

**LINKING TRADITIONAL KNOWLEDGE DATABASE ON
MEDICINAL PLANTS OF KACHCHH WITH NATIONAL
INNOVATION FOUNDATION (NIF) DATABASE**

Project Report

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DRAFT REPORT

LINKING TRADITIONAL KNOWLEDGE DATABASE ON MEDICINAL PLANTS OF KACHCHH WITH NATIONAL INNOVATION FOUNDATION (NIF) DATABASE

1. Background

Conservation of medicinal plants is one of the global biodiversity conservation agendas. It is important not only for economic prospecting, but for revitalization of traditional health practices at local levels. Majority of rural population in developing countries like India still have poor access even to basic health services and therefore it is important to reinstate some of the eliminated traditional knowledge based health care practices, parallel to modern medicine forms. Furthermore, it is well established that large amount of plant based medicinal knowledge are lying among rural communities within a 'contested domain' and since majority of these knowledge is still uncodified and not attracting any incentives, they face serious threats of permanent elimination. Also, in a sphere of rapid globalisation many of such important but uncodified knowledge on plants and diseases are still outside the purview of IPR regime and thus open for exploitation. Importantly, it needs to provide IPR benefits to this fragmented knowledge.

Documentation of knowledge and their proper protection through a well-managed database is a prerequisite for accruing the IPR and other benefits (monetary or non-monetary) to the 'poor but knowledgeable' rural individuals or communities. In 1982, Ministry of Environment and Forests (MoEF), New Delhi has initiated a country level Coordinated Research on Ethnobiology and exclusively documented the knowledge of tribal communities. Also, many independent documentation works were conducted in non-tribal regions and generated large volumes of information on traditional knowledge. Parallel to these, initiatives were also taken to evolve national databases for collating such scattered traditional knowledge data into some structured formats. National Innovation Foundation (NIF) at Ahmedabad is currently evolving one such database.

Ethnobotanical Knowledge in Kachchh

Kachchh region despite being very arid has a very rich tradition of using plants for both humans and animal health care. The earliest systematic documentation of the use of plants is of Jaikrishna Inderji Thakkar in 1926 when he published the famous book titled "*Kachchhni Varnaspati ane theno Upayog*" in Gujarati and described the economic and medicinal uses of 511 plant species of Kachchh. There is also another work "*Pachchham bet ni Varnaspatiyo*" along the same line by Ismail Master of Tuga village of Pachchham area (Bhuj Taluka), which was published in the year 2000 by Sahjeevan - a NGO, that described the uses of 113 plant species of the area. These were followed by several studies on the ethnobotanical uses of the plants of Kachchh such as: Rolla 1970; Rao 1981; Silori and Rana 2000; Solanki and Vora 2001; Kakrani and Saluja 1993, 1994, 2002; Joshi 2002). Several major studies have been commissioned by national and state level agencies such as: National Medicinal Plant Board (Ministry of Health and Family Welfare) in 1998, Studies by Gujarat Ecological Education and Research (GEER) Foundation in 2002 and studies by the Gujarat Institute of Desert Ecology (GUIDE) in 2004 supported by the Ministry of Environment and Forests, Government of India. In addition, there have also

been several grassroots level initiatives by NGOs such as the Kutch Mahila Vikas Sangthan (KMVS) and Sahjeevan that has sought to revitalise the traditional health practices. In the study by GUIDE supported by MOEF, nearly 10000 pieces of information on various uses of plants were recorded in the district. Knowledge of more than 250 plant species for the treatments of 140 different human and veterinary ailments was recorded through 5500 pieces of information.

Rationale for the Project

While much information is available on medicinal plants of Kachchh, it also raises some serious issues linked to its effective use, accessibility and most importantly its security, especially in the light of growing concerns bearing on the intellectual property rights (IPR) associated with such knowledge. Keeping national and international scenarios in view, NIF has attempted to address these issues with a much holistic approach. A national database on plants and their traditional uses, especially the medicinal values, has been set up at NIF as a part of much larger “innovators database”. One of the most important aspects of this database is that it stressed upon getting ‘informed consents’ from the knowledge holders before putting the knowledge into a public domain system like the NIF database. Obviously, these prior informed consents (PICs) provide opportunities to the knowledge holders to accrue benefits (monetary or non-monetary) from their knowledge.

NIF, with its other partners like SRISTI and GIANS, aims to bring larger incentives to the knowledge holder by supporting and promoting the innovations (including uses of plants for medicinal purpose). It is also understood that an isolated database, without any forward and backward linkages, has limited scope for contributing to both scientific communities and society at large. In the above context, and, to accrue larger benefits to the knowledge holders of medicinal plants in Kachchh, it is important to link the traditional medicinal plant knowledge of Kachchh with NIF database.

Keeping the various issues related with traditional knowledge systems, this short-term study was undertaken to consolidate the documentation effort on indigenous medicinal practices of Kachchh and associate this with NIF database.

2. Objectives and Scope of Work

As a national level initiative, NIF database has well-structured formats for data collection and storage. It is, therefore, important for the data from Kachchh conform to the NIF’s formats for compatibility. Quality of information is also very important for its efficacy and need to maintain strictly. Also, as discussed earlier, collected information should adequately backed-up by PICs. For obtaining proper and meaningful PICs, considerable preparatory work is needed and to achieve this the study has the following objectives:

- Review of existing literatures and databases of national and international repute for validation of medicinal plant knowledge of the practitioners in Kachchh
- Field visits to validate and confirm local names of certain species with the help of local experts and confirm scientific names of plant species which are described by vernacular names
- Share IPR and PIC related issues with stakeholders through meetings and workshops
- Proper detailing and inventorying of the ethno-medicinal knowledge of Kachchh and link it with the database at NIF

3. Project Duration

Five Months (October, 2004 to February, 2005)

4. Approach

It was clear from the outset that the task of obtaining PICs and detailed documentation must account for the following specific elements of the available data:

- a. Some of the knowledge is ‘common’ in the sense that there are no specific owners to it, yet may be a knowledge of the region and such case must be properly identified
- b. Some of the practices are reported by few, but could still be known in the region without an clear owner, either individual or community
- c. When certain remedies are widely practiced, it is necessary to limit the detailed documentation and PIC only to those cases on which there is some kind of consensus on ‘good practices’
- d. There must be acceptable mechanism within the traditional system itself to arrive at such a consensus
- e. If PIC is to be obtained for what are regional knowledge, there must be knowledgeable group who can certify this and take the responsibility for the PIC so that the regional knowledge is recorded as such in the national repository

Identification of Members for a Peer Group of Traditional Health Practitioners

The most important step in addressing these concerns was the identification of credible practitioners who are respected by their peers. This involved a large scouting effort and locating such experts scattered all over the district. This was a challenging task and involved working on the basis of information provided by village level informants and then following up with one to one meetings.

