

**Working Paper 491**

**Knowledge and Practice of  
Ethno-Medicine by  
Jaunsaris in Jaunsar-Bawar  
Region of Uttarakhand**

**Geeta Sahu**

ISBN 978-81-946531-7-2

August 2020

© 2020, Copyright Reserved

The Institute for Social and Economic Change,  
Bangalore

*Institute for Social and Economic Change (ISEC) is engaged in interdisciplinary research in analytical and applied areas of the social sciences, encompassing diverse aspects of development. ISEC works with central, state and local governments as well as international agencies by undertaking systematic studies of resource potential, identifying factors influencing growth and examining measures for reducing poverty. The thrust areas of research include state and local economic policies, issues relating to sociological and demographic transition, environmental issues and fiscal, administrative and political decentralization and governance. It pursues fruitful contacts with other institutions and scholars devoted to social science research through collaborative research programmes, seminars, etc.*

*The Working Paper Series provides an opportunity for ISEC faculty, visiting fellows and PhD scholars to discuss their ideas and research work before publication and to get feedback from their peer group. Papers selected for publication in the series present empirical analyses and generally deal with wider issues of public policy at a sectoral, regional or national level. These working papers undergo review but typically do not present final research results, and constitute works in progress.*

Working Paper Series Editor: **M Balasubramanian**

# KNOWLEDGE AND PRACTICE OF ETHNO-MEDICINE BY JAUN SARIS IN JAUN SAR-BAWAR REGION OF UTTARAKHAND

Geeta Sahu\*

## **Abstract**

*Tribal societies have always been rich with their indigenous knowledge derived from their ancestors which they have been using since centuries in every space of their lives. Health is one such major domain where treatment for various illness and diseases is carried on with ethno medicines or various other forms of indigenous health practices. This paper explores such practices of ethno- medicine to treat various diseases or illness among the Jaunsari tribal community. The information was collected through in-depth interviews with various traditional health practitioners using ethnographic research approach in Jaunsar-Bawar region of Dehradun, Uttarakhand. It was found that people in Jaunsari community use various ethno medicines found locally in the hills of Himalayas and Shivalik range. They use these plants to treat various diseases, infections and skin problems. Some cases of early stage cancer have been also been successfully treated by the local traditional healers.*

**Key Words:** Ethnomedicine, Jaunsaris, Uttarakhand, tribal health, traditional health practices

## **Introduction**

Healthcare in any society evolves in its socio-economic, geographical, religious and cultural aspects. Since ancient times, societies have their own concepts of health & illness and use their own indigenous knowledge to deal with these aspects through various methods. The beliefs and their application through various locally available materials are components of their healthcare system. These practices build up and grow gradually with time and space. The practices may be indigenous to the respective societies or imported from other societies. India today is such an example where many healthcare systems are working together simultaneously. Every community has its home-based remedies to treat illnesses or diseases along with ancient practices of *Ayurveda* and *Siddha*. Over the ages, various groups of people invaded India and those who settled down here brought their own healthcare systems and practices like *Unani*, *Homeopathy* and *Allopathy*.

Kleinman (1980) has suggested that there are three major healthcare sectors which might interconnect or overlap. These are the popular sector, folk sector and professional sector. The popular sector is where one can treat an illness without any consultation or payment. Home remedies can be put in the category of popular sector. Folk sector includes folk healers or practitioners who are specialised in healing the 'sacred' (through beliefs) or 'secular' way or mixing both ways. Midwives, *Vaids*, bone setters and herbalists come under the umbrella of the folk sector. These healers are not

---

\* PhD Scholar, Institute for Social and Economic Change, Bangalore. E-mail: sahugeeta@isec.ac.in.

I would like to thank my supervisor, Prof Manohar Yadav who has always believe in liberty of the students in their research work and encourage me continuously to improve my works. Further, I would extend my gratitude to the ISEC where we all are growing as a better researcher. I would also feel to mention the name of my DC members- Prof R S Deshpande (Former Director, ISEC), Prof Madheswaran (Current Director, ISEC) and Dr Gayathri Devi (Former Associate Professor, ISEC) who have always given valuable comments and suggestions to improve this work. Also, it would be incomplete to mention the name of Dr Rajesh Raushan, Assistant Professor, IIDS, New Delhi (also my Husband) who has given all his time and support whenever and wherever I needed it. Lastly, my thanks goes to the publication Department of ISEC, administration staff, reviewers of this paper and the people of Jaunsar-Bawar for giving their time and wonderful experience.

part of the official medical system but they have specialised knowledge in treating particular types of illnesses or diseases which they have gained from their ancestors. The professional sector emerged with modernity and includes allopathic medicines and doctors. These are legally organised sectors which include various specialists and paramedical staff.

This paper is an exploration of indigenous health practices with special reference to various ethno-medicines being used in *Jaunsari* society in the region of *Jaunsar-Bawar* of Uttarakhand, which is a part of the folk sector. To understand the healthcare practices, it is essential to understand the concept of health and disease prevailing in a particular society as it is the beliefs which dictate various healthcare practices. The paper studies the issues that underlying the concept of health and disease which prevails. In the next section, the gradual development of the concept of health and disease over different spaces and time periods is looked into. The 'modern' concept of health is different from the indigenous definition of health and disease; however, there are some similarities in *Ayurveda* and the 'modern' notion of health and disease. In the later sections, evidences of the use of ethno-medicine, the study area and ethno-medicine particularly used in the study area have been provided. Moreover, case studies of traditional health healers, and their way of applying these herbs and medicines have been discussed.

## Concepts of Health and Disease

In general, good health is considered as the 'absence of any ailment/illness' and illness might be considered as 'any kind of problem in the body'. It might be simple and for a short term or complex and for a long term. In other words, a disease might be an acute or chronic disease. Majumdar (1958) defined disease as 'a vital problem for every society, primitive or advanced, and every society has developed its own recipe for the treatment and cure of the diseases to which it is an heir. Primitive systems of medicine or even magic have much to commend, and so long as the people have faith in the system they own, it helps them to tide over periods of crisis, and reduces the mental conflicts that they evoke'.

History also reveals various concepts or theories behind health and diseases. *Charaka Samhita* and *Sushruta Samhita* (*Ayurvedic* medical treatises written around 1<sup>st</sup> Century AD) came up with the *Tridosha* theory which is central to *Ayurveda* which states that any disease occurs due to imbalance in three properties (*Doshas*) of body i.e. *Vatta*, *Kafa*, and *Pitta* which govern the five *Tattvas* of body-Earth, Water, Air, Ether, and Fire (Singhal and Patterson, 1993; Rizvi, 1991; Kutumbiah, 1969). A similar concept was given by Galen (1997), where he stated that the primary properties of the body need to be balanced for a healthy body. These primary properties are wet, dry, cold, and hot. Over the centuries, many invaders come to India and brought their own concepts of health and disease and their respective methods of treatment. *Unani*, *Siddha*, *Homeopathy* and *Allopathy* are such examples of healthcare methods.

