

# Documentation and Digitalization for Access to Traditional Medicine Knowledge in Southern Odisha

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## ABSTRACT

Knowledge of traditional medicine is an integral part of the indigenous knowledge of local communities. One of the basic features of traditional knowledge is that it is unwritten and exists in the minds of the local people. It is transmitted orally from one generation to another. Documenting Indigenous Medicinal Knowledge (IMK) may help to preserve tacit indigenous medicinal knowledge. The present study is conducted in the Semiliguda block of Koraput District. It tries to explore the importance of documentation and digitalization of tacit indigenous medicinal knowledge and also analyses the inadequacy of the existing frameworks in protecting and enhancing access to traditional medicine knowledge. The study highlights how the collected plants were preserved in herbarium for identification and were identified with the help of local experts by following Haien's Flora. Herbarium of specimens were prepared and deposited in COATS, Koraput. Thus it ensures access to traditional knowledge and information.

**Keywords:** Indigenous Knowledge, Documentation, Intellectual Property Rights, Traditional Medicine

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## Traditional Medicine Knowledge and Documentation needs

Traditional medicine, often known as ethno-medicine, refers to the study of traditional medical practice which is concerned with the cultural interpretation of health, diseases and illness and also addresses the healthcare seeking process and healing practices (Krippner, 2003). Therefore, practice of ethno-medicine is a complex multi-disciplinary system constituting the use of plants, spirituality and the natural environment and has been the source of healing for people for millennia (Lowe, Payne-Jackson, Beckstrom-Sternberg and Duke, 2000). Knowledge of traditional medicine is also understood as an integral part of the indigenous knowledge of local communities which according to (Sithole, 2007) is a complete body of knowledge, know-how and practices maintained and developed by the people, generally in rural areas, who have extended histories of interaction

with the natural environment. This interaction sets understandings, interpretations and meanings that are part of a cultural complex. The World Health Organization (WHO) rightly defines traditional medicine to include a diversity of health practices, approaches, knowledge, and beliefs incorporating plant, animal, and/or mineral-based medicines; spiritual therapies; manual techniques; and exercises, applied singly or in combination to maintain well-being, as well as to treat, diagnose, or prevent illness. Traditional medicine is appreciated worldwide for its total care approach, easy access, ready availability, cost effectiveness, apparent lack of side effects as well as its personal and holistic approach to treatment of health related matters.

In traditional medicine system as stated, use of plants has a significant place. From time immemorial, plants and its allied products has been used in the treatment of various ailments all over the world especially in local

communities in developing countries. Dependency on plants made humans to acquire the knowledge of economic and medicinal properties of plants by trial and error. In case of medicinal plants it has been estimated that almost 25% of plants species have some sort of medicinal use somewhere of the world (Ramawat, 2009). In addition, the statistics of modern drug development shows those natural products are the major source of inspiration for recent drug development. Significantly then, plant forms the main ingredients of medicine in traditional system of healing and has been the source of inspiration for several major pharmaceutical drugs in recent years. India is proud to be rich in biodiversity as it possesses about 8% of the estimated biodiversity in the world with around 12600 species (Amuthavalluvan, 2011). Therefore, with the tendency in modern medicine to assimilate and re-assimilate natural remedies in common practice, under various forms, the potential of regional flora becomes important.

The fact of the matter is that traditional medicine knowledge begins with the knowledge on local plants species to identify edible, medicinal and poisonous ones. Traditional medicine knowledge goes beyond knowledge of what plant species is used for treatment of a particular ailment. According to (Nijar, 1996), to transform a plant into a medicine, one has to know not just the current specie but also its location, and since some plants are lethal in certain time of the year, one also has to know the proper time for collection, the part to be used (some part of a plant could have beneficial medicinal use while another part of same plant could constitute a deadly cocktail, how to prepare it as well as the posology.

