



National Innovation Foundation

JHARKHAND INNOVATES

नवसृजन की ओर



# JHARKHAND INNOVATES



## **National Innovation Foundation**

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## **HONEY BEE NETWORK**

[www.honeybee.org](http://www.honeybee.org), [www.sristi.org](http://www.sristi.org)

**Regional Collaborator**  
Social Upliftment Trust  
Hazaribag

## CONTENTS

# JHARKHAND INNOVATES

PART I  
INNOVATIONS FROM JHARKHAND | 11

PART II  
HERBAL PRACTICES & PRODUCTS | 21

PART III  
INNOVATIONS FOR JHARKHAND | 37

## 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. We have not been equally successful in scouting and documenting innovations and traditional knowledge practices in every state.

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 from Jharkhand. 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 three parts. The mechanical innovations developed by innovators from Jharkhand are covered in part one. Selected examples of herbal traditional knowledge are given in part two. The innovations from other parts of the country suitable for the development of Jharkhand are given in part three.

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point. There are a large number of people who may not have been

## JHARKHAND INNOVATES

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  
Chairperson, Governing Council  
National Innovation Foundation, Ahmedabad  
mashelkar@nifindia.org

## 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 reason 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 making 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.

## JHARKHAND INNOVATES

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 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 75,000 ideas, innovations and traditional knowledge practices from over 500 districts of the country.

NIF has filed 182 patents in India and seven in US and one PCT. 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 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



## JHARKHAND INNOVATES

- 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 with NIF 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 Jharkhand state. Tremendously rich knowledge of biodiversity, minerals and environment can be leveraged through the proposed association.



Anil K Gupta  
Executive Vice Chairman  
NIF, Ahmedabad  
[anilg@nifindia.org](mailto:anilg@nifindia.org)



**“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

# INNOVATIONS

## from JHARKHAND

This section contains grassroots innovations emerging from the rural/urban areas of Jharkhand





**Sukhram Mistri**  
Lohardaga

## Portable welding machine

To enable an appliance/device to be welded either requires the device to be carried to the place of the welding or the welding machine to be taken to the place where the requirement is. Either way most of the time it is quite cumbersome. This welding machine has made work easy. It works well on low voltage using a single phase electric supply. NIF facilitated the testing of the device at BIT, Mesra, Ranchi, which has suggested some changes in the materials.



## Friendly electric lawn mower

A motor mounted on a self-made chasis is used to cut grass upto one feet tall from the ground level. The mower can cover 1000 square feet per hour. Interesting to note is the fact that the motor can easily be removed from the assembly and used for some other work also.



**Murari Sharma**  
Bokaro





**Ankush Kumar**  
Dhanbad

## Cob-web cleaner & Pocket alarm

### Cob-web cleaner

How many times we frown at the irritating sight of the cob webs in the corners of our rooms, which refuse to go away completely with the traditional cleaners. A possible solution comes from a young boy, who has developed a battery operated cob web cleaner, which rotates the head to clean away the last strand of a cob web.

### Beware Pick Pocket: an alarm/light to alert

A simple circuit that will make a siren to go off once some one tries to take away something from your pocket. And if you miss the alarm, a light will blink in your goggles. Another idea from the young mind!



## Fishing rod with light and sound alarm

Many times while waiting for the fish to be trapped, the mind gets diverted and one misses the fish. This fishing rod has a siren and a light to intimate that the bait has been bitten by the fish.



