



National Innovation Foundation

Uttarakhand Innovates



Honey Bee Network

UTTARAKHAND INNOVATES



National Innovation Foundation

Bungalow 1, Satellite Complex
Premchand Nagar Road
Vastrapur, Ahmedabad 380 015
Gujarat, India
Telephone: +91-79-2673 2456/2095
www.nifindia.org Email: info@nifindia.org



HONEY BEE NETWORK

www.honeybee.org, www.sristi.org

Regional Collaborators

Kamaljeet
Sonia Suryavanshi
GIAN North

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

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 Uttarakhand. Tremendously rich knowledge of biodiversity and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.



Anil K Gupta
Executive Vice Chairperson, NIF, Ahmedabad
Professor, Indian Institute of Management,
Ahmedabad
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 UTTARAKHAND

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





Arun Kumar Kamboj
Udham Singh Nagar

Biogeyser: Harnessing heat of biodigestion

Arun is a progressive farmer, who learned all the basic and intricate aspects of agriculture from the tender age of 12. He left his studies after tenth standard due to financial constraints in the family. One evening he was working with an assistant in his nursery when he saw that the heap containing cattle waste was releasing fumes of heat. He realized after touching the heap that the gathered waste is capable of radiating enough heat to make another substance hot.

After rigorous trials he came up with a system for getting warm water by utilizing heat evolved in exothermal reactions during decomposition of organic wastes. A Pipe line containing water is passed through a heap of organic wastes. Water can be warmed up to 60-70° C after storing for a period of 24 hrs (morning to morning). The amount of water that can be warmed up depends on size of the heap. He dedicated the innovation to his father and called it 'Chandan-Biogeyser'.



New variety of lemon grass 'HUNAR'

Gurpreet has been involved with the farming business for more than a decade in the terai region of the state. It was his quest for diversification that led to the development of 'hunar' variety of lemon grass. This variety selected by him is rich in citral content. It provides a fresh-lime note, which is in high demand in the market as compared to its contemporary 'metallic note'.

Gurpreet has also developed a filter for lemon grass oil purification. The oil is passed through a water chamber and then through a chemical pad. The existing technologies are centrifuge based or micro filters, which are very expensive and beyond reach of common people.

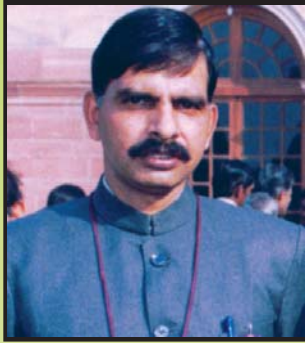


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Gurpreet Singh*
Udham Singh Nagar

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



Ravindra Mishra
Haridwar

Sculptures made from the secretion of termites and pest management for Sal trees

Ravindra Mishra has been interested in nature right from his childhood. While roaming around the forest he noticed that some trees like *Harsingar* (*Nyctanthus arbor-tristris*) and *gotra* were affected by termite attack more than others. He also noticed the selective nature of termite attack. The unusual shapes of the affected wood gave him an idea of using termites to shape sculptures. He identifies the tree with some of the dried parts already affected by the termites and then applies chemicals to the parts that he does not want the termites to attack. Over a year through periodic treatments and monitoring the shapes, a sculpture would emerge. He then cuts it away from the tree and gives it final shape using knives and other tools. He polish the sculptures to make it look better. Thus has been born a new art, using termites as biological tool.

Control of Sal pest

Some years ago in Rajaji National Park, he noticed a thick layer of reddish powder at the base of Sal (*Shorea robusta*) trees. It was caused by the insect locally called *hopelo* or *gujeri* (*Hoplosorvix icnorvix*) which made a deep bore inside the tree, lived off the sap and laid its eggs in the burrows. Eventually, the tree dries up. After doing intensive search for such herbs that repel the insect, he observed that several species of vascular plants like *kachnar*, *har singar*, *lantena*, *amaltas*, *awla*, *wild tulsi*, *harad*, *bahad*, *sirus*, *rohini*, *kinkar*, *dumsal*, etc. were disliked by the pest. He then wrote to the Chief Minister giving full details. As a result, large numbers of saplings of aromatic herbs were planted in the forests to protect *sal* trees.



LPG carburetor for motorcycle

Guljar used to read in the newspapers about various kinds of gas kits. Once he purchased a gas kit for his Honda motorcycle but noticed that the kit gave constant gas supply of a fixed compression ratio mixture irrespective of speed or load. Even, when he increased the speed, engine got disturbed. Guljar modified the kit, which could vary the compression ratio when the engine pick up was altered and thus solved the problem.



Guljar Ali
Udham Singh Nagar





Durga Sahay
Udham Singh Nagar

Alarm for flourmill

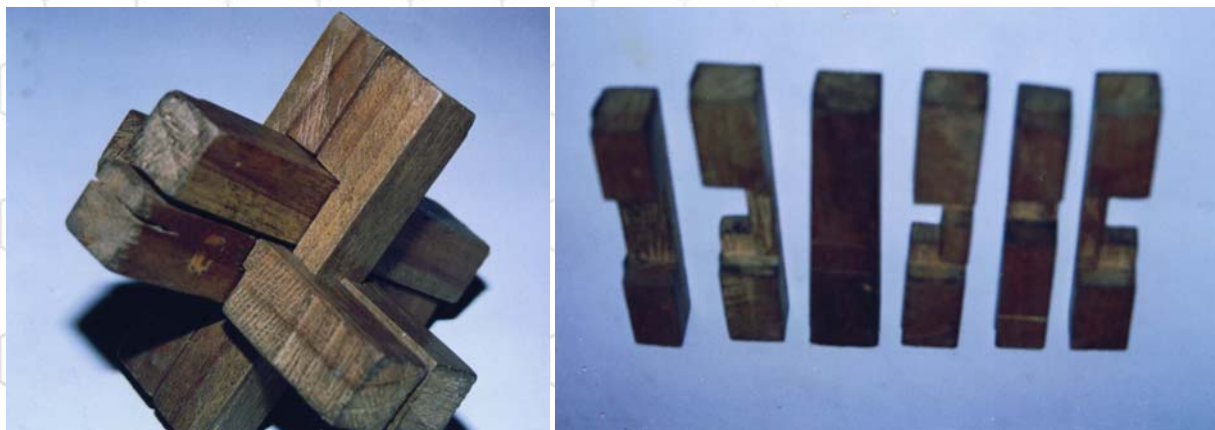
Durga was running a flourmill, which was the only one in the local area. The folks used to complain about the timings of the mill. They would come to check whether the mill was running or not before bringing the grains with them. Durga was annoyed by this problem and decided to develop some alarm system for the same. Using exhaust manifold of the engine he developed an alarm, which produced a sound signal. People now knew whether flour mill was working or not.

Wooden blocks based game for earning the right to talk!!

Amol, a carpenter by profession, makes very complex and beautiful designs. Once he was working on a very important project but his friends and several other people came and asked several questions thus disturbing him. He had to concentrate while working on the project. In order to avoid the interruptions, he developed a game using six wooden blocks and also put a condition that “he will only talk to those who could rearrange the six wooden blocks as done by him originally”. It is interesting to note that thousands of people tried but failed while he could do so in a mere ten seconds. What a way of achieving concentration and keeping disturbing friends away!



Amol Kumar
Udham Singh Nagar





Late Padmadutt Balutiya
Nainital

Traditional knowledge for making a check dam hundred years ago

A very interesting story has been passed down through generations about the building of this check dam. According to the elders in the area, in the late 1880s, Robertson, the British Commissioner at the time, had a dam constructed to retain the water in Bheemtal, so that it would not be wasted and could be used when the need arose. But the dam broke down during the rainy season. Colonel Ramsay, who succeeded Robertson, at the request of farmers, decided to construct a check dam to solve the problem of water shortage. As soon as Padmadutt Balutiya came to know that Ramsay was going to build a dam, he went to the site and checked the design of the dam. He felt that the design was flawed and told Ramsay that it would not be able to withhold the water pressure. He suggested that instead of the straight wall, if the dam could be constructed with a convex shape it would withstand the pressure of water. The force of water would not concentrate at a particular point but would be distributed evenly over the entire length, thus minimizing the water pressure.



