F., *Toona ciliate* Roem., *Madhuca indica* (Koen) were observed.

Rata Devi Area (Jhalawar)

A pure patch of *Anogeissus pendula* Edgew and *Wrightia tomentosa* Roem at different location and *Diospyros melanoxylon* Roxb. with *Anogeissus pendula* Edgew. skall were found naturally colonizing in this area.

Thandi Jhiri Forest Nursery (Jhalawar)

Jharan Mahadev sacred grove in Jhalawar is situated along the stream that ensures round the year supply of water and survival of the vegetation mainly *Dendrocalamus strictus* (Roxb.) Nees, d *Phoenix sylvestris* (L.) Roxb and *Schleichera oleosa* (Lour) Oken. The forest department runs a forest nursery inside the grove for the production of seedling for plantation and distribution in its natural form.

Prithvi Villas Palace is the private residence of the family of farmer ruler. In the city, locally it is called "*Darbar ki Kothi*". Tree species *Madhuca indica* (Koen), *Holarrhena antidysenterica* (Roth.) A. DC., *Bambusa* spp., *Ficus benghalensis* L., *Pandanus odoratissimus* Lam., *Grewia subinaequalis*, *Schrebera swietenioisedes*, *Sterculia urens* Roxb., *Mitragyna parviflora* (Roxb.), *Santalum album* L., *Syzygium jambos*, *Ixora coccinea*, *Madhuca indica* (Koen), *Mangifera indica* L., *Schrebera swieteniodes*, *Schleichera oleosa* (Lour) Oken., *Dendrocalamus strictus* (Roxb.) Nees, *Santalum album* L. and *Bambusa* spp. were naturally colonizing in this area.

Gagron Fort (Jhalawar)

Gagron fort is situated on the confluence of Kalisindh and Ahu rivers. Common tree species *Butea monosperma* (Lam.) Taub., *Anogeissus pendula* Edgew., *Sterculia urens* Roxb., *Acacia leucopholea* (Roxb.), *Schleichera oleosa oleosa* (Lour) Oken., *Holoptelea integrifolia* (Roxb.) Planch, *Mitragyna parviflora* (Roxb.), *Phoenix sylvestris* (L.) Roxb. Oken., *Acacia catechu* (L.f.) and *Diospyros melanoxylon* Roxb naturally occurred in this area.

NauLakha fort-Jhalrapatan (Jhalawar)

In this area *Anogeissus pendula* Edgew *Madhuca indica* (Koen) Macbr *Tamarindus indica* L., *Diospyros melanoxylon* Roxb. were common tree species. Other species but a few individuals *Terminalia arjuna* (Roxb. ex DC.) Wt *Acacia leucophloea (*Roxb.), *Anogeissus latifolia* (Roxb. Ex. DC.), *Acacia nilotica* (L.), *Acacia Senegal* (L.), *Balanites aegyptiaca* (L.), *Lantana camara* L. *Butea monosperma* (Lam.) were seen.

Thandi Jhiri – (Herbal Garden) Jhalrapatan (Jhalawar)

In Thandi Jhiri (Jhalrapatan) of Jhalawar *Pandanus odoratissimus* Lam., *Anogeissus pendula* Edgew., *Anthocephalus cadamba* (Roxb.) Miq., *Azadirachta indica* A. Juss., *Bombax ceiba* L., *Butea monosperma* (Lam.) Taub., *Ficus benghalensis* L., *Ficus racemosa* L., *Ficus religiosa*, *Madhuca indica* (Koen.) Macbr., *Mangifera indica* L., *Moringa oleifera* Lamk., *Syzygium cumini* L. Skeel, *Tamarindus indicus* L., *Terminalia arjuna* (Roxb. ex DC.) Wt. and Arn were recorded from this area.

Sheetaleshwar Mahadeo Temple Chandrabhaga

An ancient temple stands on the bank of Chandrabhaga River, in Jhalarapatan. A large cattle fair is being organized by the department of Tourism during Oct-Nov each year along with cultural and folk programs. It was represented by the species *Anthocephalus cadamba* (Roxb.) Miq., *oleosa* (Lour) Oken., *Ficus racemosa* L., *Ficus religiosa*, *Madhuca indica* (Koen.) Macbr., *Mangifera indica* L., *Syzygium cumini* L. Skeel,

Tamarindus indicus L., *Terminalia arjuna* (Roxb. ex DC.) Wt.

Other Sacred Places of Jhalawar

Other sacred places namely Mitthe Saheb Dargah (Gagron Fort), Pipa Ji Dham (Gagron), Sati Mata Chabutra Golan (Khanpur), Rata Devi Temple (Asnawar), Kamkheda Balaji Temple (Aklera), Eid Gah, Tambain ki Khan (Teez ka Chabutra), Mangal Nath Dungri (Jhalawar), Naulakha Fort (Anand Dham), Nasiya Ji Baori, Thakur Shab Baori, Duwarika Dhish Temple (Jhalrapatan).