Formation of a Peer Group

The formation of a peer group involves taking a bigger step of bringing together all the experts identified through the scouting efforts into a common platform, which was to almost all of them a completely new experience. In fact, many of them had never shared such a platform together before with such a common purpose. This again was not an easy task, as it required several rounds of small meetings to build trust and mutual understanding. This task is made difficult with the general inhibition to share knowledge and more by the fear that sitting together would inevitably force them to share proprietary knowledge. The peer group formation became possible after several rounds of one-to-one meetings in which we could convince them that we are not seeking to either extract their knowledge or share it with others.

Two peer-groups, one of male herbal healers and another of women practitioners, were formed over a period of nearly two months. At one point it looked nearly impossible to form a women’s peer group, as women practitioners are not operating from clinic like facilities but visit homes informally and operate mostly within the village limits. The male practitioners, on the other hand, operate either from their homes or ‘clinics’ and are well known beyond their own village bounds. Interestingly, once the men’s group was formed, they emphasized the need for a women’s group. The formation of women’s group became possible with the wholehearted cooperation from the KMVS and its affiliates.

The peer-group took up the following tasks:

- 1) Reviewing all the available information to identify cases where proper validation is needed on aspects such as mismatch between known uses and those reported in some studies or by someone in village surveys
- 2) Cross checking the local names of herbs and resolving plant nomenclature related issues
- 3) Understanding important issues related with PIC and IPR on traditional as well as personal knowledge on herbal medicines

The peer group also began to address some of the longer-term tasks such as:

- 1) Evolving a district level network of bare-foot herbal healers for promotion of knowledge based traditional health practices
- 2) Identification of important areas for the promotion of herbal medicine practices and conservation of knowledge, including transfer of knowledge across generation for developing long term project
- 3) Evolving MVIF project ideas as group effort

Table 1: List of Peer Group Members				
Name	Sex	Age (~ years)	Village/Taluka	Remarks
Grass Root Practitioners				
Parmaben Savabhai Marwada	F	50	Jamkunariya/ Pachachham, Bhuj	Midwife
Fatimabai Ibrahim Khalifa	F	50	Bhadrawandh, Abdasa	Midwife
Barmaben Jiven	F	50	Dhrobana Pachachham, Bhuj	Midwife
Fakir Mohammad Turk	M	50	Dhrab, Mundra	Stone specialist
Fakir Mohammad Sameja	M	50	Asambia, Mandvi	Knowledge of plants
Mangaldas Bhanushali	M	75	Balachod, Abdasa	Skelto-muscular
Rahmatullah	M	75	Tragadi, Mandvi	Skelto-muscular
Tulsi Bhai Suthar	M	50	Kera, Bhuj	General physician
Sale Mohammad Jath	M	55	Mandvi, Mandvi	Runs a successful marketing system for remedies
Viveki Maharaj Joshi	M	75	Gadhsisa, Mandvi	Belongs to the Royal Physician's family
Kheraj Kara Maheshwari	M	55	Mau Moti, Mandvi	Child specialist
Other Experts from the Region				
Nipun Bhuch	M	40	Bhuj	Qualified ayurvedic doctor
R.S.Dodiya	M	55	Bhuj	Professor of Botany
Kulinkant Shah	M	65	Bhuj	Heading an NGO and had developed and market different herbal products

Information Dissemination

For the effective communication with local healers and other individual respondents, much of technical information including list of medicinal plants, remedies for which they are used, etc were translated into Gujarati. Copies of these Gujarati translations were distributed to all the peer group members and other interested persons.

Organize Workshops and Meetings

Quite a large number of meetings were organized with different stakeholders. Two types of meetings were organized to get inputs:

- (i) Individual meetings with the respondents and peer group members.

(ii) Group meetings with peer group members.

Other than these, three workshops were also organized to discuss various issues related with the documentation of knowledge, PIC, MVIF and sustainability of the sector. While two workshops were attended by most of the peer group members, one workshop was organized exclusively for the women practitioners. The details of all the workshop and meetings organized during the course of study is presented in Table 2.

#	Date	Place	Content
1	31 Oct. 2004	Tragadi, Mandvi	Discussed about the PIC and possibilities of forming a group of grassroot herbal practitioners. Also discussed about the possibilities of initiating product developments through the support of MVIF.
2	5 Nov. 2004	Balachod, Abdasa	
3	16 Jan 2005	Bhuj	
4	26 Jan 2005	Dhrab, Mundra	Verification of herbal solutions vis-à-vis local names and diseases.
5	30 Jan 2005	Mandvi	Shared the entire medicinal plant database with the participants.
6	6 Feb. 2005	Gadhshisha	Detailing of herbal solutions by peer group and provided PIC for some solutions
7	7 Feb. 2005	Bhuj	The meeting was exclusively attended by women practitioners. Discussed about the PIC in the context of herbal medicines. Also, detailing of some herbal solutions were attempted.
	March 2005	Proposed	Concluding workshop to share experience, findings and various issues emerged through this project. Also would like to discuss about the future course of actions in order to revitalize traditions of herbal based health practices as a joint effort of various stakeholders.

Improving the ethno-medicinal Information on Kachchh

The peer groups considered 5103 cases of herbal uses for detailed examination and reviews. Of these, 1708 could be considered as remedies¹. It is important to mention here that all these cases were are not associated with any individual but with groups. It is logistically very difficult to follow up the group cases. Therefore, only 2366 cases from individual respondents were considered for further detailing. Further, many of this information were associated with those plants or plant products, which are not naturally available in Kachchh but can get in the local market. Also, as discussed earlier, for a particular plant species, report of many of the plant parts had the similar meanings². Similarly, different local wordings of many aliments carry the similar clinical meanings³. All these were rectified with the assistance from the peer group.