Unfortunately, Ramsay did not pay heed to his suggestions and had the dam constructed 'his way'. The dam was washed off in the first rain. Ramsay tried three more times, but each time he met with the same results. The next time, Ramsay wrote to London, explaining his case and asking for a specialized engineer. The engineer came and started the work with a new design. Again Padmadutt went to Ramsay and suggested that if this dam could not withstand the water pressure, he should be allowed to build the dam the next year according to his design. Ramsay agreed. This dam also could not sustain even first rain and was washed away, then Padmadutt was given a chance. The dam at Nainital, designed by the late Padmadutt Balutiya in 1895 is over hundred years old, continues to stand strong and has not required any repairs since its construction.

NIF awarded him posthumously in the 3rd National Award Function held at Ahmedabad in 2005.





Meghnath Mistry
Udham Singh Nagar

Kerosene based egg hatching incubator

Meghnath wanted to start a poultry business and enquired about the incubators available in the market. He found the prices beyond his limits. Knowing that eggs are hatched by heat, he dug a pit and kept eggs in a circular pattern around a kerosene lamp. The entire system was covered by a blanket and kept untouched for 30 days. After 30 days he found some eggs had matured from one side only. He then started observing hens and ducks and noticed that they rotate the eggs after every half an hour.

Using this knowledge he then developed an incubator, which included container for holding eggs covered by thermocol sheets, a water tank above the egg container and a kerosene lamp outside the assembly. Chimney of the lamp was designed in such a way that hot air passes through the water tank to the incubator for maintaining humidity and temperature inside the chamber. Eggs are rotated manually after six hours and the hatching rate is above 60%.



Multicrop combine unit

Harvesting of wheat and collection of chaff for feeding the animals is a time consuming process. The existing combines are fitted to tractors and need separate units to be fitted for harvesting of wheat and then for cutting of straw. Few farmers have the dual tractor-combine units and most small farmers have to wait for combine units to be available and pay necessary hire charges.

The innovator has developed a dedicated single unit which, can simultaneously do both harvesting of wheat and generating the straw and depositing them in two separate tanks on either side. The machine also cleans grains, pulses and oilseed crops without breakage.

Using an Ashok Leyland engine, with a compact footprint, it is a versatile option that can maneuver in tight zones with narrow plant interspacing. The machine can harvest wheat at the rate of one acre per hour.



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Chinder Singh
Udham Singh Nagar

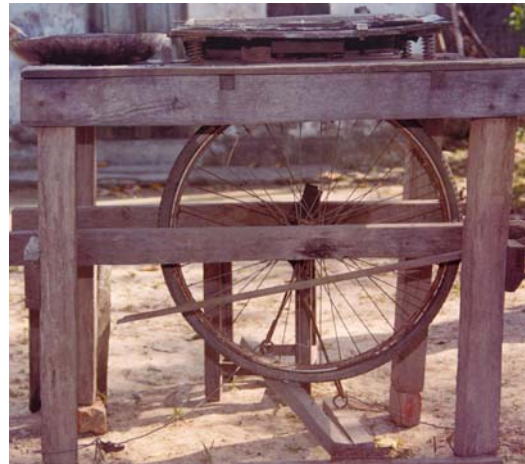


Sukhranjan Mistri
Udham Singh Nagar

Pedal operated tile making machine

Traditionally tiles are made manually, which is a time consuming, less productive and a boring task. Small potters cannot afford costly machines to increase the productivity. Sukhranjan developed a pedal operated tile making machine, which works on the principle of conversion of mechanical energy from pedaling of wheel into vibration of tile on the top of the wooden foundation. Within 2 minutes of pedaling, air trapped in the mortar is released and the mortar is converted into the tile of desired shape. It can be used for making cement as well as clay tiles.

NIF has awarded Sukhranjan during its 3rd National Award Function in 2005.



“Indrasan” paddy variety

Indrasan actively participated in the freedom movement (1942) and spent 18 months in Gonda & Gorakhpur jails. After Independence he was awarded a piece of land of about 15 acres by the Govt. of India. In 1972, he was awarded a *Tamrapatra* by the then Prime Minister Smt. Indira Gandhi. A prominent member of his community, Indrasan got elected as Sarpanch of the village eight times. Though his formal education ended with the fifth standard he was invited to be a member of Uttar Pradesh Seeds and Tarai Development Corporation Limited.

This idea for an improved paddy variety stemmed from the problems that Indrasan faced in cultivating high yielding variety seeds procured from the Pantnagar University. It was one of the first farmer-developed varieties, which diffused over thousands of hectares all over the Indo-Gangetic plains. It has a yield of about 8000 kg/ha, which is quite high in comparison to conventional paddy varieties. The productivity of the crop as well as the



recovery rate of the grains were much higher than the other varieties. The starch obtained is of superior quality in comparison to the conventional alternatives. The major distinguishing character of this variety is its red coloured roots. It matures in 120 days and reaches a height of 80-100 cm with uniform spikelets. Another point in its favour is its high resistance to disease unlike other traditional varieties.

During 11th Shodh yatra, (26 May - 4 June 2003, from Gokulnagari to Dehgala) the members of the Honey Bee network honoured him at his doorstep and tried to atone to some extent at least, for the years of neglect. NIF also awarded him during its 3rd National Award Function in 2005.

11



Indrasan Singh
Udham Singh Nagar



Bhupendra Singh
Udham Singh Nagar

Insect killer and thief catcher

Bhupendra was unhappy about the use of pesticides to protect the crops from insects/pests and their harmful effects on human beings. He developed this insect killer, which can be powered by 12 V DC power or 230 V AC supply whichever is available. It has a CFL tube and aspirator to attract the insects and wiring for electric shock in order to kill these insects.

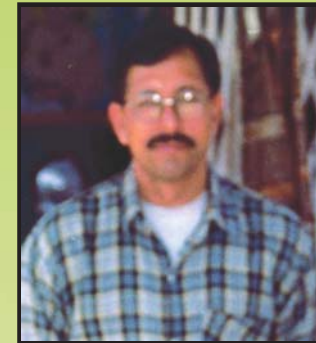
He has also developed a thief catcher kit, which has a sensor and remote alarm. The alarm can be kept within 100 m range from the sensor. When anyone touches the appliance to which the sensor is attached, the alarm would ring thus making the thief run away or be caught.



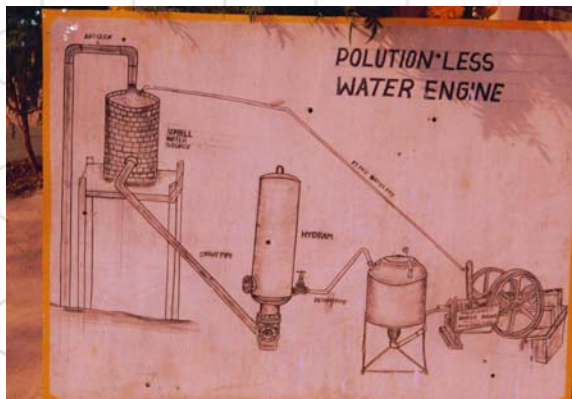
Compressed air engine and the idea of an efficient freewheel

Ashok Kumar had an idea of developing a water lifting pump for hilly regions without using fossil fuel. The main components of his device as proposed are water tank, pipe, hydram, compressed air tank and pump. Compressed air is used to power the movement of piston in the pump and thus lift the water. This concept earned lots of applaud from many senior technicians. Ashok has also suggested modification in the design of flywheel used in engines to prevent fluctuation in the energy. He proposes that instead of metallic flywheels, a shell of metal sheet can be developed and filled with properly compressed clay. Based on some experiments done by him, he says that metal/clay ratio of 1:1 can serve the purpose and it will not reduce the engine life significantly. It can help in saving ample amount of money and metal. The idea needs further testing.

He also has gone beyond simply innovating machines to strengthening the innovators club in the state to connect one innovator to another and to get them supported from various organizations and people.