Sita Bari – Shahbad (Baran)

Sitabari is in an ideal sacred grove in Hadoti area, situated about 45 Km from Baran in Kelwara kasba on National highway connecting Sivpuri-Gwalior. This is a holy worship place. It is well known in the area that 'Sita Mata' has lived in this place after being left-out by Lord Ram. This place is also known as the birthplace of Lav and Kush. There are several kunds (Ponds) in Sitabari namely Balmiki kund, Sita Kund, Laxman Kund, Surya Kund, Lav- Kush Kund. The tribal Sahariya fair occurs at this place in the May/June every year.

Sita Bari is the oldest sacred grove of study area with gene pool of old tree species (more than 200 Years) namely *Saraca indica* (Roxb.) *Anogeissus pendula* Edgew., *Azadirachta indica* A. Juss., *Bombax ceiba* L., *Butea monosperma* (Lam.) Taub., *Ficus benghalensis* L., *Ficus racemosa* L., *Ficus religiosa* L., *Madhuca indica* (Koen.) Macbr., *Mangifera indica* L., *Moringa oleifera* Lamk., *Syzygium cumini* L. Skeels, *Tamarindus indicus* L., *Terminalia arjuna* (Roxb. ex DC.) Wt. and Arn., *Bombax ceiba* L., *Carissa congesta* Wight, *Ehretia laevis*, *Cordia dichotoma* Forst. F., *Drypetas roxburghii*, *ficus virens* Ait., *Mangifera indica* L., *Schleichera oleosa* (Lour). *Syzygium cumini* L. Skeels and *Terminalia arjuna* (Roxb.ex DC.). This area needs protection, conservation and natural growth of these species. Sitabari vegetation represents a sub-tropical evergreen type of forest. It is considered as sacred place with religious importance and mythological evidence. This site needs protection, conservation and natural growth of these species

Sher Garh Fort

The historic Shergarh fort is in Hadoti area, situated about 65 Km. from Baran district. In Atru tehsil, sitting atop hillock on the bank of Parwan River, the fort of Sher Garh looks impregnable. The fort stands a little detached from the walled township, which is a boast of its ancient history. Brahmani and Jain temple and Buddhist monasteries were also found here. A natural belt of teak and Butea was found along with *Acacia catechu* (L.F.), *Acacia nilotica* (L.D), *Acacia leucopholea* (Roxb.), *Balanites aeyptiaca* (L.), *Butea monosperma* (Lam.) Taub and *Diospyros melanoxylon* Roxb. were observed.

Shahbad Forest area (Baran)

The Shahbad forest is hotspot of biodiversity in Rajasthan several temples mainly Bijasan Mata Ji, Lal Bai Chabutra, Dhakar Baba Chabutra, Teja Ji Chabutra, Durga Temple, Hanuman Temple, Kunda-Kho, Shiv Temple, Tapswi Bagichi, Jama Majjid, Nagar Cott. Mata ji Temple, Kanya Dhehn, Rameshwar Temple.

This area was rich in floral diversity as evidenced by *Anogeissus pendula* Edgew., *Diospyros melanoxylon* Roxb, *Azadirachta indica* A. Juss, *Lannea coromandelica* (Houtt.), *Sterculia urens* Roxb and *Wrightia tomentosa* Roem are common tree species. Pure patch of *Anogeissus pendula* Edgew was seen in the sloppy terrain. Other species but few individuals were noticed *Mitragyna parviflora* (Roxb.), *Acacia leucophloea* (Roxb.), *Acacia nilotica* (L.), *Aegle marmelos* (L.) and *Feronia limonia* (L.), *Madhuca indica* (Koen.), *Guazuma ulmifolia* Lam., *Phoenix sylvestris* (L.) Roxb., *Terminalia alata* Heyne ex Roth, *Terminalia arjuna* (Roxb. ex. DC), *Nyctanthes arbor-tristis* L. and *Balanites aegyptiaca* L., *Ziziphus xylopyrus* (Retz.) and *Flacourita indica*. (Burm.f.) were naturally colonizing in different location mainly the Shahbad fort, Kunda Kho, Shiv Temple, Tapswi Bagichi, Jama Majjid, Nagar Cott. Mata ji Temple, Kanya Dhehn, Rameshwar Temple.

Kanya Dah – Bilas garh

The ruins of the Bilas Garh situated in the lonely place inside dense forest area which support tree species *Acacia catechu* (L.F.), *Acacia nilotica* (L.D), *Balanites aeyptiaca* (L.), *Butea monosperma* (Lam.) Taub and *Diospyros melanoxylon* Roxb., and shrubs, under-shrubs were also abundant in the marginal zone.

Nahargarh fort Kishanganj (Baran)

A natural belt of teak occurred along with *Acacia nilotica* (L.D), *Guazuma ulmifolia* Lam., *Acacia leucopholea* (Roxb.), *Balanites aeyptiaca* (L.), *Butea monosperma* (Lam.) Taub and *Diospyros melanoxylon* Roxb. The shrubs and under shrubs were also frequent in this area.

Bhund Devera – Ramgarh (Baran) Bhand Devara temple (Shiv Temple) is ancient and based on the Khajuraho art and known as Rajasthan's Mini Khajoraho. In this area pure patch of *Butea monosperma* (Lam.) Taub, *Anogeissus pendula* Edgew along with few individuals of *Madhuca indica* (Koen)., *Guazuma ulmifolia* Lam., *Feronia limonia* (L.), *Balanites aegyptiaca* (L.) and *Lagerstroemia parviflora* Roxb were recorded.

