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METHODOLOGY & STUDY AREA

2.1 Methodology Framework
The framework for this study was based on principles of ethnobotany (Cotton, 1996), ethnopharmacology (Etkin, 2001), and ethnomedicine. Social science methods were used to determine a population and sample which well represent the diversity of Saora traditional healers. A variety of research tools were used to generate data on 1) The system of treatment; 2) Health conditions; 3) Preparation methods; 4) Materia medica; and 5) Socio-demographics among healers. Data analysis methods were specific to each type of data that was collected.

2.1.1 Population of Saora and their Villages
Estimated numbers of Saora villages found in Pithora, Sankara and Kasdol Tehsil (Sub-districts) and Blocks of Raipur Division were obtained from various Government Records and Offices. This study was focused on the population of Saora settlement located in these three sub-districts and blocks areas. From Aug. 2003 to Dec. 2004 these areas were opportunistically selected for surveying Saora Villages for traditional healers. Saora community was predominantly a forest dweller, farmer and labourers with similar culture, traditions and language. Only villages which were over 15 Saora households, according to village data were included for the study. 40 Saora villages have been surveyed out of which 400 Saora households were covered.

2.1.2 Population and Sample of Healers
For the present research work the populations were categorized in three criteria, the first population consisted of blocks located in Raipur Division of Chhattisgarh State. A sample of blocks and Gram Panchayats known to have Saora population was randomly selected. A second population of 40 Saora Villages was surveyed for
Traditional Healers. A third population of 56 Saora traditional Healers was identified and healers were interviewed from this population until a target of 40 Healers was reached. During the process of recording and documenting data, this number was reduced to 30 healers who participated in in-depth study.

2.1.2.1 Population of Traditional Healers

Triangulation is conducted by posing a question in different ways and times to several informants (Alexiades, 1996). This method is effective for cross-checking and validating information.

Triangulation methods were used for collecting information from herbalists, blowing doctors and spirit healers. In each surveyed village, groups of local residents were selected by approaching people who were outside their homes and available for a few minutes. Leaders of the village and shop owners were specifically targeted for interviews, because they are often quite knowledgeable of local current events. Interviewed residents were asked to list traditional healers in their village and neighboring villages. They were also asked to list Saora villages in their nearby to verify and add to our list of Saora villages. Surveys among the general population in 40 villages identified 56 traditional healers, including herbalists, blowing doctors, spirit healers. Some healers were identified as multi-skilled healers, and these healers are distinguished.

Table: 2.1

<table>
<thead>
<tr>
<th>Type of Healer</th>
<th>Pithora</th>
<th>Sankara</th>
<th>Kasdol</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbal</td>
<td>15</td>
<td>13</td>
<td>18</td>
<td>46</td>
</tr>
<tr>
<td>Spirit</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>06</td>
</tr>
<tr>
<td>Herbal / Spirit</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>19</td>
<td>26</td>
<td>56</td>
</tr>
</tbody>
</table>
2.1.2.2 Sample of traditional healers

Purposive sampling or judgment sampling, as described by Bernard (2002), was conducted by developing specific criteria for a study group and then locating individuals who fit these criteria. This method is often used to test a hypothesis with a representative sample in pilot studies and to describe cultural phenomena. Purposive sampling was used in this study to select sample healers according to established criteria (Table 2.2). Quota sampling, as described by Bernard (2002), was conducted by identifying subpopulations of interests and then, establishing the proportion of these subpopulations that will be used for the final sample. Quota sampling was used in this study to determine a sample number of 30 healers, which was the maximum number of healers that the resources of this research could support. This sample number was proportioned into 20 herbalists, 4 bone settlers' doctors, and 6 spirit healers. Disproportionate sampling, as described by Bernard (2002), is often used to ensure that a sub-population is represented in a random sampling of the population. The population is broken up into different strata and random sampling is conducted among these strata.

Table: Criteria of the study group. The symbol ‘*’ marks the only criterion that determined from data generated during healer surveys among the community, in contrast to profile interviews which were used to determine the remaining criteria.
All healers who were identified by villagers as traditional healers were considered to have healing capabilities that were respected among local people (criterion 2). Healers who were triangulated by village residents (identified by more than one villager) were considered more likely healers to pass criteria. These healers were interviewed using profile interviews. If a triangulated healer passed all criteria, different types of healers in the same village or sub-district were interviewed. In this way, clusters of healers were formed to reduce pressure on time and financial limitations. A total of 56 healers were interviewed in February-May 2004. It was not always a straightforward process to determine if healers passed the criteria. Criterion 1 was challenged when healers stated that they had one Saora parent. In this case, the healer passed the criteria if the healer had a Saora mother, grew up in a Saora village, and learned from a Saora healer. Criterion 4 was challenged when healers reported they learned from themselves and spirits. Healers who learned from spirits were included in the study because, as ethically Saora people, it was assumed that spirits originate from Saora culture. Multi-talented healers were another challenge in the sampling process. To overcome this, the healer's main area of expertise was determined by weighing perceptions of the healer from three different sources. This included other community members (data collected from survey and triangulation methods), the healer, and researcher. In this way, most healers could be categorized into one type of healer.