The perception of health, disease and its treatment among the tribal communities is also as wide as their culture. Most of the tribal societies believe in fate and see the hand of unseen forces behind any disease. Moreover, they believe that they fall sick due to the punishment of mystical forces. For them untimely death is also the result of the wrath of their deities. Therefore, they worship these

deities to protect themselves from the evil spirits and diseases (Sinha, 1994). In other words; among the tribals, the belief in the interference of supernatural agency or unseen forces is particularly strong in the context of health and disease. Thus they have specific gods associated with various diseases (Chaudhuri, 1986; Elwin, 1955; Dube, 1970). Broadly speaking, a majority of tribal communities believe in four types of spirits:

1. Protective deities: These deities or spirits are worshipped at community and village level. These spirits are believed to protect the people from all problems and take care of their welfare.
2. Benevolent spirits: Benevolent spirits are basically worshipped at the family level. In the same community, these spirits might vary from one family to another. The belief is that they need to be worshipped regularly; otherwise, their anger will bring diseases or calamities.
3. Evil or malevolent spirits: They are believed to cause small pox, abortion etc.
4. Ancestral spirits: They are worshipped in families or at the village level. They are believed to be benevolent and to protect the family members (Sinha, 1994; Vidyarthi, 1977).

In the studied area, it was found that *Jaunsaris* also believe supernatural powers are responsible for many diseases, disabilities and mental illness. They have a strong faith in destiny, luck, magic, horoscope etc. Many of the illnesses are treated with this worldview. Priest and magicians have an important role to play in such treatments. They also sacrifice animals so that their deities are happy and take care of them. Witches, sorcerers and black magic are also part of their beliefs about health. However, the younger generation has not accepted these beliefs. The elders decry education as being responsible for such cavalier attitudes among the younger generation.

### **Evidence of Use of Ethno-medicine in Different Societies**

Ethno-medicine, a branch of the traditional medical system, is the easiest available health treatment method all around the world, especially in developing countries. Since ancient times, there has been evidence of the use of indigenous and ethno-medicine in various societies. In south Asia and Africa, more than 60% of the total population use various ethno-medicines to treat diseases and illnesses. The World Health Organization has estimated that 80% of the inhabitants of the world rely mainly on traditional medicines for their primary healthcare needs, and it may be presumed that a major part of traditional healing involves the use of plant extracts or their active principles (Zhang, 2000). According to WHO, "traditional medicine has a long history. It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness"(WHO, 2013). In another report of WHO (2016) based on the western Pacific region, it is revealed that in China, 30% to 50% of the total medicinal consumption is that of traditional medicine. In Ghana, Mali, Nigeria and Zambia, the first line of treatment for 60% of children suffering from malaria is use of herbal medicine. In developed countries like the United States, United Kingdom and South Africa also, 70% of people suffering from HIV/AIDS prefer traditional medicine instead of modern medicines and treatment.

At present, the global market of these traditional medicines has been estimated to be around US \$62 billion and the demand is growing rapidly (Indian Council of Medical Research, 2003). It is

globally recognised that medicinal plants play a significant role in providing health benefits to human beings. People are leaning towards medicinal plants as an important source of medication/healthcare which is believed to cure illness without any side-effects. In India itself, every community has its own traditional ways of treating diseases and illnesses.

Jain (1963) mentioned a total of 27 ethno-medicines used by the *Gond* tribal community in Madhya Pradesh to treat various diseases. Ahirwar et al. (2017) mentioned 47 herbal medicines are used among *Kol*, *Gond* and *Mawasi* tribal groups in the districts of *Betwa*, *Dasan* and *Tikamgarh* in Madhya Pradesh. Among these 47 medicinal plants used by tribal herbal healers, 16 species were of herbaceous plants, 6 species were shrubs, 23 species were of trees and 4 species of climbers and 1 species under shrubs and 2 species of grass were used in the preparation of traditional medicines. Jain and Tarafdar (1970) discovered that *Santhal* tribe of Jharkhand were known to 377 medicinal plants available in their region. Shah and Joshi (1971) conducted a study in the region of *Kumaon*, Uttarakhand among *Khasia Rajputs* and *Bhotias*. They found that these tribal groups were using around 75 herbal medicines available in the mountains of *Himalayas*.

In Maharashtra, more than 2000 medicinal plants were found being used to treat various health problems such as diarrhoea, jaundice, skin problems, tuberculosis, migraine, stroke, urinary tract infections, fertility problems, wounds, piles, poisonous bites and menstrual problems among various communities at village level (Abdul, 1997; Jagtap et al., 2006). Evidence of use of around 70 medicinal plants has also been found in the districts of Mysore and *Coorg* in Karnataka (Kshirsagar and Singh, 2001).

Nomadic tribes and pastoral communities have their own history of using various medicinal plants. They were the ones who had knowledge of these plants and were responsible to make it available for the traditional healers practicing in the nearby areas. Sharma and Singh (2001) have documented such knowledge in trans-Himalayan societies. A practice similar to Ayurveda has been popular among the folk of *Ladakh*, known as *Amachi* which uses mineral waters and hot spring waters in various forms, puncturing of veins and herbs to treat various diseases (Navchoo and Buth, 1989; Ball, 1986). Rai and Lalramnghinglova (2010) have recorded more than 300 medicinal plants belonging to 96 families of plants being used in the state of Mizoram.

There have been also mentions of medicinal plants in *Rigveda* and *Atharvaveda* where these plants are referred to as *Aushadhi*, literary meaning heat producer. There are also popular *Samhitas* and *Granthas* about medicines and *Ayurvedic* practices which reveal that the practice of ethno-medicine in various forms is not new to our country and its communities (Rishi et al., 2016). Hence, one can say that the practice of ethno-medicine and various health systems was prevalent among indigenous societies. It has been in practice since centuries; however, the concepts and notions have been modified or changed during various periods of time in various places.