**Sanjay Karmakar**  
East Singhbhum

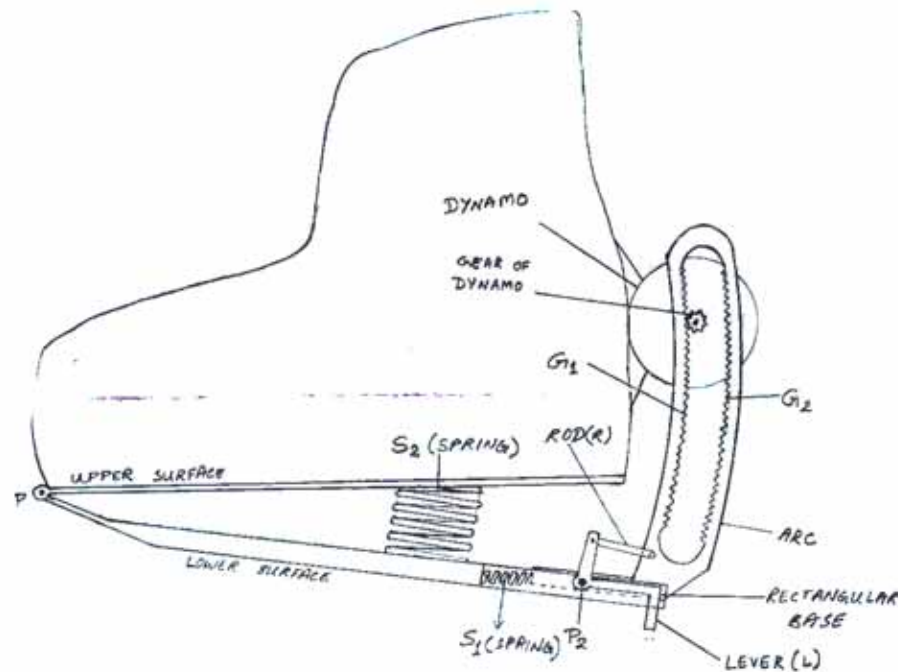




**Rajesh Ranjan**  
Ranchi

## Battery charging shoes

This is an idea about shoes that would be able to charge batteries that can run various small devices later. In the lower layer of the shoe, a dynamo could be attached. When the shoe would press against the ground, the rotor of the dynamo would rotate due to the weight of the body. Hence, electricity would be generated and the rechargeable batteries would get charged. For his idea, Rajesh was awarded in NIF's Second National Competition for Grassroots Innovation and Traditional Knowledge in 2002.





## Tower irrigation system

It is a simple and effective irrigation technique to pump water in the agricultural fields in areas of predominantly undulating topography. It consists of a motor pump that raises water to an optimum height, the water then flows down through the pipes due to gravity and is channeled to the fields through the network of underground pipes. The technology does need further exploration and development.



**Meenu Mahato**  
Hazaribag



## **20<sup>th</sup> Shodh Yatra** **December 26, 2007- January 2, 2008** **Patamda, East Singhbhum & Purulia to Bankura, West Bengal**

Shodh Yatra is a journey on foot in the search of knowledge, creativity and innovations at grassroots.

It is an attempt on the part of SRISTI, a Honey bee network partner based at Ahmedabad and NIF along with other network partners to reach out to the remotest part of the country with a firm belief that hardships and challenges of natural surroundings are the prime motivators of creativity and innovations.

Shodh Yatra aims at unearthing such traditional knowledge and grassroots innovations that have not only simplified the lives of men, women and farm labourers but have also significantly contributed towards the conservation of bio-diversity.

The yatris, during the 20<sup>th</sup> Shodh Yatra, over the period of seven days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, scientists, students, innovators, farmers, journalists and traditional knowledge holders from India and abroad.



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

# HERBAL PRACTICES & PRODUCTS

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



## Uses of *Achyranthes aspera* L. (Apamarga)

### NIF Database

#### Uses from Jharkhand

##### Fever

Roots are tied around the neck  
- *Ishidor Minjh, Gumla, Jharkhand*

##### Asthma

Whole plant (50-100g) is ground into a fine powder. 5g of this powder is taken with water till the ailment cures  
- *Ahmed Hussain, Lohardaga, Jharkhand*

##### Poisonous bites

Roots (25g) are ground into a fine paste, and juice is extracted. The Juice is taken orally and the remaining paste is applied on the bite site  
- *Jighha Oraon, Gumla, Jharkhand*

##### Abscess

Root paste is applied on the abscess  
- *Ravi Oraon, Hazaribag, Jharkhand*

#### Uses from other states

##### Headache

Root paste is applied on the spot of the bite and also administered orally  
- *Jagjit Bahadur, Sitapur, Uttar Pradesh*

##### Toothache

Teeth are brushed with freshly plucked roots  
- *Bhagvat Prasad Yadav, Nawada, Bihar*

##### Itching

Powdered roots (5g) are taken orally with water twice a day for seven days  
- *Indira Kumari, East Champaran, Bihar*

### Uses in Classical Codified Literature

Dried aerial parts are taken orally in case of diabetes<sup>1</sup>; a powder made from the dried plant is given orally to treat whooping cough<sup>2</sup>; decoction of the plant is used as laxative<sup>3</sup>; and decoction of the plant is applied externally on boils and pimples<sup>3</sup>.

Product 'Cystone'<sup>4</sup> is made from this plant, which inhibits calculogenesis by reducing stone-forming substances like oxalic acid, calcium hydroxyproline and prevents urinary tract infections. Thirty five patents have been found on the medicinal applications of *Achyranthes* like for curing laryngopharyngitis<sup>5</sup>, bronchial asthma<sup>6</sup> etc.