Kakoni

It is famous for dancing Ganesh idol. Recently Archaeological department has announced the place as unsecured. About 60% statues of the Kakoni temple are kept in the Museums at Kota and Jhalawar district. *Lagerstroemia parviflora* Roxb., *Diospyros melanoxylon* Roxb., *Lannea coromandelica* (Houtt.), *Manikara hexandra* (Roxb), *Anogeissus pendula* Edgew., *Holoptelea integrifolia* (Roxb.) Planch and *Madhuca indica* (Koen). Macbr. were frequent in this area.

Taadka Balaji

Saaket Dham Taadka Balaji, Saket Dham has famous and ancient Hanumanji, Jind Maharaj, Mataji, and Sivji Temples. This place was surrounded by woody species. *Balanites aegyptiaca* L., *Acacia nilotica* (L.), *Aegle marmelos* (L.), *Feronia limonia* (L.), *Madhuca indica* (Koen.) and *Phoenix sylvestris* (L.) Roxb. were frequent in this area.

Other Places of Baran

Ramgarh Mataji, Brahmani Mata (Soursan (Baran), Shani Dhaam -Jain Temple Bodh Math and Mata Temple (Banniya in Bagher), Bhand Devara, Kisnnoi Mata Ji or Annapurna Mata Ji, Brahma Sagar Kund, (Ramgarh), Ganesh Temple

'Dancing Stachu' (Kakoni), Kapil Dhara (Kelwara), Dhakar Baba Chabutra, Hanuman Temple (Shahbad forest and Fort), Nidhal Devi (Samraniya), Bhanwargarh Fort Kapil Dhara were also visited. These all were found well under supervision of different community committees and Government organizations.

Impact of urbanization and human activities were observed in degraded and exploited religious places and gardens (private property) mainly Jugdevpura and Nagarkot of Kishangunj, Jhora Tora and Kotra Mataji of Shahbad Range. Other green sites included Hujoor ka Bagicha, Gokulpuria Bagicha of Jhalawar, were completely replaced by Kota stone polishing factories or residential colonies. It was also noticed in Jhalawar - Karonde ke balaji, Dhokde ke Balaji, Mangal Nath Dungri, Khejadi ke Balaji which were getting degraded, need protection and conservation through eco-restoration.

Results

Out of total 65 plant species used for religious purpose, 14 plant species were used to prepare rosaries, 12 plant species used in *hawan samgri*, flowers of 15 plant species were used for making garlands, and 25 plant species were used in various social and religious ceremonies (Rathore and Yadav 2022b) [8]. Sacred Groves (temple, baories, raries and orans), alongwith tree species which were conserved and protected and surveyed are tabulated in Table 1(a) for jhalawar and Table 1(b) Baran. A total of 34 sacred groves in major four sites of Jhalawar (Rata Devi–Gagroan, Bagher, Jhalrapatan) had been identified (Rathore and Yadav 2022a) [7]. Out of 34 sites, five were ignored and two sites Mangal Nath Dungri and Ganesh Temple (Kakoni) of Jhalawar were found unprotected and degraded sacred places which need protection, Table 1(b) highlighted out of total 14 sacred groves in Baran, three were found ignored and two sacred groves, namely Bhand Devra (Ramgarh), Kapil Dhara (Kelwara), were degraded, and others were conserved representing ancient foundation. It was also observed that tree species conserved by local people for their spiritual values in almost all visited sites which also serve as key stone resources for protection of local fauna.

Table 1 (a): Sacred groves and existing old tree species (Jhalawar district)

