

Transformation among Bhil Tribe: Loss of Ethnobotanical knowledge

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Abstract

This study is a small attempt to deal with the finding of factors responsible for transformation among Bhils which is with passing time is slackening the string of Ethnobotanical knowledge.

In the present study, an attempt has also been made to document the reasons for the loss of ethnobotanical knowledge in Bhils. Some of the reasons enlisted are: Loss of forest area fragmentation of habitat, invasion of foreign species and increase in agriculture practices among the tribal people, loss of biodiversity which had caused alteration in the choice of plants available for the Bhils for their food, fodder, medicinal and other uses this study raises the questions that if due to huge force of transformation, Bhils themselves continue to expunge their knowledge, then how traditional Ethnobotanical knowledge would help mankind and emphasis on the idea that maintaining cultural transformation is the need of the hour to save their existence and aid mankind.

Keywords: Ethnobotany, Bhil, transformation, traditional Ethnobotanical knowledge

Introduction

Ethnobotany is the study of the relationship between people (ethnic groups) and plants (botany). The term "ethnobotany" was coined by John William Harshberger in 1895 during his tenure at the University of Pennsylvania, USA, to describe the use of plants by humans for various purposes, including medicinal uses. In 1941, Jones [23] defined ethnobotany as the study of the relationship between primitive people and plants. Broadly speaking, ethnobotany examines the interactions between plants and people. Richard Evans Schultes, in 1962 [35], described ethnobotany as the study of the relationship between primitive human societies and their environment, particularly plants.

According to the Census of India (2011), tribal people make up 8.6 percent of India's total population, totaling 104 million individuals, the largest tribal population in the world. The Bhils, after the Gonds and the Santhals, are the third-largest tribe in India, primarily residing in Madhya Pradesh, Rajasthan, Gujarat, and Maharashtra (Rajora & Solanki, 2019). In Rajasthan, the Bhil tribe comprises 44% of the state's total tribal population, mainly concentrated in the southern districts.

The Bhils, who inhabit forests and hills, possess extensive knowledge of forest produce, which has significant ethnobotanical value. This knowledge has traditionally been passed down through generations. However, the transmission of ethnobotanical knowledge has largely ceased due to various factors. Consequently, this knowledge now exists mostly in remnants among the older generation of Bhils, while the younger generation has minimal understanding of the uses of plants and other life forms in their environment.

The state of Rajasthan is situated in the northwestern part of the Indian Union (23° 30' and 30° 11' North latitude and 60° 29' and 78° 17' East longitude) and is the largest state in terms of area (3, 42, 239 sq. km). The Aravalli Hills runs through the heart of the state, and divide into two halves, with three-fifths of Rajasthan on the western side towards

the Thar Desert and two-thirds on the eastern side consisting of the catchment area of Banas and Chambal rivers. The south-eastern region has a varied terrain of extensive hill ranges, fertile table land and dense forest. Several tribes inhabited in the state of Rajasthan viz. Bhils, Bhil-Meena, Meena, Damor, Garasia, Sehariya (major tribes), Dhanka, Kathodia, Patelia, Naikda, Koli Dhor, Kokna (minor tribes) Out of twelve scheduled tribes, Bhil is the second largest tribe of the state followed by Mina. Mina and Bhil together constitute 93 per cent whereas Garasia, Damor, Dhanka & Saharia combine to form 6.6 per cent of the total ST population.

Table 1: Tribal population of Rajasthan

Tribal Population	18.3 Lakhs (2.6% of total population)
Bhil	44.38 % of total tribal population

Bhils are concentrated southern part of the state in Banswara, Dungarpur, Udaipur, and Chittorgarh. Some population also resides in the Barmer district also (Fig.1).

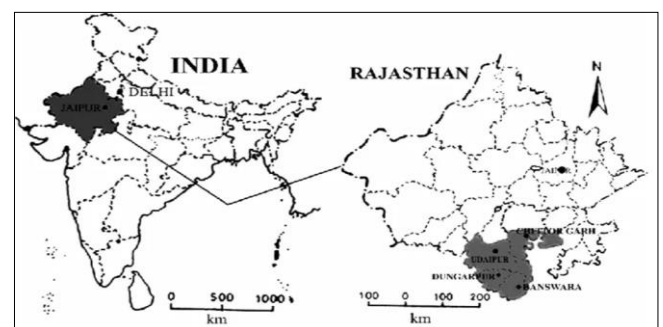


Fig 1: Map showing areas inhabited by Bhil tribe

The origin of name 'Bhil' is thought to be come from word 'Billu' meaning bow and arrow. Bhils are predominantly dependent on forest and are experts in handling bow and arrow.