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

### NIF Database

#### Eye ailments

Two drops of juice extracted from the green leaves are put in the eye

- Kumari Nigar Pravin, Hazaribag, Jharkhand

#### Sunstroke

Juice extracted from the fresh leaves is taken orally

- Vijaya Bharati, Hazaribag, Jharkhand

#### Dysentery

One fruit is soaked in a litre of water, seeds are removed and juice is extracted from the pulp, sugar (20g) is added and the juice is administered orally

- Gamaliyal Hembrom, Hazaribag, Jharkhand

#### Diabetes

Juice is extracted from fresh leaves (25g) and administered orally on an empty stomach

- Randhir Kumar, Hazaribag, Jharkhand

#### Uses from other states

##### Fever

Leaves of bel and *Swertia chirayita* (Roxb. ex Flem) Karsten. (250 g) are boiled in a litre of water to obtain a decoction of 250 g. 100 g decoction is given to the patient twice a day for seven days

- Sindhoo Kumari, Gopalganj, Bihar

##### Jaundice

Freshly plucked green leaves are soaked in a glass of water and taken on an empty stomach 2-3 times a day till cured

- Akhilesh Kumar Yadav, East Champaran, Bihar

#### 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

### Uses in Classical Codified Literature

Burnt fruit pulp is applied on rheumatic arthritis<sup>2</sup>; 10g fruit pulp is given before sleep to overcome morning sickness<sup>7</sup>; fruit rind is applied externally on head to kill headlice<sup>8</sup>.

'Bael'<sup>4</sup>, prepared from *Aegle* is used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. 'Lukol's'<sup>4</sup> is a tonic made from this plant along with other plants. This improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system control leucorrhoea. 'Bilwa'<sup>9</sup>, a product of *Aegle* is used as a medicine to cure a number of diseases. Fifty three patents have been found on the medicinal applications of *Aegle* like for curing diabetes<sup>10</sup>, gastric ulcer<sup>11</sup>etc.



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

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

### NIF Database

#### Uses from Jharkhand

##### Headache

Juice extracted from bark (20g) is given orally  
- Prishila Tuddu, Hazaribag, Jharkhand

##### 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

##### Joint pain

Bark paste is applied on the aching joint  
- Prishila Tuddu, Hazaribag, Jharkhand

#### Uses from other states

##### Asthma

Decoction of the bark is given orally  
- Robert L. Hamte, Aizawl, Mizoram

##### Gastric

Few leaves are ground with black pepper and taken orally before food  
- Indra Kanta Ojha, Sibsagar, Assam

##### Wound

Paste of bark and leaves is applied on infectious wound  
- Robert L. Hamte, Aizawl, Mizoram

##### Psoriasis

Seed oil is taken orally for 21 days  
- P. D. Walikar, Bagalkot, Karnataka

#### Uses in Classical Codified Literature

Fresh bark is put in water to draw out the latex in it, which is taken orally in case of tuberculosis<sup>12</sup>; dried powder is administered orally to cure diarrhoea<sup>13</sup>; and the bark extract is given orally to get rid of intestinal worms<sup>14</sup>.

'Ayush-64 cap./tab.'<sup>15</sup>, prepared from this plant is effective as an antimalarial compound both for treatment and prophylaxis. Fifteen patents have been found on its medicinal applications like use as an antipyretic<sup>16</sup>.





## Uses of *Argemone mexicana* L. (Satyanasi)

### NIF Database

#### Uses from Jharkhand

##### Fever

One teaspoon of root decoction is taken with a glass of water twice a day for 2 to 3 days

-- *Gopal Mahato, Hazaribag, Jharkhand*

##### Itching

Seeds (50g) are ground, mixed in coconut oil and applied on the infected body part

- *Prishila Tuddu, Hazaribag, Jharkhand*

##### Eczema

Whole plant (25g) is crushed along with black pepper (2 nos) and the paste is applied topically

- *Suresh Thakur, Hazaribag, Jharkhand*

##### Poisonous bites

Juice extracted from roots is administered orally

- *Jighha Oraon, Gumla, Jharkhand*

#### Uses from other states

##### Abscess/blisters

Juice extracted from the plant is applied on the affected part

- *Chandra Kanvar, Sikar, Rajasthan*

##### Intestinal worms

½ inch root is taken along with water thrice a day to remove hookworms

-*Amar Singh, Kangra, Himachal Pradesh*

##### Urinary disorder

Latex (10ml) is taken orally along with milk

- *Rani B. Bhagat, Pune, Maharashtra*

##### Itching

Juice extracted from the plant is applied on the affected part

- *Rameshwari Devi, Sikar, Rajasthan*

### Uses in Classical Codified Literature

Seeds powder is taken with water to reduce toothache<sup>17</sup>; decoction of the plant is given orally<sup>18</sup>; seed oil is useful in case of colic pain<sup>17</sup>; and rheumatics should take seed powder to get relief<sup>17</sup>.