S. No.	Village	Site Place	Foundation	Tree Species
1	Jhirniya	Shiv ji temple.	150 year	*Anogeissus pendula, Anogeissus latifolia*, Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Aegle marmelos, Sterculia urens**
2	Thandi Jhiri Forest Nursery	Shiv ji, Balaji and Sai-Baba Temple.	Ancient *	*Diospyros melanoxylon, Ficus benghalensis, Ficus religiosa, Mitragyna parviflora*, Tectona grandis, Azadirachta indica*
3	Raipur	Nani Baori	Ancient	*Terminalia bellerica, Terminalia arjuna, Butea monosperma, Ficus benghalensis*
4	Khanpur	Brahmani Mata Temple	Ancient	*Madhuca indica, Diospyros melanoxylon, Acacia nilotica, Butea monosperma*
5	Bagher	Baori and Amjhar Mata Temple	Ancient **	*Sterculia urens, Anogeissus latifolia, Flacourtia indica,Butea monosperma, Ficus religiosa*
6	Banniya (Bagher)	Bodha Math and Mata Temple	Ancient **	*Azadirachta indica, Butea monosperma, Madhuca indica*, Ficus religiosa, Aegle marmelos*
7	Gagraon Fort	Mitthe Saheb Dargah	600 year con.	*Tamarindus indica, Azadirachta indica, Sterculia urens, Madhuca indica.*
8	Jhalawar (Gagron)	Pipa ji Dham	500 year con.	*Ficus benghalensis, Ficus religiosa, Aegle marmelos Holoptelea intergifolia, Ficus religiosa*
9	Golan (Khanpur)	Sati Mata Chabutra	300 year	*Ficus benghalensis, Tamarindus indica*
10	Asnawar	Rata Devi Temple	Ancient *	*Anogeissus pendula, Diospyros melanoxylon, Madhuca indica, Mitragyna parviflora **
11	Aklera	Sheetala Mata Temple	Ancient	*Mitragyna parviflora, Azadirachta indica*
12	Aklera	Kamkheda Balaji Temple	Ancient con.	*Ficus benghalensis, Ficus religiosa, Holoptelea intergifolia Ficus benghalensis,*
13	Jhalawar	Raj Rajeshwar Temple	300 year con.	*Azadirachta indica, Ficus benghalensis, Ficus religiosa*
14	Jhalawar	Ganesh Temple (Garh Place)	500 year con.	*Azadirachta indica,Ficus benghalensis*
15	Jhalawar	Sati Chabutra	500 year con.	*Feroni limoni, Ficus benghalensis, Butea monosperma,*
16	Jhalawar	Durga Temple	300 year con.	*Ficus benghalensis, Ficus religiosa*
17	Jhalawar	Panch Mukhi Balaji	200 year con.	*Ficus benghalensis, Butea monosperma, Azadirachta indica*
18	Jhalawar	Eid Gah	200 year con.	*Acacia nilotica Tamarindus indica, Azadirachta indica, Holoptelea intergifolia, Sterculia urens**
19	Jhalawar	Tambain ki Khan (Teez ka Chabutra)	200 year **	*Diospyros melanoxylon, Acacia nilotica, Ficus benghalensis, Aegle marmelos*
20	Jhalawar	Mangal Nath Dungri	500 year	*Madhuca indica, Butea,Syzygium cumini monosperma, Mangifera indica, Tamarindus indica, Ficus benghalensis*
21	Jhalrapatan	Naulakha Fort (Anand Dham)	500 year con.	*Madhuca indica*, Ficus benghalensis, Ficus religiosa, Tectona grandis, Anogeissus pendula. Aegle marmelos*
22	Jhalrapatan	Nasiya Ji Baori	400 year con.	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis*
23	Jhalrapatan	Nasiya Jain Temple	400 year con.	*Tectona grandis Ficus benghalensis, Azadirachta indica; Holoptelea intergifolia, Aegle marmelos*
24	Jhalrapatan	Thakur Sahab Baori	300 year con.	*Mimusops elengi, Ficus benghalensis, Ficus religiosa, Azadirachta indica*
25	Jhalrapatan	Duwarika Dhish Temple	250 year con.	*Ficus benghalensis, Ficus religiosa, Holoptelea intergifolia, Mimusops elengi**

S. No.	Village	Site Place	Foundation	Tree Species
26	Jhalrapatan	Gopi Nath Temple	250 year con.	*Ficus benghalensis, Ficus religiosa, Holoptelea intergifolia, Flacourtia indica*, Wrightia tinctoria*
27	Jhalrapatan	Shanti Nath Jain Temple	400 year con.	*Ficus religiosa Ficus benghalensis, Azadirachta indica Wrightia* tinctoria*.
28	Jhalrapatan	Thandi Jhiri (Shiv Temple)	Ancient con.	*Mimusops elengi, Ficus benghalensis, Ficus religiosa, Azadirachta indica Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis, Pandanus odoratissimus*, Guazuma ulmifolia**
29	Jhalrapatan	Chandra Bhaga (Shiv Temple)	Ancient con.	*Ficus benghalensis, Ficus religiosa, Azadirachta indica, Mangifera indica, Syzygium cumini, Tectona grandis.*
30	Tin Dhar (J.Patan)	Banjarni Temple	300 year *	*Ficus benghalensis, Ficus religiosa, Boswellia serrata, Butea monosperma, Tectona grandis*
31	Khandiya Village	Nath Ji Samadhi/ Chabutra	Ancient	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Ficus benghalensis.*
32	Gaori Pond	Balaja Temple and Mata Ji Temple of Tamboly communities	Ancient *	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis Ficus religiosa,Boswellia serrata*

Sacred groves (*) – Ignored, (**) – Degraded and decline, (con) – Conserved, (***) under danger and unsafe. Tree species (*)-Rare or Threatened

Table 1(b): Sacred groves and existing old tree species (Baran district)