Ashok Kumar Singh
Udham Singh Nagar



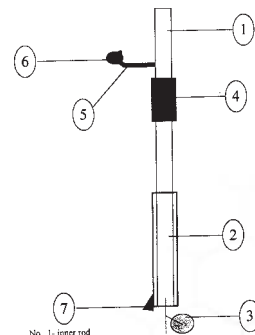


Saurabh Pathya
Mayank Shekhar
Rajeev Verma
Ratul Ahuja
Anurag Rastogi
 Students, GBPUAT
 Udham Singh Nagar

Modified stick for blinds

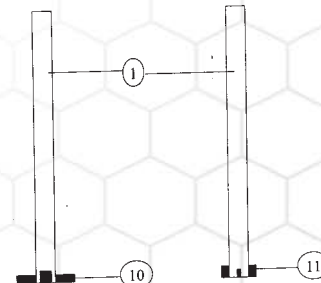
The students desired to do something to improve the lives of the blind people. They observed available sticks and compiled the problems, which were associated with these sticks.

They developed a stick, which was cheap, light and simple in construction. The stick has sensors for detecting uneven ground, potholes, presence of water, and could differentiate between doors and walls etc. The sensor detects and warns the stick holder by giving a warning sound. It also has a bell to produce specific sound to make people around aware that the person is blind. The stick also helps in climbing up/down stairs.



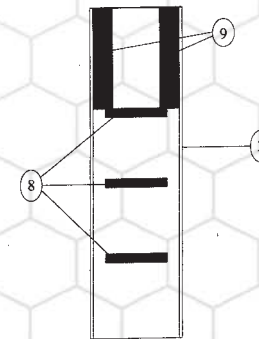
No. 1- inner rod
 No. 2- outer rod
 No. 3- wheel
 No. 4- circuit box
 No. 5- handle
 No. 6- bell
 No. 7- metallic hood

Fig 1



No. 1- inner rod
 No. 10- metallic brush
 No. 11- metal protrusion

Fig 2



No. 2- Outer rod
 No. 8- Metallic strips
 No. 9- Metallic stoppers

Fig 3

Rural essential oil extractor

A blacksmith by family occupation and a motor mechanic by profession, Harish was keen to make the lives of women living in the hills easier. Knowing medicinal value of herbs commonly grown in hilly region, he enquired about the potential of oil extracted from such herbs. He met some scientists in agriculture fair and came to know that there is a huge difference in value of raw herbs and essential oils but that the extraction machines were quite costly.

He came up with a small extraction unit by fitting a condensation attachment over the cooker in place of whistle. Leaves of medicinal herbs are put in the pressure cooker, water added and the lid is then closed. Mixture inside the cooker is heated up and oil is evaporated and collected separately.

Though the concept is well known but how many people like him have bothered and come up with this sort of solution?

Harish Tamta
Almora



Vickey
Udham Singh Nagar

Popularizing science: visualization of sound waves

Vickey could not continue his studies due to the poor economic condition of his family and was running a bicycle repairing shop. Once, one of his friends, studying in the 12th standard, approached him for developing a good project. Vickey thought a lot and developed a crude model to visualize sound waves.

He took a fused tube light, broke one end of the tube, cleaned the white coating and filled the tube with black powder. One speaker is connected to the open end of the tube and the other speaker is connected with a stereo. As the stereo is switched on sound waves flow through the tube and create impressions over the wooden powder, resulting in change of location and thus creating wave impressions.

Refined technologies to see sound waves are available, but are not within the reach of school students. Rural students can imagine only, this kind of simple solutions can help in teaching kids even in the primary standard.

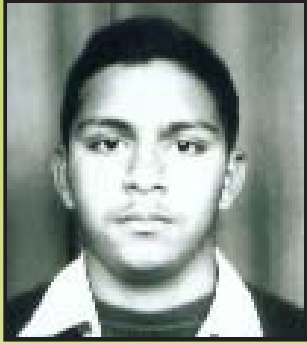


Fuel sticks from pine needles and special stove

Pine needles are shed by trees during autumn season. The needles are very oily in nature and sometimes result in serious fire hazards in the hilly terrains. These are highly combustible and result in frequent forest fires. Pine needles are also very difficult to crush. Looking at this problem Nand Kishore developed a machine to grind the needles into powder. He mixed powder with dried dung and a few other supplements and then pressed these into stick forms. For burning these sticks he also developed an improved chulha.

Nand Kishore Upadhyay
Haldwani



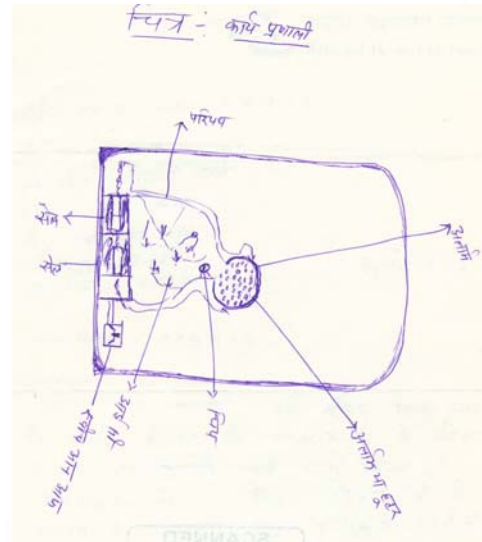


Bhaskar Joshi
Haridwar

Thief proof suitcase: an idea

Bhaskar, a student of class 11th (2003), was worried about increasing incidence of theft while traveling and in crowded places. This problem triggered a thought of making an alarm for reducing theft. He came up with the idea of a kit having sensor, which triggers an alarm, if somebody touches the baggage. He designed the circuit but unfortunately could not make a prototype.

The technology exists abroad but is not normally used in India. The reason may be lack of access and awareness.



Agricultural implements made of metal alone

Baisakhi Lal is a carpenter by profession. He observed that the farming implements used in the hilly region wore out fast. The metallic part remained intact but the wooden portion got damaged very frequently. Repair of these implements requires wood, which comes only by cutting the trees. As he was worried about depleting forests Baisakhi Lal designed farm implements, completely made of metal, in order to save the trees. He named these implements '*Parvatiya Vriksh Mitra*'. To promote them he gave one implement each to every village in the nearby areas free of cost.

Baisakhi has developed metallic indigenous plough, marker, weeder, rack etc. These implements have been tested by District Agricultural Dept. Rudraprayag, Tehari and Ajeevika Project District Management Unit, Chamba, Tehri. The innovator has sold about 5000 units with 50% subsidy. National Innovation Foundation has recently received his entry through the project director, Ajeevika Project.



Baisakhi Lal
Tehari Gadhwal





11th Shodh Yatra **26th May to 4th June 2003** **Udham Singh Nagar, Uttarakhand to Pilibhit, Uttar Pradesh**

Shodh Yatra is a walk through the villages in 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 may be 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.

The yatris, during the 11th Shodh Yatra, over the period of nine 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, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country.





A white plate containing a portion of browned, textured meat or vegetable, a slice of light green melon, and a small garnish of red and white spices.

A metal bowl filled with a dark, chunky vegetable soup or stew, with a silver spoon resting inside.

A metal bowl containing a green leafy vegetable salad, possibly spinach or chard, with some dressing.

A white plate with a green leafy vegetable salad and a silver spoon.

A metal bowl containing a chickpea salad with green vegetables and a silver spoon.

A colorful woven basket filled with a variety of fresh vegetables, including okra, green beans, tomatoes, and other produce.

Several long, thin green stalks, possibly leeks or similar vegetables, are laid across the metal tray.

A green plastic bag and a colorful knitted fabric (blue, pink, yellow) are visible in the upper right corner.



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 January 31, 2009.** The Seventh National Competition will start on February 1, 2009 and continue till December 31, 2010. 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 *Abrus precatorius* L. (Ghughachi)

NIF database

Use from Uttarakhand

Dog bite

Mix half of the seed with curd and take it twice a day for two-three days

- *Indrasingh Rana, Udham Singh Nagar, Uttarakhand*

Uses from other states

Backache

Mix powdered seeds of the plant along with the powder of rhizome of *Acorus calamus* L., roots of *Asparagus racemosus* Willd., and leaves of *Vitex negundo* L., *Cannabis sativa* L. with honey. Make tablets and take one tablet twice a day for three to four weeks

-*Ami Chand, Kangra, Himachal Pradesh*

Baldness

Apply seed paste on the scalp along with honey

-*Mangilal Purohit, Churu, Rajasthan*

Mouth ulcer

Apply the green leaf juice topically

- *Chhitar Lal Gurjar, Sawai Madhopur, Rajasthan*

Stomachache

Take seeds (100g) with ghee or butter for relief

- *Kalpana, Trichy, Tamil Nadu*

Knee pain

Take seeds (6g) orally with milk for 14 days

- *Pavan Mehra, Sikar, Rajasthan*

Uses from Classical Codified Literature

Dried leaf and root powder is given orally in the case of eye complaint¹; decoction of the young leaves is given orally for cough²; leaf powder is given orally in case of urine problems³; and seed extract is used in sciatica³.