During the process of recording and documenting data, this group of 56 healers was whittled down to 30 healers according to personal rapport with the healer, logistic criteria, and supplemental criteria that was specific to the healer type. Logistic criteria included growing reluctance to share their knowledge with us, time conflicts that made them unavailable, and quotes of exorbitant fees to share their knowledge. The supplemental criteria were developed during the interview process to increase the quality of data generated among the healers by identifying the most talented and knowledgeable healers. These criteria were based on basic
definitions of the types of healers that were developed as the sample selection progressed. Herbalists were defined as healers who are able to specify the plant parts and names used to treat health conditions, method of using the plant, symptoms of health

2.2 Research tools for collecting data
Field trips were conducted from February 2004 to July 2005 to collect data from the healers. Each healer was visited once every two or three months. Home stays were arranged in Community Hall of the village, house of the head of the village throughout the study area. During the field trips these homes were used as a base for few days that was spent visiting other healers in the district. Healers were visited in rounds, and each healer was visited at least of two times. The number of rounds for each healer was determined by the need to collect more data with the healer. The least that a healer was visited was three times and the most a healer was visited was 8 different times for a total of 20 days. In this way, interviewing methods and questions were tested and fine-tuned in the first round and the interview topics became more specialized and in-depth with each subsequent round.

Data was collected with profile and socio-demographic interviews, free-lists, health condition logs, observation and unstructured interviews, treatment interviews, plant specimen collections, and participatory observation. Each research tool is described below. Refer to Tables and graphs (on Socio demographic profile, Health Profile, Healers Profile) for descriptions of data generated by each research tool and methods for categorizing these data. Profile interviews, Socio-demographic interviews, Health condition logs consisted of forms that were made prior to the field trip. These were handwritten on during the interview and later typed into a digital format. Results from free-lists, observation and unstructured interviews, and participatory observation were handwritten into Field notebook.
2.2.1 Profile interview

Profile interviews collected data which was used to determine if healers passed the established criteria to enter the sample group. These were structured interviews that were made prior to the field trip and were conducted during the surveying process.

2.2.2 Socio-demographic interview

Socio-demographic variables were selected for this study based on factors identified in past ethnomedicine studies. Nolan (1998) analyzed the effect of socio-economic factors with the number of plant applications reported. He noted that community distance from urban centers, county population density, and length of residence in a community and folk practice affected the number of plant applications reported. Socio-economic status, age, gender, occupation, and family size were considered predisposing characteristics among patients who used herbal medicine. The results showed that factors such as age, occupation, education, socio-economic status and distance to the clinic significantly influent the patient’s decision for selecting traditional medicine clinics over western clinics. Middle aged people with high education and better economical status preferred to use traditional medicine for the treatment of their illnesses.

The socio-demographic variables recorded in this study are 1) Obtaining and passing on knowledge; 2) Treatment activity among healers; 3) Birthplace and ethnicity; 4) Gender and Age; 5) Years practiced as a traditional healer; 6) Multiple treatment skills; 7) Languages and Literacy; 8) Household wealth; 9) Family size; 10) Population of village; 11) Ethnicity of village; and 12) Distance to district center and health clinic.

Socio-demographic interviews were made prior to the field trip. The interviews were conducted among two groups of people. Among leaders of the village, socio-demographic interviews were conducted as structured interviews at the same time
the introduction letter and informed consent was distributed. Among the healer and the healer's family, sociodemographic interviews were conducted as semi-structured interviews. Demographic interview questions with the healers were spread out through the course of the study or towards the end of the study period when the rapport with the healer was strong.

2.2.3 Free-lists

Free-listing is often used to determine discrete linguistic domains, by asking informants to list items within a category, such as kin, animals, plants, and diseases (Bernard, 2002). The length of the list (Brewer, 1995) and the frequency that an item is mentioned by informants (Bernard, 2002; Weller, 1988) can be statistically analyzed. Informants can be asked to elaborate on or organize the items listed, for example, by ranking a list of health conditions according to its degree of life threatening (Weller, 1984). The salience, or psychological prominence, of the listed items can be quantitatively determined by analyzing the order of the listed items, since informants tend to list the most significant items first (Martin, 1995). One disadvantage is that the list may not be complete, as it relies on memory recall of the informants. In this study, free-lists were used in-sync with the profile interview to generate baseline data on health conditions that healers could treat. Healers were asked, for example: ‘what kind of illnesses/diseases or symptoms can you (grandfather) treat?’ After listing some frequently treated illness, the healer was asked to elaborate on the symptoms, methods of treatment, and remedies for the illness. Free-lists provided a rough estimate of the healer's treatment capability, and helped to determine if the healer was appropriate for the study. For healers who were included in the study, free-lists provided a starting point for the collection of data.
2.2.4 Health condition logs

Health calendars were used successfully by Scott (1974) with ethnic groups in Miami to record the ways that families treated their health problems. With this method, families were asked to keep a health calendar describing their symptoms of illness and the action taken in response. Based on the records, further participatory observation and in-depth interviews were conducted to collect data on the etiology of health problems and the family's reasons for engaging in certain health behaviors. These logs are useful for collecting data on current health treatment activities among both traditional healers and families and provide descriptions from their perspective.

This method was modified in this study to focus on the treatment behavior among Saara healers, rather than among patients. Each time a healer was visited retrospective treatment logs were collected by asking the healers to provide information on health conditions that the healer had treated previous to the field visit. Specifying time parameters such as, within the last month, week or few days was necessary to generate information. The health condition logs were used to gauge the activity of the healer, stimulate new data on treatment practices and medicinal plant use, and verify collected data.

