

# KNOWLEDGE FOR HIMALAYAS



National Innovation Foundation



Honey Bee Network

# KNOWLEDGE FOR HIMALAYAS



## **National Innovation Foundation**

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## **HONEY BEE NETWORK**

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# KNOWLEDGE

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## PREFACE

National Innovation Foundation has been pursuing the mission of making India innovative and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. Till date NIF has been able to scout innovations and traditional knowledge practices from over 520 districts across India.

Thanks to the support of volunteers of Honey Bee network, we have been able to discover many unsung heroes and heroines of our society who have solved local problems without any outside help.

Despite various constraints, NIF has put together a small book celebrating creativity, innovations and traditional knowledge for/ from Himalayas. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover so many

examples of the ability of local communities and individuals to solve problems on their own without outside help, how much more can be done if state and private sector agencies join hands with NIF actively.

I invite the state government and its various organs to actively support our quest to uncover many more creative communities and individuals in rural and urban areas. NIF will then help in building value chain around them.

The book is divided in two parts. Selected examples of herbal traditional knowledge are given in part one. The innovations from other parts of the country suitable for the development in the Himalayan region are given in part two.

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point.

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There are a large number of knowledge rich people who may not have been educated much, may in fact be economically poor also, but still have the ability to solve a few problems so well.

The challenge really is to work out a synergy so that no creative voice remains unheard, and no solution remains localized and unrecognized. By adapting public policy in support of grassroots innovators and traditional knowledge holders, we can make economic development process more inclusive and sustainable.

This book on innovations has been compiled at the request of Dr. Vijay Kelkar, Chairman, Finance Commission and Member, Governing Council of the National Innovation Foundation as a tribute to the creativity and innovation at grassroots. This presentation is part of a series of innovation compendium prepared for each State of India. We hope this will be followed

up in the form of concrete policy and institutional initiatives in each State to empower creative people to improve the quality of life of common people and thus promote inclusive growth.

It is my belief that such examples will act as spur for other State government departments to look for creative efforts of their staff and users at ground level. I hope that NIF will have the opportunity to work closely with the State government in future and expand knowledge base, add value to selected technologies and help them diffuse through commercial and non-commercial social channels for improving the livelihood of the majority of the people.



R. A. Mashelkar, FRS  
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## Building a Bridge with Grassroots Innovators in Informal Sector

To make Indian development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by common people at village or semi-urban level. Many of these experiments lead to development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often be to solve his problem. There is no mechanism available for him to share the knowledge, innovation or practice with other people in different regions. Sometimes, ideas and innovations get diffused through word of mouth. But many times, these ideas remain localized. In the process, potential growth and social development gets constrained. To overcome this constraint, Honey Bee Network with a handful of volunteers triggered a movement, twenty years ago to scout, spawn and sustain the unaided innovations and outstanding traditional knowledge from the informal sector of our country.

Drawing upon this experience, NIF (National Innovation Foundation) was set up in 2000 with the help of Department of

Science and Technology, Government of India to scale up the idea of learning from grassroots innovators.

Under the inspiring leadership of Dr. R. A. Mashelkar, Chairperson NIF and former Director General, Council of Scientific and Industrial Research (CSIR), NIF has taken major initiatives to serve the knowledge-rich, economically poor people of the country. It is committed to make India innovative by documenting, adding value, protecting the intellectual property rights of the contemporary unaided technological innovators, as well as of outstanding traditional knowledge holders. It aims at promoting lateral learning among local communities to generate low cost affordable solutions of the persistent and emerging problems, and enhance the diffusion of innovations on a commercial as well as non-commercial basis.

### How does NIF work?

Primarily, NIF has five functions: (a) Scouting and documentation, (b) Value addition and research and

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<sup>1</sup> The Honeybee collects pollen from the flowers but they are not impoverished, in the process links one flower to another enabling cross-pollination. Similarly, the Honey Bee Network strengthens people-to-people contacts, learning and networking by pooling the solutions developed by individuals across the world

in different sectors. The network acknowledges the innovators, traditional knowledge producers and communicators so that they do not remain anonymous.

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development, (c) Business development and Micro Venture, (d) Intellectual Property Rights protection and (e) Dissemination, database development and IT applications.

NIF has been entrusted with the responsibility of building a National Register of Grassroots Innovations and Traditional Knowledge. It is not enough to document or disseminate the innovations or outstanding traditional knowledge. Value addition is very important for harnessing the full potential of the idea. NIF has entered into MOU with CSIR and Indian Council of Medical Research (ICMR) besides other organizations. CSIR has allocated funds to support research on grassroots innovations in CSIR labs. Similarly, ICMR supports research on such herbal healing knowledge, which has not been documented in the classical texts and formal institutional literature. NIF also helps in generating a very large pool of open source / public domain technologies. A small number of innovations are also protected by patents and other IPRs.

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The Honey Bee Network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of Honey Bee newsletter. It also ensures that a fair

For most innovators, attracting risk capital for converting innovations into enterprise is very difficult. They neither can offer much collateral nor are they able to develop business plan or deal with formal R&D system.

A Micro Venture Innovation Fund (MVIF) has been set up with the help of SIDBI to provide risk capital for technologies at different stages of incubation. Under single signature, innovators are trusted and investments are made to help them commercialise their innovations. Most innovators do not make good entrepreneurs. For entrepreneurship, one has to make consistent batch by batch production of products. Innovators are often incorrigible improvisers. They seldom make two things alike. NIF has helped such innovators to license their technologies to third party entrepreneurs. Most of the licenses have been given to small entrepreneurs and in a few cases, to medium enterprises.

A very elaborate benefit sharing system has been developed, governed by the Prior Informed Consent (PIC) of the knowledge

share of benefits arising from commercial exploitation of local knowledge and innovations reaches the innovators and knowledge providers.

providers. Attempt is made to share benefits not only with the innovators but also with their communities and for nature conservation. In addition, a small part is kept for contingency support to needy innovators, for R&D stakeholders, promoting women's innovations and meeting overhead costs.

It is remarkable that grassroots innovations are generating global demand, as evident from inquiries from around fifty-five countries for various technologies, NIF has succeeded in commercializing products across countries in six continents apart from being successful in materialising thirty cases of technology licensing with the help of partner agencies.

### **What has it done?**

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 1,00,000 ideas, innovations and traditional knowledge practices from over 520 districts of the country.

NIF has filed 198 patents in India and seven in US and one PCT application. Out of these, 33 patents have been granted to grassroots innovations in India and four in US. NIF has funded 113 projects under MVIF to the extent of Rs.1.3 crores. Hundreds

of technologies have diffused through farmer to farmer social network.

NIF has proved that Indian innovators can match anyone in the world when it comes to solving problems creatively. Where they perform better than the rest is in generating more affordable sustainable solutions by using local resources frugally.

Those who see poor only as the consumer of cheap goods, miss the knowledge richness at the grassroots level. *The Poor can be the Providers also.*

The Grassroots to Global (G2G) model that NIF is propagating is all set to change the way the world looks at the creativity and innovations at grassroots.

### **How can state government join hands with NIF?**

- a. NIF has no field extension unit nor does it want to have one. However, state government has several field functionaries in the field of agriculture, education, industry, rural development, women and child care, forestry, etc. There can be a very fruitful partnership between NIF as a source of innovative ideas and technologies and state



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- government as partner in dissemination, value addition and even commercialization through incentives, promotion, subsidies, etc.
- b. State government can join the national campaign for scouting innovations and traditional knowledge and motivate its grassroots functionaries to join hands to help in uncovering the talent at the community level.
  - c. Students in schools and colleges can be motivated to scout creative and innovative people in their neighbourhoods and send the entries to NIF (Post Box No.15051, Ambavadi, Ahmedabad 380 015, [campaign@nifindia.org](mailto:campaign@nifindia.org)). Examples of innovations can also be included in the curriculum of the school children.
  - d. Demonstrations and trials can be organized at various regional research stations, KVKs (Krishi Vigyan Kendras) so as to create awareness about the creative potential of common people.
  - e. The research institutions can be mandated to add value to the knowledge of innovative people and help in protecting their knowledge rights.
  - f. On the state's website, link to NIF can be given and the innovations from the region can be displayed to put forward the creative face of the state before the people.
  - g. Some of the innovative people identified by NIF and/or state government could be awarded at district and state level besides giving them support for further work.
  - h. A nodal officer could be appointed to keep a dynamic touch with NIF to ensure that all the areas of possible cooperation are explored.

I hope that NIF would be able to develop a functional, fruitful and fulfilling relationship with the government of Sikkim state. Tremendously rich knowledge of biodiversity and environment can be leveraged through the proposed association.



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**Sikkim: Mapping wind corridors, spotting prayer flags**





**“Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful and richer in depth and content”.**

**- Dr. A.P.J. Abdul Kalam**



**“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.**

**- Dr. R.A. Mashelkar**

# PART I

## HERBAL PRACTICES & PRODUCTS

This section contains details of herbal preparations used traditionally for various ailments and products based on such traditional knowledge.