'Step syrup'<sup>19</sup>, prepared from the plant, is used to cure skin diseases and soft tissue infections. Ten patents have been found regarding its various medicinal uses such as in treating psoriasis<sup>20</sup> and for headache<sup>21</sup>.



## Uses of *Bombax ceiba* L. (Semal)

### NIF Database

#### Uses from Jharkhand

##### Gynaecological disorder

Gum (5g) is ground, mixed with water and administered for 5 days

- Jugeshwar Ram, Hazaribag, Jharkhand

#### Uses from other states

##### Pimples

Paste of thorns and milk is applied on the pimples for 7 days

- Pravin Kumar Sharma, East Champaran, Bihar

##### Wound

Fresh bark is ground, mixed with little water and applied on the infected part

- Pravin Kumar Sharma, East Champaran, Bihar

##### Diarrhoea

A spoonful of juice extracted from the leaves is given along with sugar candy for 4 days

- Neha Kumari, East Champaran, Bihar

##### Constipation

Bark powder (3g), coriander powder and jaggery are taken with water

- Devaram, Sirohi, Rajasthan

##### Piles

Ground roots to make a paste. Paste (10g) is taken with water for seven days

- Antaryami Pradhan, Angul, Orissa

#### General health

Few flowers are soaked in a glass of water overnight and taken next morning for giving a cooling effect to the body

- Mukta Kumavat, Sikar, Rajasthan

### Uses in Classical Codified Literature

Decoction of the bark is given orally to combat fever<sup>22</sup>; diabetics are given decoction of the heartwood<sup>23</sup>; and to reduce stomachache bark juice is administered <sup>24</sup>.

Product 'Acne-n-Pimple Cream'<sup>25</sup> is prepared from *Bombax* along with other plants to treat pimples and skin eruptions. 'Evecare'<sup>4</sup>, a multi herb product made out from this plant, has a regularizing influence on the menstrual cycle. Eight patents have been found on the medicinal application of *Bombax* like for skincare<sup>26</sup>, AIDS<sup>27</sup> etc.



Source: <http://www.motherherbs.com/pcatifs/products-small/bombax-ceiba.jpg>

## Uses of *Butea monosperma* (Lamk.) Taub. (Palash)

### NIF Database

#### Uses from Jharkhand

##### Cuts & wounds

Juice extracted from bark is applied  
- *Dinesh Bediya, Ranchi, Jharkhand*

##### Intestinal worms

Seeds (3-4 nos.) are ground in water and given orally  
- *Sitaram Bediya, Hazaribag, Jharkhand*

#### Uses from other states

##### Toothache

Resin powder is filled in damaged gums  
- *Bhomabhai Damor, Banaskantha, Gujarat*

##### Acidity

Resin (2g) is taken with cold water  
- *Pritam Chand, Kangra, Himachal Pradesh*

##### Dysentery

Resin (25g) is administered orally  
- *Thavriben Kateria, Banaskantha, Gujarat*

##### Joint pain

Powdered resin is taken with milk  
- *Devaram, Sirohi, Rajasthan*

#### Uses in Classical Codified Literature

Bark is used as poultice for pimples<sup>28</sup>; bark juice is given orally to get rid of intestinal worms<sup>29</sup>; and dried flower powder is administered orally, which acts as diuretic<sup>17</sup>.

'Lukol<sup>4</sup>' has a stimulatory action on the endometrium and improves uterine circulation. 'Hair Loss Cream<sup>4</sup>' improves tensile strength of hair and increases hair density. Ten patents were found on its medicinal uses like for bone disorders<sup>30</sup>, skin care<sup>31</sup> etc.