Traditional medicine knowledge is a component of the traditional knowledge system which in turn is a part of the total human knowledge system. Human knowledge system usually combines both explicit and implicit knowledge. 'Explicit knowledge' represents recorded knowledge and available in various media like books, periodicals, letters, reports, memos, literature, audio-visual material, CDs films, videos etc. or electronic formats like data, software, websites, etc., which is formal and easy to communicate to others. It is also known as declarative knowledge. In contrast, implicit

or 'Tacit knowledge' represents personal knowledge, which is confined in human mind and difficult to formalize or codify and also difficult to communicate to others. This tacit knowledge helps the end-user to gain explicit knowledge as and when any individual requires. 'Tacit indigenous knowledge' (TIK) has been used interchangeably with other co-terminous terms like traditional knowledge, community knowledge, folkloric knowledge and local knowledge, to encompass the long-standing information, wisdom, traditions and practices of certain indigenous peoples or local communities. It is developed from experience gained over centuries and is used at the local level by communities as the basis for decisions pertaining to the fulfillment of their day to day needs, and is transmitted orally from generation to generation. It is stored in peoples' memories and activities and is expressed through stories, songs, art, legends, folklore, proverbs, dances myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment, materials, plant species and animal breeds. Thus, one of the basic features of traditional knowledge is that it is unwritten and exists in the minds of the local people. It is transmitted orally from one generation to another.

The origin of traditional knowledge or indigenous knowledge can be traced back to the ancient period. People used such knowledge from generation to generation for their livelihood in an unaccounted manner. However, the importance of traditional knowledge does not lose its value with the change of tradition into modernity. It plays a significant role in the lifestyle of the members of the local community and hence is an essential resource for any human development process. It forms the basis of decisions pertaining to food security, human and animal health, education, natural resource management and other vital activities. It is an integral part of the culture and history of local communities and hence a common asset in their efforts to gain control over their lives. No doubt, such knowledge is recognized to be beneficial in development strategies. Brokensha (1990) found that such knowledge system is essential for development.

### **Traditional Medicine vis-a-vis Health Care**

Health care practices constitute a major element in

every culture. The medical system prevalent in a society is a combination of traditions, beliefs, techniques, ecological adaptation, etc. This system is an integral part of the society and provides the means to the member of the society for maintaining health and preventing and curing diseases (Medhi, 1995). Allopathic doctors and clinics are not easily available among many rural communities of the world, and in such situations they still had to rely on traditional medicinal systems as their primary healthcare. Again in many cases people are practising traditional health care system where modern medical facilities have been established and doctors are easily available. This is because the modern doctors do not offer any psychological or spiritual consolation. Religious beliefs, practices and institutions have been important parts of the health care sector throughout the centuries. Faith-based curing and healing of some serious health problems such as mental illness and various other visible bodily and psychosomatic diseases are witnessed among many organized religious denominations (Howard and Janet, 1992). Religious specialists as healers and curers are in the forefront of dealing with the problem of health and disease in almost all societies, and particularly in traditional societies (Scupin and DeCorse, 1995). Health professionals need knowledge of culture and cross-cultural relationship skills because health services are more effective when responsive to cultural needs. The most important fact about traditional medicine is the way it is integrated into a whole culture. The concept of health and disease are basically biological but it has a close relation with the socio-cultural system of a society. Every culture has their own concept of disease and illness and some specific ways of coping with it. Medical system is an integral part of a culture. Every culture develops its own medical culture.

### **Documentation Needs**

Two interrelated issues emerged from the discussions demanding attention. The first one is that traditional knowledge in general and traditional medicine knowledge based on plant resources in particular do not belong to written traditions. The knowledge was orally transmitted from generation to generation within the traditional setting. The tradition being in the process of

change and the associated enabling traditional ambience of oral transmission losing ground in modernity, the undocumented traditional knowledge is in the process of disappearance. The second issue concerns its strategic relevance and importance in contemporary and future human development process. The contrasting situation therefore demands intervention in order to preserve traditional knowledge and its documentation therefore is very important. Warren *et al.* (1993) commented that the collection and storage of indigenous knowledge should be supplemented with adequate dissemination and exchange among interested parties using newsletter, journals and other media. In the context of health care system the combination of both traditional and modern practices are recognized to make important contributions, and hence documentation of traditional health care practices would be very useful for the benefit of humankind.

The documentation need is more imperative in present times because of the vulnerability of the knowledge to bio-piracy within the frame of intellectual property rights (IPR) regime. Two important points emerge from the discussion which makes it imperative to preserve traditional plant medicine knowledge, namely its declining stage in the context of transformation process from tradition to modernity, and the threat in IPR regime.