## Uses of *Abrus precatorius* L. (Chirmi/Konch)

### NIF database

#### Backache

Powdered seeds of the plant along with the powder of rhizome of *Acorus calamus* L., roots of *Asparagus racemosus* Willd., and leaves of *Vitex negundo* L., *Cannabis sativa* L. are mixed in honey and tablets are made. One tablet is given twice a day for three to four weeks

-Ami Chand, Kangra, Himachal Pradesh

#### Baldness

Seeds are ground into a paste and applied on the scalp along with honey

-Mangilal Purohit, Churu, Rajasthan

#### Mouth ulcer

Juice extracted from the green leaves is applied on the ulcers

- Chhitar Lal Gurjar, Sawai Madhopur, Rajasthan

#### Stomachache

Seeds (100g) are taken with ghee or butter for relief

- Kalpana, Trichy, Tamil Nadu

#### Knee pain

Seeds (6g) are taken orally with milk for 14 days

- Pavan Mehra, Sikar, Rajasthan

### Uses from Classical Codified Literature

Dried leaf and root powder is given orally in case of eye complaint<sup>1</sup>; decoction of the young leaves is given orally for cough<sup>2</sup>; leaf powder is given orally in case of urine problems<sup>3</sup>; and seed extract is used in sciatica<sup>3</sup>.

It is one of the ingredients of 'Tranquil'<sup>4</sup> for relieving stress and anxiety. Ten patents have been found on the applications of *Abrus* as a natural sweetener<sup>5</sup>, oral contraceptive<sup>6</sup>, etc.



## Uses of *Aegle marmelos* (L.) Corr. (Bel)

### NIF Database

#### Nasal bleeding

Leaves are ground into a paste, which is applied on the top of the nose

- *Puran Chand, Kangra, Himachal Pradesh*

#### Headache

Equal amounts of roots of bel and leaves of *Leucas aspera* L. are ground into a paste and applied

- *Bhadi Ram Bharali, Guwahati, Assam*

#### Diabetes

150ml of the juice extracted from the pounded roots is administered orally

- *Maibum Lolito Meitei, Bishempur, Manipur*

#### Jaundice

Juice extracted from leaves or fruits is given orally

- *Ngairangbam Santosh Singh, Imphal East, Manipur*

#### Eye diseases

Juice is extracted from the green leaves and two drops are put in the eye

- *Kumari Nigar Pravin, Hazaribag, Jharkhand*

#### Menorrhagia

Leaf paste is administered orally to control the disorder

- *Rani B. Bhagat, Pune, Maharashtra*

#### Sunstroke

Juice extracted from the fresh leaves is taken orally

- *Vijaya Bharati, Hazaribag, Jharkhand*

#### Intestinal worms

Juice extracted from the green leaves is taken orally

- *Jagjeet Bahadur, Sitapur, Uttar Pradesh*

#### Diarrhoea

Pulp of the ripen fruit is taken

- *Jagjeet Bahadur, Sitapur, Uttar Pradesh*

#### Veterinary practice

#### Abdominal pain

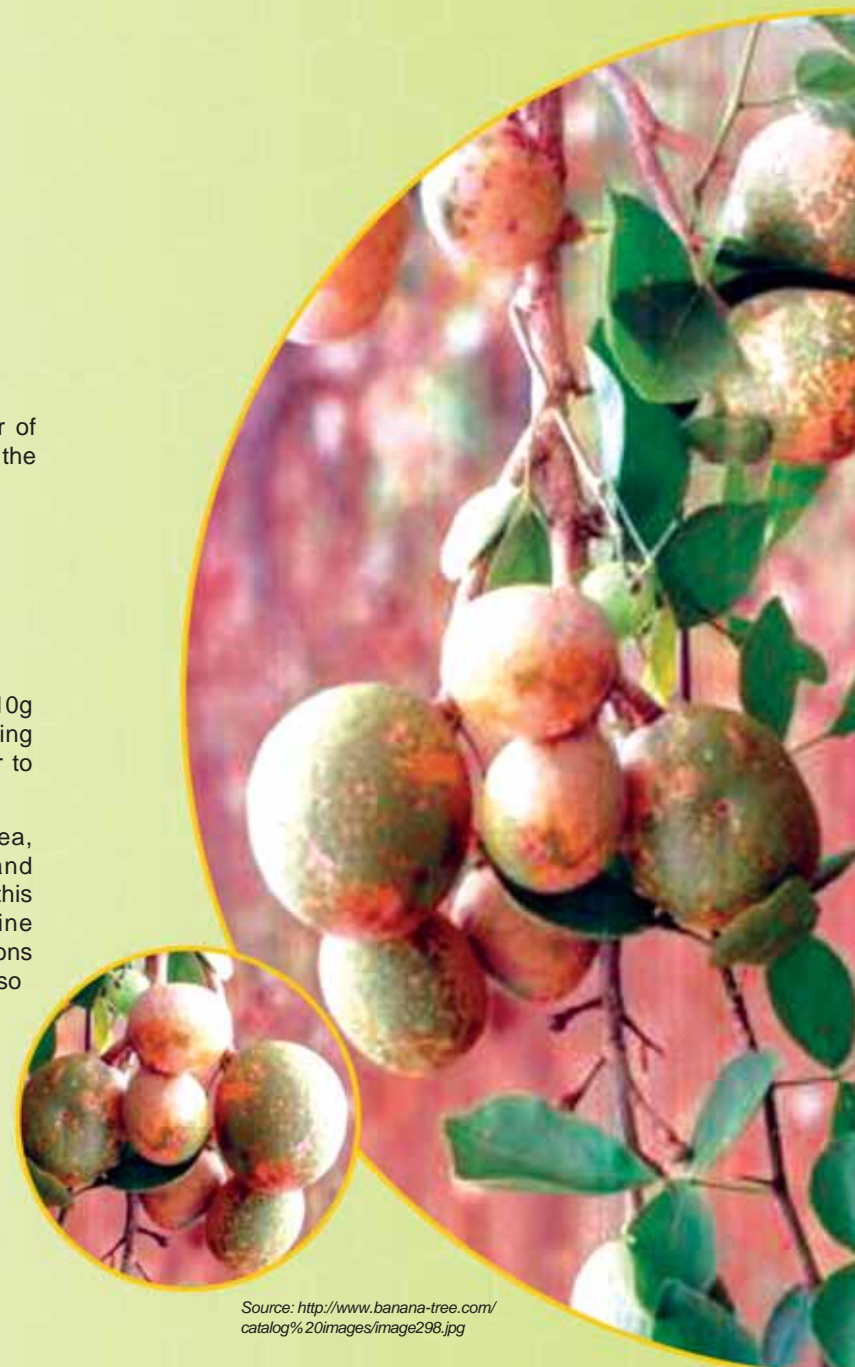
Leaves of *Aegle* and *Euphorbia neriifolia* L., flower of *Tagetes erecta* L., are mixed with fodder and fed to the animal

- *Dipendra Kumar, East Champaran, Bihar*

### Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis<sup>7</sup>; 10g fruit pulp is given before sleep to overcome morning sickness<sup>8</sup>; and fruit rind is applied externally on hair to kill headlice<sup>9</sup>.

'Bael'<sup>10</sup>, prepared from *Aegle* is used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. Lukol's<sup>10</sup> tonic is made from this plant along with other plants. It improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system also help control leucorrhoea. 'Bilwa'<sup>11</sup>, a product of *Aegle* is used as a medicine to cure a number of diseases. Fifty-three patents have been granted on the medicinal applications of *Aegle* for curing diabetes<sup>12</sup>, gastric ulcer<sup>13</sup> etc.



Source: <http://www.banana-tree.com/catalog%20images/image298.jpg>

## Uses of *Alstonia scholaris* (L.) Br. (Chatawan)

### NIF Database

#### Wound

Paste of bark and leaves is applied on infectious wound

- Robert L. Hamte, Aizawl, Mizoram

#### Gastric

Few leaves are ground with black pepper and taken orally before food

- Indra Kanta Ojha, Sibsagar, Assam

#### Asthma

Decoction of bark is given orally

- Robert L. Hamte, Aizawl, Mizoram

#### Fever

Powdered bark (50g) is taken with water thrice a day

- Kutuva Birhorni, Koderma, Jharkhand

#### Stomachache

Juice extracted from bark (20g) is administered orally

- Prishila Tuddu, Hazaribag, Jharkhand

#### Headache

Juice extracted from bark (20g) is given orally

- Prishila Tuddu, Hazaribag, Jharkhand

#### Joint pain

Bark paste is applied on aching joint

- Prishila Tuddu, Hazaribag, Jharkhand

#### Psoriasis

Seed oil is taken orally for 21 days

- P. D. Walikar, Bagalkot, Karnataka

### Uses in Classical Codified Literature

The bark is used against skin diseases and rheumatism<sup>14</sup>; the root juice is taken with milk to cure leprosy<sup>14</sup>; fresh bark is put in water to draw out the latex in it, which is taken orally in case of tuberculosis<sup>15</sup>; dried powder is administered orally to cure diarrhoea<sup>16</sup>; bark extract is given orally to get rid of intestinal worms<sup>17</sup>.