A typical interview began by asking the healer, 'During the last month did you treat any health conditions of patients?' If the healer answered, yes, then the healer was asked, 'How many patients came to see you?' This number was recorded and then, the healer was asked 'What kind of illness or symptoms did the last patient who visited you have?' The healer was asked to think back to each health condition that they treated until the number of patients had been fulfilled. In the case that healers did not treat any health conditions during the past month, the healer was asked to recollect the month before. If the healer treated numerous health conditions during the month (more than they could remember), then the time parameters were narrowed to a lesser interval, such as a week or a few days.
Among most healers, health conditions were recorded until at least 6 months of recollected health conditions had been documented for each healer. However, among very active healers (treating more than one patient a day), it was not realistic to reach this quota. During each field trip, these healers were asked to recollect the health conditions that they had treated day by day, until the healer could not remember farther back. After the healer had been part of the study for over 6 months (over multiple field trips), this data collection was considered complete.

2.2.5 Observation and unstructured interviews
Observations and unstructured interviews of healers were conducted throughout the field study to record data on treatment methods and their role as healers. This method was especially valuable for studying the treatment methods used by spirit mediums. During the process of recording Treatment ceremonies, for example, we discussed the ceremony multiple times with many different people (leader of the ceremony, other mediums and surrounding villagers) to gain a more comprehensive picture of the ceremonies and beliefs. Data generated from these methods were documented as handwritten field notes. These notes were used to identify distinctive characteristics among the healer types, which were tested on following field trips with the healers.

2.2.6 Treatment methods interviews
These interviews were developed mostly from observations and unstructured interviews with the healers. This method relied heavily on diversity of healers, high sample number of healers, and multiple visits with healers in order to generate the topics. Distinctive treatment characteristics were identified and developed into an outline of variables that was specific to each type of healer. The topics in the outline
were covered with each healer, so that standardized data was collected with the healers.

As an example, during an interview with one blowing doctor (A magico-religious practioner), it was noted that he only practiced his blowing treatment before eating. This was identified as a possible defining characteristic among blowing doctors. Following interviews with blowing doctors confirmed this, and this characteristic was included in the treatment interview. Throughout the course of the study, each blowing doctor was interviewed to collect data on this characteristic.

Interviews with blowing doctors focused on the practical aspects of the blowing method(s). No effort was made to document their blowing incantations, as these are usually highly guarded by the healer (or required monetary fee in exchange). Occasionally, healers volunteered to give their incantations and these were recorded.

2.2.7 Non Participant observation

This technique requires the researcher to participate in tasks with the community of study and observe the community members' interactions and daily life. Data may be collected by recording observations and asking questions (Alexiades, 1996). Participatory observation is considered a highly reliable technique. It reduces the possibility of behavior change among the people of study and offers the researcher an intuitive understanding of the culture which improves his/her ability to formulate more sensible questions (Bernard, 2002). However, it often requires a lengthy study period to form rapport with the community, which is necessary to gather valid data. This method can be quite useful within studies of ethnomedicine. Traditional medical knowledge can be highly guarded by healers and a lengthy correspondence using subtle and unobtrusive methods, such as participant observation, is often necessary to document knowledge. Voeks (1995) used this
method successfully to examine the plant pharmacopoeia and healing concepts used in spiritual healing ceremonies by traditional specialists in Brazil. Participant observation was used in this study to generate, collect and confirm data on treatment methods among all types of healers. But, this method proved most invaluable among spirit healers. In substitution of an authentic spirit ceremony with a patient, general spirit healers were asked to conduct fortune-telling ceremonies for us, so that we could experience and observe a spirit ceremony.

2.2.8 Specimen collection

Voucher specimens of materia medica were collected as dried specimens and photographs. Dried specimens consisted of plant material. These were fertile and infertile herbarium specimens that were usually collected from a site with the healer and raw materia medica plant parts) that was purchased or given to us by the healer. We rarely collected raw materia medica. Healers often keep very limited supplies of medicine. Even though a healer was often willing to give us the raw material, we usually preferred to take a photograph, out of respect to the healer’s trade. In the case that the healer had large quantities of a medicine or it was a common material, we purchased the raw materials from the healer as voucher materials. Photographs were taken of plants in the natural habitat as supplements to the herbarium specimens and raw materia medica that could not be collected, such as rare and valuable material, animal parts, and minerals. We did not seek out specimens of material which could not be found in the local area or were no longer used by the healer. Information on collected dried plant specimens were recorded into a Plant specimen notebook.