## **Indigenous Health Practitioners and Healers in Jaunsari Community**

*Ethno-medicine* or the traditional medicine systems are also referred to as folk medicine or indigenous health in anthropological literature. These can be referred as the range of therapies and healing traditions such as bone settings, home remedies, the *Dai* tradition i.e. traditional midwives, practices of

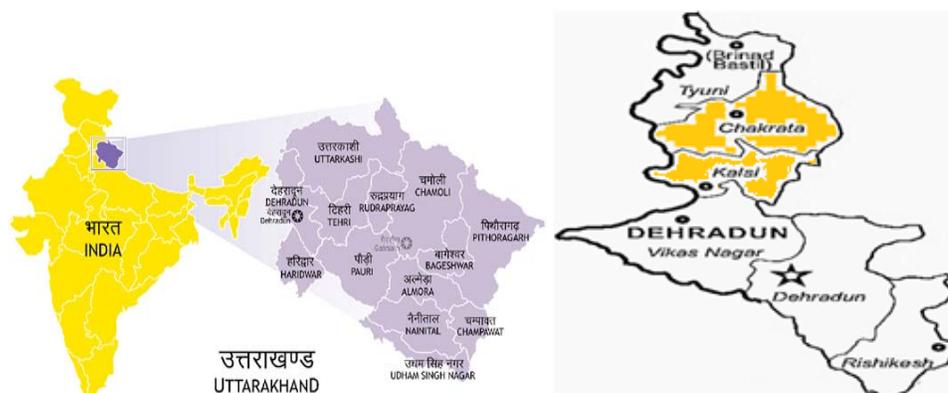
herbalism, *Marma Chikitsa* i.e. acupuncture faith and spiritual healing etc. (Mishra et al., 2018). WHO (1978) defines traditional medicine as “The sum total of all knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing”. The National Policy on Indian Systems of Medicine and Homeopathy defines traditional health as “the undocumented knowledge possessed by individuals, communities and tribal groups including birth attendants (Dai), bone setters, herbal healers, poison specialists as well as the knowledge on local grains, cereals, wild fruits, vegetables and locally available medicinal plants possessed by ordinary household (GOI, 2002). Joshi (1990), points out a few common elements of traditional medicine that are sorcery, witchcraft, divination and herbal medicines.

In the *Jaunsari* community, the disease is categorized into two- *Bimari* and *Dos*. When an illness is believed to be caused by natural forces, it is called *Bimari* but when a supernatural agency is held responsible, it is called *Dos*. The *Baman* and *Mali* healers exclusively diagnose, prevent and treat the *dos* whereas *Jariyara* and female healers specialise in *Bimari* problems. There are four types of traditional or indigenous healers- *Baman*: Astrologer or priest; *Mali*: Diviner or shaman; *Jariyara*: Herbalist; *Dai*: Midwife, masseur and gynecologist (Joshi, 2004). *Bamans* generally heal by worshipping their deities and distributing *Prasad* or by offering sacrifices to gods. Moreover, they also give *Babhuti* (Ash of incense stick or *Yajna*) to invoke protection from evil eyes. *Malis* treat people by chanting *Mantras*. *Jariyaras* heal various diseases, illness and infections by using locally available medicines obtained by herbs and plants. *Dais* specialize in women related problems.

## Study Area

The study was conducted in the state of Uttarakhand which lies on the southern slope of the *Himalayan* range in northern India, located on 28°53'24" North to 31°27'50" North latitude and the 77°34'27" East to 81°02'22" East longitude. It has a total geographic area of 53,484 km square of which 93 percent is mountainous and 64 percent is covered by forests. The capital of Uttarakhand is Dehradun which consists of six blocks i.e. Doiwala, Raipur, Sahaspur, Vikasnagar, Kalsi and Chakrata.

### State of Uttarakhand on India's MapMap of Dehradun



Source: Google Maps

This study included Chakrata and Kalsi blocks of Jaunsar-Bawar region in Dehradun. Jaunsar consists of the lower half of this region, from Chakrata southwards. Bawar includes the northern half of the region. For administrative purposes, the whole region contains two blocks- Chakrata and Kalsi. Chakrata includes a total of 119 villages and Kalsi contains 169 villages. Chakrata is a cantonment area and a hilly region of Dehradun district at the elevation of 6998 ft. One can observe that here, the climate and vegetation varies greatly, ranging from subtropical forests at the lower elevation to glaciers at the highest. The main tribal population of Jaunsar is known as Jaunsari which means 'the inhabitants of Jaunsar'.

## Data and Methodology

The data is primary in nature, collected through the ethnographic approach from the area of Chakrata and Kalsi. The field work was conducted between September 2017 and March 2019 and a maximum of four visits were done during different seasons during those one and half years to get maximum information about the medicinal plants in Jaunsar-Bawar area and their use by the people (Jaunsari) residing there. The information on medicinal plants and their medicinal use for illness and treatment was gathered through face to face in-depth interview by the researcher. The primary data collection comprises two parts. In the first part, the researcher explored the area and gathered contact details of traditional healers in Chakrata and Kalsi. It was done at a maximum of 20 kilometres distance from the headquarters to access details of traditional healers. Here, one limitation was that as the distance from the health facilities increases, the dependency on traditional healers also increases. It was found that in some locality, even if the traditional healers are living at a greater distance, they have shared their contact details with the local people and many of them have their own shops in the nearby markets, making it a minimal distance for the local people.

The traditional healers are well known as *Jariyaras* in Jaunsar-Bawar area. At the second stage, the author traced the *Jariyaras*, based on the contact details received from the people in the locality. In the hilly areas, there is a problem of transportation and they might be travelling either for treatment or for collection of herbs. After fixing the time and place of meeting, interviews were conducted to collect information on ethno-medicine. The checklist was already prepared and accordingly, in-depth interviews moved ahead. The information gathered through these interviews to explore the traditional health practices and uses of ethno-medicine by these *Jariyaras* is presented in tabular form and the detailed process of knowledge, perception and practices have been presented through case study in the present study. Another limitation of the study was that the names of herbs provided here are the local names used by *Jariyaras*, but not the scientific names of the particular herbs/plants, however wherever it was possible I have provided the scientific name of the particular herbs/shrubs.

The Jaunsar-Bawar region ranges between elevations of 1500 ft to 9000 ft and therefore the herbs, plants, trees and shrubs here are in a wide variety. As mentioned earlier, traditional health healers do not reveal the names of these herbs as they believe that revealing the names makes them ineffective. Many of these herbs are found in the foothills while others are grown at higher altitudes. The following is the list of herbs found in the region, used by the local healers.

