



National Innovation Foundation

MAHARASHTRA INNOVATES



Honey Bee Network

MAHARASHTRA INNOVATES



National Innovation Foundation

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HONEY BEE NETWORK

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Regional Collaborator
Vishwaseva Foundation
Jalgaon, Maharashtra

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PREFACE

National Innovation Foundation (NIF) 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 from 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, innovation and traditional knowledge from Maharashtra. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover at least a few 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 Maharashtra 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 Maharashtra 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 knowledge rich people who

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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 the 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 every 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 the 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 just his/her 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, National Innovation Foundation (NIF) 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

¹ 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.

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 a 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 (not all unique, not all distinctive) 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 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 area of agriculture, education, industry, rural development, women and child care, forestry, etc. There can be a very fruitful partnership between NIF as a

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- source of innovative ideas and technologies and state 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). Examples of innovations can also be included in the curriculum for the school and college education.
 - d. Demonstrations and trials can be organized at various regional research stations and 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 in 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 State of Maharashtra. Tremendously rich knowledge of biodiversity and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.



Anil K Gupta
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“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”.

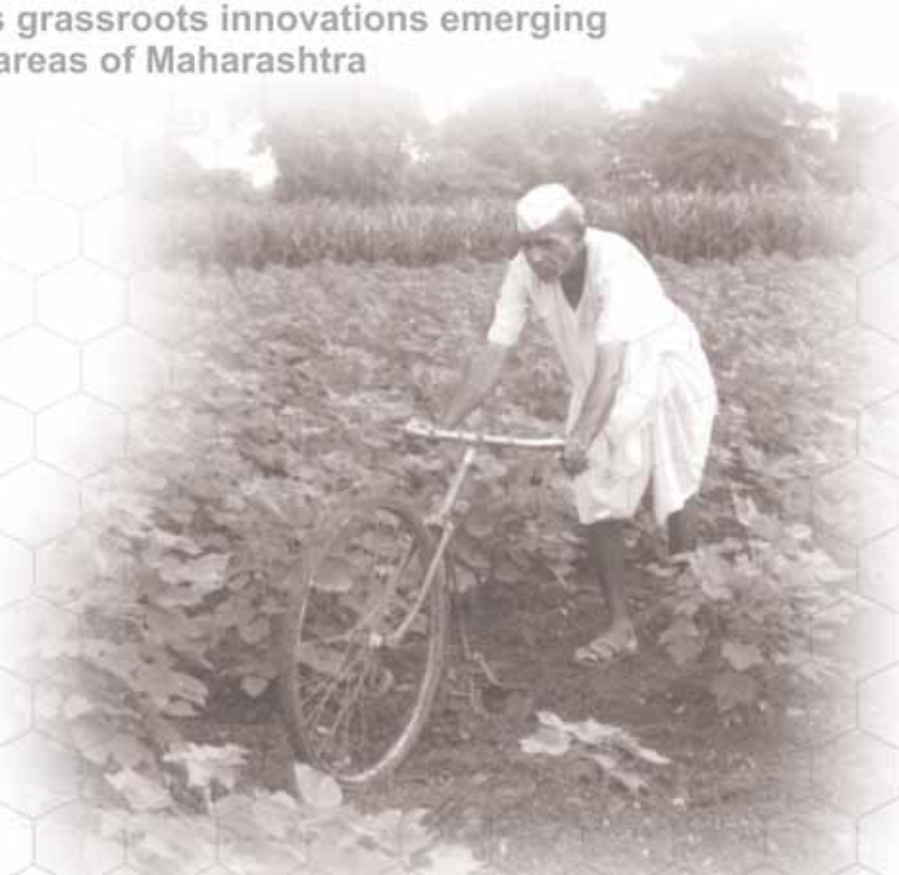
- Dr. R.A. Mashelkar

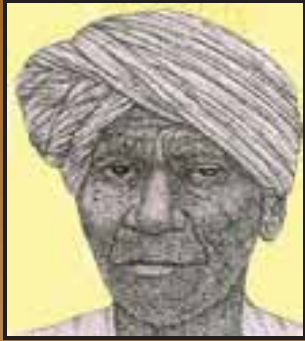
PART I

INNOVATIONS

from MAHARASHTRA

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





Marutrao Sarode
Ahmednagar

Ground Nut Pod Separator

Groundnut is harvested by uprooting the whole plant. The pods are then separated by picking them individually by hand, or in bulk by twisting the roots with one hand while holding the plant firmly in the other, or by threshing: striking the roots on a horizontal stick or steel blade. All these methods are tedious.

Marutrao Yashwant Sarode designed and fabricated a unique pod separator that used rotating blades to snip off the pods. He used a bullock-drawn blade harrow to loosen the plants first so that they were then easy to uproot. He also got a patent for the machine, way back in early seventies. He received the State award for his farm implement in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. NIF through GIAN West also facilitated prototyping of the machine at IDC-IIT Mumbai. Apart from this, he has also made a wool ginning machine.



Raisin Grading Machine Reaches Peru

Grading of raisins involves sorting by size. These are mainly meant for exports. To produce raisins, bunches of grapes are first brought from the vineyards to the raisin-manufacturing units. They are then processed according to the variety of raisins to be made. These raisins need further processing – cleaning, removal of debris, and grading into various sizes. The grading is generally done by visual inspection and normal sorting only.

This innovation is a single unit that removes dust and twigs and grades raisins by size. The machine consists of three motors and three sieves, blower, a belt and pulley mechanism and a rubber brush. With this device, the operator is safe from exposure to the dust from the blower. This machine helps in removing the drudgery involved in cleaning every single raisin and grading it accordingly. NIF through GIAN West has provided the incubation assistance for this technology. NIF has also facilitated the sale of one unit to a customer in Peru.