S. No.	Village	Site Place	Foundation	Tree Species
1	Ramgarh	Bhand Devara Shiv Temple, Kisnnoi Mata Ji or Mata Talai, Anapurna Mata Ji	Ancient**	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis, Ficus benghalensis, Ficus religiosa Butea monosperma, Guazuma ulmifolia**
2	Bilas garh KishanGunj	Kanya Dah	Ancient	*Ficus benghalensis, Ficus religiosa, Mitragyna parviflora Manikara hexandra, Sterculia urens*, Saraca asoka**
3	Sher Garh Fort	Brahmani temple Jain temple and Buddhist monasteries	Ancient*	*Anogeissus pendula, Anogeissus latifolia, Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Aegle marmelos*
4	Kishanganj	Nahar garh fort	Ancient*	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis, Sterculia urens, Guazuma ulmifolia Mimusops elengi.*
5	SitaBari ShahBad	Brahma Sagar Kund (Holi Wala)	Ancient	*Holoptelea intergifolia, Mangifera indica, Manikara hexandra. Mimusops elengi, Azadirachta indica, Saraca asoka**
6	Ramgarh	Devi Temple (Fair and Kartik Purnima	Ancient	*Holoptelea intergifolia, Mangifera indica, Azadirachta indica, Tamarindus indica, Saraca asoka*, Manikara hexandra*
7	Baran	Saaket Dham	500 year **	*Ficus benghalensis, Ficus religiosa, Sterculia urens*, Mitragyna parviflora*, Holoptelea intergifolia.*
8	Baran City	Taadka Balaji, Jind Maharaj, Mataji, and Sivji Temples	500 year *	*Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Ficus benghalensis, Ficus religiosa*
9	Kakoni	Ganesh Temple (Dancing Stachu)Laxmi Narayan Temple (Shergarh)	500 year con	*Holoptelea intergifolia, Manikara hexandra, Mangifera indica, Syzygium cumini, Tectona grandis, Ficus benghalensis, Ficus religiosa, Mimusops elengi.*
10	Bhawargarh	Jain Temple	500 year con	*Mangifera indica, Syzygium cumini, Ficus benghalensis, Ficus religiosa, Madhuca indica, Butea monosperma*
11	Kelwara	Sita Bari, Sarya Kund, Laxaman Kund,Valmiki Ashram,KapilDhara	Ancient	*Anogeissus pendula, Anogeissus latifolia, Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Aegle marmelos, Diospyros melanoxylon, Tectona grandis, Azadirachta indica*
12	Nagar kot (Sahrol) Shahbad	Nagar kot Mata temple	Ancient	*Tamarindus indica, Terminalia bellerica, Aegle marmelos,, Tectona grandis, Madhuca indica*, Butea monosperma, Mimusops elengi*
13	Jagdev Pura Shahbad	Hanumanji and Bijasan Mataji Temple	Ancient	*Anogeissus pendula, Anogeissus latifolia, Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Aegle marmelos, Diospyros melanoxylon, Tectona grandis, Azadirachta indica, Mimusops elengi**
14	JhoraTora,Sind hukara	Lalbai And Tejaji Chabutra	Ancient	*Butea monosperma, Holoptelea intergifolia, Mangifera indica, Syzygium cumini, Tectona grandis, Ficus benghalensis, Ficus religiosa, Schrebera swieteniodes*
15	Kotra Mataji Shahbad Forest	Bijasan Mataji and Durga Temple	Ancient	*Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica*
16	Shahbad Forest and Fort	Hanuman Temple and Dhakar Baba Chabutra	Ancient	*Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica*
17	Shahbad Forest and Fort	Lal Bai Chabutra	Ancient	*Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Azadirachta indica'*
18	Shahbad Forest and Fort	Durga Temple and Tejaji Chabutra	Ancient	*Mangifera indica, Syzygium cumini, Ficus benghalensis, Ficus religiosa, Madhuca indica*, Butea monosperma, Schrebera swieteniodes**
19	Shahbad Fort	Kunda Kho, Shiv Temple,	Ancient*	*Sterculia urens*, Anogeissus latifolia,*

S. No.	Village	Site Place	Foundation	Tree Species
		Tapswi Bagichi, Jama Majjid, Nagar Cott. Mata ji Temple, Kanya Dhehn, Rameshwar Temple		*Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Aegle marmelos, Diospyros melanoxylon, Tectona grandis, Azadirachta indica*
20	Samraniya	Nidhal Devi	Ancient	*Butea monosperma, Ficus benghalensis, Ficus religiosa, Tamarindus indica, Terminalia bellerica, Azadirachta indica, Flacourtia indica**

Sacred groves (*) - Ignored, (**) - Degraded and decline, (con) - Conserved, (***) under danger and unsafe. Sacred tree species (*) - Rare or Threatened