Bhils are mainly non vegetarian so their skills of Archery help them in getting meals. Bhils are in the phase of modernization. Once tribal, Bhils have been transformed into rural and now turning in to urban. In Rajasthan Bhil tribe exist as Bhil-garasia, Dholi-Bhil, Dungri-bhil, Dungri-garasia, Mewasi-bhil, Rawal-bhil, Tadvi-Bhil, Bhagalia, Bhilala, Pawra Vasva and Vasv (Mehta & Mehta, 2007) [26]. Bhils are predominantly forest dwellers, totally dependent on the forest, having brief but considerable mention in the various literary documents of ancient, medieval and modern India. Bhils live close to the forest and largely dependent on the wild biological resources for their livelihood. The Bhil tribe is called the “Dhanush Purush of India” because they are very adapt in Dhanush learning. The Bhil are known to be excellent archers coupled with deep knowledge about their local geography. Traditionally, experts in guerrilla warfare, most of them today are farmers and agricultural labourers.

A pioneer publication in the field which can be termed as ethnometerology was made by Joshi (1985) on the weather forecasting plants among the Bhils, Garasia and Kathodia tribals of Southern Rajasthan. Rajora (1987) [32] expressed the forest management skills in his book ‘Forest Management strategy and tribal social structure’. The influence of Education is nicely described by Shyam Lal (1987) [37] in ‘Education among Tribal.

Bhatt (2009) [4] mentioned Bhil culture in ‘Rajasthan ka Bhil Samaj’. Choudhary, Singh & Pillai (2009) did an ethnobotanical survey of Rajasthan to emphasize on the vast ethnobotanical knowledge of tribes of Rajasthan. Bhattacharjee, *et al* (2009) [5] very aptly described the Bhil food system where they concluded that Bhil food is devoid of specific carbohydrates, proteins and vitamins that led to malnutrition in children and women of Bhil Tribe. Singh and Jadhav (2011) [39] did worth mentioning work in Ethnobotany of Bhil tribe.

The vital Ethnobotanical knowledge trail down in the tribe from one generation to the next generation since ancient times but due to numerous reasons, transfer of ethnobotanical knowledge has ceased. In fact the knowledge is left only in traces among the older generation of Bhil and the younger generation has negligible knowledge regarding the utilization of plants and other life forms dwelling in their surroundings. The string of interdependence of people and their surrounding life forms are steadily slackening which is the major concern raised in this study. This study deals with the finding of factors responsible for transformation among Bhils which is with passing time is slackening the string of Ethnobotanical knowledge.

Dynamism in traditional knowledge is defined by Jain (2005) [19, 20] as “Any Change, whether loss in, or addition to Traditional knowledge among any human society.” Dynamism in TK can be notice in every phase of life of people in their day-to-day affairs such as survival techniques, livelihood, faith and agricultural practices. Gautam *et al.*, (2014) [8] found that the information on the medicinal uses of plants now seems to be confined to elder people. Dr. S K Jain (2001, 2005a-b, 2010, 2019) [19, 20, 21, 22] further improves the strength of ethnobotanical studies by widening the spectrum of studies like cultural dimension of biodiversity, modern ethnobotany, credibility of traditional knowledge, dynamism in ethnobotany.

Materials and Methods

Ethno-botanical survey

Ethnobotanists use a variety of interview techniques to collect ethnobotanical data (Thomas, *et al.*, 2007) [41].

For the inventorization and documentation of ethnobotanical practices prevalent in the study area methodology used as suggested by Jain & Jain (2017).