### **Declining State of Traditional Medicine Knowledge System**

Indigenous peoples are the repository of unique knowledge of the natural resources on which they depend around the world. The main reasons that contribute in the loss of indigenous knowledge are rapid land degradation such as accelerated destruction of forests, people's access to modern medicine and exposure to modern culture, and acculturation or adoption of modern culture. This shows that the passing down of customs from generation to generation is now in imminent danger of disappearance. The vast knowledge on traditional uses of plants is not fully documented and most of the knowledge is conveyed from generation to generation by word of mouth. Documenting Indigenous Medicinal Knowledge (IMK)

may help to preserve implicit indigenous medicinal knowledge. Today, the cultural survival of many indigenous communities is threatened, and some traditional systems of disseminating knowledge may already be lost. Modern lifestyles and the disruption of traditional ways of life may cause younger generations to lose interest in learning about traditional medicine. Traditional languages used to pass down information may no longer be as widely understood.

In order to conserve traditional medicine knowledge, it is necessary that inventories of plants with therapeutic value are carried out, and the knowledge related to their use documented in systematic studies. These studies can have other values too for society besides conserving traditional knowledge, for they can help to identify plants with market potential that can generate incomes for local communities. Hence, documentation of cultural heritages as a whole of the country in particular is one of the ways in preserving the indigenous knowledge of the people on medicinal plants before it is lost irretrievably.

### **Intellectual Property Rights**

Traditional medicine knowledge lies in its importance to the pharmaceutical industry especially in the area of drug development. Undeniably, traditional medicine has the capacity to provide novel inputs into the drug development process, as well as boost pharmaceutical drug discovery by very high margin. The immense benefit of traditional medicinal knowledge in the pharmaceutical drug development has given rise to bioprospecting as well as its illegal counterpart – bio-piracy. The challenges of the digital era tends to focus on the ownership rights of companies and individuals but far more daunting to the poor in developing societies are the challenges raised from waves of legislative changes to copyright and patenting law that are led by multinational companies seeking to define ownership of knowledge and to a large extent what knowledge is (Randhawa, 2009). The ability of IPR to erode traditional knowledge becomes evident on closer examination of the unique characteristics of traditional knowledge. In most cases, traditional knowledge resides in a community as opposed to an individual.

Western notions of copyright and individual rights to

privately own and control information is at odds with traditional notion that knowledge is collectively own and shared. Hence, the application of IPR in attempt to preserve and protect traditional knowledge would result in a dilemma. First, Western concept of IPR does not admit of communal ownership. Hence, if we seek to preserve and protect traditional knowledge by privatizing it, such attempt will divest it of its basic characteristics of communal ownership. This would be destructive rather than preservative. Application of modern IPR regime to traditional medicine knowledge will also have the effect of depriving the local people access to such knowledge as ownership of the knowledge will be vested in the patent holder. More so, in a world where the access to knowledge movement seems to be gathering momentum, attempt at privatization of traditional knowledge would meet serious opposition from this group also. If on the other hand, traditional knowledge is left without any basic form of protection, it will result in difficulty of access as the holders will be unwilling to disclose for fear of bio-piracy along with the resultant effect of expropriation without compensation. This would result in restrictive access to knowledge.

The need for a sustainable framework that meets the diverse interests associated with traditional medicine knowledge especially the local people is now becoming all the more obvious. This is further substantiated by the fact that the current trend in the globalization of knowledge especially in relation to once relatively obscure TK requires the establishment of a framework that will address the fear of local communities in making their knowledge accessible for beneficial use. A sustainable framework to this effect will be one that will preserve the communal rights characteristic of traditional knowledge, enhance access to traditional knowledge for scientific discovery and innovation while at the same time granting traditional communities equitable access to any commercial benefit arising from the use of such knowledge.