It is one of the ingredients of 'Tranquil'⁴ medicine for relieving stress and anxiety. Ten patents have been found on the applications of *Abrus* mainly as a natural sweetener⁵ and oral contraceptive⁶.



Source: NIF database

Uses of *Achyranthes aspera* L. (Latajeera)

NIF Database

Use from Uttarakhand

Poisonous bite

Take the fresh juice of the branch
- Hemlata Balutia, Nainital, Uttarakhand

Uses from other states

Toothache

Brush the teeth with freshly plucked roots
- Bhagvat Prasad Yadav, Nawada, Bihar

Itching

Take the powdered roots (5g) orally with water twice a day for seven days
- Indira Kumari, East Champaran, Bihar

Fever

Grind roots (5g) with half black pepper into a fine powder. Take the powder orally
- Rajkishor Prasad, Sheohar, Bihar

Hemorrhoids

Take a spoonful of dried root powder on an empty stomach till the ailment gets cured
- Vishwanath Mahato, East Champaran, Bihar

Veterinary practice

Topical inflammation

Apply the plant paste topically
- Sheikh Hifazat Hussain, East Champaran, Bihar

Headache

Make tablets (of about 5g) from the root paste. Take one tablet daily in the morning with water for three days
- Jagjit Bahadur, Sitapur, Uttar Pradesh

Asthma

Grind the whole plant (50-100g) into a fine powder. Take 5g of this powder with water till the ailment gets cured
- Ahmed Hussain, Lohardaga, Jharkhand

Poisonous bites

Apply the root paste topically and also take it orally
- Jagjit Bahadur, Sitapur, Uttar Pradesh

Abscess

Apply the root paste topically
- Ravi Uraav, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Dried aerial parts are taken orally in the case of diabetes⁷; powder made from the dried plant is given orally to treat whooping cough⁸; decoction of the plant is used as laxative⁹; and the decoction of the plant is applied externally on boils and pimples⁹.

Product 'Cystone'¹⁰ 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* mainly for curing laryngopharyngitis¹¹, bronchial asthma¹².



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

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

NIF Database

Uses from Uttarakhand

Diabetes

Take equal quantity of the leaves of *Aegle marmelos*, *Syzgium cumini* (L.) Skeels., *Ocimum sanctum* L., *Azadirachta indica* Juss., and *Ficus religiosa* L. Extract the juice and take one cup thrice a day.
- Manish Srivastava, Pithoragarh, Uttarakhand

Stomachache

Grind the fresh roots along with one black pepper. Take two spoonfuls of the paste twice a day for two days
- Chhoti Devi, Udham Singh Nagar, Uttarakhand

Uses from other states

Diabetes

Take the root juice (150ml) orally
- Maibum Lolito Meitei, Bishempur, Manipur

Jaundice

Take the leaf or fruit juice orally
- Ngairangbam Santosh Singh, Imphal East, Manipur

Headache

Grind equal amounts of root of bel and leaves of *Leucas aspera* L. into a paste and apply
- Bhadi Ram Bharali, Guwahati, Assam

Nasal bleeding

Apply the leaf paste on the nose
- Puran Chand, Kangra, Himachal Pradesh

Eye diseases

Put two drops of the green leaf juice in the eye
- Kumari Nigar Pravin, Hazaribag, Jharkhand

Menorrhagia

Take the leaf paste orally
- Rani B. Bhagat, Pune, Maharashtra

Intestinal worms

Take the green leaf juice orally
- Jagjeet Bahadur, Sitapur, Uttar Pradesh

Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis⁸; 10g fruit pulp is given before sleep to overcome morning sickness¹³; and fruit rind is applied externally on hair to kill headlice¹⁴.

'Bael'¹⁰, prepared from *Aegle* is used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. Lukol's¹⁰ 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'¹⁵, 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* mainly for curing diabetes¹⁶, gastric ulcer¹⁷ besides novel uses as herbal catalytic composition (US 6012417) for pollution control in automobiles.



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

Uses of *Bombax ceiba* L. (Semal)

NIF Database

Use from Uttarakhand

Itching in animals

Take the bark paste twice a day

- Umesh Rathore, Pithoragarh, Uttarakhand

Uses from other states

Pimples

Make a paste of thorn with milk. Apply on the pimples for seven days

- Pravin Kumar Sharma, East Champaran, Bihar

Wound

Apply the fresh bark paste topically

- Pravin Kumar Sharma, East Champaran, Bihar

Diarrhoea

Take a spoonful of leaf juice along with some sugar candy for four days

- Neha Kumari, East Champaran, Bihar

Gynaecological disorder

Take the gum powder (5g) with water for five days

- Jugeshwar Ram, Hazaribag, Jharkhand

Constipation

Take the bark powder (3g), coriander powder and jaggery with water

- Devaram, Sirohi, Rajasthan

Piles

Take the root paste (10g) with water for seven days

- Antaryami Pradhan, Angul, Orissa

General health

Few flowers are soaked in a glass of water overnight.

Filter and take the water the next morning to give a coolant effect to the body

- Mukta Kumavat, Sikar, Rajasthan

Uses in Classical Codified Literature

Decoction of the bark is given orally to combat fever¹⁸ decoction of the heartwood is given for controlling diabetes¹⁹; and bark juice is administered to reduce stomachache²⁰.

Product 'Acne-n-Pimple Cream'²¹ is prepared from *Bombax* along with other plants to treat pimples and skin eruptions. 'Evecare'¹⁰, a multi herb product made from this plant, has a regularizing influence on the menstrual cycle. Eight patents have been found on the medicinal applications of *Bombax* mainly for skincare²², AIDS²³ etc.



Uses of *Calotropis procera* (Ait.) R. Br. (Akauva)

NIF Database

Uses from Uttarakhand

Itching and irritation

Warm the leaves smeared with mustard oil and make a bandage on the affected body part for two to three days

- Sukkhi Devi, Udham Singh Nagar, Uttarakhand

Inflammation

Apply the paste of fresh roots on affected body parts

- Sukkhi Devi, Udham Singh Nagar, Uttarakhand

Migraine

Heat the leaf and extract the juice. Put two-three drops in the nostril in the opposite side of the head having pain

- Indiravati Rana, Udham Singh Nagar, Uttarakhand

Uses from other states

Stomach disorder

Grind the leaves with turmeric and make tablets. Take one tablet orally till the ailment gets cured

- P. D. Walikar, Bagalkot, Karnataka

Knee pain

Take the leaf juice orally

- Jyothi Bhatta, Chikmagalur, Karnataka

Earache

Put the latex in the ear to cure the pain

- R. C. Chowdhary, Nagor, Rajasthan

Stomachache

Smear mustard oil on a leaf and warm. Apply it over the abdomen for immediate relief

- Chawda Chanduben Jawanji, Gandhinagar, Gujarat

Arthritis

Mix latex with turmeric powder, boil it with sesame oil and then apply this paste on the aching joint

- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Skin disease

Apply the bark paste on the infected part

- Muralilal, Jaipur, Rajasthan

Uses in Classical Codified Literature

Plant extract is used as bronchodilator²⁴; flower buds of *Calotropis*, along with black pepper seeds and salt, are crushed to make pills the size of small peas. Two pills are taken twice daily for three days to cure malaria²⁵; warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain²⁶. 'Muscle & Joint Rub'¹⁰ is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'²⁷, made from this plant, is given to cure irritation of the stomach, nausea, vomiting, diarrhoea etc. Eight patents were found on the medicinal uses mainly for anti-tumor and antidotal activity²⁸ and bronchial asthma¹².