Major herbs/shrubs used by local healers in Jaunsar-Bawar

Herb/Shrub	Scientific Name	Used Part	Ailment/Illness/Disease used for	Method
Aadu	<i>Prunus persica</i>	Seed	Acne and Pimples	Aadu known as peach in English is considered as a nutritious fruit. The shell of its seed is used as scrub and face mask to cure pimples and acne.
Aank	<i>Calotropis gigantea</i>	Leaves	Muscle cramp	Also commonly known as <i>Madaar</i> , is used to treat muscle cramps. The leaves are heated and bound to the affected part of the body.
Akhrot	<i>Juglans regia</i>	Stem	Dental problems	Akhrot is known as walnut in English. Its tender stem is used as tooth brush which is believed to be a natural cleaner and shiner for teeth.
Baheda	<i>Terminalia bellirica</i>	Fruit	Cough and cold	Beleric/Bastard Myrobalan in English and <i>Bhibhtika</i> in Sanskrit is commonly known for its medicinal properties which are mentioned in <i>Charaka Samhita</i> . In Jaunsar region, it is used to treat cough. The fruit is roasted to make powder and this powder is consumed with honey.
Banafsa	<i>Viola odorata</i>	Flower	Cough, cold, fever	Commonly known as wood violet or sweet violet as its flowers are violet in colour. Flower tea is prepared to cure cold, cough and fever.
Bhatkumra	**	Leaf	Treating wounds	Leaf paste is applied on wounds.
Bicchhu Ghas	<i>Urtica dioica</i>	Leaf and flowers	Anaemia, Kidney and bladder stones	Commonly known as stinging nettle in English and <i>Kandali</i> in Hindi. It got the name because its leaves and flowers have very fine thorns which sting like a scorpion when touched and make the skin swell up. The leaf and flowers of these plants are cooked as vegetable and given to pregnant women. It is very nutritious. Moreover, it is also consumed to remove stone in kidney and gall bladder.
Brahmi	<i>Bacopa monnieri</i>	Leaf	Headache	<i>Brahmi</i> is said to be cold in nature. Its leaves are boiled and applied on the forehead in case of headache.
Buraansh	<i>Rhododendron arboreum</i>	Flower	Diabetes, Cholesterol	<i>Buraansh</i> tree is the state tree of Uttarakhand due to its medicinal properties believed to be magical. The flowers of this tree are said to be highly beneficial. The juice of this tree's flower is used as a health drink. Apart from extracting juice, they also prepare tea from its flower which is said to be beneficial for diabetes. Moreover, its leaf juice is extracted to control bad cholesterol.
Chamloti	**	Root	Boils or blisters	The paste of its root is applied on blisters/boils/ furuncles.
Chulu	<i>Prunus armeniaca</i>	Seeds	Joint pain	It looks like apricot. The oil is extracted from the seeds of this fruit which is believed to be very hot in nature. This oil is used as body massage oil for women at post-partum. It also helps in joint pains and is applied to babies to cure colds.
Dande ki Jwan	<i>Trachyspermum ammi</i>	Seed	Stomachache, Gastric trouble	These are hilly carom seeds, commonly called <i>Ajwain</i> in Hindi. Tea is prepared by boiling it to cure stomachache and gastric problems.
Deodar	<i>Cedrus deodara</i>	Bark	Mosquito repellent, Skin infection in animals	The oil is extracted from the bark of this tree and used as mosquito repellent. It is also used to treat itching and skin infections among domestic animals.
Gandheli	**	Leaf	Stomach ache, Intestinal worms	It is used when babies or children gets worms in their stomach. The juice of its leaves is given by squashing it which cures stomach ache due to worms and kills them.

<b>Giloye</b>	<i>Tinospora cardifolia</i>	Stem	Fever, for increasing platelet count	In Sanskrit, it is called as 'amrita', meaning the root of immortality as it has highly beneficial Ayurvedic properties. These are the creepers. The stem is useful in fever. It is boiled in water to drink to cure fever. Moreover, it also increases platelet count which decreases due to any kind of infection or fever.
<b>Golda</b>	**	Root	Snake bite	The roots of this herb are used for snake bite. The paste of the root is applied on the snake bite.
<b>Kaali achi</b>	**	Root	Dermatological problems	The paste of roots is applied to treat dermatological diseases such as itching, rashes, vitiligo, leucoderma etc.
<b>Kacchi Haldi</b>	<i>Curcuma longa</i>	Root	Treating pain and wounds	Turmeric is used as an anti-septic and applied on the wound to protect it from infection as well as heal it soon. It is also taken with warm milk to cure any kind of pain in the body.
<b>Kachur</b>	<i>Curcuma aromatica</i>	Root	Diabetes, Cold, Stomach ache	It looks like ginger or turmeric. Local folk call it wild turmeric. It is hot in nature. It controls diabetes, ulcers and severe colds. The powder is consumed with water on empty stomach for stomach aches and ulcers. For severe colds, its tea is consumed. Also, powder is applied on the body in cold.
<b>Kairwa</b>	**	Leaf	Controls <i>Pitta</i>	These are weeds grown in pea fields, taken with honey to control <i>pitta</i> in the body.
<b>Kaphal</b>	<i>Myrica esculenta</i>	Leaf	Headache	Its leaf paste is applied for headache.
<b>Karanvi</b>	**	Leaf	Diabetes	The leaves of these plants are highly bitter in taste and so are used to cure diabetes. The juice is prepared by boiling leaves.
<b>Kasmoi</b>	**	Root	High BP, Diabetes, Eye infections	Root powder is prepared by drying it. It is useful in controlling blood sugar level. Highly recommended for diabetic patients. Its juice is also put in eyes to cure red eyes and other eye infections.
<b>Pudina</b>	<i>Mentha spicata</i>	Leaf	Stomach ache	Known as mint in English, its leaves are eaten raw for curing stomach ache. It is also used in preparing chutney which is believed to be nutritious.
<b>Sarpgandha</b>	<i>Rauvolfia serpentina</i>	Root	Epilepsy, Nerve problems, BP and anxiety	The roots are dried to make powder. This powder is helpful in curing epilepsy and nervous disorders. It also controls anxiety and BP.
<b>Shilpada</b>	**	Root	Kidney and gall bladder stones	Roots are boiled and drunk to cure kidney and gall bladder stones.
<b>Suhai</b>	**	Leaf	Skin infection	It is used to cure skin infections. A paste is made out of it and applied along with cream (malayi) or clear butter (ghee).
<b>Timru</b>	<i>Zanthoxylum alatum</i>	Leaf	Toothache	Timru's leaves are dried in the sun to make powder. This powder is applied on teeth to treat toothache. Its twigs are used as a tooth brush. Moreover, its leaves are also boiled in water for bath and act as an antiseptic.
<b>Tulsi</b>	<i>Ocimum tenuiflorum</i>	Leaf	Cough and cold	Eating its leaves raw or making its tea with honey is beneficial for cough and cold.

\*\* These are local names of the medicinal plants and so the researcher did not get the scientific names/pictures of all these medicinal plants.