**Ramdas Madhavrao
Jagtap**
Nasik



U S Patil
Nandurbar

Natural Fibre Based Match Stick

In order to promote the use of natural fibres and reduce the reliance on wood, the innovator has successfully developed a process of making splints for safety matches using some natural fibres.

In comparison with conventional matchsticks these matchsticks burn slowly but steadily, reducing the chances of the users' fingers being burnt. Further no harmful chemical is used except the mandatory phosphorus. Preparing these matchsticks is much easier and cheaper than preparing wooden matchsticks, which require huge machinery for cutting logs of wood to suitable size. He won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. NIF in coordination with GIAN- West sanctioned an amount of Rs. 12,500 from its Micro Venture Innovation Fund towards laboratory testing and technology transfer of the matchstick. NIF also facilitated filing of the patent on the same. These sticks help in saving wood and generate market for natural fibres.



Variable Gear System for Cycle Rickshaw

Jabbarbhai succeeded in developing a new gear system wherein he fitted a double-chain and a double-sprocket mechanism in a rickshaw. He modified the existing free wheel by fitting a pawl lifter instead of a spring. The new gear system makes the task of pulling the rickshaw less strenuous. He has also developed a disc-brake system that is attached to the rear end of the rickshaw and an improved shock absorber system, which reduces the discomfort caused by the bumps on the roads.

NIF gave him a National award in the Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005 and supported him with a small investment from the Micro Venture Innovation Fund. NIF has also filed a patent in his name on his behalf.



Muhammad Sheikh Jabbar
Nagpur





Dadaji Ramaji Khobragade
Chandrapur

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 smell 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 the 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 lac acres.



Non-return Valve for Two-wheeler Engines

This innovation is an attachment for both four-stroke and two-stroke petrol engine, to economise on fuel and reduce emissions. The non-return valve is fitted between the air filter and the carburetor in a petrol engine and between the air filter and intake manifold in a diesel engine. The valve is essentially a mechanism to ensure fuller combustion of the air-fuel mixture in the combustion chamber and to reduce the release of un-burnt fuel, which causes pollution apart from reduction in fuel efficiency. This innovation fetched him a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. He also received an award at IIT, Mumbai.



Arvind Khandke
Kolhapur





Vijay Shantaram Ghodke
Aurangabad

Keyway Making Fixture

Keyway making is a part of the everyday work of local fabricators. Specialized machines for making keyway are Milling, Slotting and Shaping machines. But small-scale workshops cannot afford these machines. This particular device helps make key-ways in cylindrical shafts with precise tolerance. It caters to the need of the low-scale workshop owner who cannot afford to purchase the specialized machines for milling. This is a fast, precise and reliable key-way making instrument. The device costs Rs. 500 and the set-up time is five to ten minutes. NIF sanctioned him Rs. 15000 from the Micro Venture Innovation Fund apart from filing a patent application on his behalf. The innovation won Ghodke a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Pumpless Stove

In order to provide the poor a safer and economical alternative to the commonly available stoves, Kazi came up with this innovation. The kero gas stove comprises a tank for the kerosene oil, a burner, and a facility for providing light. This stove burns with a blue flame and does not blacken vessels. It is safer than conventional stoves as after initial pumping to light the stove, stable pressure is maintained in this stove. While ordinary stoves use brass burners that need a lot of maintenance, the kero gas stove uses a burner made by Beed casting. This burner also ensures lower fuel consumption as it does not cool as quickly as the brass burners. NIF with the help of GIAN also supported him through its Micro Venture Innovation Fund.



**Late Sarfuddin Amanuddin
Kazi**
Jalgaon





Subhas Vasant Rao Jagtap
Jalgaon

Tricycle Mounted Sprayer

Carrying heavy cylinders of pesticide on the back and spraying continuously by hand on the fields is a tedious and back breaking practice. The major problems are the weight of the spray pump the farmer has to carry on his back and secondly, the irritation and skin diseases caused due to direct contact with the pesticides. The present innovation is a spray pump mounted on a tricycle. The advantage of the device lies in its easy manoeuvrability and ease of operation. The product can be effectively used in fields with hard soil, low crop length and a distance of three to four feet between the rows for e.g. cotton, peas etc. The innovator was given a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Magnetic Shock Absorber

Kalpita, then a school student, developed an idea for a magnetic shock absorber for automobiles and two-wheelers, which makes use of the magnetic repulsion between dipoles to achieve shock absorption. This shock absorber can eradicate the problems faced in the spring shock absorbers due to friction and other factors. It could also reduce the maintenance costs as it would not need repairing, changing of springs or dealing with leakage problems as in the case of spring or oil shock absorbers. For this idea, Kalpita won a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Kalpita Patil
Jalgaon





Gopal Suresh Patil
Dhule

Walking Stick for Elderly

The innovation comprises a walking stick made up of PVC pipe with a switch at the upper end of the stick to turn a battery powered light source on and off. There is an illuminating light source (a reflector with a small bulb used in torches) towards the upper end of the stick (just after the curved part of the stick). This stick illuminates the area in front of the user and enables him to move at night also. NIF & GIAN West have invested in further refining the innovation and subsequent product development. This innovation won Gopal a consolation prize in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. Gopal was a school student when he developed this innovation.



Safety Device to Prevent Damage to Motors

Excessive voltage fluctuation in electric supply is the problem that most of the rural people have to live with. Poor quality of the electric supply often leads to frequent or premature burn out of the coils of motors. The electronic circuit designed by Kamble attempts to provide a total protection to the motor as far as possible within a limited budget. It is specifically targeted at the motors meant for powering water pumps. The circuit switches off the motor when deviation in any of the functional parameters beyond tolerable levels may damage the motor. Kamble won a National award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002 for this innovation. He tried to commercialise the technology and failed the first time. He tried again by making technology modular and reduced costs. It is working out better now.