Table 2: Ethno-botanical Categories with Plant Species in Use

Ethnobotanical Categroy	Plant Species	No.
Food	*Aegle marmelos* (L.) Correa, *Acacia catechu* (L.f.) Willd., *Kigelia pinnata* DC., *Acacia nilotica* (L.) Willd. Ex del., *Acacia senegal* (L.) Willd., *Aloe vera* (L.) Brum. f., *Amaranthus caudatus* L., *Limonia crenulata* Roxb *Amaranthus viridis* L., *Ampelocissus latifolia* Roxb. Planch., *Anogeissus pendula* Edgew., *Asparagus racemosus* Willd., *Azadirachta indica* A. Juss., *Bacopa monnieri* (L.) Wettst., *Bambusa bambos* Voss., *Bauhinia variegata* L., *Brachiaris ramose* (L.) Stapf., *Buchanania lanzan* Spreng, *Chenopodium album* L., *Cassia tora* L., *Ceropegia attenuata* Hook., *Chlorophytum tuberosum* (Roxb.) Baker, *Coccinia grandis* L., *Cucumis callosus* Rottl., *Curcuma ameda* Roxb., *Cyamopsis tetragonoloba* (L.), *Dendrocalamus strictus* (Roxb.) Nees, *Dioscorea bulbifera* L., *Dioscorea pentaphylla* L., *Diospyros melanoxylon* Roxb., *Ficus benghalensis* L., *Ficus racemosa* L., *Ficus religiosa* L., *Foeniculum vulgare* Mills., *Heteropogon contortus* (L.) P.Beauv, *Holoptelea intergrifolia* (Roxb.) Planch, *Hibiscus cannabinus* L., *Madhuca indica* (Koen.) Macbr., *Mangifera indica* L., *Momordica dioica* Roxb. ex Willd.,*Moringa oleifera* Lamk., *Nymphaea nauchali* Burm.F., *Nelumbo nucifera* Gaertn., *Oxalis corniculata* L., *Papaver somniferum* L., *Pandanus odoratissimus* Lam., *Panicum miliaceum* L., *Panicum miliare auct.non* Lam., *Pennisetum americanum* (L.), *Pennisetum purpureum* K.shum, *Phaseolus aconitifolius* jacq., *Pithecellobium dulce* (Roxb.) Benth, *Polygonum barbatum* L., *Phoenix sylvestris* L.Roxb., *Portulaca oleracea* L., *Rosa amancena* Mill., *Sorghum bicolor* (L.) Moench, *Sesamum indicum* L., *Sonchus oleraceus* L., *Tamarindus indica* L., *Trachyspermum ammi* L. Sprangue., *Trigonella carniculata* Linn., *Vigna aconitifoila* (Jacq.) Marechal, *Vigna radiata* (L.) Wiliczek, *Ziziphus mauritiana* Lamk., *Ziziphus nummularia* (Burum) W. and A., *Ziziphus xylopyrus* Willd.	66
Fodder	*Acacia leucophloea* (Roxb.) Willd., *Acacia nilotica* (L.) Willd. Ex del., *Apluda mutica* L., *Arachis hypogaea* L., *Avena sativa* L., *Brachiaria ramose* (L.) Stapf., *Brassica camperstris* L., *Bridelia retusa* L. Spreng., *Cannabis sativa* L., *Celastrus paniculatus* Willd., *Chloris virgata* Sw., *Chenopodium album* L., *Cicer ariehtinum* L., *Cucumis callosus* Rottl., *Crotalaria juncea* L., *Cynodon dactylon* L. Pers., *Dichanthium annulatum* (F.) Sk., *Digitaria ciliaris* Retz., *Echinochloa colonum* L., *Echniops echinatus* Roxb., *Eleusine indica* (L.) Gaerth., *Eragrostis tenella* (L.) P. Beauv., *Flacourtia indica* (Burm.f.) Merrill, *Foeniculum vulgar* Mills., *Gossypiyum barbadense* L., *Heteropogon contortus* (Linn.) P.Beauv, *Hordeum vulgare* L., *Indigofera cordifolia* Heyne ex Roth, *Indigofera oblongifolia* Forsk., *Lathyrus sativus* L., *Linum usitatissimum* L., *Medicago sativa* L., *Moringa oleifera* Lamk., *Nicotiana tabaccum* L., *Oryza sativa* L., *Panicum miliaceum* L., *Panicum miliare auct non* Lam., *Papaver somniferum* L., *Pennisetum americanum* (L.), *Pennisetum purpureum*. K. shum, *Phalaris minor* Retz. Obs., *Pisum sativum* var. *arvense* L., *Prosopis cineraria* L. Druce, *Rhus mysurensis* G. Don., *Saccharum officinarum* L., *Sesamum indicum* L., *Setaria glauca* L., *Triticum aestivum* L., *Vicia faba* L., *Vicia hirsute* L. S. F., *Vigna sinensis* L. Savi ex Hassk., *Zey mays* L., *Zizipus mauritiana* Lamk., *Zizipus nummularia* (Burum)W. and A.	54