Source: SRISTI Database

Uses of *Carica papaya* L. (Papita)

NIF Database

Uses from Uttarakhand

Kidney stone

Take the fresh root paste for 21 days
- Umesh Rathore, Pithoragarh, Uttarakhand

Take the root paste with water for 21 days
- Kalavati Devi, Udham Singh Nagar, Uttarakhand

Uses from other states

Cuts and wounds

Apply the leaf paste topically
- Jongam Ngemu, Papum Pare, Arunachal Pradesh

Jaundice

Take the root decoction thrice a day along with some other herbs
- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Toothache

Keep cotton dipped in the latex of the stem on the aching tooth
- Mangeram Jani, Hissar, Haryana

Intestinal worms

Take fresh latex mixed with honey orally
- Prabhat Kumar Pandey, East Champaran, Bihar

Ringworm

Apply the milky latex on the affected area
- Mukesh Kumar, East Champaran, Bihar

Jaundice

Eat the curry of tender fruit
- Sharda Devi Gangwal, Jaipur, Rajasthan

Kidney stone

Take the root juice orally
- Sandhya Suman, Sitamarhi, Bihar

Hydrocele

Make a paste of latex and tender fruit. Give one teaspoon thrice a day till the ailment gets cured.
- Dimbeswar Gogoi, Sibsagar, Assam

Veterinary practice

Lactagogue

Feed fruits daily to enhance milk production
- Manoj Kumar, Madhubani, Bihar

Uses in Classical Codified Literature

Decoction of the flower is used as cardiotoxic²⁹; bark powder is applied externally on wounds³; decoction of the bark is given orally to get rid of intestinal worms³⁰; beverage of the fruit is taken orally to cure diarrhoea³¹. Natural moisturizers and creams³² are prepared from *Carica* in combination with other plants. Thirty patents were found on its medicinal uses as an antiallergic³³ and for prevention of cancer³⁴.



Source: http://utenti.lycos.it/piantetropicali/Carica_papaya.jpg

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

NIF Database

Use from Uttarakhand

Impotency

Take leaf paste of *Centella* and *Tinospora cordifolia* (L.) Merr. daily in the morning
- Umesh Rathore, Pithoragarh, Uttarakhand

Uses from other states

Malaria

Take the decoction of the plant along with some other herbs thrice a day
- Smit Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Toothache

Make a paste of *brahmi* leaves, garlic cloves and banana roots. Apply topically and leave for one hour.
- Anil Gogoi, Sivasagar, Assam

Sinusitis

Grind leaves (10g) along with one black pepper and extract the juice. Put three drops into the nostrils. Continue the treatment for three days
- Batchu Murrur, Kokrajhar, Assam

Dysentery

Grind leaves (10) of *brahmi* and guava together to make a paste. Take this paste twice a day for ten days. In case of chronic dysentery, continue the treatment for 90 days
- Guna Ram Khanikar, Golaghat, Assam

Make a paste of leaves along with black pepper and take it orally
- Dipali Borah, Sivasagar, Assam

Memory enhancer

Take the leaf juice orally
- Savitri Devi, Kangra, Himachal Pradesh

Skin diseases

Apply the leaf paste topically over the affected part
- Savitri Devi, Kangra, Himachal Pradesh

Diarrhoea

Take two spoonfuls of the whole plant juice with a pinch of salt orally twice a day for a week
- Sapam Deben, Bishnupur, Manipur

Herbal tea for immunity

Add some leaves while preparing tea. It helps to enhance immunity
- Jasmit Singh, Hamirpur, Himachal Pradesh

Insomnia

Include whole plant paste in daily diet
- Khiroram Barman, Borpetta, Assam

Uses in Classical Codified Literature

Fresh juice of aerial part is used as brain tonic³⁵; powder of aerial parts helps to control high blood pressure³⁶; whole plant is diuretic³⁷; plant paste is applied as a poultice in case of bone fracture³⁷. 'Herbal Tea'³⁸ is mainly indicated as a health drink. 'Mentat'¹⁰ improves mental functions, mental quotient, memory span, and concentration ability and stress threshold. More than three hundred patents were found on its medicinal applications mainly as an anti-depressant³⁹.

Uses of *Ficus racemosa* L. (Gular)

NIF Database

Use from Uttarakhand

Nose bleeding

Take the crushed fruits with an equal quantity of jaggery
- Deepak Balutia, Nainital, Uttarakhand

Uses from other states

Mouth sores

Apply the latex on sores
- Aarti Kumari, Gopalganj, Bihar

Jaundice

Mix two drops of the latex in a glass of water. Take it in the morning on an empty stomach for seven days
- Sheikh Javed & Sheikh Mohammad, Hingoli, Maharashtra

Gynaecological disorder

Take the leaf juice orally
- Satyanarayan Sain, Sikar, Rajasthan

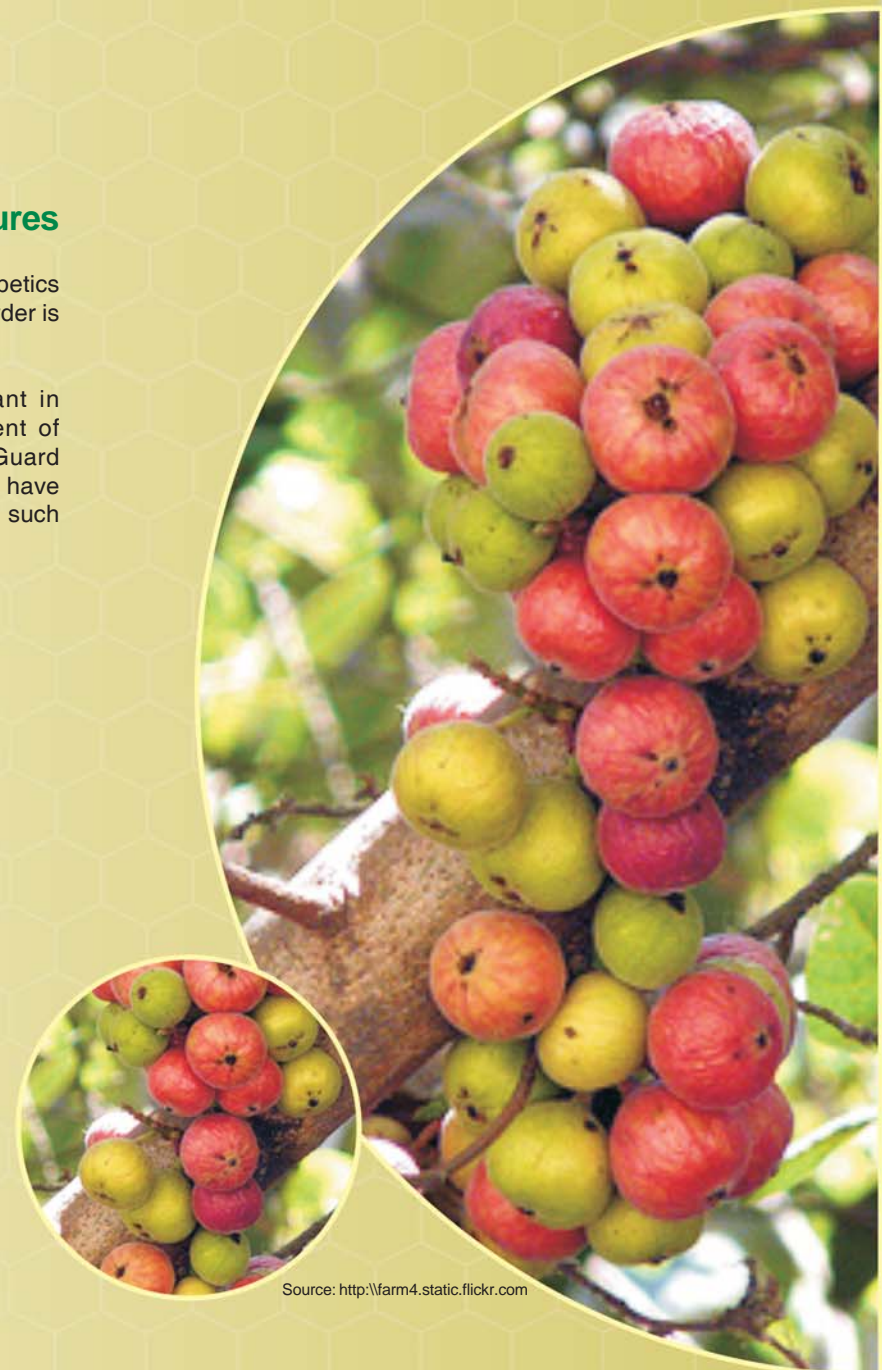
Poisonous bite

Massage crushed tender leaves over the affected area
- Ganesh Madhukar Shanbhag, Sholapur, Maharashtra

Uses in Classical & Codified literatures

Dried bark is given orally to cure diarrhoea⁴⁰; diabetics should take the decoction of roots⁴¹; dried root powder is administered orally to combat fever⁴².