Kamble Bharat Srirang
Solapur





Gopal Malhari Bhise
Jalgaon

Bicycle Weeder, Bicycle Tiller and Bicycle Harrow

For those who cannot afford bullock weeder, a small tractor or even motor cycle driven weeder, cycle based plough is a very handy device. A steel fork is connected to the axle and the other end carries different kinds of attachments. Separate attachments for weeding and tilling or a harrow are attached to the working end, using bolts and nuts. The implement is very easy to operate and is ideally suited to the needs of marginal farmers who cannot afford to maintain bullocks. Bhise won a consolation award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF also facilitated the patent application filing for the same.



An Improved Dual Pod Variety of Chick pea- “Sushil Laxmi”

The most distinctive feature of the variety is that it bears two pods per axil as compared to single pod per axil, which is a common feature of most varieties that are available in the market. The plant variety is tall (50-60cm), spreading and has bushy type growth habit. The foliage is dark green and seeds are attractive, bold (25-30 gram/100 seeds) and brown in colour. The variety has been reported to be tolerant to wilting and insect pest attack in farmer's field, yielding on an average 14 - 16 quintals per acre under irrigated conditions and 12 - 13 quintal per acre in unirrigated conditions.



Balasaheb Patil
Kolhapur





**Sheikh Jahangir Sheikh
Usman**
Jalgaon

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 in 2007. NIF also filed a patent application for the same and supported him through the Micro Venture Innovation Fund. He has also made a scooter mounted washing machine and a scooter mounted flour mill.



Mango Nipper

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. He won a consolation prize in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.



Madhav Mahajan
Ratnagiri



**Makarand Kale**

Sangli

Bullet Proof Jacket from Herbal Ingredients

This innovation is a bulletproof jacket made up of 80 percent herbal ingredients consisting of proteins, silk and cotton and 20 percent chemical constituents. Cotton cloth pieces and chemical preparations are layered alternatively. The combination of the material distributes the impact strength of high-speed bullet. Webbing of cotton cloth has a significant impact in context of energy absorption. The fabrication follows mixing, dilution, grinding, blending, impregnation and drying to get the final product. Composition of various grains is used, from which the proteins are derived. The bulletproof jacket is light weight and has good resistance against bullets, apart from having stability against temperature fluctuations. It can be moulded in any shape and size. It has good shock absorption properties and also provides good resistance to chemicals and abrasive substances. This bulletproof material can be used to make jackets, body of bulletproof cars, shields of shoulders, helmet, and fireproof devices.

The innovator won a consolation prize in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007 for his efforts. NIF has also filed a patent on behalf of the innovator.



“Jalpari”- The Water Carrier

Villages in India have women who walk miles with heavy water pitchers on their head, which results in considerable discomfort and even 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 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



6th Shodh Yatra

December 23, 2000- January 1, 2001

Mohandari (Dang), Gujarat to Dhulda (Nasik), Maharashtra

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 and social surroundings are one of 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 and other natural resources.

The yatris, during the 6th Shodh Yatra, over the period of ten 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.



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; 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. (Apamarg)

NIF Database

Uses from Maharashtra

Toothache

Roots of apamarg, leaves of neem and rhizome of ginger are ground together, juice is extracted from them, which is administered orally

- Tejas Gupte, Mumbai, Maharashtra

Asthma

Dried branches are burnt into ash, which is taken orally

- Chandrasingh Chaudhary, Nandurbar, Maharashtra

Uses from other states

Toothache

Teeth are brushed with freshly plucked roots

- Bhagvat Prasad Yadav, Nawada, Bihar

Itching

Powdered root (5g) is taken orally with water twice a day for seven days

- Indira Kumari, East Champaran, Bihar

Fever

Roots (5g) are ground with half black pepper into a fine powder, which is administered orally

- Rajkishor Prasad, Sheohar, Bihar

Hemorrhoids

Dried roots are ground into a fine powder; one spoon of it is taken on an empty stomach till ailment cures

- Vishwanath Mahato, East Champaran, Bihar

Headache

Tablets (of about 5g) are prepared from the pounded roots; one tablet is taken in the morning with water for three days

- Jagjit Bahadur, Sitapur, Uttar Pradesh

Poisonous bites

Root paste is applied on the spot of bite and also administered orally

- Jagjit Bahadur, Sitapur, Uttar Pradesh

Abscess

Root paste is applied on the abscess

- Ravi Uraav, Hazaribag, Jharkhand

Veterinary practice

Topical inflammation

Plant paste is applied externally on topical inflammation

- Sheikh Hifazat Hussain, East Champaran, Bihar

Uses in Classical Codified Literature

Dried aerial parts are taken orally in case of diabetes¹; powder made from the dried plant is given orally to treat whooping cough²; decoction of the plant is used as laxative³; decoction of the plant is applied externally on boils and pimples³.

Product 'Cystone'⁴ 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* for curing laryngopharyngitis⁵, bronchial asthma⁶ etc.



Source: <http://www.impgc.com/images/plantPictures/Achyranthes%20aspera.jpg>

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

NIF Database

Uses from Maharashtra

Diarrhoea

Eating of fruit pulp is helpful

- Ramdas Ghanshyamdas Patel, Nasik, Maharashtra

Menorrhagia

Leaf paste is administered orally to control the disorder

- Rani B. Bhagat, Pune, Maharashtra

Uses from other states

Fever

Leaves of bel and chirayata (*Andrographis paniculata* (Burm.f.) Wall.ex Nees) 250g each are boiled in a litre of water to obtain a decoction of 250g. 100g 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. This water is taken on an empty stomach 2-3 times a day till the ailment cures

- Akhilesh Kumar Yadav, East Champaran, Bihar

Diabetes

Equal quantity of leaves of bel and fruits of Indian gooseberry are taken and juice is extracted. A teaspoon of the juice is given to combat the disease