Complete and fertile specimens of each plant species were optimal. When infertile specimens were collected, healers were asked to detail the time of year when the plant flowered and subsequent collections were attempted to collect a fertile
specimen. Specimens were often verified with other villagers and healers to confirm the plants’ identity and generate more information on the medicinal plants. When a new name of a materia medica was generated, the healer was asked to describe the item. If the material was common, the scientific name was recorded. If the identity of the material was uncertain, we usually remarked ‘I don’t know this plant. I wonder what it looks like?’ and usually, the healer would volunteer to show us the material, if it was convenient (dried and collected in the house or growing near the house), or proceed to describe the material in more detail. If the identity of the plant was still uncertain and it was located far from the house or not visible at the time of year, the healer was casually asked to show us the plant the next time that we visited or at the time that the plant was growing or blooming. Plant collecting ventures were usually planned prior to the trip, by making an appointment with the healer at least a day before. Healers are often very busy and sometimes it was necessary to take short and direct trips. For example, a healer may only have time to take us into a forest in the morning before the healer took the cattle out to graze or in the late afternoon after the healer had returned. Tuesdays were targeted as plant collecting days, because healers preferred to collect plants on this day of the week, and in this way healers could collect plants while we collected specimens. A few healers were avid plant collectors and little notice was necessary for a plant collecting trip. Vernacular names of the material were recorded according to the name that the healer used with us, which has been referred to as the ‘Response’ name throughout the remainder of this manuscript. On some occasions, plants with similar names were collected with other healers. In this case, plant vouchers (as dried specimens or photographs) that were collected with one healer were verified with another healer (who did not accompany us to collect the plant) to determine if it was the same species that the healer used.
The scientific names of plant specimens were identified using a variety of resources: Chaweerat, 2005; Chaweerat, 2005; Gardner *et al.*, 2000; Lekagul, Round, 1991, Bumjob *et al.*, 2003; McClatchey, 2005; Mokkamul, 2005; Picheansoonthon, 2005; Picheansoonthon *et al.*, 2003; Picheansoonthon and Jirawong, 2003; Bonchai, 1997; Chalermglin, 2002; Smitinand, 2001; Majchacheep, 1999; Thai traditional medicine, 2004; Songwonsombut, 2002; and Songwonsombut, 2002. The identification of some specimens were confirmed at the Govt. Ayurveda College, Raipur, and Experts from Chhattisgarh Minor Forest Produce Cooperative Federation (A Subsidiary of Chhattisgarh State Forest Department).

2.3 Organizing data

Data generated from the research tools was collected in three separate collections called Field notebook, Healer data collection, and Plant specimen list. Data from Field Notebook was later dispersed into Healer data collection. As a result, Healer data collection and Plant specimen list formed the main collections of data.

2.3.1 Field notebook

The field notebook was made up of notes taken from the field. These included data from the free-lists, participatory observation, observation, and observations and unstructured interviews with the healer and community members and a record of all events and activities occurring with the healer and surrounding community members. Notes were coded by the date and healer we were visiting when the note was taken. After returning from the field, this information was copied and filed into the relevant Notes categories of the Healer data collection.

2.3.2 Healer data collection

Healer data collection was organized into three separate collections titled Herbalists & Magico-religious practicner. Each collection was further organized by healer.
codes. After each visit with a healer, data was added, re-organized and evaluated to identify activities and the direction for interview topics that should be covered on the following round with the healer. After the second or third visit with a healer, this document became fairly detailed and was used directly to guide interviews and verify previously collected data.

2.3.3 Plant specimen notebook
This was a record of all the dried plant specimens that were collected from the field. This document was organized by specimen number and included such data on the specimen as number of specimens collected, local name of the plant, collection date, healer or person who showed us the plant, location of specimen, morphological, ethnobotanical, and other associated informations on the species, and parts of the plant included in the specimen. This information was later transferred to labels for herbarium plant specimens.

2.3.4 Multi-lingual data collection
Discussions with Saora community members were usually conducted in Chhattisgarhi as intermediary languages. During the interviews, the first responses (R) of the healers to our inquiries of health conditions and materia medica were recorded first. These were the names that were used in throughout following interviews and discussions with the healers. Later, healers were asked for the health conditions and materia medica and these were noted.
Table: - 2.3 Outline of healer data collection notebook, notes category of information included for each of healer; Source / Method: origin of the information from Notes category or the method used to generate this information; Description: information that is included in the specified Note category; Dispersal site: Other note categories where information from original note category was dispersed.

<table>
<thead>
<tr>
<th>Notes category</th>
<th>Source/ method</th>
<th>Description</th>
<th>Dispersal Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and location of the Healer</td>
<td>Profile Interview Method</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Check list</td>
<td>------</td>
<td>Check list of activities to be conducted with healer to complete research study</td>
<td>------</td>
</tr>
<tr>
<td>Field Notes</td>
<td>Field note book</td>
<td>Record of activities conducted during each visit with healer.</td>
<td>Profile and socio-demographic interview, Treatment interview</td>
</tr>
<tr>
<td>Socio – Economic Demographic with the Head of the Village</td>
<td>Socio demographic interview method.</td>
<td>Socio demographic data of community</td>
<td>------</td>
</tr>
<tr>
<td>Profile Interview</td>
<td>Profile interview method, field notebook.</td>
<td>Healer’s basic personal history and defining characteristics as a healer.</td>
<td>Socio-demographics interview with healer, Treatment methods.</td>
</tr>
<tr>
<td>Socio Economic interview with Healer / Community</td>
<td>Socio economic interview method</td>
<td>Healers personal historic background and socio economic data.</td>
<td>Profile Interview</td>
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<td>Treatment Method</td>
<td>Treatment method interview method</td>
<td>General treatment methods and belief of healer.</td>
<td>——</td>
</tr>
<tr>
<td>List of Health Conditions</td>
<td>Free list, observation, unstructured interviews, participant observation, Health condition log method</td>
<td>Names of health condition in Saora symptoms, treatment method, records from health condition log</td>
<td>——</td>
</tr>
<tr>
<td>List of Materia Medica</td>
<td>Free-list, observations, Unstructured interviews, Participant observation, Health condition log, Specimen collection methods</td>
<td>Parts used in the medicine, origin or current location, photos or specimen collection number, preparation method, and use details</td>
<td>——</td>
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<tr>
<td>Health Condition Log</td>
<td>Health condition log methods</td>
<td>List and descriptions of health conditions treated by healer</td>
<td>Treatment interview, List of health conditions, List of materia medica.</td>
</tr>
</tbody>
</table>
2.4 Data verification and analysis