### **Obstacles to Documentation**

These benefits notwithstanding, the ease with which information could be copied and transmitted raises issues as to the ability of the communities to continuously



ensure ownership and integrity of their knowledge and that its sacred features are not compromised. The other dimension is the individualistic nature of some traditional medicine knowledge. Although, traditional medicinal knowledge is generally conceived as being communal in nature, undoubtedly, there are aspects of traditional medicine knowledge which usually resides in an individual as opposed to a group or the community. According to (Mgboji, 2006) it is incorrect to assert that the knowledge and skills possessed by native healers are in public domain. This belief according to him is flawed because native healers, as a matter of fact rarely reveal the secrets of medicinal or herbal remedies which they individually possess.

Local communities are usually apprehensive of documentation of their traditional knowledge outside their traditional oral medium for fear that it may be misused, stolen, used against them or that they will lose claim to the knowledge after documentation. These fears have in many cases presented serious obstacles to successful documentation of traditional medicine knowledge. Another problem that also merits attention in relation to documentation of traditional medicine knowledge has to do with verification of the knowledge. If a particular drug or plant species is alleged to cure a particular ailment, there is need to verify this claim before documentation. Verification of traditional medicine knowledge during documentation is a big challenge since in most cases, the individuals or institutions involved in the documentation are not really traditional healers themselves and may have to depend on some other sources for verification of information they receive. (Magara, 2002) also observed that the oral nature of traditional medicine knowledge makes it difficult to ascertain the authenticity of oral sources that are often forgotten. The challenge in some cases may boil down to how to document some unrecorded traditional medicine knowledge without validation and claim that it works. Verification is very important to the extent that it serves as a safety measure to counter the deadly effect that may result from application of a wrong or bogus treatment to an ailment.

Traditional medicine knowledge is the absence of collaborative effort by various government agencies in

developing countries. Various government departments and agencies as well as even NGOs are actively involved in traditional medicine knowledge documentation. But unfortunately, the efforts are not well coordinated and in most cases resulting in waste or duplication of efforts. The benefits of traditional medicine knowledge therefore warrant efforts to deal with the obstacle to documentation and accessibility. Documentation in some permanent form will be beneficial not only for the local communities but for common good of all by creating a large door for innovation and development. Current trend in information communication technology provide mediums for the digitization of traditional medicine knowledge as well as access to same. Such digitization will serve as a focal reference for research and development of traditional medicine.

### **Documentation and Digitization**

Traditional knowledge cuts across numerous developmental issues including food and agriculture, biodiversity, desertification and the environment, human rights, cultural diversity, trade and economic development (Okujagu, 2009). One of the basic features of traditional medicine knowledge lies on the fact that it is transmitted orally and/or by observation from generation to generation in a given community. Just like indigenous knowledge, traditional medicine knowledge is predominantly tacit, embedded in the practices and experiences of its holder(s). While the medium of transmission is usually through personal communication and demonstration from the tutor to the pupil or apprentice, from parents to children, Sithole, 2007 observed that the traditional medium adopted for preservation includes taboos, symbols, myths/legends, rituals as well as poetry and folklore. This method of preservation of traditional medicine knowledge in traditional societies is quite inadequate in a complex and dynamic world. In traditional societies, there was hardly any effort at comprehensive documentation of traditional medicinal knowledge. In rare cases where bare documentation exists, it was usually in the traditional dialect of the local communities. This feature of traditional medicine knowledge also constitutes a major threat to its preservation. Since, it is usually

undocumented, the knowledge dies with the holder(s) if not transmitted or if the chain of transmission is broken.

One of the best modern approaches to preservation of traditional knowledge is documentation in some permanent form and public accessibility using information and communication technologies. There are many benefits that derive from documentation and digitization of traditional medicine knowledge. Furthermore, high population pressure which has led to high demand for medicinal plants and intensive land use for agricultural and livestock expansion pose great danger to the very existence of plant diversity. Many plants which were earlier easily found are becoming scarce and at risk of becoming extinct unless strong conservation measures are taken. To preserve the traditional knowledge of plant use or our biodiversity generally, and to be able to suggest ways for their conservation, it is important to have readily available information on medicinal plants that still exist, where to find them and their uses.