- Vinita Kumari, Sitamarhi, Bihar

Eye diseases

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

- Kumari Nigar Pravin, Hazaribag, Jharkhand

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

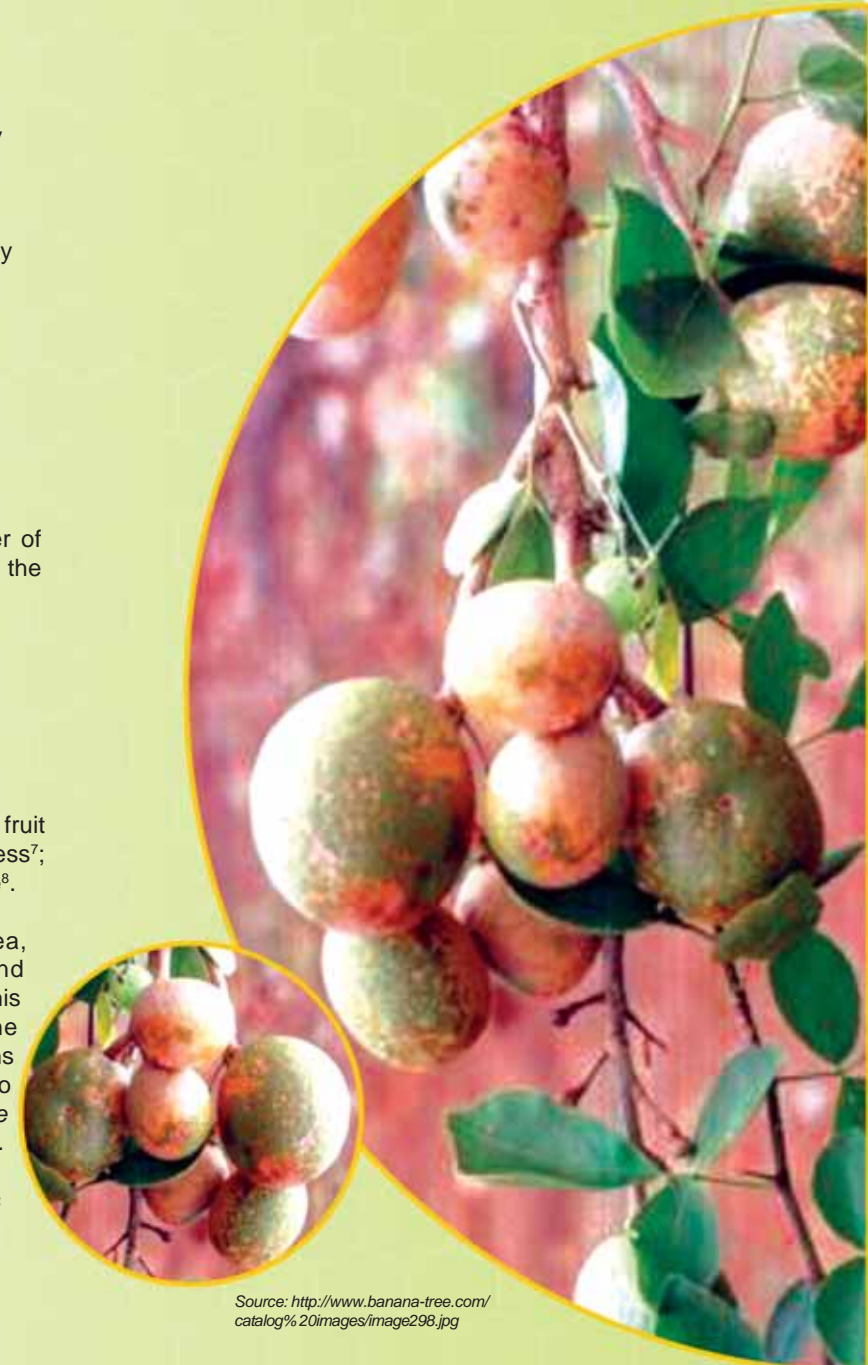
Leaves of *Aegle* and *Euphorbia neriifolia* L., flower of *Tagetes erecta* L., are mixed with fodder and fed to the animal

- Dipendra Kumar, East Champaran, Bihar

Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis²; 10g fruit pulp is given before sleep to overcome morning sickness⁷; fruit rind is applied externally on hair to kill headlice⁸.

'Bael'⁴, prepared from *Aegle* is used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. Lukol's⁴ 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'⁹, 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* for curing diabetes¹⁰, gastric ulcer¹¹ etc.



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

Uses of *Boerhaavia diffusa* L. (Punarnava)

NIF Database

Uses from Maharashtra

Kidney stone

Whole plant (50g) is boiled in about 600 to 700ml water along with three crushed black pepper seeds and one spoon of sugar till the solution remains one-third, which is then given orally

- Rani B. Bhagat, Pune, Maharashtra

Jaundice

Juice extracted from the roots is administered orally

- Rani B. Bhagat, Pune, Maharashtra

Uses from other states

Jaundice

Juice extracted from the plant is given orally for three days consecutively

- Jagnarayan Singh, Gopalganj, Bihar

Kidney stone

Roots are boiled with the milk and the milk is then taken

- Monika Kumari, Sitamarhi, Bihar

Stomach disorder

Juice extracted from the plant is mixed with an equal amount of cow's urine. Two spoons of the mixture is then taken

- Monika Kumari, Sitamarhi, Bihar

Headache

Leaves are ground into a fine paste and applied on the forehead

- Sukumar Nath, North Tripura, Tripura

Conjunctivitis

Decoction of the root (50g) is given once a day

- Ramnarayan Gameti, Udaipur, Rajasthan

Cough

Leaves of punarnava (5g), one small onion, a small piece of ginger and a spoonful of cardamom are cooked well and eaten

- Hasina Khan, Margav, Goa

Uses in Classical Codified Literature

Juice extracted from the leaves is given with milk to get relief from cataract¹²; decoction of the plant is given orally to purify blood¹³; the plant extract is used as diuretic¹⁴; decoction of the leaves is applied externally in case of any skin infections¹⁵.