The treatment and medicinal plant data was verified on two different levels, the individual and consensus level. On the individual level, data was verified with each healer by repeating methods and using different methods to collect the same data. Collected data was reviewed with the healers to verify that it was documented correctly. Among individual healers, results of free-lists, patient logs, and unstructured interviews were compared to generate data on healers' treatable health conditions, medicinal plants and treatment methods. Cross-checking data with more than one person, such as the healer, healer’s family, neighbors, village leader and other healers and community members helped to verify the identity of collected plants and socio-demographic data of the village and healer. On the consensus level, the medicinal plants and health conditions were compared and evaluated for similar use and treatment by same and different types of healers and groups of healers. In this way, it was possible to determine valid data on medicinal plant use and identify the most potentially useful and important plants. Information that was organized into the Healer data collection and Plant specimen list were analyzed into five parts: 1) System of treatment, 2) Health conditions, 3) Preparation methods, 4) Materia medica, 5) Socio-demographics. The methods used to analyze each of these parts are described below.

2.4.1 Analysis of system of treatment

This data was obtained from Treatment methods category of the Healer data collection. Because information in the Treatment methods category was organized into standard outlines between same type healers, it was possible to collate data together so that each variable included details from each individual healer. Generalizations under each variable in the outline were made, based on these compilations. Healer codes were used to reference sources for data to conserve details. These methods ensured a valid, verified and comprehensive picture of the treatment system of the healers.
2.4.2 Analysis of health conditions and range of treatment

Data from the List of health conditions and Healer data collection was compiled to form a Glossary of Health conditions. Descriptions of health conditions were evaluated to group the health conditions into categories based on information given by the healers. Criteria used to group health conditions together include the following:

1. Origin of illness: Health conditions that share similar origins were determined to be closely related.
2. Affected body parts: Health conditions that affected the same body parts were determined to be closely related.
3. Symptoms: Health conditions that share similar symptoms were determined to be closely related.
4. Treatments and remedies: Health conditions for which the healer used the same remedy and method to treat the illness were determined to be closely related. Among blowing doctors, specific incantations were used to treat groups of health conditions, and these groupings were used to categorize health conditions. A shared purpose of the remedies was also used to categorize health conditions together, for example, the category Tonics.
5. Health condition metamorphosis: Health conditions which the healer noted as more or less severe types of other health conditions were determined to be closely related.

2.4.3 Analysis of preparation methods

Data for this section was obtained from the List of Health conditions, List of materia medica, and Treatment methods. The total frequency of observations of preparation methods used by healers was categorized to depict more to less popularly used preparation methods among healers. Different vehicles and application methods associated with preparation methods were quantified according to frequency of use. Descriptions of the preparation
methods and application terms were made by generalizing the data collected from healers who used the methods.

2.4.4 Analysis of materia medica
Data from the List of Materia medica in the Healer data collection for each healer is summarized into a List of Materia medica of tables. This list is based primarily on data generated from the in-depth sample of healers, although data from supporting sample of healers was added if there was a matching material used for medicine. No specimens were collected of fungus, animals, and minerals. Specimens were not taken of all plant materials, and labeling techniques were developed for the scientific names listed in tables in order to identify between certain and less certain materia medica identifications. There are two levels of certainty and these are:

A) Scientific names without any labeling have an associated voucher specimen and are considered as valid.

B) Scientific names in brackets identify plants that were not confirmed (no voucher specimen), although the species name is likely correct. These identifications are based on the healers’ verbal descriptions of the material or were identified by the researcher and field assistants on the field and not collected as a specimen.

2.4.5 Analysis of socio-demographic data
Data from the Socio-demographic interview with head of village, Profile interview, Socio-demographic interview with healer, Treatment methods, and Health condition log were used to analyze the socio-demographic characteristics of the healers. Some statistical methods were used to measure variance and significance among different factors by using statistical software. The specific analysis methods used for each factor that is included in this section are described below.
The collected information were coded and entered in Windows – XP (Service Pack II), and Vista (Home Edition) Operating System based computer and analyzed in Microsoft Office Excel – 2003 and SPSS – 14 versions. Statistical tabulations, analysis, graph were done using MS Excel – 2003 and SPSS – 14.

**Obtaining and gaining knowledge** factor was based on data generated from the Profile interview and the Treatment methods. The healer was asked to relate how they became healers, and where the majority of their treatment knowledge had come from. When a healer named a teacher, the healer was asked to provide some information on the teacher, such as teacher’s ethnicity, languages, spoken, relation to the healer and present location.

**Treatment activity** was determined from the Profile interview and health condition log. Because the treatment activity was not homogenous among different healers, it was not possible to calculate quantifiable data.

**Years practiced as a traditional healer** was determined from the Profile interview.

The healer was asked to estimate within a ten year interval how long they had been practicing as a healer, in other words, been treating patients.