Source: [http://www.plantcreations.com/images/Butea\\_monosperma\\_amazing.jpg](http://www.plantcreations.com/images/Butea_monosperma_amazing.jpg)

## Uses of *Celastrus paniculatus* Willd. (Malkangani)

### NIF Database

#### Uses from Jharkhand

##### Tuberculosis

3 drops of oil are mixed in yolk of egg and administered  
- Prishila Tadoo, Hazaribag, Jharkhand

#### Uses from other states

##### Graying of hair

Oil is applied on the scalp  
- Sharvan Singh, Kangra, Himachal Pradesh

##### Gas/acidity

2-3 gm of powdered seeds is taken orally with water  
- Devaram, Sirohi, Rajasthan

##### Intestinal worms

Shade dried fruit is ground into a fine powder and sieved.  
2-3 tablespoon of the powder is taken orally in the morning and evening for 4-5 days  
- Nimavat Gitaben J, Junagadh, Gujarat

##### Skin disease

Oil is applied on the infected place  
- Devaram, Sirohi, Rajasthan

### Uses in Classical Codified Literature

Fruit juice is used as cardi tonic<sup>15</sup>; seeds are used as appetizer<sup>17</sup>; fruit paste mixed with warm mustard oil is applied externally<sup>32</sup>.

'Geriforte'<sup>4</sup>, an anti stress medicine facilitates respiratory functions, and assists cardiovascular functioning by improving circulation and reducing raised lipid levels. 'Anxocare'<sup>4</sup>, a memory enhancer promotes better receptivity and learning abilities. Three patents were found on its medicinal applications like treating deficit-hyperactivity disorder<sup>33</sup>.



Source: [http://envvis.fr/ht.org.in/pimages/490\\_1.jpg](http://envvis.fr/ht.org.in/pimages/490_1.jpg)

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

### NIF Database

#### Uses from Jharkhand

##### Jaundice

Plant (10g) is ground, mixed with water, filtered and the extract is taken

- *Vifiya Oraon, Lohardaga, Jharkhand*

##### Anorexia

Juice from leaves (25g) is extracted and administered orally

- *Gamaliyal Hembrom, Hazaribag, Jharkhand*

##### Skin disease

Plant is taken as a vegetable regularly

- *Bablu Bediya, Hazaribag, Jharkhand*

#### Uses from other states

##### Insomnia

Plant paste is taken along with food regularly

- *Khioram Barman, Borpeta, Assam*

##### Toothache

Equal proportion of brahmi leaves, onion and banana roots are ground to make a fine paste and applied on the aching part

- *Anil Gogoi, Sibsagar, Assam*

##### Dysentery

Paste of leaves along with black pepper is given orally

- *Dipali Borah, Sibsagar, Assam*

#### Uses in Classical Codified Literature

Fresh juice from aerial part is used as brain tonic<sup>34</sup>; powder of aerial portion is taken to control high blood pressure<sup>35</sup>; the whole plant is used as diuretic<sup>17</sup>; and plant paste is applied as a poultice in case of bone fracture<sup>17</sup>.

'Herbal Tea'<sup>36</sup> is mainly indicated as a health drink. 'Mentat'<sup>14</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>37</sup>.



## Uses of *Datura metel* L. (Dhatura)

### NIF Database

#### Uses from Jharkhand

##### Asthma

A seed soaked in water is taken orally initially, gradually a seed is increased every week for five weeks  
- Rani Farhat, Hazaribag, Jharkhand

##### Stomachache

Warm leaves are put on the belly  
- Anil Kumar Mahato, Hazaribag, Jharkhand

##### Arthritis

Paste of the leaves is applied on the aching part  
- Divakar Pathak, Lohardaga, Jharkhand

##### Backache

Roots (20g) are boiled in mustard oil (250g), filtered and the oil is massaged  
- Ramji Chink Badaik, Gumla, Jharkhand

#### Uses from other states

##### Alopecia

Juice of the leaves is extracted, smeared on the head and left for 30 minutes  
- Bansi Ghosal, West Midnapur, West Bengal

##### Headache

Seeds are chewed and spat for instant relief  
- Ganesh Das, Sirohi, Rajasthan

##### Cough

Juice from the roasted leaves is extracted; two spoonful of the juice mixed with a spoon of ghee is taken  
- Mohani Kumari, Lakhisaray, Bihar

##### Eczema

A fruit is roasted and ground to make a fine powder, sesame oil (250g) and milk is added to make a paste. The paste is applied on the infected part  
- Vikas Kumar, Nawada, Bihar

##### Diarrhoea

Seeds are ground in water, which is then filtered and administered orally  
- Ajit Singh Rathod, Nagor, Rajasthan

### Uses in Classical Codified Literature

One fruit is filled with 10g *Piper longum* L. and burnt. 5g of this ash is given with honey, morning and evening, for 5 days to cure malaria<sup>38</sup>; the thumb is kept inserted within the fruit to treat finger felon<sup>39</sup>; and the root paste is applied externally on poisonous bites<sup>40</sup>.