Plant Name Confirmation

Many reports had references to the vernacular names of the plant species without confirmed scientific name. There were a total of 483 different combinations of vernacular and scientific botanical names reported. Of this, 268 were found doubtful because of three reasons: (i) vernacular names were not able to identified for scientific name (ii) same vernacular name were given for different species (e.g. name *Loriya val* was given to *Asparagaus racemosus* and *Ceropegia bulbosa*) (iii) many vernacular names

¹ In the present context, a solution means an unique combination of plant species, plant part used and disease.

² For example, aerial parts, entire plant or stem in the case of herbaceous species may be the same. Similarly, in the case of many bulbous plants, the meaning of root, bulb and fruits may also be the same.

³ For example, Eye disease and Eye pain; Skin diseases and Eczema; Abscess and Boil; De-worming and Worms etc. had the similar meanings.

were assigned to a particular species (e.g. *Asparagus racemosus* is associated with about 13 different vernacular names most common being Shatavari. Similarly, *Tinospora cordifolia*, commonly known as Gado is also known by three other names). In most cases, there were no specimens of the species available for such verification. The name of plants were clarified through three different ways:

- Review of relevant flora
- Discussion with peer group
- Confirmation by the knowledge provider

For clarification of plant names, sketches and photographs of the plants were also showed to both peer group and individual respondents. Further, wherever needed and possible, plant samples were also collected with the help of peer group members and then resolved the confusion in the plants' name.

After round of discussions with original respondents and peer group members, both individually and in group, 213, out of initial 268 doubtful vernacular names, got confirmed. Finally, within the individual reported cases, only 39 vernacular plants names (covering 62 entries) were not able to confirm for their scientific names.

Aadraval	Kajado	Khumbhi ⁴	Patal tumbadi
Fudardi	Kalo kumbhat	Kukadvel	Rohidi
Gadheda val	Kalo pinjolo	Kutak val	Sara vel
Gavalval	Kamboi	Lal jogido	Shani vel
Jambhak	Kanajaro	Lolar	Sonval
Jathari va	Kandhero	Loriya vel	Surval
Jathari vel	Kani vel	Munger	Tripan
Jethi madh ⁵	Kantalo	Pat Khijar	Ukharad
Kagada nai	Karo pindalo	Pat pathari	Ukharwad
Kagada vel	Kasero	Patal kumbhi	

a. Detailing of Information and PIC Collection

After improving the available information, as discussed above, a total of 2269 reports were finally considered for further detailing. From this, 885 unique remedies could be identified for their detailing and collection of PICs. However, very common remedies, as reflected through frequency of reports, were not considered for the detailed documentation. The results of this process are summarized in Table 4. For the detailed documentation, a two-pronged approach was adopted:

- (a) Revisiting the original knowledge provider
- (b) Discussions with the peer group

⁴ Khumbhi (*Agaricus* sps.) is well known in the region, but there are many species, some are even poisonous ones. Therefore, the species was considered under unconfirmed list.

⁵ Jethi Madh (*Taverniera cuneifolia*) is a well-known species in the region, but in one particular case, the description of plant was not matched with the species.

#	Screening Steps	Reports	Remedies (Species – Part – Disease)
1	Total reports on human medicines considered	5103	1708
2	Reports by individual informants	2366	1040
3	Reports for those species which are available in Kachchh (excluding the plant and parts from outside Kachchh obtained from market)	2331	1009
4	Reports after correcting the name of plant parts and diseases	2331	931
5	Reports after removing those species which were not confirmed	2269	885

Out of the 885 remedies, detailing of 154 solutions was done during this study. Of this, 59 remedies were documented by individuals, 89 by male peer group and 6 by women peer group. In addition to this, during the course of present effort of detailing the information, 77 new solutions were also reported and detailed, by individual respondents (31 solutions), peer group (42 solutions) and women group (4 solutions). All these are summarized in Table 5. Thus a total of 231 solutions were detailed in the prescribed format given by NIF. Also, during the process a total of 47 PICs were collected- 32 of original solutions and 15 of newly reported cases.

In many cases, the peer group had expressed reservations about the information provided by individual informants. To ascertain this, on a subjective basis, we identified 395 remedies as one-time reports and obtained individual response by peer group members (three local healers and one qualified ayurvedic doctor). Out of 395 cases, the peer group members confirmed only 168 cases. However, during the present study, efforts were also made to get the detailed information from individual knowledge provider even for those cases that were not endorsed by the peer group.

Detail Information Provider	Original Remedies	New Remedies	Total Remedies	PIC
Individual Respondent	59	31	90	32
Peer Group member	89	42	131	11
Women Group	6	4	10	4
Total	154	77	231	47

A list of all the 231 solutions that were documented in detail is presented in **Annexure 1**.

Summary of Data

No. of Forms Filled	
No. of forms filled for detailing earlier (Ethno-botany study) reported formulations	897
No. of forms filled for detailing new reported formulations (NIF study)	186
Total no. of forms filled for detailing the solutions during the study	1083
No. of cases accounted for detailing	
No. of cases reported during the Kachchh Ethno-botany Study	5103
No. of earlier cases (from Kachchh Ethno-botany study) for which detailing are made during the NIF study	3944
No. of new cases reported during the NIF study	185
Total cases accounted for detailing during NIF Study	4129
No. of solutions accounted for detailing	
Total herbal formulations reported during the Kachchh Ethno-botany study	1708
Total herbal formulation for which detailing are made	825
Total new herbal formulation reported during the NIF study	185
Total herbal solutions with their detailing in NIF format	1010

In Brief during the NIF study 1083 forms were separately filled which accounted for a total of 4129 cases (3944 from earlier ones + 185 new ones) which actually accounted for totally 1010 different formulations (825 earlier ones + 185 new ones). It is important to note that the study focuses only on the human ailments. Veterinary diseases were not considered during this study.