Digitization of traditional medicine knowledge is the surest means of documentation for preservation. One of the major problems with traditional medicine knowledge which is highlighted is the oral nature of the knowledge. Hence documentation ensures preservation of this delicate knowledge and ensures wider dissemination. It will also result in codification of best practices which can be transmitted across communities. Additionally, documentation and online accessibility of traditional medicine knowledge will provide an active tool for research and innovation. (Gupta, 2005:172) was of the view that this will act as 'a bridge between modern science, modern medicine and traditional knowledge, and can be used for international advanced research based on information on Traditional Knowledge for developing novel drugs.' Further to that, documentation of traditional medicine knowledge provides room for validation or authentication of the knowledge claim.

### Praxis in Social Science Research

With the backdrop of the significance of documenting traditional plant medicines a research was conducted. The purpose was not to study the plants and record them following traditional approach. The most important

part of this research was to make the findings available to all who are interested in it. Obviously, documentation for the purpose dissemination of knowledge among the common people and its use for common benefit in the area of health care was a significant contribution of this study.

### Area of Study

The District Koraput is popularly known as the land of aboriginals due to their sizeable population which acts as the natural Laboratory for the documentation of traditional knowledge. It is located between 82°5' East to 83°13' East longitude and between 18°13' North to 19°10' North latitude with an area of 8807 sq. kms. The District is the home to as many as 25 different tribal communities like, Paroja, Saora, Bhumia, Godaba, Didayi, Dogaria, Kondha...etc. Semiliguda block is situated 22 kms away from the headquarters with a geographical area of about 313.56 km. After the initial survey, Renga panchayat was selected as the study area considering the availability of Godaba tribal herbalists.

### Objectives

The present study tries:

- ❖ to explore the importance of documentation and digitalization of tacit indigenous medicinal knowledge;
- ❖ to critically analyse the inadequacy of the existing frameworks in protecting and enhancing access to traditional medicine knowledge ; and
- ❖ to discuss the various efforts by governmental and non-governmental organizations towards documentation and digitization of traditional medicine knowledge.

### Methods Used

A preliminary survey was conducted in the Semiliguda block of Koraput District to prepare a database about the local Godaba healers in prescribed forms. Then information about the ethno-medicinal uses of plants to treat various diseases was collected by the methods given below from those healers who were interested to disclose information. Three basic approaches

**Table 1:** Medicinal plants used by traditional healers from Semiliguda block

No	Scientific Name	Odia Name	Local Name	Family	Description of Plant	Parts Used	Name of The Disease	Mode of Application
1.	<i>Adhatoda vasica</i> <i>Nees</i>	Basanga	Bhotachali	Acanthaceae	A bushy shrub with large minutely pubescent ellipticacuminate leaves with a foetid smell and large white flowers.	Bark	Stomach pain	For stomach pain bark is crushed and taken.
2.	<i>Asparagus racemosus</i>	Satabari	Deobadini	Liliaceae	An erect shrub with woody prickly shoots. Leaves reduced to minute scales. Flowers white, sweet-scented long in very short racemes	Tuber	Joint pain, stomach pain	For joint pain tuber is crushed and applied. For stomach pain tuber is boiled in water and is taken.
3.	<i>Ageratum conyzoides</i>	Pokasungha	Gandhiridala	Compositae	An erect hairy herb with ovate hairy petioled leaves. A very common plant often found as weed in cultivated fields.	Leaf	Scabies	Leaf paste is applied on scabies.
4.	<i>Artocarpus integrifolia</i>	Panasa	Phanas	Moraceae	Large tree with dense elliptic entire leaves, petiolate. Stipules glabrous long sheathing and leaving an annual scar mark after falling. Flowers tepals-2. Large fruit.	Root	Lactation in expectant mother	Fresh root is crushed and taken orally to enhance lactation in expectant mother.
5.	<i>Argemone Mexicana</i>	Agara	Kantakusum	Papavera-ceae	A prickly herb with pinnatifid greenish white leaves. Flowers yellow. Capsule long.	Latex	Rheumatic pain, infection of eye	Latex is massaged on body to get relieve of rheumatic pain. Thin liquid is applied on eye for eye infection.
6.	<i>Brassica juncea</i>	Sorisa	Sorsu	Cruciferae	Herb with long petioled compound leaves, often small leaflets along the petiole, glabrous or white hairs near base of plant. Flowers bright yellow, pedicels and calyx	Seed	Skin disease, cold	For any type of skin disease mustard oil is applied along with turmeric. For cold mustard oil is heated along with garlic and applied in feet, palm and chest.
7.	<i>Calotropis gigantea</i>	Arakha	Asclepiada-ceae	Asclepiada-ceae	A stout shrub. Leaves large broad sessile. Flowers light purple, large in cymes.	Root, Latex	Migrain, Snakebite	In case of migrain the latex is inserted into the vein of the forehead. The root of the plant is taken orally for snakebite