### Pictures of Some Medicinal Plants



1. Deodar; 2. Chulu; 3. Buransh; 4. Brahmi; 5. Banafsha; 6. Tulsi; 7. Timru; 8. Kafal; 9. Kachur; 10. Giloye; 11. Bicchhu; 12. Bhatkumra

Source: Pictures 1-10 Google Images, 11-12 collected from the field

## Ethno-medicine, *Jariyaras* and their Methods of Healing: Insights from the Field

*Jaunsar-Bawar* has a prosperous ecology with a completely hilly and forest area which is, therefore, also rich in herbs and medicinal plants. Many medicinal plants are naturally grown and scattered in these areas while a few are grown in the fields. Some of them have their local names and many medicinal plants are recognized by *Jariyaras* by look and their names are unknown to them. Moreover, many

*Jariyaras* know the names of these herbs but do not reveal them so that others cannot use these medicines and so they never show these medicinal plants in their original form, rather they use parts of the plants in cut and dried form to hide their identity. Further, they also believe that revealing the names of these medicines make them lose their potency. Hence, many of these medicines are known to a few people in the region and this knowledge might belong with them. However, some *Jariyaras* gave information about some types of treatment which they have been practicing for years<sup>1</sup>.

### **Case Study - I**

Shyam\* Bharti is a *Jariyara* (ethno-medicine practitioner). He has never gone to school but taught himself to read and write. He retired from the post of cook in an Ashram-type school in Chakrata region. He has been practicing medicine for more than thirty years now and cured many vital diseases in these years. He has specialized in the use of three herbs i.e. *Shilpada*, *Chamloti* and *Kaali Achi*. He discusses their uses:

1. ***Shilpada***: It is used to treat kidney and gall bladder stones. He advises the patients to boil its roots and drink it daily until the stone dissolves and comes out of your body.
2. ***Kaali Achi***: Any kind of dermatological disease is treated with this plant. If there is itching, boils or the skin is damaged in any part of the body, he asks the patient to make a paste of the roots with a stone and apply it on the affected area. It is also used to cure snake bite.
3. ***Chamloti***: If any blister/boil/furuncle occurs due to hair break or any other reason, then the paste of its roots are applied near the tip/ head of the boil. This makes all the pus come to the head and after removing it properly, the same paste is applied over the whole area.

Although he has knowledge about many other herbs he is known in the area for giving treatment with these three medicines. He says that there are various *Jariyaras* in the area. None of them has knowledge of all available herbs/medicinal plants and their use for treatment but most are specialized in the use of some particular kinds of medicine or in the treatment of a few particular diseases. He explains:

*"Earlier, our elders were not going for Doctary Ilaaj (doctors), instead they were using these home remedies or herbs to treat their illness. Nowadays people get education, so they won't believe in these treatments. There are many such medicines through which our elders used to treat various diseases. My own son and daughter-in-law do not let me give any herbal medicines to my grandchildren. They have more faith on 'English' medicines."*

---

<sup>1</sup> The reason might be that the researcher is an outsider and won't be a 'competitor' to their specialization. Moreover, they only told the researcher, the names but most of the medicines they showed were dried roots and stems which anyway the researcher would not be able to recognize. Only one practitioner somehow trusted or sympathized with the researcher that despite being a woman, she had come a long way amidst difficult circumstances to know about these medicines and their practices, and so he showed her some commonly available plants grown here and there near his house and in his garden.

\* Fictional Name

He said he was a specialist intreating with those three medicines- *Shilpada*, *Chamloti* and *Kaali Achi*. He had always been using these three ethno-medicines only. He also mentioned that he had treated *Kodh* (Vitiligo) with these three medicines.

On being asked if people still come to him for treatment, he said:

*"Yes, they do come. Three people from Chakrata are coming these days to me. I go and search for medicines for them. If someone has any health issue, then I treat them with these three medicines only. But I don't like to take money. I give my services free of cost. If someone comes to me I tell them in advance not to talk about money and then only I will give the medicine. If someone comes to me for taking medicine, then I might be in any condition, I will go and search for medicines for them. If someone asks me about the money, I tell them that you get cured first and then whenever you see me in the market just treat me with a cup of tea."*

Shyam further says that many people earn money by giving treatment to others. They give medicine in exchange for money, citing the instance of a man living in nearby *Thana* village. A majority of ethno-medicine practitioners' livelihood is totally dependent on these medicines and treatment. They also obtain herbs from forests in a large quantity and sell them to doctors in *Vikasnagar* or Dehradun, he said.

Shyam also talked about various methods of treatment. One method for treating illness is through chanting mantras while giving some medicines. It is called *Jhadna*. He states:

*"Suppose a snake has bitten someone and he comes to me. I grind the medicine on a stone and give him that paste with ghee to drink. Along with that, I touch the patient with clumps of a particular type of grass and chant some mantras. Within two to three days, the patient gets well."*

Shyam said that his guru had taught him these mantras and about the magical grass. But he does not know the name of those grasses. He can only recognize them in the forest. He said:

*"I know two other types of grass for curing snake bite. I can recognize them by seeing but I don't know the names. Even my guru did not tell me the names of those grasses. I do Jhad-Phoonk with those grasses. Many others do not even reveal anything about medicines and keep it very secret. Even when they go searching for these plants, they go alone secretly without informing anyone so that no one can follow them and come to know about these medicines"*.

He also discloses that he has knowledge of curing animals from different illnesses. Sometimes, domestic animals (livestock) such as cows or buffaloes eat any wild or poisonous grass while grazing. Their body swells heavily. The cure is to give them butter milk with salt while chanting mantras secretly and soon they get well. Asked how these mantras work, he said:

*"That I don't know. We only know that there is something in these mantras which affects them so that the poison gets down from the body of the animal soon. Either you believe in these mantras or not, but we know that butter milk helps in restricting*

*the effect of the poison. We give in the ratio of half kilogram of butter milk with 250 grams of salt. There are various mantras for various diseases which I learnt from my guru.*

Shyam cultivated the hobby of practicing ethno-medicine since his childhood. He gained this knowledge from his father and various other people of his own community. He claimed to have successfully treated many diseases such as breast cancer, leucoderma, Ichthyosis vulgaris (cracked skin), and diabetes with only those three medicines that he had mentioned earlier.