b. Literature and Database Reviews

As a part of validation of different remedies, following medicinal plant related database and reference materials were reviewed and *is still ongoing*:

- Dr. Duke's Database
- NAPRAAlert Database
- Wealth of Asia Database
- Kirtikar and Basu's Medicinal plants of India (1933)
- Nadkarni's Meterica Medica of India (1927)

Some Constraints

While conducting this survey, for the detailing of solutions, followings points were emerged:

- (i) More than often, the concerned persons were not available in the village for detailing of solution. Considering the long travel distances and long travel time, such unavailability of concerned person was found very taxing- in terms of time, energy and money. Certainly, within the time frame of this study, it was also not possible to visit the same village for the second time.
- (ii) There were the cases of strong indifferences about the detailing of the knowledge on the part of several informants since they were not active practitioners. Also, even after the reading the remedies attributed to them, on quite many occasions they were not able to recollect sufficient details as per the NIF formats.
- (iii) Despite making best of efforts to explain the concept of PIC vis-à-vis protection to their knowledge and prospects of getting some monetary and/or non-monetary benefits in future, most of the respondents were very reluctant to sign the PIC forms. It clearly suggested that most of these respondents were not having any major stake over the knowledge and thus were indifferent for most of the options given in the PIC form.

ANNEXURE 1
List of 231 herbal remedies for various human diseases documented during the study

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S.No.	Doc. Ref. Num.	Clinical Description	Local Description	Species	Part	Informant Type	Case Type	Freq. of Report
1	100	Abdominal colic	Petno dukhavo	Balanites aegyptiaca	Seed	Peer Grp.	Original	1
2	167	Abdominal colic	Petno dukhavo	Cassia fistula	Stem	Peer Grp.	New	1
3	29	Abdominal colic	Petno dukhavo	Cassia italica subsp.micrantha	Leaf	Indiv.	Original	5
4	5	Abdominal colic	Petno dukhavo	Ficus benghalensis	Leaf	Indiv.	Original	3
5	20	Abdominal colic	Petno dukhavo	Maytenus emarginata	Leaf	Indiv.	Original	1
6	104	Abdominal colic	Petno dukhavo	Moringa oleifera	Fruit	Peer Grp.	Original	1
7	116	Abdominal colic	Petno dukhavo	Mukia maderaspatana	Fruit	Peer Grp.	Original	1
8	162	Abdominal colic	Petno dukhavo	Premna resinosa	Leaf	Peer Grp.	New	1
9	181	Abdominal colic	Petno dukhavo	Prosopis stephaniana	Leaf	Peer Grp.	Original	2
10	221	Abdominal colic	Petno dukhavo	Solanum surattense	Fruit	Peer Grp.	Original	1
11	83	Abdominal colic	Petno dukhavo	Tecomella undulata*	Flower	Indiv.	New	
12	117	Arthritis	Pagno va	Acacia nilotica subsp. indica	Seed	Peer Grp.	New	1
13	136	Arthritis	Pagno va	Boerhavia diffusa	Entire	Peer Grp.	Original	2
14	201	Arthritis	Pagno va	Boerhavia verticillata	Entire	Peer Grp.	Original	2
15	165	Arthritis	Pagno va	Capparis decidua	Flower	Peer Grp.	New	1
16	24	Arthritis	Pagno va	Euphorbia caducifolia	Latex	Indiv.	Original	3
17	151	Arthritis	Pagno va	Parkinsonia aculeata	Leaf	Peer Grp.	Original	1
18	226	Arthritis/Rheumatism	Pagno va/ Sandhano dukhavo/Sandhiva	Commiphora wightii*	Gum	Women Grp.	Original	10
19	210	Asthama	Dum	Achyranthes aspera var. aspera	Entire	Peer Grp.	Original	1
20	129	Asthama	Dum	Calotropis gigantea	Flower	Peer Grp.	Original	2
21	135	Asthama	Dum	Calotropis procera	Flower	Peer Grp.	New	1
22	132	Asthama	Dum	Solanum surattense	Seed	Peer Grp.	New	1
23	8	Asthama	Dum	Sterculia urens	Gum	Indiv.	Original	1
24	169	Asthama	Dum	Tecomella undulata	Entire	Peer Grp.	New	1
25	49	Asthama	Dum	Thevetia nerrifolia	Bark	Indiv.	New	1
26	81	Asthama	Dum	Tribulus terrestris*	Fruit	Indiv.	New	
27	199	Asthama	Dum	Trichodesma amplexicaule	Entire	Peer Grp.	Original	1
28	148	Boil & Abscess	Gad/Gumada/Zamaro	Acacia nilotica subsp. indica	Bark	Peer Grp.	Original	28
29	124	Boil & Abscess	Gad/Gumada/Zamaro	Argyrea nervosa	Leaf	Peer Grp.	Original	29
30	211	Boil & Abscess	Gad/Gumada/Zamaro	Bergia suffruticosa	Entire	Peer Grp.	Original	2
31	6	Boil & Abscess	Gad/Gumada/Zamaro	Cadaba indica	Leaf	Indiv.	Original	10
32	54	Boil & Abscess	Gad/Gumada/Zamaro	Cassia italica subsp.micrantha	Leaf	Indiv.	Original	1
33	101	Boil & Abscess	Gad/Gumada/Zamaro	Cayratia carnosa	Leaf	Peer Grp.	Original	3