House building material	*Azadirachta indica* A. Juss., *Anogeissus pendula* Edgew. *Acacia* spp.,*Dalbergia sissao* Roxb., *Dendrocalamus strictus* (Roxb.) Nees, *Albizia lebbeck* (L.) Benth., *Mangifera indica* L. wood, *Tecomella undulata* (Sm.), *Eucalyptus propingua* Deane. Maiden., *Bembusa bamboose*, *Phoenix sylvestris* (L.) Roxb., *Butea monosperma* (L.) Taub., *Tectona grandis* L. and *Bembusa bamboose* Schard, *Dendrocalamus strictus* (Roxb.) Nees., *Ficus* spp., *Hibiscus cannabinus* L., *Ougenia oojeinensis* (Roxb.) Hochr, *Ceropegia attenuata* Hook., *Mangifera indica* L., *Heteropogon contortus* (L.) P.Beauv, *Ziziphus* spp., *Vetiveria zizanioides* (L.) Nash., *Tectona grandis* L. f., *Syzygium cumini* L. Skeels	20
House Hold Items related to art and craft	*Wrightia tinctoria* (Roxb.) R.Br., *Tectona grandis* L., *Hibiscus cannabinus* L., *Tecomella undulata* (Sm.), *Dendrocalamus strictus* (Roxb.) Nees., *Albizia lebbeck* (L.) Willd. Benth., *Vetiveria zizanioides* L. Nash, *Hibiscus cannabinus* L. *Phoenix sylvestris* (L.) Roxb., *Bembusa bamboose* Schard, *Butea monosperma* (Lam.) Taub., *Dalbergia sissao* Roxb., *Vetiveria zizanioides* L. Nash. *Saccharum bengalense* Retz., *Aristida adscensionis* L., *Carex crucina* Wahelenb., *Cyperus rotundus* L., *Heteropogon contortus* (L.) P.Beauv, *Mangifera indica* L., *Azadirachta indica* A. Juss., *Sacchrum spontaneum* (L.), *Tectona grandis* L. f., *Anogeissus pendula* Edgew., *Acacia* spp., *Dalbergia sissao* Roxb., *Tecomella undulata Ougenia oojeinensis* (Roxb.) Hochr, (Sm.), *Eucalyptus propingua* Deane and Maiden.,	25
Cosmetics including skin, tooth and hair cair	*Citrus* spp., *Cassia tora* L., *Hordeum vulgare* L., *Avena sativa* L., *Cicer ariehtinum* L., *Curcuma longa* L., *Ficus* spp., *Mangifera indica* L., *Helianthus annus* L., *Aloe vera* (L.) Brum. f., *Azadirachta indica* A. Juss., *Daucas Carota* Linn., *Curcuma longa* L., *Boswelia serrata* Roxb., *Brassica camperstris* L., *Arachis hypogaea* L., *Costus speciosus* (Koenig) Smith, *Eclipta alba* L. Hassk, *Emblica officinalis* Gaertn., *Lawsonia inermis* L., *Mentha arvensis* L., *Madhuca indica* J.F. Gemelin, *Polygonum multiflorum*, *Sesamum indicum* L., *Eucalyptus propingua* Deane and Maiden, *Tamarindus indicus* L., *Terminalia* spp., *Cymbopogon martinii* (Roxb.) brush, *Acacia nilotica* (L.) Willd. Ex. Del, *Tinospora cordifolia* (Willd.) Miers., *Madhuca indica* Koen Mecbr., *Mimusops elengi* L., *Casuarina equisetifolia* L., *Commiphora wightii* (Arnott), *Salvadora persica* L., *Calotropis procera*, *Cordia gharaf* (forsk.) Ehrenb. & Aschers, *Bombax ceiba* L, *Lowsonia inermis* L., *Tectona grandis* L.	35