### **Case Study - II**

Rekha Devi of Rikhad village, who is in her mid-fifties, has specialized in anti-venom treatment. She has been practicing this since almost three decades. She can treat scorpion bites, snake bites and other such venomous bites with the help of a herbal grass. She did not reveal the name of this grass. She rubs this grass on the bite marks while chanting some mantras to make the venom ineffective in the body of the patient. She believes that people like her who treat venomous bites are able to do it by keeping the image of their favourite deities in their minds so that along with the effect of the herb, the deity helps them to neutralise the poison in the patient's body. She says:

*"I remember my deity and chant mantras to connect with them. By chanting these mantras, this grass becomes effective to restrict the poison in the body. I have treated so many people in my lifetime. We have many poisonous scorpions and snakes in this region. The cases increase in the rainy season as these reptiles come out from their holes."*

On being asked if she had ever tried to treat a patient with the herb only without chanting any mantras, she replied:

*"We practice the same way that we have learnt from our ancestors. We don't experiment with the method as it is a question of someone's life."*

There are many other such practitioners in the area who have specialized in treating snake and scorpion bites.

### **Case Study - III**

Jitu Joshi, aged 63, is specialized in treating dental problems. He has knowledge of curing toothache and tooth cleaning. He uses some kind of herbal grass to cure dental problems. He gained this knowledge from his father who in turn gained it from his own father. According to him:

*"We are practicing this traditional knowledge since centuries. My father, my grandfather and great grandfather were using the same method to treat various dental problems. They were so specialized that they can show you the tooth worm after removing it from the patient's mouth. Even I can do that. People come to me from far off villages for various tooth related problems. They are satisfied with my*

*services and so they tell others also about me and with their references, other people also visit me."*

On being asked the name of the herb, he said:

*"Even I don't know the name of this grass. I only recognize it by seeing it in the forest. My father also didn't know the name. In our region, there are numerous medicinal plants which we only recognize by sight and know their uses and we have been using them for centuries. People did not bother knowing the names and some names are gone with our ancestors as they believed that revealing the name of any medicine will make it ineffective. So even in families, older generations handed down their knowledge of practicing medicine with these herbs without revealing the names."*

### **Case Study - IV**

Kamlesh Chauhan, in his mid 40s, is treating people with several herbal medicines with his knowledge based on ethno-medicine and *Ayurveda*. He has a shop of these medicines in *Sahiya* in *Jaunsar* region. He has been practicing for more than 15 years. Although he has not done any professional course in *Ayurveda*, he is specialized in treating jaundice, skin diseases (especially vitiligo) and Gathiya Bai (Local name for joint pain which moves all over the body; he is renowned in his area for treatment of this disease especially among women who face this problem post-partum.) which he has learnt from his father. He has several collections of ancient books on *Ayurveda* which he uses for his practice. He says:

*"This is our family profession since generations. I can assure 100 percent to treat any kind of 'safed chakta' (white spots on skin/vitiligo). One person from Delhi got white spots on his face. He visited many doctors for a cure but did not get any result. Somehow, he came to know about me from someone, so he thought to give me a try. He came to me for the advice. I gave him some herbs to apply on those spots and another medicine to consume. He got good results in three months. He paid me well with his own happiness."*

He says he has treated many kinds of jaundice - some people get only their eyes yellow; others get any particular part of body yellow and in many cases the whole body of the patient turns yellow. He has treated all these kinds of jaundice. The major herbs he uses are *Suhai*, *Godhanti*, *Kaala Baasa*, *Isoi*, *Giloye*, *Kairawa* etc. He also purchases many herbs from others and so he justifies himself that he is charging for these medicines because he himself is spending a large amount buying those herbs.

## Conclusion

The practice of ethno-medicine is not new to India and its various societies. However, research on these traditional practices is somewhat contemporary and under-explored. In Jaunsar-Bawar region also, native doctors have been practicing ethno-medicine since centuries, which knowledge they gained from their ancestors. The traditional healers of Jaunsari community, locally known as *Jariyaras*, are basically health specialists of their villages. They are experts in treating a few particular diseases. In this paper, information is provided on the basis of in-depth interviews conducted during fieldwork that tried to explore information about various herbal medicinal plants used in this society.

The Jaunsari community has faith in the use of ethno-medicine that they feel is highly effective and beneficial for their health, without any side-effects unlike allopathic medicines which have side effects. The *Jariyaras* are highly experienced in this community in the use of their own specialized knowledge of medicine and handling disease. It is found that rare diseases like vitiligo, leucoderma, and initial stage breast cancer have been cured by these traditional health practitioners. However, with changing times, the younger generation is losing faith in these practices. *Jariyaras* here are also now less involved in these practices as they have been practicing free of cost as a part of the welfare of their own community. Now they have the challenge of earning a livelihood and so they are engaged in other occupations. Only people of older generations are keenly involved in practicing their indigenous form of medicine, since they believe that these herbal medicines cure them without any side-effects.

Many *Jariyaras* felt that the younger generation wants results and so they are moving towards modern health services and are fonder of allopathic medicine. They don't have faith in traditional practices and even if their own family member is a *Jariyara*, they don't let them treat their grand children with home remedies and ethno-medicine. Hence, the practice of ethno-medicine is on the verge of extinction as there is no one in the family who is keen to carry forward these practices. There must be many *Jariyaras* who have stopped practicing these ethno-medicines to earn their livelihood instead and the knowledge of many such ethno-medicines and their uses will probably be lost with them. This will be a huge loss not only to the Jaunsari society but to our country also, where people could have benefitted from this knowledge which often helps cure rare diseases at a low cost.

There is a need to give a platform to these *Jariyaras* so that they can share their knowledge with society and earn their livelihood by practicing ethno-medicine. The government needs to provide a chance to such people under their AYUSH scheme where the practice of ethno-medicine could be promoted. Moreover, people in the medical sector, especially who are practicing *Ayurveda* can adopt these indigenous practices also which can be a very good combination. By this, the knowledge of every indigenous society can be protected for the wellbeing of society.