S.No.	Doc. Ref. Num.	Clinical Description	Local Description	Species	Part	Informant Type	Case Type	Freq. of Report
34	192	Boil & Abscess	Gad/Gumada/Zamaro	Cistanche tubulosa	Entire	Peer Grp.	Original	3
35	37	Boil & Abscess	Gad/Gumada/Zamaro	Cocculus hirsutus*	Leaf	Indiv.	Original	3
36	191	Boil & Abscess	Gad/Gumada/Zamaro	Cocculus hirsutus*	Leaf	Peer Grp.	Original	3
37	76	Boil & Abscess	Gad/Gumada/Zamaro	Datura metel*	Leaf	Indiv.	Original	2
38	4	Boil & Abscess	Gad/Gumada/Zamaro	Maerua oblongifolia	Leaf		Original	23
39	103	Boil & Abscess	Gad/Gumada/Zamaro	Maerua oblongifolia	Leaf	Peer Grp.	Original	23
40	57	Boil & Abscess	Gad/Gumada/Zamaro	Pergularia daemia*	Leaf	Indiv.	Original	5
41	21	Boil & Abscess	Gad/Gumada/Zamaro	Prosopis chilensis	Leaf	Indiv.	Original	32
42	149	Boil & Abscess	Gad/Gumada/Zamaro	Rivea hypocrateriformis	Leaf	Peer Grp.	Original	32
43	26	Boil & Abscess	Gad/Gumada/Zamaro	Thespesia populnea	Leaf	Indiv.	Original	1
44	52	Boil & Abscess	Gad/Gumada/Zamaro	Tinospora cordifolia	Leaf	Indiv.	Original	10
45	195	Boil & Abscess	Gad/Gumada/Zamaro	Withania somnifera	Leaf/ Root	Peer Grp.	Original	1
46	108	Boil & Abscess	Gad/Gumada/Zamaro	Xeromphis spinosa	Fruit	Peer Grp.	New	1
47	137	Burn pain	Dazyani balatara	Aloe barbadensis	Leaf	Peer Grp.	Original	1
48	185	Burn pain	Dazyani balatara	Salvadora oleoides	Leaf	Peer Grp.	Original	2
49	96	Burning sensation in stomach	Ojari ni garmi	Rivea hypocrateriformis	Leaf	Peer Grp.	New	1
50	1	Burning sensation in the upper abdomen due to improper digestion	Kothani garami	Boerhavia verticillata	Leaf	Indiv.	Original	1
51	92	Burning sensation in the upper abdomen due to improper digestion	Kothani garami	Boerhavia verticillata	Leaf	Peer Grp.	Original	1
52	231	Burning sensation in the upper abdomen due to improper digestion	Kothani garami	Boerhavia verticillata	Root	Women Grp.	New	1
53	93	Burning sensation in the upper abdomen due to improper digestion	Kothani garami	Butea monosperma	Flower	Peer Grp.	Original	1
54	2	Burning sensation in the upper abdomen due to improper digestion	Kothani garami	Ocimum americanum	Seed	Indiv.	Original	2
55	56	Chest pain	Chhatino dukhavo	Ricinus communis	Leaf	Indiv.	Original	2
56	120	Clotting of blood	Lohinu ganthavu	Aloe barbadensis	Leaf	Peer Grp.	Original	2
57	91	Clotting of blood	Lohinu ganthavu	Celosia argentea	Seed	Peer Grp.	Original	1
58	94	Clotting of blood	Lohinu ganthavu	Salvadora oleoides	Leaf	Peer Grp.	Original	1
59	45	Cold (Coryza)	Sharadi	Achyranthes aspera var. aspera	Entire	Indiv.	Original	3
60	214	Cold (Coryza)	Sharadi	Achyranthes aspera var. aspera	Entire	Peer Grp.	Original	3
61	65	Cold (Coryza)	Sharadi	Eucalyptus globulus*	Leaf	Indiv.	Original	2
62	80	Cold (Coryza)	Sharadi	Salvadora oleoides*	Leaf	Indiv.	Original	20
63	180	Cold (Coryza)	Sharadi	Tecomella undulata	Flower	Peer Grp.	Original	1
64	25	Cold (Coryza)	Sharadi	Trichodesma amplexicaule	Entire	Indiv.	Original	8
65	10	Constipation	Kabajiyat	Aegle marmelos	Fruit	Indiv.	New	1

S.No.	Doc. Ref. Num.	Clinical Description	Local Description	Species	Part	Informant Type	Case Type	Freq. of Report
66	212	Constipation	Kabajiyat	Caesalpinia crista	Seed	Peer Grp.	Original	1
67	107	Constipation	Kabajiyat	Cassia fistula	Stem	Peer Grp.	New	1
68	69	Constipation	Kabajiyat	Cassia italica subsp.micrantha*	Leaf	Indiv.	Original	29
69	131	Constipation	Kabajiyat	Celosia argentea	Seed	Peer Grp.	Original	1
70	30	Constipation	Kabajiyat	Plantago ovata	Seed	Indiv.	Original	2
71	183	Constipation	Kabajiyat	Solanum surattense	Fruit	Peer Grp.	Original	1
72	86	Constipation	Kabajiyat	Solanum surattense*	Flower	Indiv.	New	
73	170	Corn	Pagni kapasi	Citrullus colocynthis*	Fruit	Peer Grp.	New	1
74	40	Cough and cold	Udharus/ Khansi	Commiphora wightii	Flower	Indiv.	New	1
75	112	Cough and cold	Udharus/ Khansi	Commiphora wightii	Gum	Peer Grp.	New	1
76	11	Cough and cold	Udharus/ Khansi	Euphorbia caducifolia	Flower	Indiv.	New	1
77	178	Cough and cold	Udharus/ Khansi	Prosopis stephaniana	Leaf	Peer Grp.	Original	1
78	7	Cough and cold	Udharus/ Khansi	Salvadora oleoides	Leaf	Indiv.	Original	10
79	228	Cough and cold	Udharus/ Khansi	Salvadora oleoides*	Leaf	Women Grp.	Original	10
80	173	Cough and cold	Udharus/ Khansi	Solanum surattense	Flower	Peer Grp.	New	1
81	122	Cough and cold	Udharus/ Khansi	Tinospora cordifolia	Stem	Peer Grp.	New	1
82	48	Cyst	Ganth	Acacia nilotica subsp. indica	Bark	Indiv.	New	1
83	175	Cyst	Ganth	Cistanche tubulosa*	Flower	Peer Grp.	New	1
84	98	Deworming	Pet na jantu marva/krumi	Butea monosperma	Seed	Peer Grp.	Original	1
85	42	Deworming	Pet na jantu marva/krumi	Justicia procumbens	Fruit	Indiv.	New	1
86	150	Diabetes	Madhuprameh	Corchorus depressus*	Entire	Peer Grp.	Original	1
87	186	Diabetes	Madhuprameh	Enicostemma axillare*	Leaf	Peer Grp.	Original	1
88	111	Diarrhoea	Atisar	Cordia gharaf	Leaf	Peer Grp.	New	1
89	154	Diarrhoea	Atisar	Cymbopogon martinii	Leaf	Peer Grp.	New	1
90	18	Diarrhoea	Atisar	Grewia tenax	Root	Indiv.	Original	5
91	171	Diarrhoea	Atisar	Nymphaea pubescens	Flower	Peer Grp.	New	1
92	216	Diarrhoea	Atisar	Tribulus terrestris	Fruit	Peer Grp.	Original	3
93	84	Diarrhoea	Atisar	Tribulus terrestris*	Entire	Indiv.	Original	3
94	73	Diarrhoea	Atisar	Zingiber officinale*	Root	Indiv.	New	1
95	106	Dysentery	Marado	Ceropegia bulbosa	Bulb	Peer Grp.	New	1
96	157	Dysentery	Marado	Helicteres isora	Fruit	Peer Grp.	New	1
97	139	Ear ache	Kanni taklif	Aristolochia bracteolata	Leaf	Peer Grp.	Original	4
98	77	Ear ache	Kanni taklif	Ficus benghalensis*	Leaf	Indiv.	Original	1
99	60	Ear ache	Kanni taklif	Luffa cylindrica*	Fruit	Indiv.	New	1
100	155	Ear ache	Kanni taklif	Solanum surattense	Entire	Peer Grp.	New	1
101	153	Ear ache	Kanni taklif	Tinospora cordifolia	Leaf	Peer Grp.	New	1
102	85	Emesis (help vomiting)	Ulti karavava	Calotropis procera*	Flower	Indiv.	New	1