'Muscles & joint rub'<sup>4</sup>, is a highly effective medicine for backaches, muscular sprains and joint pains made from the plant. 'Unicough syrup'<sup>41</sup> is used to cure bronchitis, cough/cold and asthma.

## Uses of *Leucas aspera* Spr. (Guma)

### NIF Database

#### Uses from Jharkhand

##### Migraine

2 drops of the juice extracted from freshly plucked leaves is put in the nose

- Ramji Chink Badaik, Gumla, Jharkhand

#### Uses from other states

##### Sinusitis

Juice of leaves is put in the nose

- Nayan Kalita, Kamrup, Assam

##### Fever

Equal amount of flower of guma; leaves of *Azadirachta indica* A. Juss., *Ocimum sanctum* L.; roots of *Cyperus rotundus* L., *Solanum xanthocarpum* Schrad. & Wendl. and black pepper seeds are pounded and the juice is extracted. Two spoonful of the juice is taken orally

- Nushrat Jahan, Gopalganj, Bihar

##### Stomachache

Curry made from the plant is taken

- Usha Rani, Darbhanga, Bihar

##### Jaundice

Juice from pounded leaves is extracted and little quantity of goat urine is mixed; this is given twice a day for 4 days

- Shalini Shrivastava, Balia, Uttar Pradesh

##### Eczema

Plant is burnt and some coconut oil is mixed with the ash. The paste is applied on the infected body part

- Gokul Singh, East Champaran, Bihar

### Uses in Classical Codified Literature

Dried plant powder is applied in case of scabies<sup>42</sup>; the plant is used as an anthelmintic<sup>43</sup>; a handful flower (5g) roasted in ghee is given once a day to cure cough<sup>44</sup>.

'Herbal Steam Bath'<sup>45</sup> is used to clean dirt and bad odour in the body, stop burning sensation in eyes, prevent watery eyes, headache, nausea, migraine etc. 'Herbex Cough Syrup'<sup>36</sup> is very effective for all kinds of cough and cold, asthma, bronchitis, wheezing cold and upper respiratory tract infections.



Source: AWCCDS, Bihar

## Uses of *Pongamia pinnata* (L.) Pierre (Karanj)

### NIF Database

#### Uses from Jharkhand

##### Toothache

Teeth are brushed with its stem  
- Rahul Kumar Gupta, Hazaribag, Jharkhand

##### Fever

Seeds (10g) and black pepper (2nos) are ground together, pellets of gram size are prepared and taken orally  
- Devendra Kumar, Hazaribag, Jharkhand

##### Inflammation

Paste of the seeds of karanj (few), ginger (4g) and asafetida (1g) is prepared and administered orally with water  
- Devendra Kumar, Hazaribag, Jharkhand

##### Skin diseases

Seed oil is applied on the infected place  
- Rahul Kumar Gupta, Hazaribag, Jharkhand

#### Uses from other states

##### Hair care

Seed oil is mixed with pounded seeds of *Nyctanthes arbor-tristis* L. and applied on head  
- Rani B. Bhagat, Pune, Maharashtra

##### Asthma

Decoction of leaves of karanj, *Adhatoda vasica* Nees. and roots of *Achyranthes aspera* L., *Solanum xanthocarpum* Schrad. & Wendl. is prepared. Two spoonful of the same is taken orally  
- Tolabai Gameti, Udaipur, Rajasthan

##### Wound

Seed oil (100ml) mixed with burnt leaves of *Phyllanthus fraternus* Webst. (250g) is applied on the wound  
- Davalal Gameti, Udaipur, Rajasthan

### Uses in Classical Codified Literature

Dried flower powder is taken orally to reduce blood sugar<sup>46</sup>; juice extracted from green fruits is mixed with mustard oil and applied in case of rheumatic pain<sup>47</sup>; and fresh bark extract is administered orally to cure bleeding piles<sup>28</sup>.

'Erina Plus gel'<sup>4</sup> acts as a stimulant and helps in increasing the blood supply to skin. It prevents hair loss and skin disorders. 'Face Treatment Cream'<sup>48</sup> acts as a revitalizer, moisturizer and anti-wrinkle skin cream, and also works on dark circles and puffiness around the eyes. Ten patents were found on its medicinal applications mainly for hair care<sup>49</sup>, skin diseases<sup>50</sup>.