- Semi structured questionnaire surveys having open ended and close ended questions, in-depth interviews and focus group discussions to be conducted to collect information about EVP from tribal and rural people of study area.
- Before taking interviews, rapport is to made with tribal people and PIC (Prior Informed Consent) form has been sign from every informant. Simmonds (2009) [38] emphasizes on importance of having “Prior informed consent (PIC)” and “Access and Benefit-Sharing” clauses in research agreements, especially when dealing with traditional knowledge.
- Ethnobotanically useful plant species will be collected and Herbarium will be prepared (Rao & Sharma, 1990) [34]. It is essential to make herbarium specimens when collecting data on local plant names and uses, as this allows for the proper scientific identification of each plant (Van Andel, 2017) [42].
- All the collected specimens will be identified up to species level with the help of standard Floras (Hooker, 1872-1897; Bhandari, 1990; Shetty and Singh, 1987-93; Tiagi & Aery, 2007) [40, 36].

For the proper documentation of ethnobotanical study, it is essential to collect voucher specimen/ herbarium and deposit them in a permanent collection where they will be available indefinitely to confirm the identity of the plant(s) under discussion (Nesbitt, 2014) [27].

Screening of Literature

Screening of Literature provides vast knowledge compiled by the authors on that particular subject. (Rao & Hajra, 1987) [33]. Literature based on studies of Bhil Tribe to understand social, ethnic structure of Bhil tribe and to grab information about ethno-botanical Knowledge of Bhil tribe.

Local Forest officials, Agriculture officers, School teachers working in Tribal belt may be of enormous help to get vital information about the Tribes.

Ethnobotanical tools

Measuring the “importance” of plants and vegetation to people is a central concern in quantitative ethnobotany. A common tool to quantify otherwise qualitative data in the biological and social sciences is an index. Relative cultural importance (RCI) indices such as the “use values” developed by Prance, *et al.* (1987) [31] and Phillips & Gentry (1993) [29, 30] are applied in ethnobotany to calculate a value per folk or biological plant taxon. These approaches can provide data amenable to hypothesis-testing, statistical validation, and comparative analysis.

Observations and Results

In the fieldwork, 40 Bhil people residing in Bhil inhabited villages of Chittaurgarh (Rajasthan) were interviewed regarding their knowledge of plants and their uses. A small semi structured questionnaire regarding their lifestyle, food and medical facility was formulated and questions were asked from the tribals.

The questionnaire was mainly focused on their knowledge of wild plants they knew that are used for food, medicine and other purposes. After this they were asked whether they knew plants or plant uses that were no longer grown or collected from the wild and used.

Table 2

	Question	Children below 15 years	Person between age of 15-25	Person between 25-45	Person between 45-60	Person above 60
1	How many of them can identify various wild plants used previously by Bhils?	No	4 or 5	8-10	10-15	mostly
2	How many of them have ever consumed the plants so discussed as food or medicine?	Most of them	Most of them	Most of them	Most of them	All of them
3	If they have consumed the plant, was it purchased from market or collected from their surroundings?	Purchased from market	Purchased from market	Purchased from market	Purchased from market	Collected from wild in older days nowadays Purchased from market
4	Are they ever heard about the use of wild plants for food or medicine from their parent or grandparents?	No	Yes	Yes	Yes, Often	Yes, grandparents used to tell uses of Plants
5	Do they feel pride on being termed as member of community having vast ethnobotanical Knowledge?	No proper answer	Yes	Yes	Yes	Yes
6	Do they want to conserve their Ethnobotanical Knowledge?	Yes but first want to know about the plants	Yes	Yes	Yes	Yes

The above chart clearly indicates that Ethnobotanical knowledge is not percolating in proper manner among various strata of the tribe.

The younger lot has very less knowledge and the transfer rate of Ethnobotanical knowledge is also less which is an alarming signal.

To have further enquiry about the transfer of Ethnobotanical knowledge some other questions were also asked:-

1. What are the probable reasons for not knowing or using the said plant?

The middle aged person just know the names but haven't seen the plant while the children below 15 years of age not even heard of the plants. But the older lot in the age bracket between 45-60 and above 60 know the plants by name and could identify some of the plants.