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103	63	Excessive bleeding during menstrual cycle (Menorrhagia)	Rakt pradar	Coccinia grandis	Leaf	Indiv.	New	1
104	225	Excessive bleeding during menstrual cycle (Menorrhagia)	Rakt pradar	Salvadora oleoides*	Root	Women Grp.	New	1
105	74	Eye infection	Aankh ni taklif/Aankh na dukhavo	Abutilon fruticosum*	Leaf	Indiv.	New	1
106	209	Eye infection	Aankh ni taklif/Aankh na dukhavo	Acacia nilotica subsp. indica	Leaf	Peer Grp.	Original	2
107	23	Eye infection	Aankh ni taklif/Aankh na dukhavo	Amaranthus lividus	Leaf	Indiv.	Original	1
108	12	Eye infection	Aankh ni taklif/Aankh na dukhavo	Cassia absus	Seed	Indiv.	Original	2
109	138	Eye infection	Aankh ni taklif/Aankh na dukhavo	Cassia absus	Seed	Peer Grp.	Original	2
110	105	Eye infection	Aankh ni taklif/Aankh na dukhavo	Clerodendrum phlomidis	Leaf	Peer Grp.	Original	1
111	203	Eye infection	Aankh ni taklif/Aankh na dukhavo	Clerodendrum phlomidis	Leaf	Peer Grp.	Original	1
112	58	Eye infection	Aankh ni taklif/Aankh na dukhavo	Lepidium sativum*	Seed	Indiv.	New	1
113	41	Eye infection	Aankh ni taklif/Aankh na dukhavo	Prosopis chilensis	Leaf	Indiv.	New	1
114	219	Fat reduction	Charabi utarava	Tinospora cordifolia	Aerial Part	Peer Grp.	Original	1
115	115	Fever	Taav/ Baru/ Kosobaro	Achyranthes aspera var. aspera	Leaf	Peer Grp.	Original	1
116	62	Fever	Taav/ Baru/ Kosobaro	Calotropis procera	Latex	Indiv.	Original	2
117	15	Fever	Taav/ Baru/ Kosobaro	Calotropis procera	Leaf	Indiv.	Original	5
118	79	Fever	Taav/ Baru/ Kosobaro	Pennisetum typhoides*	Seed	Indiv.	Original	1
119	16	Fever	Taav/ Baru/ Kosobaro	Salvadora oleoides	Leaf	Indiv.	Original	4
120	202	Fever	Taav/ Baru/ Kosobaro	Tecomella undulata	Leaf	Peer Grp.	Original	1
121	14	Fever	Taav/ Baru/ Kosobaro	Trichodesma amplexicaule	Entire	Indiv.	Original	2
122	197	Fever	Taav/ Baru/ Kosobaro	Trichodesma amplexicaule	Entire	Peer Grp.	Original	2
123	196	Fever	Taav/ Baru/ Kosobaro	Withania somnifera	Leaf	Peer Grp.	Original	1
124	36	For pregnant women	Suvavadi mate	Azadirachta indica	Leaf	Indiv.	New	1
125	204	For pregnant women	Suvavadi mate	Commiphora wightii	Gum	Peer Grp.	Original	1
126	38	For pregnant women	Suvavadi mate	Pedaliium murex	Fruit	Indiv.	New	1
127	61	For pregnant women	Suvavadi mate	Prosopis stepheniana*	Fruit	Indiv.	New	1
128	218	For pregnant women	Suvavadi mate	Tribulus terrestris	Fruit	Peer Grp.	Original	1
129	223	For pregnant women	Suvavadi mate	Waltheria indica	Entire	Women Grp.	Original	2
130	125	Fracture	Asthibhang	Acacia nilotica subsp. indica	Bark	Peer Grp.	Original	46