Ethnobotanical Categroy	Plant Species	No.
Music Instrument including Dhol, Flute, Tambura, Sanng, Pipipya, Gophan	*Crotalaria spectabilis* Roth., *Albizia* spp., *Acacia nilotica* (L.) Willd. Ex. Del., *Abelmoschus moschatus* Medicus., *Hibiscus cannabinus* L., *Ailanthus execelsa* Roxb., *Boswelia Serrata* Roxb., *Pterocarpus marsupium* Roxb., *Tectona grandis* L., *Mangifera indica* L., *Azardirachta indica* A. Juss., *Dendrocalamus strictus* (Roxb.) Nees., *cocos nucifera*, *Ficus* spp. L., *Phoenix sylvestris* L. Roxb., *Holoptelea integrifolia* (Roxb.) Planch	16
Agricultural implements including Transport vihichles, storage mulch	*Acacia nilotica* (L.) Willd. Ex. Del, *Mangifera indica* L., *Butea monosperma* (Lam), *Tecomella undulata* (Sm.), *Tamarindus indica* L., *Anogeissus pendula* Edgew, *Pterocarpus marsupium* Roxb, *Butea monosperma* (Lam) Taub., *Azardirachta indica* A. Juss., *Terminalia bellerica* (Gaertn.) Roxb., *Dendrocalamus strictus* (Roxb.) Nees, *Tectona grandis* L. f., *Dalbergia sissoo* Roxb., *Mangifera indica* L., *Vetiveria zizanioides* L. Nash., *Sacchrum spontaneum* (L.), *Ougenia oojeinensis* (Roxb.) Hochr, *Hibiscus cannabinus* L., *Aristida adscensionis* L., *Carex crucina* Wahelenb., *Cyperus rotundus* L., *Heteropogon contortus* (L.) P.Beauv, *Phoenix sylvestris* (L.) Roxb.	21
Dye	*Abrus precatorius* L., *Acacia* spp., *Achyranthes aspera* L., *Aegle marmelos* (L.), *Azadirachta indica* A. Juss., *Bauhinia variegata* L., *Butea monosperma* (Lam) Taub., *Emblica officinalis* Gaerth., *Hibiscus roso-sinensis* L., *Lawsonia inermis*, *Mallotus philippinesis*, *Moringa oleifera*, *Nyctanthes arbor-tristis*, *Phyllanthus fraternus*, *Punica granatum*, *Delonix regia* (Bojar ex Hook.) L., *Tamarindus indica* L., *Terminalia arjuna* (Roxb. ex DC.) Wt. and Arn, *Vitex negundo* L., *Albizia lebbeck* (L.) Willd Benth	18
Tannin	*Acacia nilotica* (L.) Del., *Aegle marmelos* (L.),*Justicia adhatoda L.* Medic., *Anogeissus latifolius* (Roxb. Ex DC.) Wall. Ex Guill. and Perr., *Acacia leucophloea* (Roxb.) Willd., *Albizia lebbeck* (L.) willd. Benth., *Bauhinia lanzan*, *Calotropis gigantean* R.Br., *Cassia fistula* L., *Terminalia* spp., *Wrightia tinctoria* (Roxb.) R.Br., *Ziziphus* spp.	15
Gum	*Acacia leucophloea* (Roxb.) Willd., *Acacia nilotica* (L.), *Aegle marmelos* (L.) Correa., *Albizia lebbeck* (L.) Willd. Benth., *Anogeissus latifolia* (Roxb. Ex DC.), *Azadirachta indica* A. Juss., *Bombax ceiba* L., *Buchanania lanzan* Spreng., *Butea monosperma* (Lam) Taub., *Commiphora* spp., *Delonix regia* (Bojar ex Hook.), *Feronia limonia* (L.) Swingle, *Lannea coromandelica* (Houtt.) Merrill, *Moringa oleifera* Lamk, *Pithecellobium dulce* (Roxb.) Benth., *Pterocarpus marsupium* Roxb., *Sterculia urens* Roxb,*Terminalia bellirica* (Gaertn.) Roxb.	17
Resin	*Ailanthus execelsa* Roxb. (Arru), *Cannabis sativa* L., *Carica papaya* L., *Boswellia serrata* Roxb. Ex Colebr., *Commiphora mukul* (H. Ex S.) Engl.	5
Oil including Non edible and Essentials Oil	Non edible oil *Argemone mexicana* L., *Azadirachta indica* A. Juss., *Cleome viscose* L., *Dalbergia latifolia* Roxb., *Euphorbia dracunculoides* Lam., *Moringa concanensis* Nimmo ex Dalz., *Ricinus communis* L., *Tamarindus indica* L. *and Tectona grandis* L.f. Essential oils (Volatile oils) *Jasminum* spp., *Citrus* spp., *Cymbopogon martinii* (Roxb.) watson *Vetiveria zizanioides* L. Less., *Rosa involucrate* Roxb., *Mentha arvensis* L., *Pandanus odoratissimus* Lam. *Holarrhena antidysenterica* (Roth.) A. DC., *Abelmoschus moschatus* Medicus, *Ocimum* spp.	20
Religious ruthuals including rosaries garland and ornaments	Rosaries: *Caesalpinia bonduc* L., *Aegle marmelos* L. Corr., *Azadirachta indica* A. Juss., *Ficus religiosa* L., *Nymphaea nouchali* Burm. F., *Pterocarpus marsupium* Roxb., *Coix lacryma-jobi* L., *Caesalpinia bonduc* L. *Oryza sativa* L. Grains, *Terminalia arjuna* (DC.) Wt. et. Arn Stem, *Guazuma ulmifolia* Lam. *Vitex negundo* L. Stem, *Nymphaea nauchali* Burm. F., *Ocimum sanctum* L., Hawan Samgri: *Aegle marmelos* L. Corr., *Mimusops elangi* L., *Ficus relgiosa* L., *Mangifera indica* L., *Madhuca indica* (Koen.) Macbr, *Ocimum sanctum* L., *Terminalia tomentosa* (Roxb.) Wight & Arn., *Pandanus odoratissimus* Lam., *Butea monosperma* (Lam) Taub, Garland: *Delonix regia* (Bojar ex Hook.), *Erythrina indica* L., *Madhuca indica* (Koen.) Macbr, *Holarrhena antidysenterica* (Roth.) A. DC., *Tabernaemontana* spp. *Wrightia tinctoria* (Roxb.) R. Br., *Nerium indicum* Mill., *Jasminum sambac* (L.) Ait, *Thevetia peruviana* (Pers.) Merrill., *Tagetes* spp. L., *Rosa indica* L., *Cassia fistula* L., *Abrus precatarus* L., *Coix lacryma-jobi* L. and orange flowers of *Butea monosperma* (Lam) Taub., *Malvastrum coromandelianum* L. Garcke., Other: *Boswellia serrata* Roxb. Ex Colebr., *Lowsonia inermis* L. rhizome of *Curcuma* spp. *Ficus* spp., *Azadirachta indica* A. Juss., *Aegle marmelos* L. Corr., *Mimusops elengi* L. (Morsali), *Abrus prectorius* L., *Cassia fistula* L., *Cicer arientinum* L., *Vitex negundo* L., *Vetiveria zizanioides* (L.), *Tamarindus indica* L., *Syzygium cumini* (L.), *Mangifera indica* L., *Dendrocalamus strictus* (Roxb.) Nees, *Acacia jacquemontii* Benth., *Acacia nilotica* (L.) Del., *Achyranthes aspera* L., *Lowsonia inermis* L., *Musa paradisiacal*, *Aegle marmelos* (L.) Correa., *Calotropis procera* (Ait) f.	65

Table 3: Major ethnobotanical categories and number of plants species in use

S. No.	Name of Major Categories	Number of Plant Species
1.	Wild Edible Plants	32
2.	Fodder	49
3.	Cosmetics	12
4.	Musical Instrument	18
5.	Natural Dyes	20
6.	Tannin	15
7.	Gums and Resins	25
8.	Essential Oils and Other Product	42
9.	Social And Religious Ceremonies	12
10.	Timber And House Building Materials	28

S. No.	Name of Major Categories	Number of Plant Species
11.	Medicinal Plant	247

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