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

### NIF Database

#### Uses from Jharkhand

##### Nasal bleeding

Dry fruit (25g) is boiled in mustard oil (100g). The oil is filtered and applied on the forehead  
- Sahim Ansari, Lohardaga, Jharkhand

#### Uses from other states

##### Mouth ulcer

Leaves are chewed  
- Shripal Singh, Bulandshahar, Uttar Pradesh

##### Cough

Juice extracted from the roots is taken orally  
- Priyanka Kumari, Gopalganj, Bihar

##### Stomachache

Leaves of makoi (200g) is fried in mustard oil (20ml), salt is added and administered  
- 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>51</sup>; juice extracted from the whole plant is applied externally on the burnt part<sup>52</sup>; poultice of the plant is placed on the aching joint<sup>3</sup>; fruits are ground and taken orally to cure diarrhoea<sup>53</sup>.

'Herbolax'<sup>4</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>54, 55</sup>.



## 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 Livestocks 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.



### Poulmax

*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.



## PART III

# INNOVATIONS for JHARKHAND

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





**Arvindbhai Patel**  
Gujarat

## Auto air kick pump

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.



## Unicool- the Natural 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!





**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.





## Earthen kitchen products

### Tawa/pan

Non-stick tawas have become an essential part of our kitchens to prepare low oil food but are costly. Their non-stick coating also does not last long. Blending traditional and modern technology, Mansukhbhai has developed a clay tawa with a black non-stick food grade coating. Being non-metallic, the rotis, dosas and other items cooked on it give a different taste and feel altogether.

### Mitticool

A fridge for the common man that does not require electricity and keeps food fresh too. With this basic premise in mind Mansukhbhai came up with Mitticool, a fridge made of clay. It works on the principle of evaporation. Water from the upper chambers drips down the side, taking heat from the inside gets evaporated, leaving the chambers cool. Cool and affordable, this is the option to keep food, vegetables and even milk fresh naturally for days.



04



**Mansukhbhai Prajapati**  
Gujarat



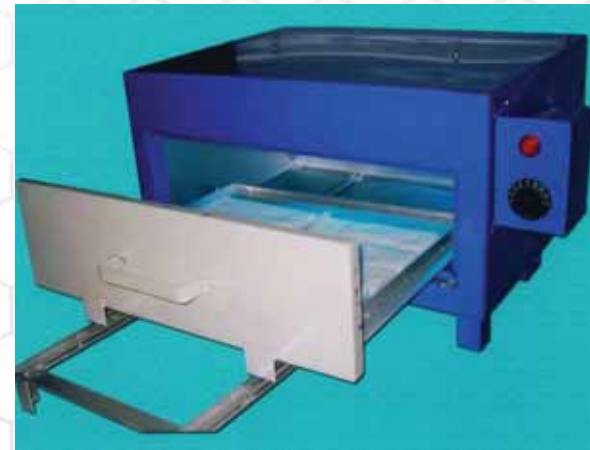
**A. Muruganandam**  
Tamil Nadu

## 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 industry standard raw materials 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 of NIF, the innovator has been able to install over fifty units in seven states.



## Maruti Jhoola- the health care chair

Modern life with its fast pace and sedentary lifestyle has created the need for solutions incorporating relaxation and invigoration. Maruti Jhoola is a unique health chair with multiple capabilities, functions and settings for various postures and seating dynamics.

It is ergonomically designed and serves the purpose of seating as well as exercising, with a capacity to accommodate a person weighing 120 kgs. It can double up as a hammock or a jhoola. The health chair has established itself as useful for people suffering from arthritis and joint ailments. To facilitate marketing an entrepreneur has been engaged. Earlier, lot of cost was spent on packaging and transportation of the chair. It is now being redesigned and the cost may come down.



**Sakrabhai Prajapati**  
Gujarat





**Raghav Gowda**  
Karnataka

## Manual milking machine

Safe milking of cows/buffaloes is a requirement across rural India and this product is an efficient step in that direction. It is a low cost, manually operated device that helps farmers to milk the animal hygienically and also reduces drudgery in the process.

The machine has simple controls and can be easily operated by women as well. The creation of suction and low vacuum makes it suitable for other applications also. NIF has been giving marketing support to the innovator. As a result, this machine has also been sold to customers in Phillipines, Uganda and Ethiopia apart from India.



## 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, 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 from the Micro Venture Innovation Fund at NIF. One unit has been sent to Kenya on a pilot basis for application feasibility study in the country.