The probable reasons according to them are:

- No more utilisation of said medicinal plants after invent of Allopathic medicines and other medical facilities available in nearby Govt Hospitals
- Plants are not available in their vicinity due loss of biodiversity
- The transfer rate of Ethnobotanical knowledge is very slow,
Younger lot says that their parents /grandparent are not telling them about wild plants. Older lot blames education system for non- acceptance of their traditional methods by the youth.
- Most of them are of the view that this knowledge is not required in this modern era

2. Which all plants are not available these days in their vicinity and Why?

Table 3

Scientific name	Local name
<i>Curculigo orchiodes</i>	Kali moosli
<i>Feronia limonia</i>	Ketumbadi
<i>Garuga pinnata</i>	Kankad,bohlla
<i>Amranthus gangeticus</i>	Kangani
<i>Cordia garaf</i>	gundi

In their opinion these plants are not found in forest due to over exploitation as well as fragmentation of habitat.

- What could be the measures to conserve Traditional /Ethnobotanical Knowledge?
 - Transfer of knowledge from older generation to next generations.
 - The older generations has to own the responsibility of transfer of knowledge down the lane.
 - Conservation of forests.
 - Forest which the main warehouse of ethnobotanical knowledge and source of biodiversity need to be conserve in word and spirit.
 - use of knowledge with proper importance/ benefits to the person providing knowledge

Plants used by bhils for food

Ethnofood of Bhils was studied elaborately by Joshi (1982) [24] Singh and Pandey (1998) which become a major reference in collecting the list of plants used by the Bhils. Some plants were locally named by the peoples interviewed and are listed along with their botanical name. An attempt to prepare list of some of the plants used by the Bhils as food along with the part/use is as under:

Table 4

Sno	Botanical name	Family	Local name	Use as Food
1	<i>Aegle marmelos</i>	Rutaceae	Bel, Bel-patra	Mature fruits eaten.
2	<i>Aloe vera</i>	Liliaceae	Ganwar patha	Pulp of leaves mixed with unripe mangoes to serve as vegetable.
3	<i>Amranthus caudatus</i>	Amaranthaceae	Chauli	Leaves are cooked as vegetable.
4	<i>Amranthus gangeticus</i>	Amaranthaceae	Kangani	Pseudo-cereal, cooked like rice.
5	<i>Abelmoschus esculentus</i>	Malvaceae	Bhindi	Cooked as vegetable
6	<i>Allium Cepa</i>	Liliaceae	Kanda	Vegetable prepared of leaves, Bulbs eaten raw or as vegetable.
7	<i>Annona squamos</i>	Annonaceae	Sitapha	Mature fruits eaten
8	<i>Allium Sativum</i>	Liliaceae	Lasun	Bulbs are used as condiments leaves are used for vegetable
9	<i>Arachis hypogea</i>	Fabaceae	Mungphali	Cultivated during rainy season seed eaten raw. Also used to get oil form seeds
10	<i>Brassica campestris</i>	Brassicaceae	Sarson	Leaves are used as vegetable, seed oil is also used for cooking food.
11	<i>Carica papaya</i>	Caricaceae	Papita	Unripe fruits are used as vegetable, ripe fruits are eaten.
12	<i>Capparis decidua</i>	Capparaceae	Ker	Unripe fruits are used for vegetable as well as pickled.
13	<i>Capsicum annum</i>	Solanaceae	Mirch	Unripe fruits are used in vegetable, dried fruits are powdered to use as spice.
14	<i>Cassia fistula</i>	Caesalpiniaceae	Amaltas	The flowers are cooked as vegetable.
15	<i>Carissa congesta</i>	Apocynaceae	Karunda	Unripe fruits are pickled.
16	<i>Citrus medica</i>	Rutaceae	Nimbu	Edible fruits.
17	<i>Colocasia esculenta</i>	Araceae	Arbi	Edible tubers used as vegetable.
18	<i>Cordia garaf</i>	Ehretiaceae	gundi	Flowers and young fruits are cooked as vegetable.
19	<i>Curculigo orchiodes</i>	Hypoxidaceae	Kali moosli	Roots are eaten raw.
20	<i>Diospyros melanoxylon</i>	Ebenaceae	Timbru	Edible fruits.
22	<i>Feronia limonia</i>	Rutaceae	Ketumbadi	Pulp is used to make bitter chutney.
23	<i>Garuga pinnata</i>	Burseraceae	Kankad,bohlla	Ripe fruits are edible.
24	<i>Madhuca indica</i>	Sapotaceae	Mahua	Flowers and fruits are cooked and also consumed raw
25	<i>Mangifera indica</i>	Anacardiaceae	Aam	Ripe fruits are edible, raw fruits are cooked as vegetable and pickled.
26	<i>Momordica dioca</i>	Cucurbitaceae	Kinkoda	Raw fruits are cooked as vegetable.
27	<i>Moringa concanensis</i>	Moringaceae	Jangli-seruga	Unripe fruits are eaten.
28	<i>Nyphaea nauchali</i>	Nyphaeaceae	Kamal	Petiole is cooked as vegetable.
29	<i>Phoenix sylvestris</i>	Arecaceae	Khajoor	Mature fruits are eaten
30	<i>Pithecellobium dulce</i>	Mimosaceae	Jangal -jalebi	Mature pods are eaten
31	<i>Securingea leucopyros</i>	Eupobiaceae	Putanjiva	Ripe fruits are eaten.
32	<i>Zea mays</i>	Poaceae	Makai	Main cereal in the food of Bhils.