**Multiple treatment skills** were determined from the survey interview among villagers and from the Profile interview. Healers, who were knowledgeable of only 1-2 treatments, were not considered proficient in this skill. ‘Skills’ were considered acting as a different healer role, such as Herbalists or Spirit healer.

**Household wealth** was determined from the Socio-demographic interview with the healer. Household wealth was rated on a scale of 1-5; poor to wealthiest. This was qualitatively estimated by the researcher according to a number of factors including the number of family members, working adults, and younger members in school in the household, ownership of land, vehicles, livestock and other material items, overall state of the house, and general statements made by the healer and family regarding their financial situation.
Population of village was determined from the Socio-demographic interview with the leader of the village.

Distance to district center was determined from the Socio-demographic interview with the leader of the village. The district center is also the location of the hospital.

Distance to health clinic was determined from the Socio-demographic interview with the leader of the village.

2.5 STUDY AREA
The present Research Study “Traditional Medicinal System among the Saora Tribal Community of Raipur Division” was carried out during 2003 -2005. The details of study site, climate, geology, soil, forest types and other land use figures are described below. The study was conducted in Raipur Division’s Pithora, Kasdol (Sub districts) & Sankara (Block), where the maximum concentration of Saora Tribal Community is found. One more purpose of selecting this three is that the boundary of these towns touch the territory of Barnawapara wildlife sanctuary. Study area is rich in herbal medicinal plants. And also the concentration of Saora Tribal Community is, maximum in these areas.

2.5.1 Geographical location and physiographic
The study area nesting between 210 18' to 210 30' North latitudes and 800 22' to 820 37' East longitudes. The general topography of study area reveals that the area is mostly undulating with varying degree of slopes found especially in the Southern and Eastern aspects, while the North-Western aspects are predominantly covered with different mountain ranges. The highest peak of 470 m in Northern aspect is located in Munda pathar hill range. In Western aspect, the highest peak of 458 m is located in Kansa pathar hill range. The study area is surrounded by dry deciduous forests, grasslands, agriculture lands and human habitations. All villages in the sanctuary area are
categorized, as forest villages and majority of them are accessible through Kachcha roads, accessible only in dry season. Road network is absent in few hilly tracts, which are inaccessible due to steep slopes and dense forests.

2.5.2 Climate and Weather

The climate of study area is dry humid tropical with an average annual rainfall of 1200 to 1350 mm. It gradually decreases from South-East direction to North-West direction. About 80 per cent of annual rainfall is received from South-West monsoon, during June to August. The highest amount of rainfall occurs in July. Number of rainy days varies from 90 to 100 days. The mean monthly maximum temperature ranges from 27.3°C in January to 41.8°C in May and mean monthly maximum temperature ranges from 12.7°C in December to 27.3°C in May. The mean annual maximum and minimum temperature of study area are 33.10°C and 20.5°C, respectively. The weather conditions of Raipur district 2004-2005 are presented in Fig.

2.5.3 Humidity

Relative humidity of Study area increase with the onset of South-West monsoon and it generally becomes more than 80% in July. In the post monsoon and winter seasons, the relative humidity lies between 50 to 65% in the morning (8:00 to 12:00 hrs) while it varies between 30 to 40% in the afternoon (12:00 to 16:00 hrs).

2.5.4 Geology

The Study area has three distinct geological formations Viz. Chhattisgarh super group, Late Precambrian and Early Precambrians. Lithologically the area is divided into seven groups namely Raipur Shale and limestone, Khairagarh Sandstone, Gunderdehi Shale, Cuddapahas charmur limestone, Chandrapur sand stone grit, Dharwar rocks, Granite and genesis.
2.5.5 Physico-chemical characteristics of the soil

Soils of Study Area are grouped into three classes viz., Inceptisols, Alfisols and Vertisols. The Inceptisols are immature soils mostly sandy loams having light texture and shallow to moderate depth. They are low in organic matter and available nutrients, which support mainly grasslands and degraded forests.

Table 2.4 Important physical and chemical properties of soils in study area (0.20cm depth)

<table>
<thead>
<tr>
<th>Properties</th>
<th>Inceptisols</th>
<th>Alfisols</th>
<th>Vertisols</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Physical properties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical composition (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse sand</td>
<td>5.50%</td>
<td>2.9%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Fine sand</td>
<td>28.12%</td>
<td>22.7%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Silt</td>
<td>35.80%</td>
<td>29.8%</td>
<td>22.8%</td>
</tr>
<tr>
<td>Clay</td>
<td>28.50%</td>
<td>41.4%</td>
<td>50.6%</td>
</tr>
<tr>
<td>CaCO₃</td>
<td>0.39%</td>
<td>0.5%</td>
<td>Nil</td>
</tr>
<tr>
<td>B. Chemical properties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>6.1</td>
<td>7.6</td>
<td>7.3</td>
</tr>
<tr>
<td>E.C. inch Mhos/cm. At 25°C</td>
<td>0.20</td>
<td>0.65</td>
<td>0.20</td>
</tr>
<tr>
<td>Average nutrient kg/ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2O5</td>
<td>33.6</td>
<td>10.0</td>
<td>26.4</td>
</tr>
<tr>
<td>K2O</td>
<td>82.40</td>
<td>220</td>
<td>280</td>
</tr>
<tr>
<td>N total</td>
<td>132.44</td>
<td>182.62</td>
<td>211.22</td>
</tr>
<tr>
<td>Water holding capacity (%)</td>
<td>40.06</td>
<td>50.5</td>
<td>61.01</td>
</tr>
</tbody>
</table>

Source: working plan of Raipur forest division, period 1986-1996.