'Ayush-64 cap./tab.'<sup>18</sup>, prepared from this plant is effective as an antimalarial compound both for treatment and prophylaxis. Fifteen patents have been found on the medicinal applications like for use as an antipyretic<sup>19</sup>.





## Uses of *Cassia fistula* L. (Amaltas)

### NIF Database

#### Ringworm

Paste of the scrubbed tuber is applied on the infected part of the body for a few days

- Kumar Chandel, Hamirpur, Himachal Pradesh

#### Dysentery

Equal amount of bark of *Cassia*, *Mangifera indica* L., *Psidium guajava* L. and *Spondias pinnata* (L. f.) Kurz. is ground into a fine paste. Two spoonful of this paste are administered orally

- Niru Patangia, Sonitpur, Assam

#### Cough

Skin of the fruit is chewed in the morning

- Santoshben Gamar, Banaskantha, Gujarat

#### Mouth sore

Juice extracted from the plant is kept on a banana leaf and the leaf is burnt. The ash is then applied on the affected part

-Purna Borah, Golaghat, Assam

#### Stomachache

Decoction of the fruit and jaggery is taken orally

- Bhagwati Lal Kumawat, Chittorgarh, Rajasthan

### Uses in Classical Codified Literature

Powder of dried bark is applied in case of leucoderma<sup>20</sup>; fruit juice is taken in jaundice<sup>21</sup>; fruits are used as diuretic<sup>21</sup>; and root powder is applied in skin diseases<sup>21</sup>.

Pilex<sup>10</sup>(Vein care) helps support metabolic processes involved in maintaining the vascular system's integrity for optimum health and appearance; Purim<sup>10</sup> (Hemo care) is used for blood purification. Six patents has been found on the medicinal applications of *Cassia fistula* like as an antiviral<sup>22</sup>.



## Uses of *Centella asiatica* (L.) Urban (Brahmi)

### NIF Database

#### Memory enhancer

Juice extracted from the leaves is administered orally  
- *Savitri Devi, Kangra, Himachal Pradesh*

#### Insomnia

Plant paste is taken along with food regularly  
- *Khioram Barman, Borpeta, Assam*

#### Toothache

Equal proportions of brahmi leaves, onion and banana roots are ground to make a fine paste, which is applied on the aching tooth  
- *Anil Gogoi, Sibsagar, Assam*

#### Anorexia

Juice extracted from leaves (25g) is administered orally  
- *Gamaliyal Hembrom, Hazaribag, Jharkhand*

#### Stomachache

Eating of fresh leaves helps alleviate stomachache  
- *Krishna Chand, Kangra, Himachal Pradesh*

#### Dysentery

Paste of leaves along with black pepper is administered orally  
- *Dipali Borah, Sibsagar, Assam*

#### Diarrhoea

Whole plant is ground and juice is extracted. Two spoons of the juice, with a pinch of salt, is administered orally twice a day for one week  
- *Okshongbung Mamang Leikai, Bishnupur, Manipur*

#### Jaundice

10g of the plant is ground, mixed with water, filtered and the extract is taken  
- *Vifiya Oraon, Lohardaga, Jharkhand*

#### Skin diseases

Lea paste is applied topically  
- *Savitri Devi, Kangra, Himachal Pradesh*

Plant is taken as a vegetable regularly  
- *Bablu Bediya, Hazaribag, Jharkhand*

#### Herbal tea

Tea is made using leaves of the plant to enhance immunity  
- *Jasmit Singh, Hamirpur, Himachal Pradesh*

### Uses in Classical Codified Literature

Fresh juice from aerial part is used as brain tonic<sup>23</sup>; powder of aerial portion is taken to control high blood pressure<sup>24</sup>; the whole plant is used as diuretic<sup>21</sup>; and the plant paste is applied as a poultice in case of bone fracture<sup>21</sup>.

'Herbal Tea'<sup>25</sup> is mainly indicated as a health drink. 'Mentat'<sup>10</sup> improves mental functions, mental quotient, memory span, concentration ability and stress threshold. More than three hundred patents were found on its medicinal applications mainly on anti-depressant activity<sup>26</sup>.

## Uses of *Ficus carica* L. (Anjir)

### NIF Database

#### Cold

Fruit juice is administered orally to combat cold  
- *Mehnaza Tabassum, Anantnag, Jammu & Kashmir*

#### Gastritis

Two tablespoon of powder of shade dried fruit is mixed in 200ml of water. The mixture is left over night and is taken next morning  
- *Kumar Chandel, Hamirpur, Himachal Pradesh*

#### Kidney disorder

Ripe fruit is eaten  
- *Roomi Jan, Anantnag, Jammu & Kashmir*

#### Cardiac problem

Juice (2 spoons) extracted from the fruit is warmed slightly and taken orally  
- *Sarathy Maity, East Midnapur, West Bengal*

#### Blood purification

Fruit, if taken regularly, acts as blood purifier  
- *Devaram, Sirohi, Rajasthan*

#### Bleeding piles

Two fruits are soaked in half a glass of water for twelve hours. This water is taken after twelve hours and same process is repeated until the ailment cures  
- *Kumari Sarita, Sikar, Rajasthan*

#### Leucoderma

Bark powder (2 spoons) is given with water  
- *Sarathy Maity, East Midnapur, West Bengal*

#### Corns

Fruit sap is applied topically  
- *Roomi Jan, Anantnag, Jammu & Kashmir*

#### Itching

Topical application of leaf extract is helpful  
- *Dilber Shabir, Anantnag, Jammu & Kashmir*

### Uses in Classical Codified Literature

Decoction of boiled fruit is taken orally to cure cough<sup>27</sup>; milky latex is applied externally to get rid of warts<sup>21</sup>; juice extracted from fruit is taken in case of constipation<sup>21</sup>; and fruit juice also acts as a laxative<sup>21</sup>.

Refreshing fruit pack<sup>10</sup> prepared from fig rejuvenates the facial skin. Four patents have been found on medicinal applications of fig like in treating tumor<sup>28</sup> etc.



## Uses of *Jatropha curcas* L. (Ratanjyot)

### NIF Database

#### Jaundice

Juice extracted from leaves and bark is mixed with jaggery. One tea-spoonful of this mixture is given orally  
- *Dimbeswar Gogoi, Sibsagar, Assam*

#### Tumor

Leaves are warmed after smearing with oil and tied on the tumor  
- *Madhav Shankar Rao Patil, Jalgaon, Maharashtra*

#### Skin disease

Paste made from the leaves is applied topically  
- *Madhav Shankar Rao Patil, Jalgaon, Maharashtra*

#### Thorn pain

Latex of the plant is applied on the affected part  
- *Madhav Shankar Rao Patil, Jalgaon, Maharashtra*

#### Eczema

*Jatropha* oil (60g) and bee wax (30g) is heated at 60° C and borax (1g) is added in water (10 ml); both are mixed together and stirred slowly on simmer flame. The resultant ointment is applied on the infected area  
- *Raghubir Agarwal, Hissar, Haryana*

#### Agnail

Latex is applied on the infected part  
- *Atilik Baruah, Sibsagar, Assam*

#### Piles

Juice extracted from the leaves is given orally  
- *Chingakhm Binashaki Devi, Imphal West, Manipur*

#### Veterinary practice

#### Foot & mouth disease

Seeds are ground with latex of *Calotropis gigantea* R.Br. and edible oil in small amount. The paste obtained is applied topically  
- *Gandubhai, Dang, Gujarat*

### Uses in Classical Codified Literature

Bark powder is taken orally with water to get cured from pyorrhoea<sup>29</sup>; leaves are useful in ulcer<sup>21</sup>; young branches are warmed in fire and tied on the aching joint<sup>30</sup>; and the latex is applied on the burnt part<sup>31</sup>.

'*Jatropha* tincture'<sup>32</sup> is used as a disinfectant, antiparasitic and anticoagulant. Thirteen patents have been found mainly on the medicinal uses such as for cuts, burns and wounds<sup>33</sup>.



Source: NIF Database

## Uses of *Juglans regia* L. (Akhrot)

### NIF Database

#### Hair care

Daily application of the oil on the scalp reduces hair fall  
- *Joginder Singh Negi, Kullu, Himachal Pradesh*

#### Wounds

The sap of the fruit is directly applied on the affected part  
- *Nasir Ahmed Shaik, Anantnag, Jammu & Kashmir*

Unripe fruit rind is ground into a fine powder and applied on injured body part

- *Mohd. Jamal Sheikh, Anantnag, Jammu & Kashmir*

#### Tongue cleaning

Bark of akhrot is chewed along with the leaves of neem (*Azadirachta indica* Juss.)