Plants used by bhils for medicinal purposes

The list of plants used by Bhils/tribals is Very enriched and is studied by many workers. Jain 1963, Joshi 1982 [24], 1983,

1995 Singh and Pandey 1998, Katewa and Guria 1997, Meena and Yadav, 2010, Katewa and Jain, 2004.

A small step to enlist medicinal plants used by Bhils is as under:

Table 5

Sno	Botanical name	Family	Local name	Use
1	<i>Abelmoschus moschatus</i>	Malvaceae	Jangli bhindi	Extract of roots is used to cure dysentery.
2	<i>Abrus precatoris</i>	Fabaceae	Chirmi	Leaves crushed in water to cure heartburn.
3	<i>Acacia catechu</i>	Mimosaceae	Kher	Taken oral suspension for easy child birth by women.
4	<i>Adiantum caudatum</i>	Adiataceae	Adashishi	Paste of leaves is used as ointment
5	<i>Aegle marmelos</i>	Rutaceae	Bel, Bel-patra	Extract of roots to cure piles.
6	<i>Argemone maxicana</i>	Papaveraceae	Pili-kateli, Satynashi	Seed oil is used to cure skin disorders
7	<i>Barleria critata</i>	Acanthaceae	Patro	Root paste is applied on swellings
8	<i>Cassia absus</i>	Caesalpiniaceae	Chiksi	Seed paste is used to cure infection
9	<i>Cassia fistula</i>	Caesalpiniaceae	Amaltas	Fruit pulp is used to cure stomachache
10	<i>Dalbergia sisso</i>	Fabaceae	Shisham	Leaves and bark is used for inflamed mammary glands
11	<i>Eclipta alba</i>	Asteraceae	Bhrangraj	Whole plant used as hair tonic and also to cure skin disorders
12	<i>Euphorbia hirta</i>	Eupobiaceae	Dudhi	Leaves are taken orally to cure dysentery
13	<i>Ficus bengalensis</i>	Moraceae	Bargad, Bar	Tender aerial roots are used to cure boils, piles and blisters
14	<i>Ficus religiosa</i>	Moraceae	Pipal	Leaves are used to cure inflammatory ulcers.
15	<i>Lantana camara</i>	Verbenaceae	Chudarana	Leaves are used to cure rheumatism.
16	<i>Pedaliium murex</i>	Pedaliaceae.	Gokhru	Plant boiled in milk and taken orally to cure impotence in males Mature fruits eaten
17	<i>Phyllanthus emblica.</i>	Eupobiaceae	Aamla	Powder of dried fruits mixed with Ghee and used to cure bleeding nose
18	<i>Tridax procumbens</i>	Asteraceae	Kalal	Juice of plant leaves applied on cuts to stop bleeding and early healing of wounds
19	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Stem bark powder is used to cure stomachache.
20	<i>Zingiber officinale</i>	Zingiberaceae	Adrak	Rhizome juice is used to cure sore throat

Discussion and Conclusions

A vast number of plants are used by the Bhils and the ethnobotanical knowledge stored in the treasure of tribal people is yet not explored fully. It is very much necessary to collect and document the knowledge with proper sustainable development of the tribals. As it is said the knowledge till date is only some pages of book and the rest of the library has set to fire of modernisation so it is better to restore the knowledge before it get vanished.