These soils are commonly found in the Eastern and Southern aspects. Alfisols occur in mid land situation which are moderately deep and hence have good water holding capacity and bear luxuriant vegetation, on the other hand Vertisols are deep clayey soils having good water holding capacity and are
supporting rich vegetation. Some of these lands are utilized for cultivation of agricultural crops. The Physico-chemical properties of different soils of study area are given in Table 2.4

2.5.6 Forest types and flora

According to Champion and Seth (1968), the forests of the Study area are classified into four major forest types viz., (1) Southern Tropical Dry Deciduous Teak Forest (5A/C1b), (2) Northern Tropical Dry Peninsular Deciduous Sal Forest (5B/C1c), (3) Northern Tropical Mixed Deciduous Sal Forest (5B/C2), (4) Dry Bamboo Brakes (5/E9). The predominant wood flora found in these forests are Tectona grandis, Terminalia, tomentosa, Buchnania lanzan, Madhuca indica, Boswellia serrata, Acacia catechu, Dalbergia panniculata, Chloroxylon parviflora, Shorea robusta, Dalbergia latifolia, Cleistanthus collinus etc. In degraded forests, Butea monosperma, Lagerstroemia lanceolata, Cleistanthus collinus, Bauhinia vahlii, etc are commonly found. In under Storey Shrub layer, woodfordia fruticosa, Dudonia viscosa, Ziziphus spp., Phoenix spp., Nyctanthes arbor-tristis are commonly found. Among the bamboos, Dendrocalamus strictus is most predominant bamboo, while Bambusa bamboos also occasionally occur in these forests. The important grasses like Cynodon dactylon, Heteropogon contortus, Eragrostis tenella, Sehima dicanthium and Dicanthium annulatum etc. are also found in the study area.
2.6 ETHNOGRAPHY OF SAORA

Saora is among one of the oldest tribal community, inhabiting in India. They lived in the state of Orissa, Chhattisgarh, Andhra Pradesh, & West Bengal. Nag et al (1972) refers to the saora as an ancient aboriginal community which had a widespread distribution in middle and south-eastern India during 800 BC to 1200 AD. This community has been identified by various authorities with Sauri of Plini and Sabrai of Ptolemy (Thurston, 1909). In Chhattisgarh state Saora are distributed mainly in four districts Raipur, Mahasamund, Bilaspur and Raigarh. If we see the statistics the overall population of Saora is about 10,160,00 in India, and in account of Chhattisgarh they are approximately 90,000.

(Population Source: www.everyculture/southasia/saora.htm, 12-02-2008)

2.6.1 Origin and Historic Background

In Sanskrit Saora means mountaineer, barbarian or savage. According to General Cunningham saora belongs to Kolarian family. Various stories of the origin of saora are given in the Sanskrit literature. In the Aitreya Brahman they are spoken as the descendents of Vishwamintra, while in the Mahabharata they are said to be created by Kamdhenu, Vashista’s wonder working cow in order to repel the aggression of Vishwamitra. Local tradition traces their origin to the celebrated Seori of Ramayana, who is supposed to have lived somewhere near the present Seorinarayan in the Bilaspur district and to given her name to this place. Another story makes one Jara Saora their original ancestor, who was said to have shot lord Krishna in the form of a deer. Another states that they were created for carrying stones for the construction of great temple at Puri and for dragging the car of lord Jagannath, which they still do at present time. Another mythological tale, in the beginning of the creation lord Mahadeo wished to teach the people how to cultivate the ground, and so he made a plough and took out his bull Nandi to yoke it. But there was dense forest on the earth, so he created a being whom he called
Savar and gave him an axe to clear the forest. In the meantime Mahadeo went away to get another bullock. The Saora after clearing the forest felt very hungry, and finding nothing else to eat killed Nandi and ate the flesh on teak leaf. And for this reason the young teak leaves when rubbed give out sap which is the colour of blood to the present day. After sometime Mahadeo returned and finding the forest well cleared was pleased with the Savar, and as a reward endowed him with the knowledge of all edible and medicinal roots and fruits of the forest. But on the looking round for the Nandi he found him lying dead with some of his flesh cut off. The Savar pleaded ignorance, but the Mahadeo sprinkled a little nectar on Nandi, who came to life again and told what had happened. Then Mahadeo was enraged with the Savar and said “You shall remain a barbarian and dwell for ever in poverty in the jungle without enough eat”. And accordingly this has always been the condition of Saora descendents.

The saora villages are mostly homogenous they usually lived with other tribal community like Binjhwar, Kanwar, Gond, Kondh, Agharia etc. Their houses are mostly made up of clay with roof of straws and other forest weed grasses. The house contains 2-3 rooms along with kitchen. The wall is painted (washed) with white or yellow clay. The floor is made up of clay and they wipe it with cow dung. The dress of saora is of scantiest the women wear Lugda and men wear Panchha & Bandi. The women pitch ornaments in the ear and nose rings. Women are tattooed and sometimes men also pierced. The main diet is Bhat, Kodo, Paje, Seasonal vegetables, Urad, Mung, and Tuar. They also take non-vegetarian food like meat, chicken, deer, rabbit, etc. Both men and women consume liquor made up of Mahua locally known as Mahua Daru. Men generally chew tobacco and smoke hand made Bidi.