- *Shilpa Jain, Rajkot, Gujarat*

#### Swelling on body

Oil (50g) is mixed with with cow's urine (10g) and taken  
- *Shripal Singh, Bulandshahar, Uttar Pradesh*

#### Knee pain

Couple of fruits are taken everyday to get relief  
- *Koushlya Kumawat, Sikar, Rajasthan*

#### Memory enhancer

Mesocarp of the fruit is ground and tablets are prepared from it. One tablet is taken orally thrice a day  
- *Sapam Deben Singh, Bisehmpur, Manipur*

### Uses in Classical Codified Literature

Poultice of fruit is applied externally on abscess<sup>34</sup>; the fruit is used as carminative<sup>21</sup>; oil extracted from fruit is taken to get rid of tapeworms<sup>21</sup>; and the plant is used to cure rheumatism<sup>14</sup>.

'Fairness cream'<sup>10</sup> improves complexion, nourishes and makes the skin soft; 'Gentle exfoliating walnut scrub'<sup>10</sup> gently exfoliates dead skin cells. Thirty patents have been found on the medicinal applications of walnut in antitumor<sup>35</sup> medication, for haircare<sup>36</sup>, etc.



Source: SRISTI Database

## Uses of *Nyctanthes arbor-tristis* L. (Harshingar)

### NIF Database

#### Malaria

Juice of the leaves is taken orally along with honey  
- *Prabati Kalita, Kamrup, Assam*

#### Intestinal worms

Juice of the flowers is extracted after squeezing them. Two spoonful of this juice are taken orally for two days with a pinch of salt  
- *Manoj Kalita, Kamrup, Assam*

#### Hair fall

Seeds are crushed in water and the paste is applied on hair scalp  
- *Rani B. Bhagat, Pune, Maharashtra*

#### Cough/cold

Paste is prepared using three leaves and black pepper. It is then taken orally with water  
- *Ashok Kumar Yadav, East Champaran, Bihar*

#### Fever

Decoction of the leaves is given orally  
- *R.K. Bheirosana Singh, Bishnupur, Manipur*

Leaves (6-7), along with ginger, are crushed to extract juice, which is administered orally thrice a day  
- *Rani B. Bhagat, Pune, Maharashtra*

#### Wound

Topical application of leaf paste gives relief  
- *Ranjeet Kumar, Sheohar, Bihar*

#### Pain

Fresh leaf paste is applied on the fractured part to alleviate pain  
- *Ramsharan Dhruv, Dhamtari, Chhattisgarh*

#### Diabetes

Decoction of the leaves is taken orally for 40 days  
- *Shama Pravin, Gopalganj, Bihar*

Juice of the leaves is taken orally  
- *Rani B. Bhagat, Pune, Maharashtra*

### Uses in Classical Codified Literature

Dried fruits are taken orally to get relief from cough<sup>37</sup>; decoction of dried flower is given with jaggery as an anti-fertility agent in females<sup>38</sup>; and the leaf juice is applied externally on ringworm and other skin diseases<sup>38</sup>.

'Lupin'<sup>39</sup>, is a medicine used for pain and inflammation associated with musculoskeletal and joint disorders. Six patents have been found on its medicinal uses such as in treating Leishmaniasis<sup>40</sup> and also for its natural property as a dye<sup>41</sup>.

## Uses of *Phyllanthus emblica* L. (Amla)

### NIF Database

#### Eye irritation

Juice from ripen fruit is extracted and an equal amount of honey is added. One drop of the mixture is put in the eyes before going to bed at night

- Indira Chandel, Bilaspur, Himachal Pradesh

#### Diabetes

Equal amounts of amla, *Terminalia chebula* Retz., *Terminalia bellirica* Roxb. are ground into a fine powder. Two spoonful of this powder are given orally

- Pritam Chand, Kangra, Himachal Pradesh

#### Stomach ulcer

Equal amounts of amla and *Terminalia chebula* Retz. are taken and powder is made. Two spoonful of powder, along with two spoonful of honey and four spoonful of water are taken, mixed properly and administered orally

- Guna Ram Kanikar, Golaghat, Assam

#### Diarrhoea

Juice of amla, with an equal quantity of lemon juice, is administered orally

- Bina Chaudhry, Kamrup, Assam

#### Cough/cold

Powder is prepared from fruits (4) and *Glycyrrhiza glabra* L. (10g). 5g of this powder is taken with a glass of water

- Ved Prakash, Faridabad, Haryana

#### Jaundice

Equal amounts of amla fruit, ginger, black pepper and turmeric are ground into a fine powder. One teaspoonful of this powder is given with honey

- Nagarmal Bagaria, Nagor, Rajasthan

#### Wounds

Pounded leaves are applied on wounds

- Sevaram Bhaskar, Dhamtari, Chhattisgarh

#### Gynaecological disorder

Equal amounts of amla, tapioca and cumin are ground into a fine powder. One spoon of the powder is given orally to cure the disorder

- Guna Ram Kanikar, Golaghat, Assam

#### Poisonous bite

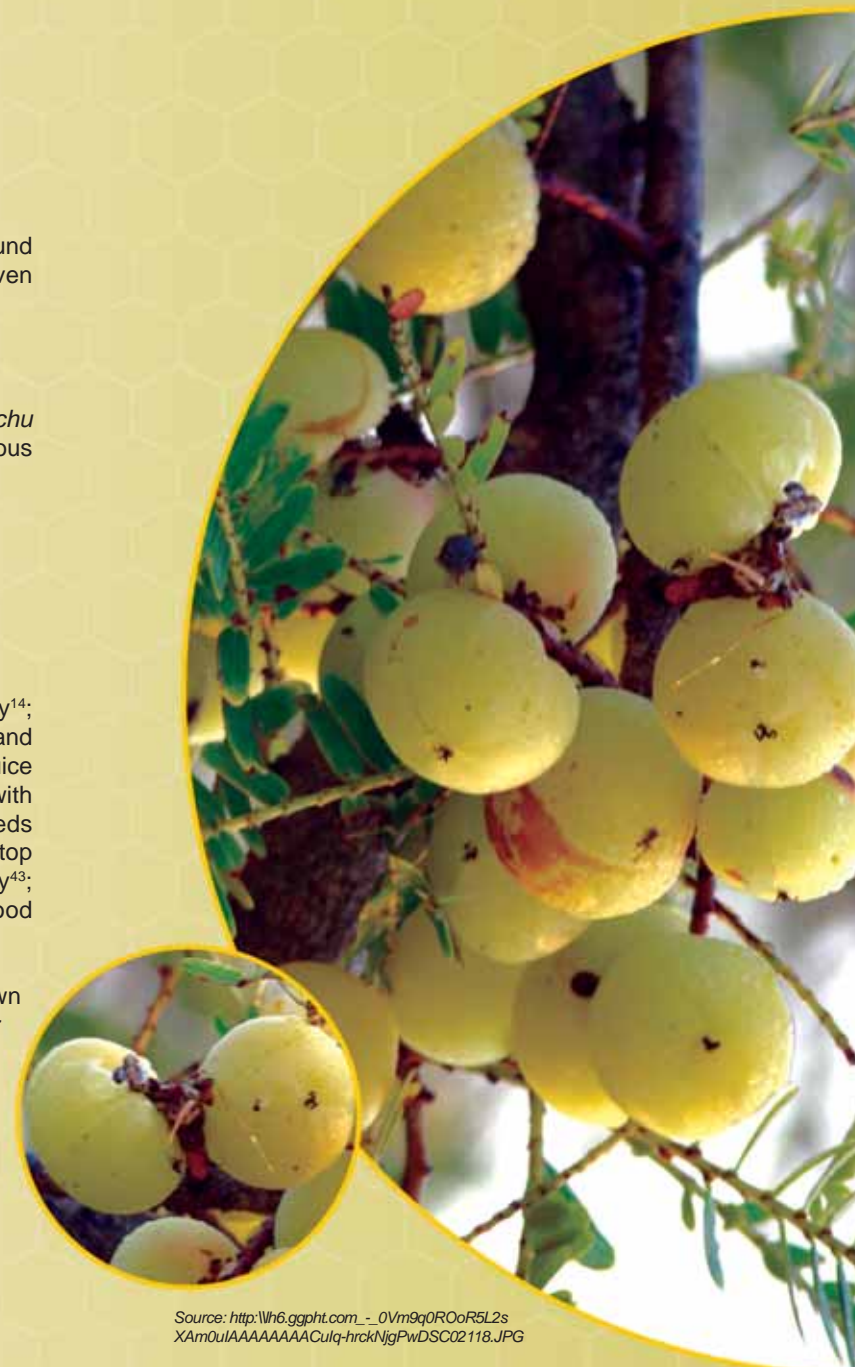
About 3-4 root pieces along with a leaf of *Areca catechu* L. are chewed to get relief from the effect of poisonous bites

- Anna Gangavarn, Osmanabad, Maharashtra

### Uses in Classical Codified Literature

Bark and fruits are used in diarrhoea and dysentery<sup>14</sup>; fresh juice of the fruit, mixed with pure cow's butter and honey, is administered to cure obstinate hiccough<sup>14</sup>; juice relieves pain in urine trouble<sup>14</sup>; pulp (2-3g) is eaten with warm milk to get rid of headache<sup>42</sup>; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding<sup>7</sup>; fruits are taken orally to reduce acidity<sup>43</sup>; and decoction of the fruit is taken to increase blood count<sup>44</sup>.