Jain (2005a) ^[19, 20] enlisted following situations for the loss in Ethnobotanical knowledge:-

- Habitation for long period in a forest environment different from the usual or familiar vegetal cover, like employment in a distant place.
- Continued contact with and use of some more suitable substitute plant.
- Prolonged non-occurrence of any disease, injury or ailment. EK about cures for these ailments can gradually be lost.
- Some plant part of newly introduced plant may be useful for food, dyes or other needs.

Pressure from agricultural expansion, wide spread cutting for fuel wood combined with seasonal drought as main factors for environmental degradation. In addition the increase in population growth rate would result in the intensification of agriculture in marginal areas which would lead to deforestation with decrease in number or loss of medicinal plants in the wild. (Yirga, 2010) ^[43].

The transition in Bhils had cause a loss of ethnobotanical knowledge. There are various reasons for the above mentioned loss which is mainly divided into following categories:

The diverse forms of life which previously had given shelter, livelihood and food to Bhils are gradually under gone process of loss of biodiversity.

The probable factors responsible for the biodiversity loss are listed as under:

a. Invent of Agriculture

In ancient times, the land was never considered a property but it was only a territory. Land has gradually got converted into private property. The forest has changed into agricultural land.

Bhils have started growing crops and all food grains are cultivated rather than collecting from forest. The Bhil farmer is now not a tribal but has become a rural person. Many of the wild plants are being lost in the process of domestication of plants.

b. Habitat loss

For the urban settlement, agricultural land mining, industries or making dams or highways the natural habitat of wild plants may be destroyed by humans. Due to this the plant species present in that area become rare and ultimately extinct.

c. Deforestation

The traditional Bhil area was surrounded by hills and thick forest area but gradually the trees are being cut and lack of afforestation drive leads to deforestation resulting in loss of biodiversity.

The forest were cut down to give pace to modernisation, some timber related industries and many other wood works,

which forced Bhils to live in smaller areas surrounded by plants cultivated rather than naturally grown plants which caused hindrance in transfer of ethnobotanical knowledge. One of the ways in industrialization helps create inequity is by concentrating economic value on the processing, as opposed to the extraction, of resources: the value of raw materials bought from resource rich regions by technology-rich ones is low compared to the value of the manufactured products sold back to them (Alexiades, 2003) ^[1].

d. Invasion of foreign species

Species which are not native to an area when introduced intentionally or accidentally, the species invade the area and become competitor for the native plants.

Plants species such as *Lantana Americana*, *Prosopis chilensis* and *Parthenium* are termed as bioterrorist as they do not allow any other plants to grow in the area once occupied by these species.

Lantana spp. grow profusely and do not allow any herb to grow in its vicinity.

Prosopis chilensis is growing very fast and covers vast range of forest with-in 2-3 years, thereby posing a great competition to other forest plants.

e. Fragmentation of forest area

The Bhils who were peacefully living in the forest covered area are being disturbed by fragmentation of their habitat which is done for construction of roads across the bhils habitation. Activities like legal as well as illegal mining has also caused the loss of various herbaceous species due to lack of substratum and proper moisture.

By the processes of colonization many forest areas are converted into rural areas which has caused fragmentation of habitats of tribals who are then forced to shift into rural areas /sub-urbans.

f. Environmental Pollution

The everyday increasing environmental pollution also had impact of the plants growing in the forest or nearby area. The plants cannot withstand the change in physical and chemical composition of soil, air and water due to pollution. In fact the pollution is one of the driving force to change the diverse forms of Life in an area.

Bhil have faced a major setback in the form of loss of Biodiversity in their vicinity as well as a extreme social transformation which has led to loss of Ethnobotanical knowledge. But still some patches of Bhil inhabitation are left which could be protected from facing same phase of devastation. It is high time to conserve traditional knowledge of ethnobotanical importance and at the same time the sustainable development of tribals to live their life comfortably.

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