8.	<i>Caryota urens</i>	Salapa	Palmaceae	Palmaceae	A stout palm with ringed trunk. Leaves pinnate and long. A female flower lies in between two males. Fruit globose.	Root	To get relieved from the effect caused due to intake of salapa in case of pregnant women.	For ladies who have taken salapa during pregnancy, to remove the effect of salapa, the root of the tree is taken along with bamboo leaf, bark of tamarind tree and bark of champa tree are boiled and given to the patient.
9.	<i>Citrus medica</i>	Lembu	Rutaceae	Rutaceae	A thorny bush. Flowers often unisexual and pink. Fruit mamillate at the apex.	Fruit	Boil, Vomiting	For boil, lemon oil is applied. For vomiting lemon juice is taken along with water.
10.	<i>Colocassia esculenta</i>	Saru	Araceae	Araceae	Tubers small. Leaves dark green in colour. Flower in spadix.	Tuber	Boil	The paste of the tuber is applied locally to cure boils.
11.	<i>Curcuma montana</i>	Sakuta	Zingiberaceae	Zingiberaceae	A herb with elliptic or oblong leaves. Flowers in dense Spike.	Rhizome	Fever	The rhizome crushed and taken orally
12.	<i>Cassia occidentalis</i>	Kalachakunda	Caesalpinaceae	Caesalpinaceae	An erect herb with compound leaf. Flowers yellow in axillary and terminal racemes. Pod long, flat.	Leaf	Wound	The paste of the leaf is applied on wounds.
13.	<i>Cardiospermum helicacabum</i>	Phutaphutika	Sapindaceae	Sapindaceae	An annual wiry herb with acuminate leaflets. Flowers white. Capsules depressed pyriform and winged at angles.	Tuber	Joint pain	For joint pain, tuber is boiled in water, crushed and is applied
14.	<i>Curcuma longa</i>	Haladi	Zingiberaceae	Zingiberaceae	A herb with rhizomatous stem. Leaves usually oblong. Spikes short with peduncle.	Rhizome	Round worm, Skin disease, Snake bite	For children a paste of turmeric and neem is given orally to cure roundworm. For skin diseases paste of turmeric is applied along with mustard oil. Turmeric is also used against snake bite



15.	<i>Gossypium hirsutum</i>	Kapa	Malvaceae	Malvaceae	A coarse, stunted, rounded bush, much branched, yellowish-green, usually covered with dust from the character of the numerous hairs on the shoots, petioles and leaf-veins. Leaves are thin, three lobed, lobes short, triangular, with straight margins. Base rounded, cordate. Balls large, spherical, ovate, cotton white.	Root and fruit	Cough	Root and fruit is crushed together and taken.
16.	<i>Ocimum canum</i>	Banatulsi	Labiatae	Labiatae	Erect slender herb. Stems densely pubescent. Leaves elliptical, entire with slender petiole. Flowers in a whorl in terminal racemes.	Leaf	Migraine	For migrain, leaf of <i>Ocimum canum</i> is crushed along with garlic and applied along with oil.
17.	<i>Lawsonia inermis</i>	Manjuati	Lythraceae	Lythraceae	A large shrub with often thorny branches. Leaves opposite. Flowers small in terminal paniced cymes. Fruits dry: seeds many, smooth	Root	Jaundice	The root is crushed and taken with water of raw rice to cure jaundice.
18.	<i>Mangifera indica</i>	Aamba	Anacardiaceae	Anacardiaceae	Trees with flowers in terminal panicles. Fruit, drupe large with fleshy and fibrous mesocarp.	Bark, Kernel	Diarrhoea, Bleeding of nose	The bark of mango along with the bark of <i>Psidium guava</i> is crushed together and taken to cure diarrhoea. The juice of mango kernel is poured into nose to stop bleeding in nose
19.	<i>Allium cepa</i>	Piaja	Liliaceae	Liliaceae	Usually a pungent smelling herb with tunicate bulbs. Leaves mostly narrow and flat. Flowers greenish-white in umbels.	Bulb	Cough and cold	Burned onion and ginger is taken along with flower of <i>Plumeria rubra</i> to cure cough and cold
20.	<i>Acorus calamus</i> L.	Bacha	Aracaceae	Aracaceae	A herb with long leaves. Flowers light green.	Root	Dumb	The root is given to children who are unable to speak.