Product 'Tricawin'⁴³ is prepared from this plant in combination with others herbs for the treatment of specific and non-specific leucorrhoea. 'Diabet Guard Capsules'⁴⁴ is used to cure diabetes. Fifty patents have been found on its various medicinal applications such as to treat stomach ulcer.⁴⁵



Uses of *Kalanchoe pinnata* (Lam.) Pers. (Paththar chatta)

NIF Database

Use from Uttarakhand

Kidney stone

Take the leaf juice for 10-15 days
- Sukkhi Devi, Udham Singh Nagar, Uttarakhand

Uses from other states

Injury

Put warmed leaves on the affected body part
- Onom T. Doming, East Siang, Arunachal Pradesh

Eye pain

Put two drops of the leaf juice in the eyes
- Susanta Kumar Manjhi, Birbhum, West Bengal

Stomach disorder

Take two spoonfuls of the leaf juice orally
- Susanta Kumar Manjhi, Birbhum, West Bengal

Diarrhoea

Take the leaf juice orally along with some sugar
- Bikesh Kumar, Sitamarhi, Bihar

Cuts & wounds

Apply the leaf paste topically
- Arun Ghosh, Bankura, West Bengal

Pain

Apply the leaf paste topically
- Priyanka Pramanik, Purulia, West Bengal

Jaundice

Take the leaf juice along with black pepper orally
- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Kidney stone

Grind the leaves of the plant with a piece of turmeric and extract the juice. Add some jaggery and take the preparation for ten days.
- Dimbeswar Gogoi, Sivasagar, Assam

Take leaf juice orally once a day for 25-30 days.
- Guna Ram Khanikar, Golaghat, Assam

Uses in Classical Codified Literature

Plant paste is applied on forehead to alleviate headache⁴⁶; leaf paste is applied externally to cure cuts and wounds⁴⁷; fresh sap of plant is used for eye diseases⁴⁸. Product 'Regenerating Day Cream'⁴⁹, a multiherbal medicine enhances skin's tone and elasticity, helps to smooth wrinkles and fine lines. Five patents were found on the medicinal applications of *Kalanchoe* mainly as an antiobesity⁵⁰ medication.



Source: NIF database

Uses of *Solanum nigrum* L. (Makoi)

NIF Database

Use from Uttarakhand

Inflammation

Make a curry of *Solanum* and *Cuscuta reflexa* Roxb.
Take it for two or three days
- *Chhoti Devi, Udham Singh Nagar, Uttarakhand*

Uses from other states

Malaria

Take the decoction of the plant along with some other herbs thrice a day
- *Yanueg Jamoh Lego, East Siang, Arunachal Pradesh*

Nasal bleeding

Boil dry fruit (25g) in mustard oil (100g) and filter. Apply the filtrate on the forehead
- *Sahim Ansari, Lohardaga, Jharkhand*

Mouth ulcer

Chew the leaves
- *Shripal Singh, Bulandshahar, Uttar Pradesh*

Cough

Take the root juice orally
- *Priyanka Kumari, Gopalganj, Bihar*

Fry the leaves of makoi (200g) in mustard oil (20ml) and take it orally with a little salt
- *Sukhai Mali, Faridabad, Haryana*

Jaundice

Take the root juice orally
- *Suman Kumari, Gopalganj, Bihar*

Stomachache

Take the fried leaves of *Solanum*, neem and *Vitex negundo* L. orally twice a day
- *Moirangthem Mani Devi, Imphal West, Manipur*

Uses in Classical Codified Literature

Powdered fruit is given orally to reduce fever⁴⁶; juice extracted from the whole plant is applied externally on the burnt part⁵¹; poultice of the plant is placed on the aching joint⁹; fruits are ground and taken orally to cure diarrhoea²⁶.

'Herbolax'¹⁰ 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^{52,53}.



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

NIF Database

Use from Uttarakhand

Diabetes

Soak handful of rice overnight in water. Take it the next morning after adding the powder of *Tinospora* leaves
- Deva Bharti, Bageshwar, Uttarakhand

Uses from other states

Typhoid

Take the decoction or powder of the stem orally
- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Asthma

Take two spoonfuls of the leaf juice orally with honey for 40-42 days
- Ramabandhu Mahajan, Jalgaon, Maharashtra

Diabetes

Take leaf powder (¼ spoon) regularly
- Patel Singh, Hissar, Haryana

Rheumatism

Mix the plant (25g), dry ginger (5g) and sesame oil (5g), soak in water overnight. Take the filtered solution next morning
- Jagjit Bahadur, Sitapur, Uttar Pradesh

Piles

Boil, dry and grind the whole plant (50g) into a fine paste. Make tablets and take one tablet thrice a day for 3-5 days
- Pukhram Angouba Singh, Bishnupur, Manipur

Veterinary practice

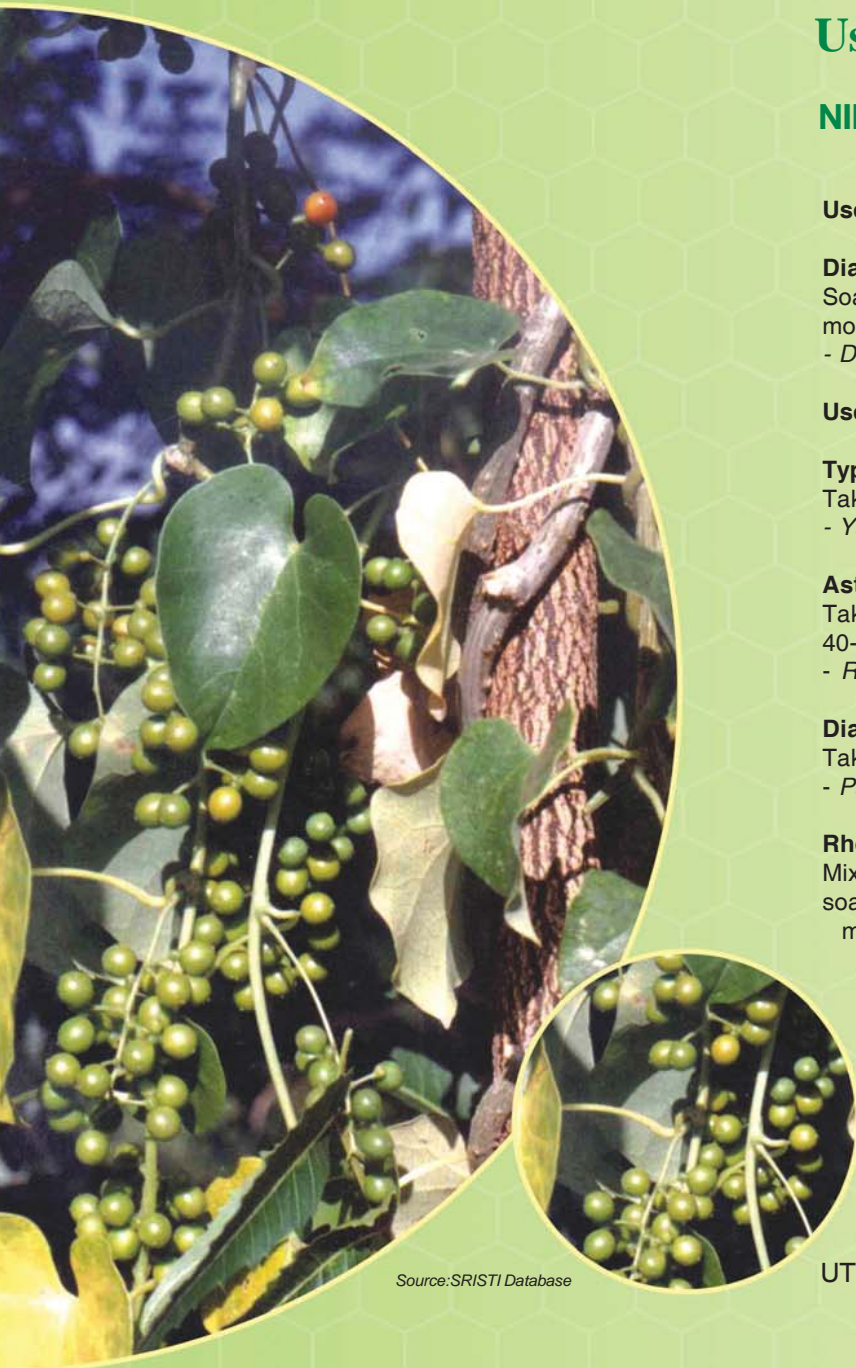
Anestrous

Grind the plant, along with the bark of *Cassia fistula* L. and leaves of *Artocarpus heterophyllus* Lam., and take orally
- Honnegowda, Bengaluru rural, Karnataka