## References

- Ahirwar, R P, Jagrati Tripathi and Ranjana Singh (2017). Ethnomedicinal Study of Plants Used by Tribal Person for Fever Diseases in Tikamgarh District, M.P. *Journal of Medicinal Plants Studies*, 2 (3): 64-67.
- Ball, K (1986). Ladakh: A Happy People- But for how long? *The Lancet*, 327 (8473): 145-46.
- Chaudhuri, B (1986). Medical Anthropology in India. In Buddhadeb Chaudhuri (ed), *Tribal Health: Socio-Cultural Dimensions*. New Delhi: Inter-India Publications. Pp 3-11.
- Dube, S C (1970). *Manav Aur Sanskriti*. Delhi: Rajkamal Prakashan.
- Elwin, V (1955). *The Religion of an Indian Tribe*. London: Oxford University Press.
- Galen (1997). *Selected Works*, translated with an introduction and notes by P N Singer. London: Oxford University Press.
- Government of India (2002). National Health Policy on Indian Medicine Systems and Homeopathy-2002. New Delhi: Ministry of Health and Welfare.
- Indian Council of Medical Research (2003). *Quality Standards of Indian Medicinal Plants*, Vol. 1. New Delhi, India.
- Jagtap S D, S S Deokule and S V Bhosle (2006). Some Unique Ethnomedicinal Uses of Plants Used by the Korku Tribe of Amravati District of Maharashtra, India. *Journal of Ethnopharmacology*, 107: 463-69.
- Jain, S K (1963). Observations on the Ethnobotany of the Tribals of Madhya Pradesh. *Vanyajati*, 11: 177-83.
- Jain, S K and C R Tarafdar (1970). Medicinal Plant-lore of Santals: A Revival of P.O. Buddings' Work. *Economic Botany*, 19: 236-50.
- Joshi, P C (1990). Traditional Medical System in Healthcare. In Ashish Bose *et al* (eds), *Tribal Demography and Development in North-East India*. Delhi: B R Publishing.
- (2004). The World of Tribal Healers. In Kalla A K and P C Joshi (eds), *Tribal Health and Medicines*. New Delhi: Concepts Publishing Company. Pp 17-45.
- Kareem, Abdul M (1997). *Plants in Ayurveda: A Compendium of Botanical and Sanskrit Names*. Bangalore: Foundation for Revitalization of Local Health Traditions.
- Kleinman, A (1980). *Patients and Healers in the Context of Culture: An Exploration of Borderland between Anthropology, Medicine and Psychiatry*. Berkley: University of California Press.
- Kshirsagar, R D and N P Singh (2001). Some Less-known Ethnomedicinal Uses from Mysore and Coorg Districts, Karnataka State, India. *Journal of Ethnopharmacology*, 75: 231-38.
- Kutumbiah, P (1969). *Ancient Indian Medicine*. Orient Longmans: Bombay.
- Majumdar, D.N. (1958). *Races and Cultures of India*. Bombay: Asia Publishing House.
- Mishra, A, N Devki and Harilal Madhavan (2018). The Making of Local Health Traditions: Revitalizing or Marginalisation. *Economic and Political Weekly*, LIII (30): 41-49.
- Navchoo, I A and G M Buth (1989). Medicinal System of Ladakh, India. *Journal of Ethnopharmacology*, 26 (2): 137-46.
- Rai, P K and H Lalramnghinglova (2010). Ethnomedicinal Plant Resources of Mizoram, India: Implication of Traditional Knowledge in Healthcare System. *Ethnobotanical Leaflets*, 14: 274-305.

- Rishi, A, D C Singh and R C Tiwari (2016). An Overview of Ethnomedicine and Future Aspect of Ethnomedicinal Plants. *International Journal of Ayurveda and Pharma Research*, 4 (5): 29-33.
- Rizvi, S N H (1991). *Medical Anthropology of the Jaunsaris*. New Delhi: Northern Book Center.
- Shah, N C and M C Joshi (1971). An Ethnobotanical Study of the Kumaon Region of India. *Economic Botany*, 25 (4): 414-24.
- Sharma, P K and V Singh (2006). Ethnobotanical Studies in North-West and Trans-Himalaya: Ethno-Veterinary Medicinal Plants Used in Jammu and Kashmir, India. *Journal of Ethnopharmacology*, 27 (1-2): 989, 63-70.
- Singhal, G D and T J S Patterson (1993). *Synopsis of Ayurveda*, Based on the Translation of Susruta Samhita. Delhi and Oxford: Oxford University Press.
- Sinha, U P (1994). Traditional Tribal Medicine and Modern Healthcare System. In Basu, S (ed), *Tribal Health in India*. Delhi: Manak Publications Pvt. Ltd. Pp 151-63.
- WHO (2016). Traditional Medicine [Homepage on Internet]. WHO Representative Office China; WPRO. [http://www.wpro.who.int/china/mediacentre/factsheets/traditional\\_medicine/en/](http://www.wpro.who.int/china/mediacentre/factsheets/traditional_medicine/en/) Accessed on September 26, 2019.
- Vidyarthi, L P (1977). *The Tribal Culture of India*. New Delhi: Concept Publishing Company.
- WHO (1978). *The Promotion and Development of Traditional Medicine*. Technical Report Series 622. Geneva: WHO.
- Zhang, X (2000). Integration of Traditional and Complementary Medicine into National Healthcare Systems. *Journal of Manipulative & Physiological Therapeutics*, 23 (2): 139-40.