were adopted to study the uses of plants by Godaba communities:

- ❖ An interview based approach in which questions re-lated to the uses of plants for different purposes (i.e. medicine, food, fuel, fodder etc.) was recorded with the help of an informant while making visits to the forests for the collection of plant species and their identifications.
- ❖ An inventory based approach involving collection of plant specimens and subsequent interviews with in-formants registering the local names and uses of the plants collected.
- ❖ An interactive discussion approach through meetings and discussions held with various stakeholders like, traditional herbal healers (vaidyas), school teachers, social workers and local people to record about the different uses of plants, methods and periods of collection, their conservation strategies and the fate of traditional knowledge systems, etc. The folk lore knowledge about the use of plants for medicinal purposes was also collected.

These Godaba healers were interviewed about the plants that they use for medicinal purpose, the disease for which they use the plants, the parts which they use and the mode of application. Informants were chosen with the help of elderly people and school teachers in the study sites. Unstructured interviews were conducted, with the help of local translator. Before conducting the interviews, informants were briefed about the aims of the study.

## RESULTS AND DISCUSSION

The study reveals 20 ethno medicinal plant species that are frequently used for the treatment of various ailments in Semiliguda block. The medicinal value of each plant was enumerated in the following pattern:

Though the accessibility of Western medicine for simple and complicated diseases is available, many people in the sample area of Semiliguda block still continue to depend on medicinal plants, at least for the treatment of some simple diseases such as, cold, cough, fever, headache, poison bites, skin diseases and tooth infections. Well-

knowledge healers have good interactions with patients and this would improve the quality of healthcare delivery. The present day traditional healers are very old. Due to lack of interest among the younger generation as well as their tendency to migrate to cities for lucrative jobs, there is a possibility of losing this wealth of knowledge in the near future. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens.

### **Digitalisation: Collaborative Efforts of COATS and Research Team**

Traditional medicines are an invaluable resource for humankind. It is used to refer both traditional medicine system and various forms of indigenous medicine. Tribal people are endowed with enriched traditional wisdom to use available nature resources around them. Each tribe has explored the medicinal property of herbs in their area by observation and trial and error method. They followed their own health practices, believes, spiritual therapies and exercises. They are comprehensively knowledgeable in the usage of plant for treating various diseases. The accessibility, availability, low cost with less side effects and reliable therapeutic efficacy, traditional Indian medicine drew the attention of global market and many pharmaceutical companies in discovering natural bioactive compounds. Therefore, it is important to collect, document the traditional knowledge of tribal people on traditional medicine and conserving information on indigenous medicinal plants for exploiting as a novel bioactive compounds for treating infectious diseases.

Digitalization of all this information is possible because of the development of database system. Antidiabetic plants used in ethno medicine is digitalized and made available in online. It consists of information like name of the plant, geographical distribution, and part of the plant investigated, dosage, active constituents with antidiabetic property with their structures, physical and chemical properties and its action. In order to bring out the knowledge of traditional medicine to the modern world and to make it accessible from everywhere a database has to be generated. There are many databases on medicinal plants. The data can be searched through

the search page available in the top panel. Basically, the user can search the database by three names such as the scientific name of the plant, vernacular name and finally by the disease name. The left panel contains title like plant name, vernacular name and disease which are hyperlinked. The search results appear in the new page with the details of the plants. Detailed information about the plants is being displayed in a separate web page containing common name, scientific name, family, classification, physical characteristics, medicinal uses, active constituents and references which is hyperlinked. The photograph of each plant is also displayed in the same page. In the disease search option, all the plants used for the particular disease will be displayed. Each one is hyperlinked with its plant profile file.