Uses in Classical Codified Literature

Powdered roots are taken to cure mouth ulcer⁵⁴; powdered plant is administered orally with honey to get relief from stomach disorder⁵⁵; the stem is bitter and is used as anthelmintic³⁷; and decoction of the plant is given orally to cure diarrhoea⁵⁶.

Tinospora is a well known medicinal plant and is used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon'¹⁰ etc. More than a hundred patents were found on its medicinal applications mainly as an antiallergic⁵⁷ and for cancer⁵⁸.



Source:SRISTI Database

Uses of *Ziziphus mauritiana* Lamk. (Bor)

NIF Database

Use from Uttarakhand

Indigestion

Mix the fruit pulp of *Ziziphus* with one year old vinegar and add some black salt to it. Take the formulation for fifteen days on an empty stomach

- *Jivan Nath Bichchunath, Udham Singh Nagar, Uttarakhand*

Uses from other states

Hair care

Boil the fresh leaves (100-150g) in one litre of water. Wash the hair with cooled decoction.

- *Baba Anantanand, Hissar, Haryana*

Acne

Apply the leaf paste topically

-*Ajay Kumar Jena, Balasore, Orissa*

Indigestion

Take one spoonful of the root paste orally

- *Madhusuda Munda, Keonjhar, Orissa*

Rheumatism

Apply the leaf and root paste (along with the roots of *Cassia auriculata* L.) on the aching part

- *Jivanbhai Bhanjibhai Jagarana, Bhabnagar, Gujarat*

Veterinary practice

Lactagouge

Feed the cattle with dry leaf powder mixed in fodder

- *Baba Anantanand, Hissar, Haryana*

Uses in Classical Codified Literature

Pounded leaves are applied on boils¹⁸; powdered leaves are taken to reduce blood sugar⁸; decoction of the plant is administered orally as a diuretic⁵⁹; and powder of dried fruit is given orally with water to cure diarrhoea¹.

'Dhanwantharam oil⁶⁰' is prepared from *Ziziphus* along with other plants used for rejuvenating body and skin care. More than ten patents have been found on its medicinal applications mainly for treating cancer and tumorous growth⁶¹.



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 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.

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.



PART III

INNOVATIONS for UTTARAKHAND

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





Dadaji Ramaji Khobragade
Maharashtra

HMT- an Improved Paddy Variety

Khobragade selected and bred the HMT rice variety from the conventional 'Patel 3', a popular variety developed by Dr. J. P. Patel, JNKV Agriculture University, Jabalpur. He succeeded after five years of continuous study and research on a small farm owned by him without any support from the scientific community. This variety has an average yield of 40 – 45 quintals per hectare with short grains, high rice recovery (80 %), better 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. 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 in five states.



Kudrat 9- An Improved Variety of Wheat

The innovator believes that every farmer should get good quality seeds to deliver high yielding varieties of crops. He has developed a number of improved wheat, paddy, mustard and pigeon pea varieties, which are high yielding, robust stem, having bold seeds with good smell, taste and which are resistant 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 tillers with lengthy spikes and has a hardy stem. The grain has a good taste. The average yield of this variety is 55-60 quintals / hectares.



**Prakash Singh
Raghuvanshi**
Uttar Pradesh





Jai Prakash Singh
Uttar Pradesh

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

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



Richa 2000- An Improved Variety of Pigeon pea

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



Rajkumar Rathore
Madhya Pradesh





Ishwar Singh Kundu
Haryana

Herbal Growth Promoter

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

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

The innovator won a consolation award in NIF’s Fourth National Biennial Competition. 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 to the garden in Rashtrapati Bhavan.



***Aloe vera* Gel Extractor**

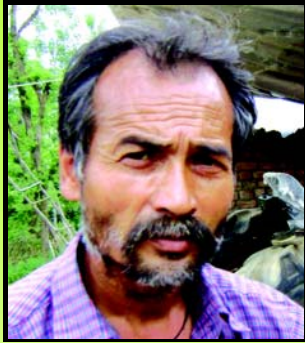
The innovator has developed an effective multipurpose unit capable of pulverizing, steaming, and extraction of gel for herbal applications.

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





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

Modifications in Gears for Mountainous Slope

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

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



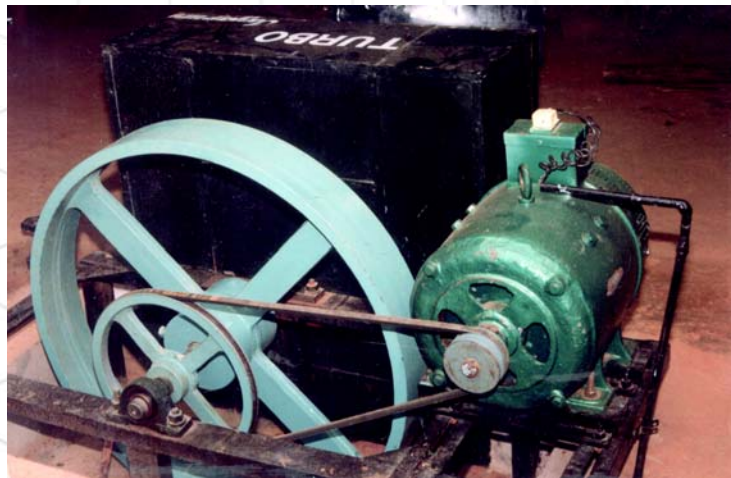
Modified Hydro Electricity Turbine

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

Hydro electric turbine is specifically designed for the hills. It costs Rs.30,000 and meets the individual electric needs of a rural household. The innovator has installed a few of these turbines in the hilly villages of Karnataka.



G. K. Ratnakar
Karnataka





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. It costs approximately two thousand rupees. This innovation was awarded in NIF's Fourth National Biennial Competition.

This innovation was also selected for value addition by CMERI, Durgapur under Mechanical Joint Implementation Committee (JIC) of CSIR-NIF.



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 farm implement 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 supported with working capital needs of his enterprise under the Micro Venture Innovation Fund of NIF. More than a hundred farmers have bought his thresher.



Madanlal Kumawat
Rajasthan





Sheikh Jahangir Sheikh Usman
Maharashtra

Two-wheeler Based Spray Painting Device

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



Portable Painting System

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

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



Gurjeet Singh
Himachal Pradesh





Arvindhbhai Patel
Gujarat

Auto Air Kick Pump

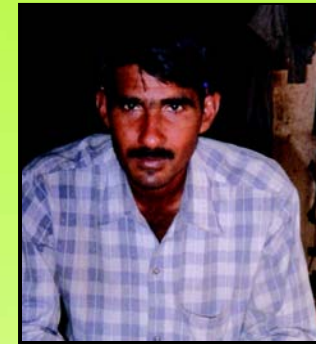
This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle having kick start or auto start mechanism so as to fix the problem on the spot and enable the rider to reach the nearby gas station or repair shop.

This device converts the compressor into an air pump. A pinch of polymer granules is also inserted to seal the leakage in the tube. The user can kick and fill air in the tube. This may last for a few kilometers to reach a pump repairing shop. An entrepreneur from Mumbai has licensed this technology and has sold more than 2500 pieces so far, mainly in North Eastern India through another technology licensing initiated by NIF North East cell at IIT Guwahati.