2.6.2 Economy

Saora are economically not so sound, mainly they are cultivators and non skilled farm labourers. Their main source of economy is cultivation of rice and
labour work in farm or government agencies. They also collect NTFP’s from forest; it is also one of the major sources of their economy.

Ownership of irrigated rice field is recognized by law and such fields can be bought and sold. Behind the legalistic concept of land tenure lies another, in which ancestors reside after death in the sites that their descendent cultivate, thereby guaranteeing their heir’s right. Because irrigated land gives a higher input of labour, it tends to be owned by relatively wealthy people, who thereby become wealthier. Although non Saora are legally forbidden to own land in tribal area, in practice outside traders and moneylenders control much of this land through complex web of debt, mortgage and fraud.

Poorer people work for hire in the field, but the egalitarian ethos of reciprocal work parties is strong. The most important specialized occupation is that of the Shaman and Medicine Men. Men’s and women’s roles are not as strictly divided as in many Indian societies and there are no tasks that can not be done by either sex without embarrassment (except the women traditionally do not climb trees or play musical instruments). Thus men can be seen fetching water for the household and also women ploughing land with men.

2.6.3 Social & Religious Structure

The saora of chhattisgarh are divided in to three endogamous groups namely; Bade Saora, Aade Saara & Thakur Saora. They are further divided in to several clans, the main clans are Bhaisa, Bhoi, Bagh, Kundla, Banmula, Binchi, Bagula Hansraj, Nag, Bhatia, Surajbanshi, Guria, Bahera, Hathia etc. All the clans have their own totem. Saora community is patrilineal, most of their families are nucleus and joint families are rare. Only the son inherits the paternal property in equal proportion. The women of saora community carry out household work, and take part in almost all economic pursuit.

Saora worship Jagannath, Thakurdev, Dulhadev, Karia-Dhurwa, Shabar-Shabri, Samlai etc. Dulha Dev is located in the kitchen of every home. Along with these gods they also worship Hindu deities, river, mountains, forest, sun,
moon and village gods. Navakhai, Dussera, Rathayatra, Hareli, Nagpanchami, Janmashtami, Diwali are the main festivals of saora.

2.6.4 Kinship Groups
The basic unit of social organization is birinda. This is an exogamous patrilineage in which the core of men stay put while women marry out. Parallel cousins within the lineage are “brothers” and “sisters”. Other parallel cousins and all cross cousins are also referred as “brothers” and “sisters” implying the impossibility of marriage down to the third generation.

2.6.5 Marriage
Adult marriage is practised in this community. Of the various types of marriages, those arranged through the negotiations are considered prestigious. They often practised polygyny. Levirate and Sororate types of marriages are also prevalent. The remarriage of widow, widower, and divorcee are allowed. The marriage takes place at bride’s residence and bride price is settled through mutual discussion between both the families with the help of a mediator. Generally the proposal of marriage comes from boy’s family. The average age of marriage for boys is 14-19 years and for girls is 13-16 years. Divorce is allowed only after the payment of compensation.

2.6.6 Birth Ceremony
Saora generally do not perform any ritual at the time of pregnancy. The delivery is conducted at home under the supervision of senior ladies of family and community. The umbilical cord is cut by knife or blade. They recommend some special diet for pregnant lady, which includes Kulthi Dal, Decoction of Khamhar Bark, Sonth, Pepper, Gud etc. Just before the delivery they give Kake Pani (Decoction of Beatle nut) to the pregnant lady, they think that this can reduce the labour pain and the delivery takes place normally. After the sixth day of birth a ritual is performed known as Chhati, in which both new born
and the mother take bath and give offerings to their clan deity. After that a feast is organized for the relatives and community members.

2.6.7 Death Ceremony
Soara generally burn the dead body. But, if the death is due to some unnatural cause like accident, snake bite, suicide etc., than they bury the dead body. They also bury the dead body of child instead of burning. On the 3rd day of the cremation the male members of the family cut their hairs, beard and moustaches and take bath. On 10th day a ritual is performed in which they worship their clan deities and village god and gives offerings to them, after that a feast is organized for the relative and community members.

2.6.8 Domestic Unit
The basic household contains a married couple and their children. Many houses also contain married siblings, aged parents and sometimes relatives. Where a man has several wives then they live together unless they quarrel, in which case he build them separate houses and divide his time between them. Neighbours are usually relatives or good friends and make quite free with each others house.

2.6.9 Inheritance
As such son marries he builds his own house. The youngest son stays behind with the parents and inherits the house. A man’s fields are shared equally among his sons. As an ancestor spirit he always resides in one of this site. Where there are no sons, they may be inherited by cousins in the closest branch of lineage. Alternatively, they may be claimed by the lineage of his wife’s brother if it is decided that the dead person has gone to reside in one of their plots. Personal possessions are likewise shared out equally. A woman may also have her own field, provided by her own brothers. This woman’s
wealth never passes under her husband's control and is usually inherited by her daughter.

2.6.10 Socialization

A woman's child is closely associated with her body and only gradually socialized into her husband's lineage. One of the baby's first illness is diagnosed as a dead patrilineal ancestor who wishes to give up the child his/her name. If the child survives to the age of weaning, it receives the ancestor's name. There are no rites associated with the puberty.