*Phyllanthus* is one of the main ingredients of well known medicines 'Triphala, Chavanprash and Amla hair oil'<sup>10</sup>. Seventy-six patents have been found on its medicinal uses such as for diabetes<sup>45</sup>, liver disorders and immune deficiencies<sup>46</sup>.



## Uses of *Solanum nigrum* L. (Makoi)

### NIF Database

#### Tonsillitis

Equal amount of leaves of *Solanum* and *Alpinia galanga* Willd. are ground and tablets prepared from it. One tablet is administered orally twice a day

- Yumnam Rajenkumar Singh, Imphal West, Manipur

#### Stomachache

Leaves of *Solanum*, neem and *Vitex negundo* L. are fried and administered orally twice a day

- Moirangthem Mani Devi, Imphal West, Manipur

#### Nasal bleeding

Dry fruit (25g) is boiled in mustard oil (100g). The oil is filtered and applied on the forehead

- Sahim Ansari, Lohardaga, Jharkhand

#### Mouth ulcer

Leaves are chewed

- Shripal Singh, Bulandshahar, Uttar Pradesh

#### Cough

Juice extracted from the roots is taken orally

- Priyanka Kumari, Gopalganj, Bihar

Leaves of makoi (200g) are fried in mustard oil (20ml) and administered with little salt

- Sukhai Mali, Faridabad, Haryana

#### Jaundice

Juice extracted from the roots is administered orally

- Suman Kumari, Gopalganj, Bihar

### Uses in Classical Codified Literature

Powdered fruit is given orally to reduce fever<sup>30</sup>; juice extracted from the whole plant is applied externally on the burnt part<sup>47</sup>; poultice of the plant is placed on the aching joint<sup>48</sup>; fruits are ground and taken orally to cure diarrhoea<sup>49</sup>.

'Herbolax'<sup>10</sup> made from *Solanum* along with other plants is used as gentle laxative in case of constipation and for electrolyte balance. Ninety patents were found on its medicinal uses mainly on hepatitis<sup>50,51</sup>.





## Uses of *Tinospora cordifolia* (Willd.) Miers ex Hk. f. & Th. (Giloy)

### NIF Database

#### Jaundice

Juice extracted from stem is administered orally till the ailment cures

- D. K. Phukan, Guwahati, Assam

#### Piles

Whole plants (50g) are boiled, dried and ground into a fine paste. Tablets are then prepared and one tablet is administered orally to the patient thrice a day for 3-5 days

- Pukhram Angouba Singh, Bishnupur, Manipur

#### Migraine

Stem of the plant (250g) is boiled in water along with green gram (250g) and sesame oil (250ml) till half of the decoction remains and then applied on the forehead

- Stedimon Arackal Paul, Port Blair, Andaman & Nicobar Islands

#### Asthma

Juice is extracted from the leaves and two spoonful are administered orally with honey for 40-42 days

- Ramabandhu Mahajan, Jalgaon, Maharashtra

#### Chronic fever

Whole plant (50g) and leaves of *Ocimum sanctum* L. (11) are soaked overnight and pounded together next morning, and given to the patient with honey or sugar candy

- Jagjit Bahadur, Sitapur, Uttar Pradesh

#### Diabetes

Fresh leaves (1-2) are taken on an empty stomach

- D. K. Phukan, Guwahati, Assam

Powder of the leaves (¼ spoon) is taken regularly

- Patel Singh, Hissar, Haryana

Juice of the plant and radish is extracted and given orally

- Jagjit Bahadur, Sitapur, Uttar Pradesh

#### Veterinary practice

##### Anestrous

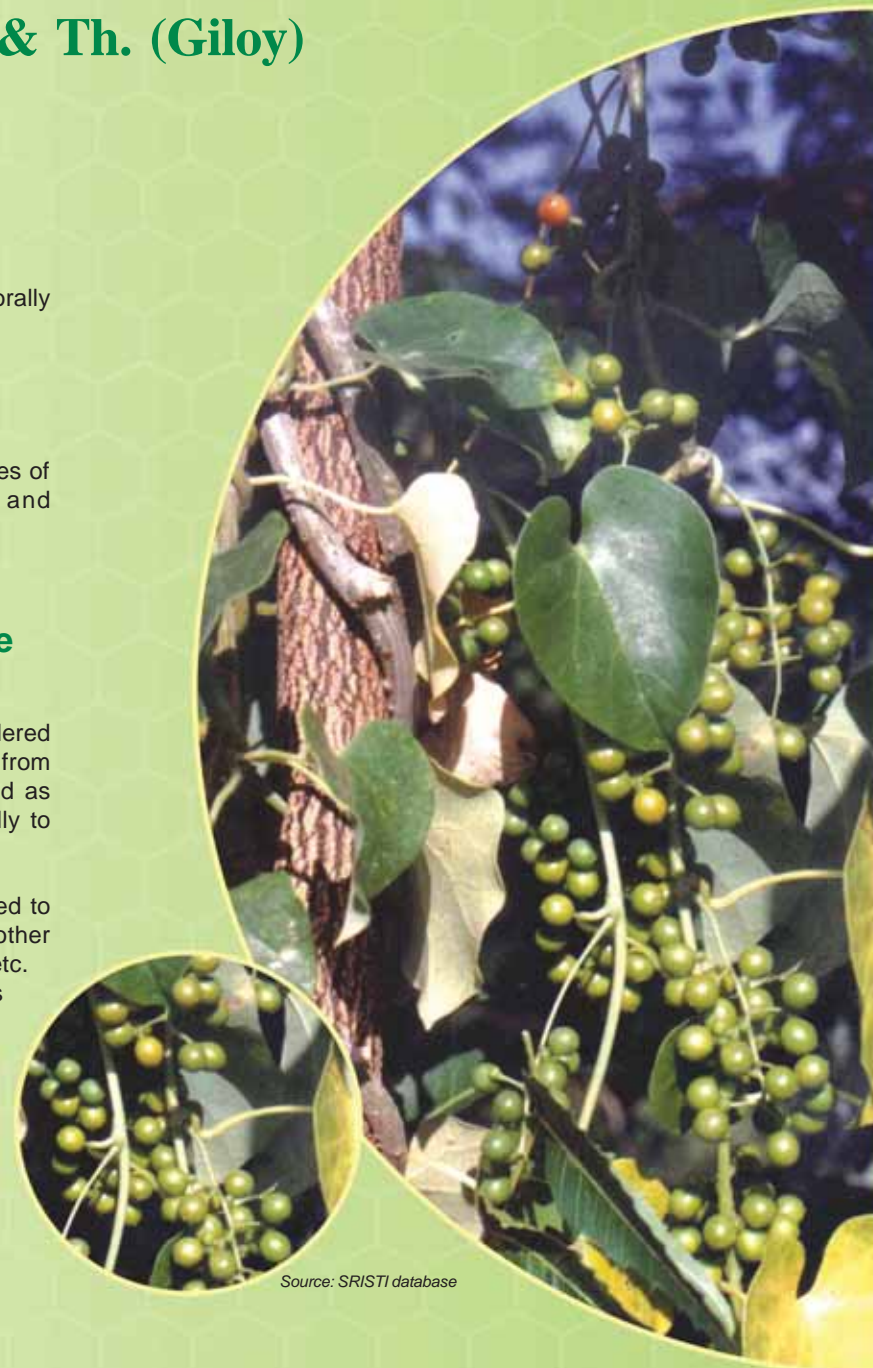
Plant, along with bark of *Cassia fistula* L. and leaves of *Artocarpus heterophyllus* Lam., is ground and administered orally

- Honnegowda, Bengaluru rural, Karnataka

### Uses in Classical Codified Literature

Powdered roots are taken for mouth ulcer<sup>52</sup>; powdered plant is administered orally with honey to get relief from stomach disorder<sup>53</sup>; the stem is bitter and is used as anthelmintic<sup>21</sup>; decoction of the plant is given orally to cure diarrhoea<sup>54</sup>.