## Recent Working Papers

- 431 **Impact of Irrigating with Arsenic Contaminated Water on Farmers' Incomes in West Bengal**  
Madhavi Marwah Malhotra
- 432 **Macroeconomic Determinants of Software Services Exports and Impact on External Stabilisation for India: An Empirical Analysis**  
Aneesha Chitgupi
- 433 **Fiscal Dependency of States in India**  
Darshini J S and K Gayithri
- 434 **Determinants of Farm-Level Adoption of System of Rice and Wheat Intensification in Gaya, Bihar**  
Shikha Pandey and Parmod Kumar
- 435 **Monsoon Diseases in Lower Kuttanad (Kerala): An Environmental Perspective**  
Bejo Jacob Raju and S Manasi
- 436 **Risk Sources and Management Strategies of Farmers: Evidence from Mahanadi River Basin of Odisha in India**  
Jayanti Mala Nayak and A V Manjunatha
- 437 **Determinants of Intra Urban Mobility: A Study of Bengaluru**  
Shivakumar Nayka and Kala Seetharam Sridhar
- 438 **Structure and Strategy of Supermarkets of Fruits and Vegetables Retailing in Karnataka: Gains for Whom?**  
Kedar Vishnu and Parmod Kumar
- 439 **Income and Vehicular Growth in India: A Time Series Econometric Analysis**  
Vijayalakshmi S and Krishna Raj
- 440 **A Critical Review of Apprenticeship Policy of India**  
K Gayithri, Malini L Tantri and D Rajasekhar
- 441 **Sustainability Concerns on Sugarcane Production in Maharashtra, India: A Decomposition and Instability Analysis**  
Abnave Vikas B
- 442 **Economic, Occupational and Livelihood Changes of Scheduled Tribes of North East India**  
Reimeingam Marchang
- 443 **Need for a Study of State Policies towards the Development of Religious Minorities in Karnataka**  
Azhar Khan C A
- 444 **An Analysis of Bilateral Trade Between Canada and India**  
Malini L Tantri and Preet S Aulakh
- 445 **Should they Avoid the Middlemen? An Analysis of Fish Processing Firms in India**  
Meenakshmi Rajeev and Pranav Nagendran
- 446 **Growth and Consolidation of Kerala Non-Gazetted Officers' Union: From Its Formative Years to Union Militancy Phase**  
Jithin G
- 447 **The Relationship Between Economic Growth and Carbon Emissions in India**  
Kaumudi Misra
- 448 **Tax Revenue in India: Trends and Issues**  
Pratap Singh
- 449 **Technical Efficiency of Unorganised Food Processing Industry in India: A Stochastic Frontier Analysis**  
Padmavathi N
- 450 **Demonetisation 2016 and Its Impact on Indian Economy and Taxation**  
Pratap Singh
- 451 **Impact of Perform-Achieve-Trade Policy on the Energy Intensity of Cement and Iron and Steel Industries in India**  
Kaumudi Misra
- 452 **Impact of Non-Cognitive Skills on Cognitive Learning Outcomes: A Study of Elementary Education in India**  
Indrajit Bairagya and Rohit Mukerji
- 453 **Assessment of Vulnerability to Floods in Coastal Odisha: A District-Level Analysis**  
Niranjan Pradhan and S Madheswaran
- 454 **Who Benefits from Higher Education Expenditure? Evidence from Recent Household Survey of India**  
Ramanjini and Karnam Gayithri
- 455 **How the Modern Food Retail Chains Emerging as Alternative Channels of Agricultural Marketing? Evidence from Karnataka**  
Kedar Vishnu, Parmod Kumar and A V Manjunatha
- 456 **Educational Development, and Household and Public Expenditures on Education in Manipur**  
Reimeingam Marchang
- 457 **Social Audit of MGNREGA - A Panacea or a Placebo? Issues and Ways Forward in Karnataka**  
Sanjiv Kumar and S Madheswaran
- 458 **State, Religion and Society: Changing Roles of Faith-Based Organisations in Kerala**  
Abdul Raouf
- 459 **Single Child Families in Tripura: Evidence from National Family Health Surveys**  
N Pautunthang and T S Syamala
- 460 **MGNREGA Ombudsman a Forlorn Scarecrow: Issues and Ways Forward in Karnataka**  
Sanjiv Kumar and S Madheswaran
- 461 **Dynamics of Procurement of Modern Food Retail Chains: Evidences from Karnataka**  
Kedar Vishnu and Parmod Kumar
- 462 **Determinants of Micro-Level Decisions of Sugarcane Farmers**  
Lavanya B T and A V Manjunatha
- 463 **Assessing Quality of Higher Education: An Empirical Study of Commerce Graduates, Kerala State**  
Indrajit Bairagya and Bino Joy
- 464 **Farmers' Perception on Risk and Management Strategies in Mahanadi River Basin in Odisha: An Economic Analysis**  
Jayanti Mala Nayak and A V Manjunatha

- 465 **An Analysis of Revenue Diversification Across Select Indian States**  
J S Darshini and K Gayithri
- 466 **Urban Governance in the Context of Urban 'Primacy': A Comparison of Karnataka and Andhra Pradesh**  
Anil Kumar Vaddiraju
- 467 **Urban Financing and Accountability Structures - Case Study of Bruhat Bengaluru Mahanagara Palike**  
Shankari Murali and S Manasi
- 468 **Status of Unorganised Food Processing Industry in India - A Study on Key Performance Indicators**  
Padmavathi N
- 469 **Sustainability of India's Current Account Deficit: Role of Remittance Inflows and Software Services Exports**  
Aneesha Chitgupi
- 470 **BCIM Economic Corridor and North East India**  
Reimeingam Marchang
- 471 **The Nation and Its Historical Mediations: Towards Typologies of Regions/States**  
Anil Kumar Vaddiraju
- 472 **Structure and Functions of Social-Ecological Systems: A Case Study from Indian Sundarbans**  
Sneha Biswas
- 473 **Multiple Vulnerabilities in Utilising Maternal and Child Health Services Across Regions of Uttar Pradesh, India**  
Prem Shankar Mishra and T S Syamala
- 474 **Fertility at the Crossroads of Ethnicity and Gender: Understanding Oraon Tribe in Jharkhand, India**  
Ujjwala Gupta
- 475 **Complexities of Collaboration, Negotiation and Contestation: Agragamee and the State**  
Ambuja Kumar Tripathy
- 476 **International Best Practices of Apprenticeship System and Policy Options for India**  
K Gayithri, Malini L Tantri and D Rajasekhar
- 477 **Public Healthcare Infrastructure in Tribal India: A Critical Review**  
Mohamed Saalim P K
- 478 **Whether Caste Impedes Access to Formal Agricultural Credit in India? Evidence from NSSO Unit Level Data**  
Karthick V and S Madheswaran
- 479 **Harmonization of Intellectual Property Rights Across the Globe: Impact on India's Pharmaceutical Exports**  
Supriya Bhandarkar
- 480 **Decentralization and People's Participation in Educational Governance: A Review of International Experiences**  
Mahima Upadhyay and D Rajasekhar
- 481 **Initiatives in Solid Waste Management: A Case Study of the City of Bengaluru**  
Natasha Kalra and S Manasi
- 482 **Agrarian Change in Bihar: A Study of Two Villages**  
Prashant Kumar Choudhary
- 483 **Information Asymmetry, Exclusion and Inclusion Errors and Elite Capture of MGNREGA: Critical Examination of IEC Strategies in Karnataka and Ways Forward**  
Sanjiv Kumar, S Madheswaran and B P Vani
- 484 **Political Regimes and Religious Minorities in Karnataka: 2008-2018**  
Azhar Khan Chikmagalur Akbar
- 485 **Economic Estimation of Health and Productivity Impacts of Traffic Congestion: A Case of Bengaluru City**  
Vijayalakshmi S and Krishna Raj
- 486 **Economic Development in the Princely State of Jammu & Kashmir (1846-1947)**  
Sardar Babur Hussain
- 487 **Local Government and Decentralized Natural Resource Management**  
Mahima Upadhyay
- 488 **Agrarian Distress and Farmer Suicides in Kerala**  
Ance Teresa Varghese
- 489 **Ownership of Firms and Their Implication for Productivity: An Empirical Investigation in to Indian Mining Industry**  
Meenakshi Parida and S Madheswaran
- 490 **Determinants of Agricultural Credit in Rural India by Social Group**  
Karthick V and S Madheswaran

Price: ₹ 30.00

ISBN 978-81-946531-7-2



## INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE

(ISEC is an ICSSR Research Institute, Government of India and the Grant-in-Aid Institute, Government of Karnataka)

Dr V K R V Rao Road, Nagarabhavi P.O., Bangalore - 560 072, India

Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008

E-mail: [balasubramanian@isec.ac.in](mailto:balasubramanian@isec.ac.in); Web: [www.isec.ac.in](http://www.isec.ac.in)