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131	31	Fracture	Asthibhang	Capparis decidua	Root	Indiv.	Original	31
132	222	Fracture	Asthibhang	Capparis decidua	Stem	Women Grp.	Original	6
133	70	Fracture	Asthibhang	Capparis decidua*	Stem	Indiv.	Original	6
134	99	Fracture	Asthibhang	Cassia auriculata	Stem	Peer Grp.	Original	1
135	188	Fracture	Asthibhang	Commiphora wightii*	Gum	Peer Grp.	Original	1
136	220	Fracture	Asthibhang	Sterculia urens	Gum	Peer Grp.	Original	1
137	168	Gangarine	Kidiyaro	Clerodendrum phlomidis	Leaf	Peer Grp.	New	1
138	208	General antivenom	Zer utarava	Xeromphis spinosa	Fruit	Peer Grp.	Original	1
139	13	General pain	Dukhavo	Aloe barbadensis	Leaf	Indiv.	Original	2
140	28	General pain	Dukhavo	Trigonella foenum-graecum	Seed	Indiv.	New	1
141	133	General Pain during pregnancy	Dukhavo (suvavad)	Waltheria indica	Entire	Peer Grp.	Original	4
142	179	General swelling	Soja	Solanum nigrum	Aerial Part	Peer Grp.	Original	2
143	3	Glaucoma	Aankh no zamar	Maerua oblongifolia	Leaf	Indiv.	New	1
144	213	Hair growth	Bal ni vridhi/ Nava bal mate	Annona squamosa	Seed	Peer Grp.	Original	2
145	78	Hair growth	Bal ni vridhi/ Nava bal mate	Lagenaria leucantha*	Fruit	Indiv.	Original	1
146	224	Headache	Mathano dukhavo	Argyrea nervosa	Leaf	Women Grp.	Original	1
147	50	Headache	Mathano dukhavo	Capparis decidua	Flower	Indiv.	New	1
148	32	Hydrocele	Vadraval	Pentatropis spiralis	Leaf	Indiv.	New	1
149	89	Impure blood	Lohino kharabo	Cucumis prophetarum	Root	Indiv.	Original	1
150	17	Jaundice	Piliyo	Maytenus emarginata	Leaf	Indiv.	Original	1
151	193	Kidney stone	Pathri	Celosia argentea	Aerial Part	Peer Grp.	Original	1
152	189	Kidney stone	Pathri	Kalanchoe pinnatum*	Leaf	Peer Grp.	Original	1
153	200	Kidney stone	Pathri	Tribulus terrestris	Entire	Peer Grp.	Original	1
154	152	Localised loss of hair	Undari	Eclipta prostrata*	Entire	Peer Grp.	Original	1
155	55	Memory enhancer (tonic)	Yadshakti vadharva	Bergia suffruticosa	Entire	Indiv.	Original	1
156	187	Memory enhancer (tonic)	Yadshakti vadharva	Convolvulus microphyllus*	Entire	Peer Grp.	Original	2
157	34	Migrane	Aadhashishi	Capparis decidua	Root	Indiv.	Original	1
158	164	Mouth blisters (Stomatitis)	Modhani chandi	Acacia nilotica subsp. indica	Leaf	Peer Grp.	New	1
159	156	Nutritious food	Poshak aahar	Cassia fistula	Stem	Peer Grp.	New	1
160	229	Piles	Masaa/ Haras	Abutilon fruticosum	Seed	Women Grp.	New	1
161	121	Piles	Masaa/ Haras	Celosia argentea	Seed	Peer Grp.	New	1
162	176	Piles	Masaa/ Haras	Launaea procumbens	Leaf	Peer Grp.	Original	1
163	184	Pneumonia	Fefsano sojo	Salvadora persica	Leaf	Peer Grp.	Original	1
164	161	Pneumonia	Fefsano sojo	Tecomella undulata	Leaf	Peer Grp.	New	1
165	113	Post pregnancy tightening of vaginal muscles	Yoni na snayu	Clerodendrum phlomidis	Leaf	Peer Grp.	New	1

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166	97	Rabies	Hadakva	Calotropis procera	Latex	Peer Grp.	New	1
167	230	Regularization of menstrual cycle	Masik bandhi	Boerhavia diffusa	Root	Women Grp.	New	1
168	59	Rheumatism	Sandhano dukhavo/Sandhiva	Aristolochia bracteolata*	Leaf	Indiv.	New	1
169	19	Rheumatism	Sandhano dukhavo/Sandhiva	Calotropis procera	Leaf	Indiv.	Original	3
170	146	Rheumatism	Sandhano dukhavo/Sandhiva	Capparis cartilaginea	Leaf	Peer Grp.	Original	2
171	143	Rheumatism	Sandhano dukhavo/Sandhiva	Cissus quadrangulare	Stem	Peer Grp.	Original	13
172	194	Rheumatism	Sandhano dukhavo/Sandhiva	Citrullus colocynthis	Fruit	Peer Grp.	Original	1
173	141	Rheumatism	Sandhano dukhavo/Sandhiva	Salvadora oleoides	Leaf	Peer Grp.	Original	1
174	27	Rheumatism	Sandhano dukhavo/Sandhiva	Sterculia urens	Gum	Indiv.	New	1
175	110	Rheumatism	Sandhano dukhavo/Sandhiva	Tinospora cordifolia	Stem	Peer Grp.	New	1
176	87	Rheumatism	Sandhano dukhavo/Sandhiva	Tribulus terrestris*	Fruit	Indiv.	Original	1
177	190	Ring worm	Daadar	Cassia obtusifolia*	Leaf	Peer Grp.	Original	1
178	140	Ring worm	Daadar	Commiphora wightii*	Gum	Peer Grp.	Original	1
179	102	Ring worm	Daadar	Leptadenia pyrotechnica	Latex	Peer Grp.	Original	2
180	177	Ring worm/ Abscess	Daadar/ Gumada	Launaea procumbens	Leaf	Peer Grp.	Original	1
181	71	Scorpion bite	Vichhi no dankh	Calotropis gigantea*	Root	Indiv.	New	1
182	159	Scorpion bite	Vichhi no dankh	Cistanche tubulosa	Root	Peer Grp.	New	1
183	134	Skin disease (Erysipelas)	Ratava	Aloe barbadensis	Leaf	Peer Grp.	Original	1
184	123	Skin diseases	Chamadina rog/Kharajvu/ Khas	Argemone mexicana	Bark/leaf	Peer Grp.	New	1
185	127	Skin diseases	Chamadina rog/Kharajvu/ Khas	Butea monosperma	Flower	Peer Grp.	Original	6
186	207	Skin diseases	Chamadina rog/Kharajvu/ Khas	Citrullus colocynthis	Fruit	Peer Grp.	Original	1
187	142	Skin diseases	Chamadina rog/Kharajvu/ Khas	Fagonia indica	Entire	Peer Grp.	Original	48
188	172	Skin diseases	Chamadina rog/Kharajvu/ Khas	Oligochaeta ramosa	Leaf	Peer Grp.	New	1
189	68	Skin eruption	Alai	Cocculus hirsutus*	Leaf	Indiv.	Original	1
190	35	Skin rashes	Sharir par dhimada/chakama	Cucumis prophetarum*	Root	Indiv.	Original	1
191	44	Snake bite	Sarp dansh	Aerva persica	Root	Indiv.	Original	2
192	166	Snake bite	Sarp dansh	Aristolochia indica	Root	Peer Grp.	New	1
193	47	Snake bite	Sarp dansh	Citrullus colocynthis	Root	Indiv.	New	1
194	205	Snake bite	Sarp dansh	Corallocarpus epigeus	Root	Peer Grp.	Original	8
195	75	Snake bite	Sarp dansh	Corallocarpus epigeus*	Root	Indiv.	Original	8
196	72	Snake bite	Sarp dansh	Tephrosia purpurea*	Leaf	Indiv.	New	1
197	126	Snake/ Scorpion bite	Sarp dansh/ Vichhi no dankh	Cistanche tubulosa	Entire	Peer Grp.	Original	10
198	9	Snake/ Scorpion bite	Sarp dansh/ Vichhi no dankh	Dipcadi erythraeum	Bulb	Indiv.	Original	3
199	217	Sperm increaser (tonic)	Virya vardhak	Tribulus terrestris	Entire	Peer Grp.	Original	2
200	145	Stomach pain	Barolno sojo/ Petno dukhavo	Aloe barbadensis	Leaf	Peer Grp.	Original	8
201	39	Stop vomiting	Ulti rokva	Abutilon fruticosum	Leaf	Indiv.	New	1
202	51	Swelling in intestine	Barolno sojo	Cissus quadrangulare	Leaf	Indiv.	New	1