'Liver-kidney care'¹⁶ made from this plant works synergistically on the liver and kidney to heal and prevents infections in both systems. Fourteen patents were granted for various medicinal applications of *Boerhaavia* for different ailments like liver disorders¹⁷, hypertension¹⁸ etc.



Source: SRISTI database

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

NIF Database

Uses from Maharashtra

Acidity

Poultice made from cooked lukewarm flowers is tied on the stomach

-Madhav Rao Shankar Rao Patil, Jalgaon, Maharashtra

Skin diseases

Young pods levigated with cow urine are topically applied

-Madhav Rao Shankar Rao Patil, Jalgaon, Maharashtra

Uses from other states

Cuts & wounds

Juice extracted from bark is applied

- Dinesh Bediya, Ranchi, Jharkhand

Intestinal worms

Seeds (3-4) are ground in water and given orally

- Sitaram Bediya, Hazaribag, Jharkhand

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 pimples¹⁹; bark juice is given orally to get rid of intestinal worms²⁰; and dried flower powder is administered orally as diuretic¹⁷.

'Lukol⁴' has a stimulatory action on the endometrium and improves uterine circulation. 'Hair Loss Cream⁴' improves tensile strength of hair and increases hair density. Ten patents were found on its medicinal uses for bone disorders²¹, skin care²² etc.



Source: http://www.plantcreations.com/images/Butea_monosperma_amazing.jpg

Uses of *Datura metel* L. (Dhatura)

NIF Database

Use from Maharashtra

Stomachache

Juice extracted from the leaves is massaged on the belly for immediate relief

- *Bhagat Mahadev Gangadhar Rao, Beed, Maharashtra*

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*

Asthma

A seed soaked in water is taken orally initially, gradually a seed is increased every week for five weeks

- *Rani Farhat, Hazaribag, Jharkhand*

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*

Stomachache

Warm leaves are put on the belly

- *Anil Kumar Mahato, Hazaribag, Jharkhand*

Diarrhoea

Seeds are ground in water, which is then filtered and administered orally

- *Ajit Singh Rathod, Nagor, Rajasthan*

Backache

Roots (20g) are boiled in mustard oil (250g), filtered and the oil is massaged

- *Ramji Chink Badaik, Gumla, Jharkhand*

Arthritis

Paste of the leaves is applied on the aching part

- *Divakar Pathak, Lohardaga, Jharkhand*

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*

Uses in Classical Codified Literature

One fruit is filled with 10g *Piper longum* L. and burnt. About 5g of this ash is given with honey, morning and evening, for 5 days to cure malaria²³; the thumb is kept inserted within the fruit to treat finger felon²⁴; and the root paste is applied externally on poisonous bites²⁵.

'Muscles & joint rub'⁴, is a highly effective medicine for backaches, muscular sprains and joint pains made from the plant. 'Unicough syrup'²⁶ is used to cure bronchitis, cough/cold and asthma.



Uses of *Eclipta alba* (L.) Hassk. (Bhangra)

NIF Database

Uses from Maharashtra

Headache

Juice extracted from leaves is taken orally to get rid of pain

- Rani B. Bhagat, Pune, Maharashtra

Hair care

Shoot paste is applied on hair to strengthen the hair

- Rani B. Bhagat, Pune, Maharashtra

Cuts & wounds

Shoot paste is applied on the injured body part

- Rani B. Bhagat, Pune, Maharashtra

Uses from other states

Greying of hair

Handful of leaves are ground, mixed with mustard oil (50g) and applied on head

- Supriya Kumari, Lakhisaray, Bihar

Earache

1-2 drops of the juice extracted from fresh leaves are put in the ear

- Dipak Kumar Tiwari, Gopalganj, Bihar

Mouth sores

Fresh leaves are chewed for immediate relief

- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Cough

Juice is extracted from the pounded leaves and honey is added. 1-2 drops of this mixture is given thrice a day

- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Jaundice

Juice is extracted from the plant and three spoonful are given orally along with sugar candy (50g) twice a day till cured

- Raghuvansh Prasad Singh, Munger, Bihar

Bodyache

Juice extracted from the leaves is applied

- Vijay Gupta, Mujjafarpur, Uttar Pradesh

Uses in Classical Codified Literature

Powder of dried aerial parts is used for asthma²⁷; buds ground in sesame oil are applied to the forehead to get rid from headache²⁸; and the plant is applied on ringworm lesions²⁹.

'Bhringraja'³⁰ is used as a liver tonic and for various chronic skin diseases. 'Eclipta tincture'³¹, a highly effective medicine of liver ailments such as cirrhosis and infective hepatitis and other conditions involving hepatic enlargement. Thirteen patents have been found on its medicinal applications mainly for liver disorders³² and in hair care³³.



Source: http://www.missouriplants.com/Whiteopp/Eclipta_alba_plant.jpg

Uses of *Jatropha curcas* L. (Ratanjyot)

NIF Database

Uses from Maharashtra

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

Uses from other states

Eczema

Jatropha oil (60 g) and bee wax (30 g) is heated at 60° C and borax (1 g) 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

Jaundice

Juices extracted from leaves and bark is mixed with jaggery. One tea-spoonful of this mixture is given

- Dimbeswar Gogoi, Sibsagar, Assam

Veterinary practice

Foot & mouth disease

Seeds are ground with latex of *Calotropis gigantea* R.Br. and edible oil in a 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 pyorrhoea³⁴; the leaves are useful in ulcer³⁵; young branches are warmed in fire and tied on the aching joint³⁶; and the latex is applied on the burnt part³⁷.