*Tinospora* is a well known medicinal plant and used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon<sup>10</sup>' etc. More than hundred patents have been found on its medicinal applications such as an antiallergic<sup>55</sup>, for cancer<sup>56</sup> etc.



Source: SRISTI database

## Herbal Formulations for Healthy Crops

### SRISTI SHASTRA

*Arkhiben Vankar, Ranabhai Kamaliya, Banidan Gadhvi, Gemal Rana, Rajnikant Patel, Ahmadbhai Kadivala, Gujarat.*

It flourishes the growth of the plant by increasing flowering as well as fruiting. Besides overall vegetative growth, it is not harmful to nature and human beings. It also controls sucking pests like white fly, heliothis, aphid etc.

### SRISTI KRUSHAK

*Popatbhai Rupabhai Jambucha, Gujarat*

It is an excellent remedy for leaf curl disease. Besides controlling the disease it increases the vigor of the plants by increasing overall growth.

### SRISTI SURAKSHA

*Community Knowledge, Gujarat*

It is a very efficient treatment for termite and acts as a vitaliser to the affected crops. To control termites the herbal formulation is mixed with sand and spread in the field. Some times it is released in the field along with the flow of irrigation water. In some cases, it is also drenched in the affected part of the plant and sprayed on the vegetation to repel termites.

### SRISTI PRAYAS

*Community Knowledge, Gujarat*

It is a highly effective formulation to act as a herbal growth promoter, which stops shedding of flowers as well as increases the overall growth of the plant. This formulation strengthens the plants internally and enables them to withstand extreme weather conditions. Constant use of this formulation increases the yield and reduces the toxic content in our daily diet.

### SRISTI SHAKTI

*Community Knowledge, Gujarat*

A herbal growth promoter, which helps in production of excellent quality organic food grain. Constant use of this formulation not only increases the yield but also reduces the toxic contamination in our food and environment.



## Herbal Formulations for Livestock and Poultry

### Coccicure

*Sudakarbhai K. Gaudi & Jeevalbhai M. Gaudi, Dang, Gujarat*

It is a unique herbal medication for prevention and curing of Coccidiosis (*Eimeria* sp infections) in Poultry. The primary function of the medication is to reduce the oocytes maturation and affects the life cycle of various *Eimeria* species.

### Poultmax

*Community knowledge, Valsad, Dang, Gujarat*

It is a unique herbal medication for promoting poultry immunity. It cures symptoms like greenish diarrhoea, conjunctivitis, nasal sputum, drop in egg production and respiratory distress in poultry. About 30g/100 birds for 0-4 weeks & 60g/100 birds for 4-8 weeks may be administered for seven days in stress or for three days before and three days after expected stress.

### Mastiherb

*Ukhardiyabhai S. Raot, Dang, Gujarat*

Mastiherb is a unique intramammary herbal medication for curing mastitis in animals. Clinical trials indicated efficacy of the medication over subclinical mastitis; clinical mastitis and chronic mastitis. It was also validated in case of mastitis due to *Staphylococcus aureus*. The dose rate was found to be single intra mammary infusion for minimum three days after adequate standardization.



-These formulations are based on traditional knowledge of farmers and developed by Sadbhav-SRISTI Sanshodhan Laboratory ([www.sristi.org](http://www.sristi.org)). These products are licensed to Matrix Biosciences Pvt. Ltd, Hyderabad, Andhra Pradesh. The benefits are shared with the knowledge providers, communities, nature, those who add value and other stakeholders in the knowledge and value chain.



**Diverse in design,  
symmetric in nature**



Strength does not come through concrete in shifting sands,  
layers of disconnectedness

Making Homes: Sikkim





**NATIONAL INNOVATION FOUNDATION, INDIA**

## **The Sixth National Biennial Competition for Green Grassroots Unaided Technological Innovations and Traditional Knowledge**

### **Co-sponsors**



Honey Bee Network



CSIR



SRISTI



IIM-A

### **The competition**

The NIF, set up by Department of Science and Technology, GOI, seeks entries of unaided technological innovations and traditional knowledge developed by an individual or group comprising farmers, artisans, fishermen and women, slum dwellers, workshop mechanics, students, local communities etc., in managing natural and/or other resources. The innovations can be in machines, gadgets, implements, or processes for farm operations, household utility, transportation, energy conservation or generation, reduction in drudgery, creative use of biodiversity, development of plant varieties, generation of herbal remedies for human or animal health or developing new or any other low cost sustainable green technology related to various aspects of survival in urban and rural areas. Creative ideas for innovative technologies which have not yet been reduced to practice are also welcome. Communities developing People's Biodiversity Register (PBR) or People's Knowledge Register (PKR) are encouraged to register/link their knowledge base with the National Register at the NIF.

### **The awards**

The best three innovations and traditional knowledge practices will be awarded Rs 1,00,000, Rs 50,000 and Rs 25,000 each in different categories. In addition, individuals and/or organizations that make extraordinary contributions in scouting grassroots innovations and traditional knowledge may also get awards worth Rs 50,000, 25,000 and 15,000 respectively besides recognition to many others. There will be several consolation prizes of Rs 10,000 each in different categories depending upon the number of entries and incremental inventiveness and potential social and environmental impact. Three most outstanding innovative ideas may be given prizes of Rs 50,000, 25,000 and 15,000 in addition to consolation prizes of Rs 5,000 each. There are special prizes for innovations by or dealing with, physically challenged people. The

innovations /ideas of professionally trained persons are not considered for award or financial support. There are special awards for journalists writing about grassroots innovations and/or traditional knowledge and creating greater awareness about NIF's missions. *The award money may be revised in due course.*

### **Students**

Young inventors and innovators are invited to send their ideas or innovations for a special category of awards for them. These should be unsupervised, an outcome of their own creativity, without any support from their teachers or outsiders. There will be prizes worth Rs 15,000, 10,000 and Rs 7,500 for the best three entries and several consolation prizes of Rs 5,000 each in this category.

### **How to participate**

Individuals or groups may send as many entries as they wish on plain paper providing a) genesis of the innovation and traditional knowledge b) its background and c) educational qualification and occupation, accompanied by photographs and/or videos if possible and any other information that may help in replicating the innovations/traditional knowledge. Herbal entries may be accompanied by dried plant samples to enable proper identification procedure. The **Sixth National Competition started on February 1, 2007 and entries would be accepted till December 31, 2008.** Every entry should include the **full postal address** to facilitate further communications.

### **Where to send entries?**

National Coordinator (Scouting & Documentation), National Innovation Foundation, Bungalow No. 1 Satellite Complex, Premchand Nagar Road, Ahmedabad 380015 Gujarat  
Toll Free No 1800 233 5555 Fax: (079) - 2673 1903  
email: [campaign@nifindia.org](mailto:campaign@nifindia.org); [www.nifindia.org](http://www.nifindia.org)

## PART II

# INNOVATIONS FOR HIMALAYAS

This section contains details of innovations,  
which are deemed suitable for introduction  
in Himalayas





**Dadaji Ramaji Khobragade**  
Maharashtra

## HMT- An Improved Paddy Variety

Khobragade selected and bred the HMT rice variety from the conventional 'Patel 3', a popular variety developed by Dr. J. P. Patel, JNKV Agriculture University, Jabalpur. He succeeded after five years of continuous study and research on a small farm owned by him without any support from the scientific community. This variety has an average yield of 40 – 45 quintals per hectare with short grains, high rice recovery (80 %), better aroma and cooking quality in comparison with the parent ones. Most remarkable feature of the variety is the thinness of grain. It has been included as a standard reference for thinness by Protection of Plant Variety and Farmers' Right Authority (PPVFRA).

He won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. NIF has filed an application under PPVFRA 2001 to register his variety. Apart from HMT he has also developed six other paddy varieties namely DRK, Vijay Anand, Nanded Chinur, Nanded 92, Deepak Ratna and Nanded Hira. He regrets that local agricultural university took the credit merely for purifying the seeds and did not give him the due honour. HMT has diffused in more than one lakh acres in five states.





## Kudrat 9- An Improved Variety of Wheat

The innovator believes that every farmer should get good quality seeds to deliver high yielding varieties of crops. He has developed a number of improved wheat, paddy, mustard and pigeon pea varieties, which are high yielding, robust stem, having bold seeds with good taste and resistance to major pests & diseases.

“Kudrat 9”, an improved wheat variety, developed by him using simple method of selection is quite popular among the farmers in different parts of Uttar Pradesh, Madhya Pradesh, Chattisgarh, Maharashtra, Rajasthan, Gujarat and some parts of Bihar, Haryana and Punjab. This variety bears large number of ear bearing tillers with lengthy spikes and has a hardy stem. The grain contains high protein and has better taste. The average yield of this variety is 55-60 quintals / hectares.