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203	46	Swelling in intestine	Barolno sojo	<i>Citrullus colocynthis</i>	Fruit	Indiv.	Original	2
204	64	Swelling in intestine	Barolno sojo	<i>Leptadenia pyrotechnica</i>	Fruit	Indiv.	New	1
205	82	Swelling in intestine	Barolno sojo	<i>Taverniera cuneifolia*</i>	Root	Indiv.	Original	1
206	109	Swelling in intestine	Barolno sojo	<i>Tecomella undulata</i>	Leaf	Peer Grp.	New	1
207	88	TB	Fefsano xay	<i>Zizyphus mauritiana*</i>	Stem	Indiv.	Original	1
208	22	Throat problem	Galani taklif	<i>Azadirachta indica</i>	Leaf	Indiv.	Original	1
209	43	Throat problem	Galani taklif	<i>Pennisetum typhoides</i>	Seed	Indiv.	Original	1
210	128	Tonic	Shaktiwardhak	<i>Acacia nilotica</i> subsp. <i>indica</i>	Gum	Peer Grp.	Original	3
211	206	Tonic	Shaktiwardhak	<i>Acacia senegal</i>	Gum	Peer Grp.	Original	3
212	147	Tonic	Shaktiwardhak	<i>Achyranthes aspera</i> var. <i>aspera</i>	Seed	Peer Grp.	Original	3
213	227	Tonic	Shaktiwardhak	<i>Corchorus depressus*</i>	Entire	Women Grp.	Original	8
214	182	Tonic	Shaktiwardhak	<i>Pedalium murex</i>	Entire	Peer Grp.	Original	5
215	33	Tonic	Shaktiwardhak	<i>Tribulus terrestris</i>	Entire	Indiv.	Original	21
216	198	Tonic	Shaktiwardhak	<i>Trichodesma amplexicaule</i>	Entire	Peer Grp.	Original	2
217	130	Tooth ache	Dantno dukhavo	<i>Abutilon indicum</i>	Stem	Peer Grp.	Original	1
218	144	Tooth ache	Dantno dukhavo	<i>Acacia nilotica</i> subsp. <i>indica</i>	Stem	Peer Grp.	Original	9
219	118	Tooth ache	Dantno dukhavo	<i>Aerva persica</i>	Stem	Peer Grp.	New	1
220	66	Tooth ache	Dantno dukhavo	<i>Citrullus colocynthis*</i>	Root	Indiv.	Original	2
221	67	Tooth ache/worm removal	Dantna jantu kadhva/ Dantno dukhavo	<i>Solanum surattense*</i>	Fruit	Indiv.	Original	22
222	95	Typhoid	Antardano tav	<i>Boerhavia diffusa</i>	Leaf	Peer Grp.	New	1
223	215	Urinary problem	Peshabni taklif	<i>Achyranthes aspera</i> var. <i>aspera</i>	Entire	Peer Grp.	Original	1
224	119	Urinary problem	Peshabni taklif	<i>Asparagus racemosus</i>	Root	Peer Grp.	Original	4
225	160	Urinary problem	Peshabni taklif	<i>Ceropegia bulbosa</i>	Bulb	Peer Grp.	New	1
226	174	Urinary problem	Peshabni taklif	<i>Pentatropis spiralis</i>	Leaf	Peer Grp.	New	1
227	158	Urinary problem	Peshabni taklif	<i>Tinospora cordifolia</i>	Stem	Peer Grp.	New	1
228	90	Urinary problem	Peshabni taklif	<i>Tribulus terrestris</i>	Fruit	Indiv.	Original	14
229	163	Urinary problem	Peshabni taklif	<i>Tribulus terrestris</i>	Thorn	Peer Grp.	New	1
230	53	Urinary problem	Peshabni taklif	<i>Tribulus terrestris*</i>	Fruit	Indiv.	Original	14
231	114	Urinary problem	Peshabni taklif	<i>Triumfetta rotundifolia</i>	Leaf	Peer Grp.	New	1

* Indicate the PIC is collected for the solution.

Informant Type: Indiv. = Individual; Peer Grp. = Peer group; Women Grp. = Women group

Case type: Original means the solutions were reported in KEDB; New means the solution is reported during the course of this study.

Frequency of Report: Frequency of solutions provided in KEDB study