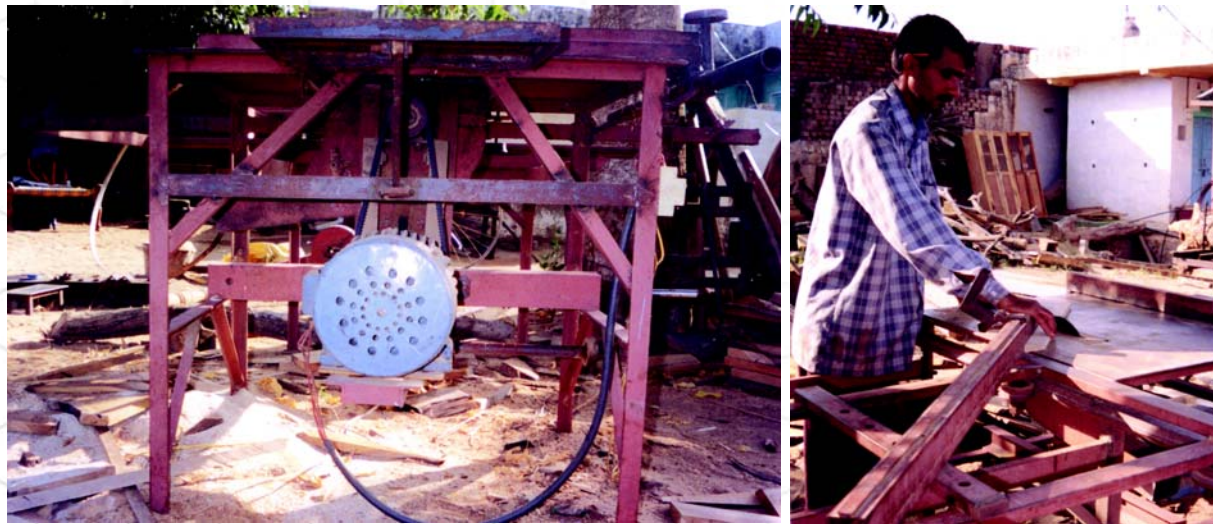


Safe Wood Cutting Machine

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



Kishanlal Jangid
Rajasthan





Khimjibhai Kanadia
Gujarat

Panihari - A Head Load Reducing Device

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

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



Jalpari- The Water Carrier

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

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



16



Madhav Sawant
Maharashtra



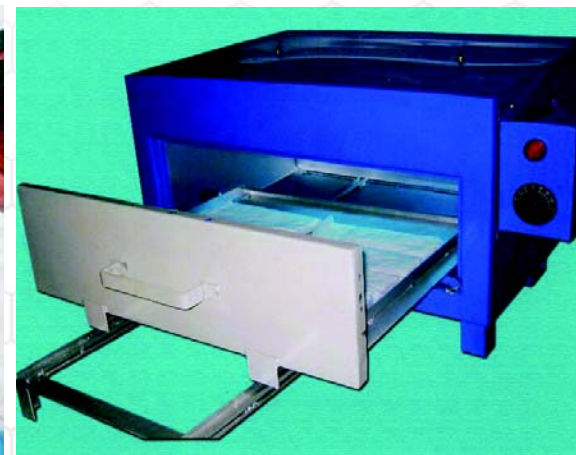
A. Muruganandam
Tamil Nadu

Sanitary Napkin Making Machine

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

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

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



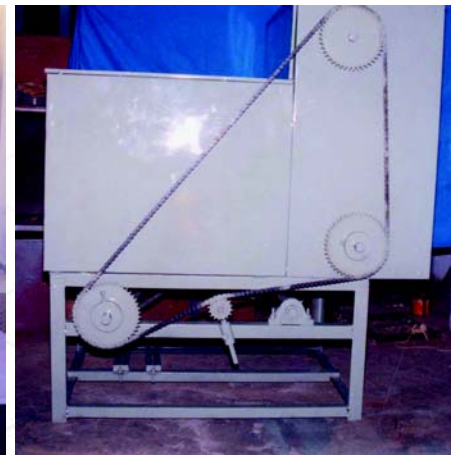
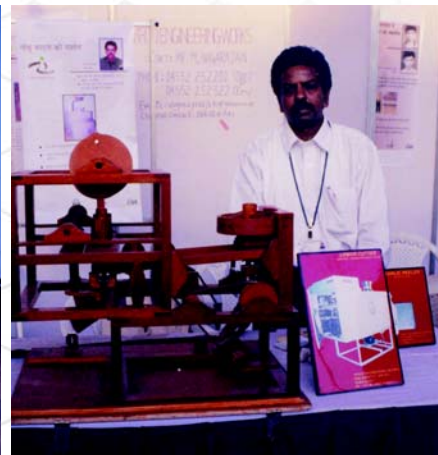
Garlic Peeling & Lemon Cutting Machine

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

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



M. Nagarajan
Tamil Nadu





Dulal Choudhary
Assam

Beauty Care Umbrella

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

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



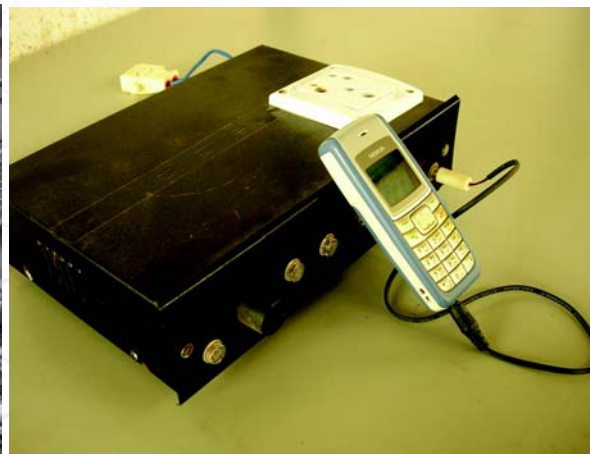
Mobile Operated Switch and Multi-media Poster

Imagine a village where the farmer has the luxury of being able to stay at home and switch his irrigation pump in the faraway field on or off as required during the day or at night. This is made possible by this brilliant 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.



Prem Singh Saini
Haryana

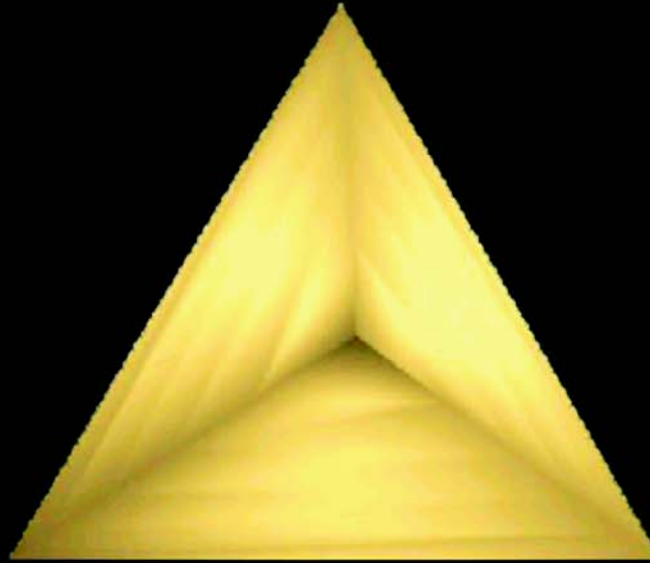


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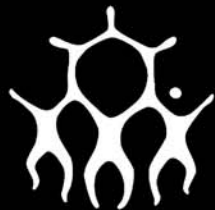
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Honey Bee Network
SRISTI
P.O. Box : 15050, Ambawadi P.O.
Ahmedabad - 380 015, Gujarat, India
Phone: +91-79-27912792, 27913293
e-mail: honeybee@sristi.org
www.sristi.org/honeybee.html



National Innovation Foundation
Bungalow 1, Satellite Complex
Premchand Nagar Road
Vastrapur
Ahmedabad 380 015, Gujarat
Telephone: +91-79-2673 2456/2095
www.nifindia.org