**Prakash Singh  
Raghuvanshi**  
Uttar Pradesh





**Jai Prakash Singh**  
Uttar Pradesh

## Virat (JP-6)- An Improved Variety of Pigeon pea

This new variety has coloured flowers, long leaves and bunchy type pods bearing at the top. The seed weight (19 – 20 gram/ 100 seeds), number of pods / plant (500 - 600), big size pods (3 – 5 inch), number of seeds/pod (5 – 6) and perennial yield (1st year 12 -14 quintal/ acre and 2nd year 14 – 15 quintal/ acre) is higher as compared to the local popular variety. This variety requires less quantity of seed (4 – 5 kg/acre) and maintenance as compared to other varieties grown in the region.



## Richa 2000- An Improved Variety of Pigeon pea

This variety has big flowers, long leaves and bunchy type pod bearing at the top. Topping is done periodically, which results in bushy growth. This variety has synchronous maturity with higher yield (24 quintals/acre), more branches / plant (12-14) and more pods/plant (700 – 800) than other local popular varieties of the region. Rathore was given a consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.



**Rajkumar Rathore**  
Madhya Pradesh





**Ishwar Singh Kundu**  
Haryana

## Herbal Growth Promoter

A herbal plant growth promoter, which is effective in protecting the plants from a broad spectrum of pests apart from providing necessary nutrition has been developed. It is named as “*Kamaal*” meaning wonderful, due to its performance. It is effective in field crops as well as in vegetable crops.

The main ingredients of the product are “*aak*” (*Calotropis gigantea*), “*reetha*” (*Sapindus trifoliatus*), “*dhatura*” (*Datura metel*), “*neem*” (*Azadirachta indica*), Tobacco (*Nicotiana tabacum*), and “*bhang*” (*Cannabis sativa*), etc.

The innovator won a Consolation Award in NIF’s Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. He has also been supported under the Micro Venture Innovation Fund of NIF for commercialising “*Kamaal*”. The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied for use in the gardens in the Rashtrapati Bhavan with encouraging results.



## Aloe vera Gel Extractor

The innovator has developed an effective multipurpose unit capable of pulverizing, steaming, and extraction of gel for herbal applications.

With this device, the innovator uses the specially designed pressure cooking chamber to extract the essence from *Aloe vera*. Being a compact portable unit, it can be quickly and easily transported and used anywhere even in the fields, to process herbs and deliver on demand. The present machine has a capacity to process 100 kg of *Aloe vera* per hour. The innovator was supported for production and commercialisation through GIAN North . One unit has been sent to Kenya on a pilot basis for application feasibility study in the country. Once the feasibility is confirmed, a contract order from the country is expected for more number of units. NIF has also filed a patent for the machine in the innovator's name.



**Dharamveer**  
Haryana





**Kamal Narayan  
Pradhan 'Gorkha'**  
Himachal Pradesh

## Modifications in Gears for Mountainous Slope

Anybody who has driven on mountainous roads knows that while descending on the slopes, one needs a kind of locking mechanism in the gear to prevent slippages. Kamal Narayan has modified the old gears which may get worn out and may cause accidents if not replaced or repaired.

He has modified the gear arrangement to prevent slippage even in the new vehicles. This innovation has been found very useful by the heavy vehicle drivers. Its dissemination, however, is localised.



## Ten-in-one Agricultural Implement

Every season presents a variety of farm work requiring skilled labour and implements, which lands many small farmers in a fix. The innovator has developed a multi-functional motorized implement that addresses ten key applications centered on rural needs.

The equipment can do ten tasks including water pumping, chaff cutting, generation of electricity, grinding and sharpening of tools, sawing and cutting of wood, coconut dehusking, winnowing, threshing of paddy, threshing of groundnut and cutting of grass for soft cattle feed.



**Guru Charan Pradhan\***  
Orissa



\* Professional registered in NIF's Professional database. As per its mandate, NIF does not consider professionals for awards or financial support, but only helps in providing visibility or linkages.



**N Sakthimainthan**  
Tamil Nadu

## Hand Operated Water Lifting Device

An efficient way of pumping water to meet requirements in a cost effective way is always a challenge in rural India.

Developed from locally available materials, this hand operated water lifting device is simple in design, delivers high discharge and is low cost compared to conventional hand pump, bucket pump, and bicycle operated pumps.

The Innovation has been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.





## Improved Multicrop Thresher

Farmers across India require a reliable machine that achieves threshing with minimal grain breakage, clean output for a variety of crops. The innovator has developed a versatile thresher that can meet these needs.

The modified thresher reduces setup time to less than 15 minutes to switch over from one crop to another, and achieves minimal breakage. Its latest variant can also handle groundnut apart from threshing other cereals and pulses.

The innovator has been provided working capital for his enterprise from the Micro Venture Innovation Fund of NIF. More than a hundred farmers have bought his thresher.



**Madanlal Kumawat**  
Rajasthan





**Sheikh Jahangir Sheikh  
Usman**  
Maharashtra

## Two-wheeler Based Spray Painting Device

The innovation is a painting device that can be easily mounted on a two-wheeler scooter and carried to a customer's place. Deriving power from the two-wheeler's engine to run the compressor, this device lends flexibility of usage to the painter. This innovation won Sheikh Jahangir a consolation prize in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. NIF has also filed a patent application for the same and has supported him through the Micro Venture Innovation Fund. He has also made a scooter mounted washing machine and a scooter mounted flour mill.



## Portable Painting System

Often, users need a small portable spray painting system to meet local needs including indoors. Gurjeet has developed such a system using available parts such as compressor, air tank and a spray gun.

Weighing hardly ten kilograms and costing one-third of the commercial systems, it works very well. By using a tube in place of air tank, the innovator projects that the cost can be reduced for certain type of jobs.



**Gurjeet Singh**  
Himachal Pradesh





**Ghonakanta Gogoi**  
Assam

## Multi Purpose Wood-working Machine

Small carpentry workshops have difficulty in purchasing and using multiple machines due to high initial costs, space constraints and maintenance considerations.

This multipurpose machine with minimal footprint, is built to address all major workshop needs, allowing completing the sequence of wood-working operations in one place, and allowing better control on finished product.



## Safe Wood Cutting Machine

The innovator has developed a diagonal cutting system, which enables cutting at different angles. The machine uses a 2HP motor, transmission system, rotating platform, and saw blade with a simple elegant construction. It consists of a moving platform to feed the job, while being able to fix and cut the job in any orientation. It also has facilities to mount multiple fixtures using an inbuilt scale for measurement and productivity enhancement.



**Kishanlal Jangid**  
Rajasthan





**Karuna K. Nath**  
Assam

## Manual Wood Cutting & Bamboo Cross Cutter

Cutting of wood effectively and efficiently is achieved by this machine. The equipment is cost efficient, and can be manually operated with both hand and foot pedal options. Most importantly it is portable, and can be taken to any worksite and has more productivity compared to manual sawing.

This equipment consumes lesser time and labour compared to available saws and has a mechanism and linkages similar to manually operated sewing machine. The work of three labourers can be done by one labour using this machine. The innovator has been supported under the Micro Venture Innovation Fund scheme of NIF and has been doing modest business in the area.



## Auto Air Kick Pump & Natural Water Cooler

This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle having kick start or auto start mechanism so as to fix the problem on the spot and enable the rider to reach the nearby gas station or repair shop. This device uses the engine as the compressor for pumping air into the tube. A pinch of polymer granules is also inserted in the tube to seal the leakage in the tube.

Arvindbhai won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF, apart from filing a patent in his name, facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs. The technology is available for licensing to entrepreneurs in different states.

Water Cooler: We already have refrigerators that operate on the principle of heat transfer and earthen pots that work on the principle of evaporation to cool water today. Arvindbhai



has combined both features. In his natural water cooler, water is passed through cotton string covered copper coils, which are continuously being moistened by a dripper. Evaporation of water from lining on the coil cools the water inside. Cool water without electricity, isn't it a nice idea!



**Arvindbhai Patel**  
Gujarat



**Khimjibhai Kanadia**  
Gujarat

## Panihari - A Head Load Reducing Device

Rural women walk tens of miles with heavy load on their head, which causes stress, discomfort and eventually head and neck injuries.

The product is an ergonomically designed device fixed on top of the head, with two extended supporting rods from the sides of the device. The device transfers the weight carried on the head to the shoulders, which is better positioned to carry weight.





## Jalpari- The Water Carrier

Women who walk miles with heavy water pitchers on their head, suffer discomfort and even injuries. This innovation consists of a shoulder slung unit fixed with water canisters balanced on either side.

The carrier has two washable plastic containers of 20 liters capacity in the front and the back respectively. Metallic handle grips for holding and picking, a soft flexible shoulder strap and a tap for taking out water are some of the features of this versatile unit.