**Dharamveer**  
Haryana



**Amrutbhai Agrawat**  
Gujarat

## Aaruni-the tilting bullock cart

In a traditional bullock cart, with two wheels, part of the load is borne by the draft animals on their shoulders and neck. Moreover, the harnessing system makes it difficult to negotiate sharp bends or turns in the road. This causes galls on the neck of the bullocks, which affects not only the efficiency of the animals but also their stamina. This cart is thus designed to overcome the shortcomings of the traditional carts by having an extra wheel to balance the load. In addition, the cart has a tilting mechanism that is based on the rope and pulley system, which can be controlled by a lever located alongside the cart driver.



## Pulley with stopper

Millions of villagers in India face the problem of the hoisting rope sliding away inside the well when left free, with chafing of hands and crashing of bucket. This simple, low cost innovation is a pulley stopper that solves the problem.

A ratchet is attached to a pulley for preventing the movement of rope towards the well thereby reducing slippage, accidents and injuries to women and children. The innovation is available in three models - Ganga, Narmada and Saraswati.





**Dulal Choudhary**  
Assam

## Production of soft *muga* silk

The innovator has mechanised the process of *muga* silk weaving by way of making modifications in the conventional mechanised loom. *Muga* silk weaved with the device becomes soft as well as blocks UV radiations up to 80 % as per laboratory tests at Tezpur University.

The innovator has made various products like shirts, belts, caps etc. with the *muga* weaved from this loom. He has also made an umbrella out of this material which is durable, stain free, and water proof. It has a pleasing golden shine which illuminates colour, better than that offered by conventional umbrellas.

NIF had facilitated the technology transfer of this *muga* umbrella to Assam Silk Development Centre.



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



## 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





**Madhav Sawant**  
Maharashtra

## “Jalpari”- the water carrier

Every village in India has women who walk miles with heavy water pitcher on their head which results in considerable discomfort and long drawn injuries. This innovation is an alternative and 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 each in the front and the back. 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.



## 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 has 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 to the garden in Rashtrapati Bhavan.



**Ishwar Singh Kundu**  
Haryana





**Khimjibhai Kanadia**  
Gujarat

## Panihari - A head load reducing device

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

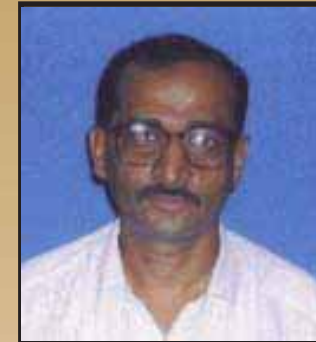
The product is an ergonomically designed device fixed on top of the head, with two extended supporting rods from the sides of the device. The device transfers the weight carried on the head to the shoulders, which is better positioned to carry weight.



## Fruit harvesting device

Farmers all over India need a simple device that can reach tall branches of trees to cut and harvest thousands of fruits per day. This innovative device with unique shape and cutting action can be used to harvest fruits quickly, saving time and increasing output.

The novelty lies in the design of replaceable cutting blades and hooking angle given to the oval shaped ring that assists in harvesting the fruits on upright branches. It is light weight, durable and suitable for harvesting fruits like mango, safota, guava, orange, etc.



**Madhav Mahajan**  
Maharashtra

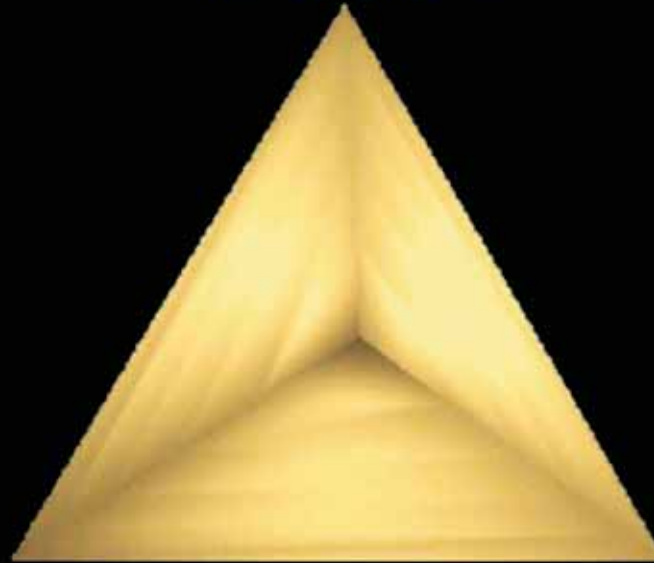


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