'Jatropha tincture'³⁸ is used as disinfectant, antiparasitic and anticoagulant. Thirteen patents have been found mainly on medicinal uses such as cuts, burns and wounds³⁹.



Source: NIF Database

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

NIF Database

Uses from Maharashtra

Hair fall

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

Fever

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

Intestinal worms

Oral intake of leaf juice kills the worms
- Rani B. Bhagat, Pune, Maharashtra

Uses from other states

Cough/cold

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

Intermittent fever

Two leaves of harshingar, neem, three black pepper and four leaves of tulsi are ground in half litre of water and boiled till half a cup of residue remains. This is cooled and taken orally
- Arjun Singh, Bharatpur, Rajasthan

Diabetes

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

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

Uses in Classical Codified Literature

Dried fruits are used orally to get relief from cough⁴⁰; decoction of dried flower is given with jaggery as an anti-fertility agent in females⁴¹; and leaf juice is applied externally on ringworm and other skin diseases⁴¹.

'Lupin'⁴², 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 Leishmaniasis⁴³ and also for its natural property as a dye⁴⁴.



Source: <http://prathom.swu.ac.th/panmai/pic/7-10110-002-110.JPG>

Uses of *Phyllanthus emblica* L. (Amla)

NIF Database

Use from Maharashtra

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 from other states

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

General health

Seeds are ground into a fine powder and cooked with ghee and sugar and small bolus (ladoos) prepared from it, which are eaten

- Dharamveer, Yamunanagar, Haryana

Diabetes

Dry fruits and seeds of *Syzygium cumini* (L.) Skeels are ground to make a fine paste. Pellets are prepared from paste. This pellet is to be taken orally

- Prakash Kumar Mali, Sirohi, Rajasthan

Jaundice

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

- Nagarmal Bagaria, Nagor, Rajasthan

Wounds

Pounded leaves are applied on wounds

- Sevaram Bhaskar, Dhamtari, Chhattisgarh

Veterinary practice

Swelling of throat

Equal amounts of fruits of amla and bark of *Jasminum sambac* (L.) Ait. are ground and given orally with water

-Ramdas, Dang, Gujarat

Uses in Classical Codified Literature

Pulp (2-3g) is eaten with warm milk to get rid of headache⁴⁵; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding²; fruits are taken orally to reduce acidity⁴⁶; and decoction of the fruit is taken to increase blood count⁴⁷.

Phyllanthus is one of the main ingredients of well known medicine 'Triphala, Chavanprash and Amla hair oil'⁴. Seventy-six patents have been found on its medicinal uses such as for diabetes⁴⁸, liver disorders and immune deficiencies⁴⁹.



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

NIF Database

Use from Maharashtra

Hair care

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

Uses from other states

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

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 are 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 sugar⁵⁰; juice extracted from green fruits is mixed with mustard oil and applied in case of rheumatic pain⁵¹; and fresh bark extract is administered orally to cure bleeding piles⁵².

'Erina Plus gel'¹⁴ acts as a stimulant, helps in increasing the blood supply to skin. It prevents hair loss and skin disorders. 'Face Treatment Cream'⁵³ acts as a revitalizer, moisturizer and anti-wrinkle skin cream and also work on dark circles and puffiness around the eyes. Ten patents have been found on its medicinal applications mainly for hair care⁵⁴, skin diseases⁵⁵.



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

NIF Database

Use from Maharashtra

Asthma

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

- Ramabandhu Mahajan, Jalgaon, Maharashtra

Uses from other states

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

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

Powder of the leaves (¼ spoon) is taken regularly

- Patel Singh, Hissar, Haryana

Jaundice

Juice of the plant and radish is extracted and given orally

- Jagjit Bahadur, Sitapur, Uttar Pradesh

Rheumatism

Plant (25g), dry ginger (5g) and sesame oil (5g) is soaked in water overnight and the next morning the mixture is filtered and administered