**Madhav Sawant**  
Maharashtra





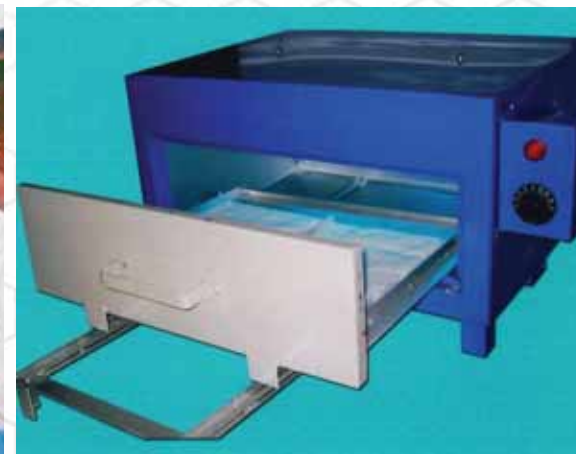
**A. Muruganandam**  
Tamil Nadu

## Sanitary Napkin Making Machine

Sanitary napkins, a universally needed product, have a very low penetration in India due to high price and the traditional trend of using cheaper but unhygienic old cloth pieces. The innovator has developed a machine that produces quality sanitary napkins at a low cost.

One can prepare sanitary napkins with standard material while cutting down the cost in production. It requires three to four persons to produce two pads per minute. Costing less than half of conventional options, this machine produces sanitary pads @ Rs.1 to Rs. 1.50 per pad approximately.

The innovator prefers to sell the napkin making machinery only to self-help groups of women. He has also designed a napkin vending machine such that one can put a coin and get a pad. With the support from the Micro Venture Innovation Fund scheme, the innovator has been able to install fifty units in seven states.



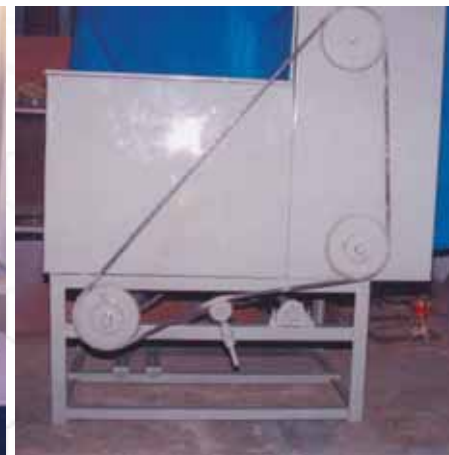
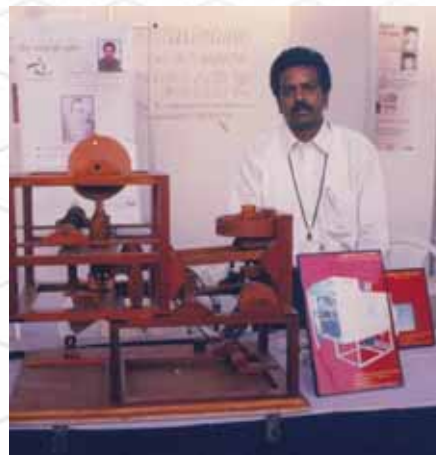
## Garlic Peeling & Lemon Cutting Machine

Faster peeling of garlic in an effective way is a major requirement in the pickle industry. This product is a food-grade, fully automated machinery designed for bulk quantity peeling of garlic. The machine ensures minimal damage and has wide application in making pickles and herbal medicines. The machine is energy efficient, saves labour, needs low capital and operating cost. It frees the industry from capacity constraints caused by shortage of labour in peak seasons.

The second product is also used in pickle industry, but for cutting lemons. It is a cost effective machine, having innovative design, with continuous feeding system. It performs precise and standard cutting of large quantity of lemons in uniform shape and sizes. It can be operated by one person and cuts lemon into maximum eight pieces. The innovator has been supported under MVIF scheme and has achieved a turn over of around sixty lakhs since 2003.



**M. Nagarajan**  
Tamil Nadu





**Dulal Choudhary**  
Assam

## Beauty Care Umbrella

Protection from harsh rays of the sun is a requirement in most parts of a tropical country like India. An umbrella made from traditional yet multifaceted material is a boon for the common man.

This innovative umbrella is durable, stain free, water proof and is produced from muga silk. It has a pleasing golden shine, which illuminates colour and protects from UV radiations up to 80 percent as per laboratory tests, far better than that offered by conventional umbrellas. NIF had facilitated the technology licensing of the innovation to Assam Silk Development Centre in 2005. The product has been sold to customers in Europe and Australia also.



## Mobile Operated Switch and Multi-media Poster

Imagine a village where the farmer has the luxury of being able to stay at home and switch his irrigation pump in the faraway field on or off as required during the day or at night. This is made possible by this innovation, which uses the power of mobile telephony to trigger electrical control switches.

The farmer can remotely know the status of the pump in his cell phone and turn the motor on or off by calling the particular configured number. It activates the switching by certain number of rings and hence incurs no call charges. Prem Singh has developed several other innovations, one of which is the viewer triggered multi-media poster. If any agency wants to communicate some graphic message with different language audios or videos, this multi-media poster can be very useful. NIF facilitated a Mumbai based company to purchase two hundred units of the talking poster worth around eight lakh rupees for diffusion in various states. These were made available in five local languages.



**Prem Singh Saini**  
Haryana





**Imli Toshi Namu**  
Nagaland

## Hydro generator using bamboo composite

Energy generation and pumping water for irrigation is a widespread rural need. The innovator has used the bamboo powder, a by-product from the bamboo lathe machine invented by him, and mixed it with a resin to create a strong composite to fabricate the lightweight hydro turbine for generation of energy.



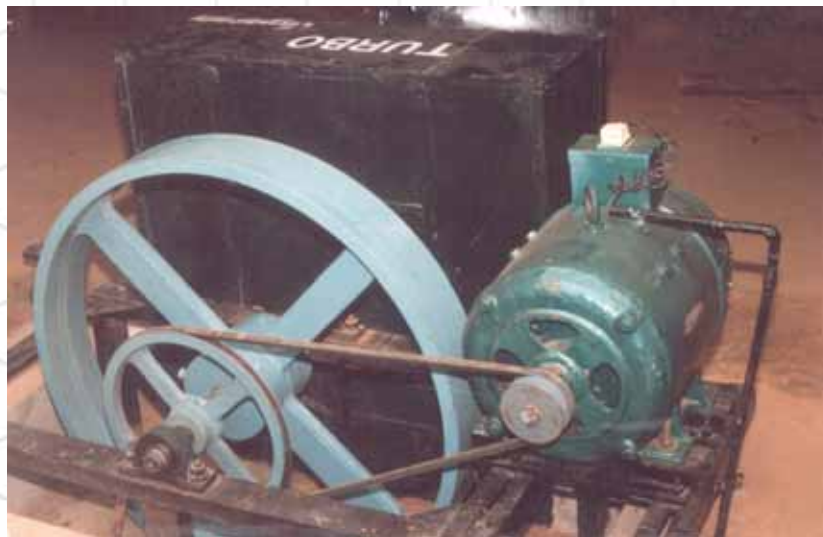
## Modified Hydro Electricity Turbine

Electricity supply in the hills is always a problem with either the difficulty of access or distribution or disruptions.

This hydro electric turbine is specifically designed for the streams in the hilly terrains. It costs Rs. 30,000 and meets the individual electric needs of a rural household. The innovator has installed a few of these turbines in the hilly villages of Dakshin Kannada, Kadagu, Hassan and Chikmagalur districts. The innovator is popularly known as 'Turbo' Ratnakar. He was given State Award in NIF's Second National Competition in 2002 (also see Honey Bee, 14(4) & 15 (1): 11-15, 2003).



**G. K. Ratnakar**  
Karnataka



Sikkim: Local shelter for local bees





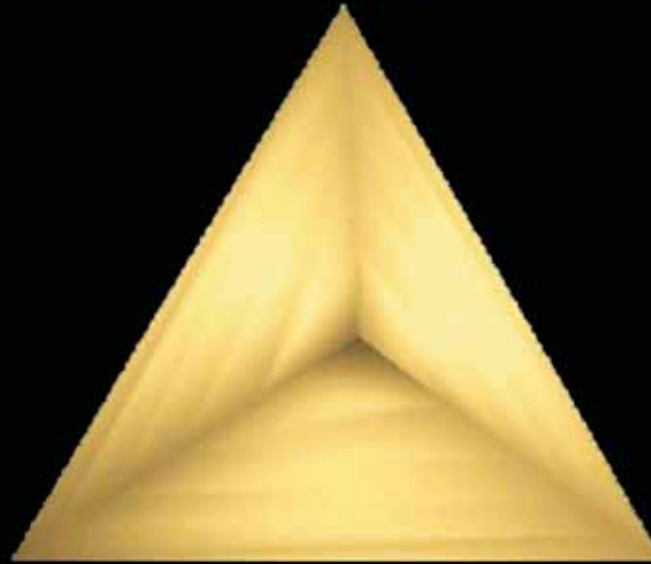


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