The collected plants were preserved in herbarium for identification. The plants were identified with the help of local experts by following Haien's Flora and submitted in COATS, Koraput. Herbarium of specimens were prepared and deposited in COATS, Koraput. The Council of Analytical Tribal Studies (COATS) is a prestigious institution which is the first of its kind established by a voluntary organization to undertake extensive studies on tribal and their problems with the sole object of supplementing the efforts of Govt. in the sphere of socio-economic development of tribal in this area of their predominance which is an epitome of tribal problems in the State. The institution has the distinct feature in contrast to the Scheduled Castes and Scheduled Tribes Training and Research Institute, Bhubaneswar functioning under the administrative control of the S.Ts & S.Cs Development Dept. of Govt. of Orissa, providing training facilities which are only confined to govt. servants, whereas COATS imparts training to all (both Govt. servants & N.G.Os) apart from providing wider scope in the spheres of teaching and research to those interested in tribal affairs and allied matters. *The institution* takes the first step to develop a database or repository of indigenous traditional knowledge. It is required for making a selection and scrutinization of data to be stored in a database. The storage and retrieval of indigenous traditional knowledge is a difficult process which requires classification, indexing and assigning metadata for making the database accessible to the

users. Keeping this in mind it considers the storage and steps are taken to consider classification of textual data, graphical, pictorial, audio-visual picture of indigenous traditional knowledge in database. By developing the database is not the end of the process. The next important step taken is to promote the library services as it prepares the strategy of information services to disseminate information. It is essential to propagate the use of indigenous traditional knowledge for human causes through certain activities such as seminars, workshops, debates, lectures and exhibitions in which such stories of indigenous traditional knowledge use need to be reflected.

Adequate publicity majors have been taken-up so that people are aware about the use of indigenous traditional knowledge in their daily livelihood. Library plays a very significant role in acquisition, organization and dissemination of knowledge in any subject. Libraries available in rural areas are the sources of such indigenous traditional knowledge and can act as a key agency in local community for collection, organization and preservation of local culture. A significant measure that is taken up by the institution is that after identifying and collecting such information, the appropriate technology is used for capturing that knowledge in variety of media such as, audio, video, digitized, electronic database. All such knowledge available in libraries is then digitized in systematic classification, cataloguing and indexing so that effective retrieval can be made. Whenever required, retro conversion of those documents can be done for developing digitized format. The traditional knowledge digital library is developed with the objective to protect the ancient and traditional knowledge of the country from exploitation such as bio-piracy and un-ethical patents. Such system of digital library strengthens indigenous traditional knowledge system which will be ultimately used for sustainable development of people. The present research team took advantage of the documentation process of the COATS to preserve the plant medicine samples collected from the field.

## CONCLUDING REMARKS

Odisha is the land of enriched cultural heritage and traditions. It has a vast reservoir of indigenous

knowledge existing in rural society. Indigenous traditional knowledge is the real knowledge exists in people's mind, local society, which is more informal in nature. This sort of knowledge represents the human mind with insight on how a large number of communities manage their livelihoods through an informal knowledge system. In spite of the present modern world the people and knowledge seekers are searching for traditional knowledge to unfurl the mystery of such knowledge system and revive the indigenous traditional knowledge scenario. It is acknowledged fact that the indigenous traditional knowledge system is essential for development for which it is required to prepare documenting such knowledge sources existing and useful for the people at large and develop a documentation centre in a State like Odisha. The responsibility of documentation centre is to identify the knowledge sources, information sources and acquire the details of each knowledge entity, classify them, prepare metadata, develop databases to preserve those information for further use. The preparation of electronic database of indigenous traditional knowledge is the need of the hour. The collection and storage of indigenous knowledge should be given priority with right dissemination among interesting organizations and individuals. Promotional activities and publicity majors are required to be taken up to promote the use of libraries that appears to be very significant in acquisition, organization, and dissemination of indigenous traditional knowledge related information to the users and the public. Until an equitable framework which defines and addresses the legitimate diverse interests of all the parties in this dispute is put in place, access to TK will continue to be difficult and problematic. It is hoped that this research will contribute to the on-going debate as to the appropriate framework that will adequately protect the basic characteristics of TK while at the same time ensuring access to traditional knowledge and information.

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