- Jagjit Bahadur, Sitapur, Uttar Pradesh

Veterinary practice

Anestrous

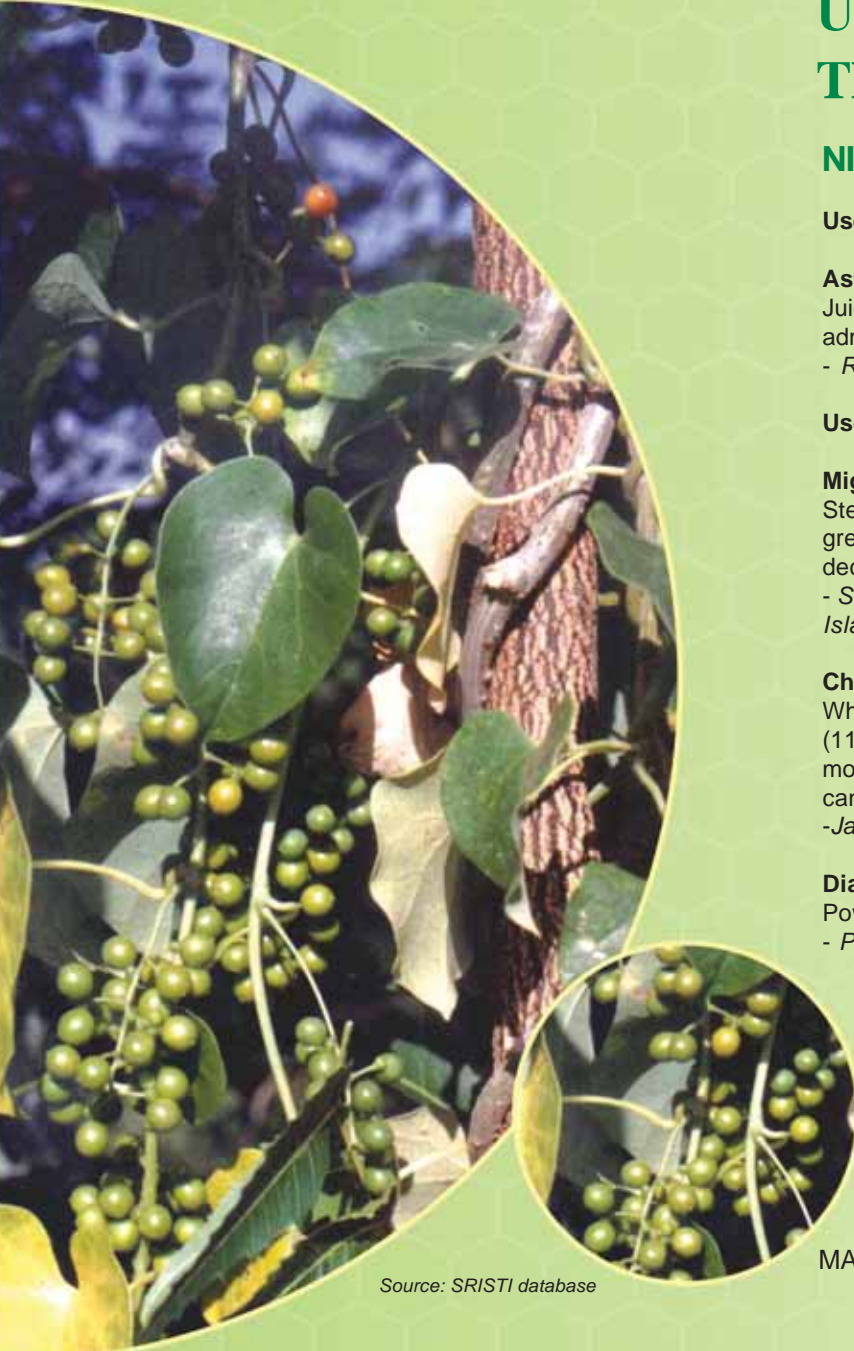
Plant along with bark of *Cassia fistula* L. and leaves of *Artocarpus heterophyllus* Lam. is ground and given orally

- Honnegowda, Bengaluru rural, Karnataka

Uses in Classical Codified Literature

Powdered roots are taken for mouth ulcer⁵⁶; powdered plant is administered orally with honey to get relief from stomach disorder⁵⁷; the stem is bitter and is used as anthelmintic³⁵; and decoction of the plant is given orally to cure diarrhoea⁵⁸.

Tinospora is a well known medicinal plant and used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon⁴' etc. More than hundred patents have been found on its medicinal application such as an antiallergic⁵⁹, and for cancer⁶⁰ etc.



Source: SRISTI database

Uses of *Vitex negundo* L. (Nirgundi)

NIF Database

Uses from Maharashtra

Rheumatism

Lukewarm leaves are put on aching joints
- Naganath Durga Chogule, Sholapur, Maharashtra

Lumbago

Juice is extracted from fresh leaves and is massaged on the affected area
- Shreenand B. Dandekar & Meera Dandekar, Ratnagiri, Maharashtra

Uses from other states

Ear pain

Leaves are boiled in mustard oil, oil is then filtered and used as an ear drop
- Bhagat Ram, Kangra, Himachal Pradesh

Stomachache

Powdered leaves of *Vitex*, *Cocculus hirsutus* (L.) Diels. and *Bombax ceiba* L. are mixed in equal ratio and taken
- Yusuf Khan, East Champaran, Bihar

Ulcer

Half cup juice extracted from the leaves is taken orally
- P D Walikar, Bagalakat, Karnataka

Muscular pain

Leaves are smeared with mustard oil, lukewarmed and applied on the affected part
- Savita Kumari, Gopalganj, Bihar

Skin disease

Small pieces of plant mixed with cow's urine is applied on the affected skin
- K. Lakshmana Shetty, South Karana, Karnataka

Veterinary practice

Wound

Leaf paste is applied topically
- Nageshwari Devi, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Smoulder leaves and inhale smoke to get rid of cough²; in case of diarrhoea flowers are used³⁶; and extract of the plant is taken as a diuretic².

'Muscle & joint rub'⁴, is a highly effective medicine for backache, muscular sprain and joint pain. 'Dental Cream'¹⁴ is a specially formulated toothpaste that tightens and reduces swelling of gums, stops gum bleeding, prevents toothache, decay and controls bad breath. 'Atharva Nirgundi Siddha Tail'⁶¹ is useful in arthritis, joint pain, relieves oedema. Thirty-five patents were found on the medicinal applications like for rheumatic arthritis⁶².



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). 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.



Glimpses of the 6th Shodhyatra



PART III

INNOVATIONS

for MAHARASHTRA

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



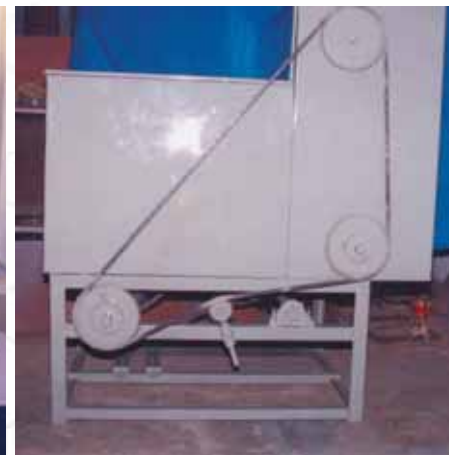
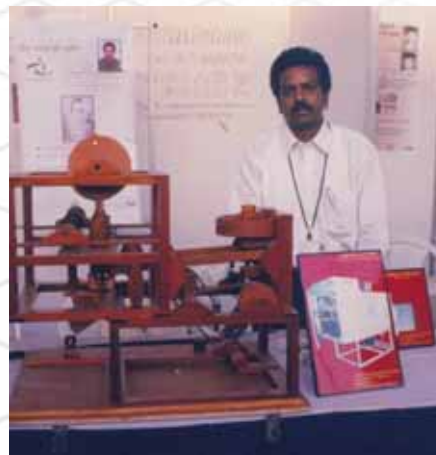
Garlic Peeling & Lemon Cutting Machine

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, and has 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 size. It can be operated by one person and cuts lemon into eight equal pieces. The innovator has been able to run a good business with the financial support of Micro Venture Innovation Fund and marketing effort of NIF.



M. Nagarajan
Tamil Nadu





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.



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





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.



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





Yusuf Khan
Sikar, Rajasthan

Groundnut Digging Machine

Harvesting groundnut is a tedious process. While digging nuts upto 20 percent of the pods are left underground. Complete digging out of all the groundnut pods from the soil is often not possible as manual labor is scarce, costly and other means are not available.

The innovator has revolutionized groundnut digging with this sturdy rugged desert unit which is retrofitted on a standard 35HP tractor. As the tractor moves forward, the vanes at the bottom of this unit rotate, digging and scooping out the soil-groundnut mixture and dropping them into a vibrating storage bin. The bin has fine sieves at the bottom which lets out the soil while trapping the individual groundnut pods on the top. The hatch at the back of the unit is used to take out the groundnuts.

The unit consumes four litres of diesel per hour and completes digging out groundnuts from a hectare of field in one day. The unit can run on uneven terrain and can also be used to sift out small stones, solid residue and garbage from fields and country roads.



The innovator has been supported under the 'Micro Venture Innovation Fund' of NIF for commercialising his innovation. In 2006, the technology was licensed to a Vizag based company called Ardee Hi-Tech Pvt. Ltd. This license was targeted for its application as a sea beach cleaner.

Power Generation Through Sewage

There is a search going around the world for solutions that harness alternate energy sources to generate electricity. The innovator has developed a system that generates energy from slow moving sewage or any other source of flowing water.

In this arrangement, electricity is generated when the slow moving sewage/water is passed through a cylindrical drum. The helical blades inside the drum rotate it and generate power. The capacity of the existing pilot unit is 30 kVA. This technology can have a tremendous impact on the generation of power from low velocity, high volume discharge of effluents from industries and civil sewage processing plants. NIF has been actively following up with national and international entities for partnership in taking this innovation forward. NIF has also filed a patent for the technology in the innovator's name. Public agencies such as municipal authorities can particularly help in testing its utility.



K. Balakrishna
Karnataka





Madanlal Kumawat
Danta, Rajasthan

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.



Trench Digging Machine

While on a trip, the innovators noticed laborers manually digging the ground to make long trenches to lay telephone cables, taking months to complete the work. This inspired the innovators to build a mechanized equipment to dig trenches rapidly.

The trench digging unit developed by the innovators can be fitted to any tractor. The modified unit has a hydraulic lever to adjust digging depth and to maneuver the running unit, a planetary gear system and motion converter unit to achieve speed reduction and deliver power from the tractor. The compact machine can dig narrow and deep channels evenly, on hard and soft soil conditions. In one hour, it can dig 65 meters long, 5 feet deep and 14 inches wide pit, while consuming only 2.5 liters of diesel per hour. The equipment costs less than half that of imported models. It is even used by the local telephone department to lay cables.



Radhey Shyam Tailor
Nathulal Jangid
Yusuf Khan
Sikar, Rajasthan





Prakash S Raghuvanshi
Uttar Pradesh

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 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 great taste. The average yield of this variety is 55-60 quintals / hectares.



Bullet Santi-Motorcycle Based Multipurpose Plough

Like other drought prone regions, Amreli region, from where the innovator belongs, has severe labor shortage, few farm animals or mechanized implements to conduct farming operations. To address this need, the innovator designed a unique unit: the 'Bullet Santi'.

Using the chassis, drive and power of an Enfield Bullet motorcycle, the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. This helps in ploughing, weeding and sowing seeds. Being a unique local solution, the machine has proved to be cost effective and fuel efficient. Bullet Santi can plough an acre of land in half an hour consuming only two litres of fuel. Innovator got a patent in India and USA. Given the fact, many other users and innovators copied this technology, he has appreciated the concept of 'Technology Commons' implying no restrictions for other innovators to copy and adapt. But commercial firms will need license from members of the 'Technology Commons'.



Mansukhbhai Jagani
Gujarat





Arvindbhai Patel
Gujarat

Auto Air Kick Pump & The 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!

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.



Ishwar Singh Kundu
Haryana

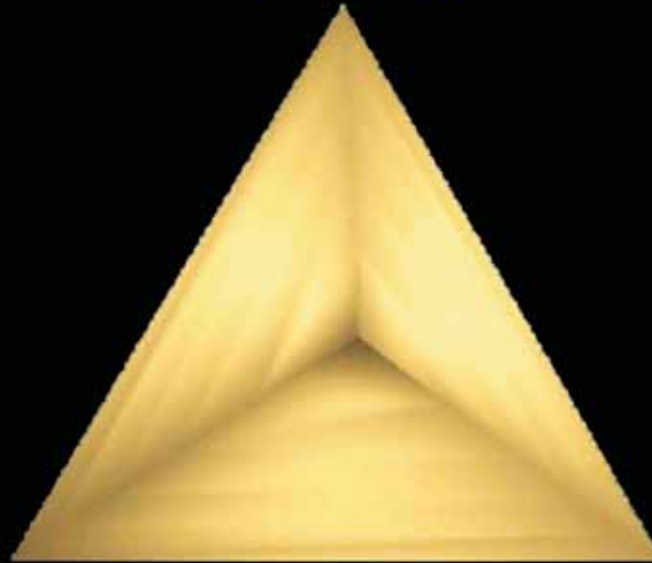


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Innovation



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