Honey Bee Network

KARNATAKA

Innovates

National Innovation Foundation

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National Innovation Foundation

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HONEY BEE NETWORK

Regional Collaborator
PRITVI, Bangalore

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KARNATAKA INNOVATES

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 Karnataka. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover so many examples of the ability of local communities and individuals to solve problems on their own without outside help, how much more can be done if state and private sector agencies join hands with NIF actively.

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

The book is divided in three parts. The mechanical innovations developed by innovators from Karnataka 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 Karnataka 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

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
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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.

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.

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

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The Honey Bee Network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of Honey Bee newsletter. It also ensures that a fair 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 182 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

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 Government of Karnataka state. Tremendously rich knowledge of biodiversity, minerals and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.

Anil K Gupta
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Professor, Indian Institute of Management, Ahmedabad
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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

“By adapting public policy in support of grassroots innovators and traditional knowledge holders, we can make economic development process more inclusive and sustainable”.

- Dr. R.A. Mashelkar

PART I

INNOVATIONS
from KARNATAKA

This section contains grassroots innovations originating from ignited minds of Karnataka

Raghav Gowda
Dakshin Kannada

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 reduce 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. Raghav was given State Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 for the machine (also see Honey Bee, 15(4):4-9, 2004).

02

Power generation through sewage/slow moving water

K. Balakrishna
Bangalore

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 cylindrical drum provide desired efficiency to the system in generating 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 and 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.

Late Annegowda
Hassan

‘Chandrike’ cocoon stand

With a goal to develop a disease free, eco-friendly and cheap alternative to the commonly available plastic and bamboo cocoon stands, Annegowda in 2003 developed a cocoon stand *i.e.* ‘Chandrike’ made from mulberry stalks. The chandrike so prepared is believed to be resistant to diseases. The silk worms are placed on these chandrikes at the cocoon formation stage.

These cocoon stands, which have a spinning capacity of around 10 kg, cost not more than Rs. 10 (only the cost of the rope) and can be used for 2-3 cycles of rearing. These are cheaper and more durable than bamboo and plastic chandrikes, and are easy to maintain. Another important feature is that the disease does not transfer from one season to another as it is very easy to pick out the diseased cocoons. Harvesting the cocoon from these chandrikes is also very simple. He was given a Consolation Award in NIF’s Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007 (also see Honey Bee, 17(4) & 18(1):16-19, 2006 & 2007).

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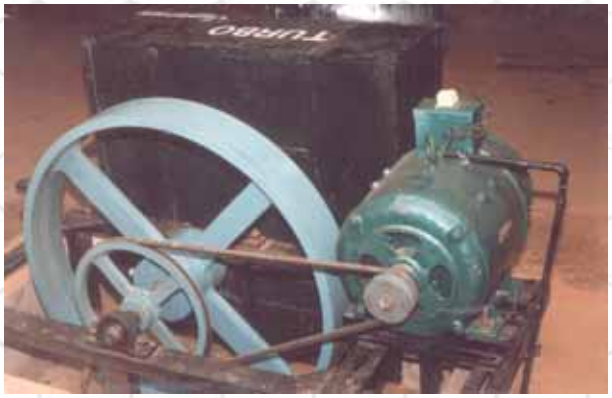
04

Modified hydro electricity turbine

G. K. Ratnakar
Chikamagalur

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

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



Annasaheb Udgavi
Belgaum

Chandraprabha water gun & Multi-purpose sugarcane based farm machinery

Chandraprabha water gun

During sugarcane cultivation, Annasaheb faced difficulty in irrigating the dense crop. Also, he discovered that the best method to solve the problem of aphids and white flies was through a high-pressure water spray. Hence, after studying the conventional sprinkler irrigation system, he designed a new rotor sprinkler to suit the sugar cane crop. He also got ideas from similar devices he saw in Japan.

An additional 400 gm of weight has been added to his water gun (also called as rain gun), to achieve a balanced shaft movement. At the outlet, a groove has been provided for fixing nozzles of different sizes to throw water at different radial length as needed. A locking system to prevent the sprinkler head from throwing water into neighboring fields (that is, beyond the range) has been introduced. The water gun has the ability to cover as much as 140 feet radius and can even be used to apply compost/biogas slurry on the

crops. He was given a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 for the water gun (also see Honey Bee, 12(2):11-16, 2001). He did try to license his technology to a company but did not get any sustained income from that. NIF has supported him again through TePP program of DSIR so as to improve the efficiency of water gun/rotor sprinkler afresh.

Multi-purpose sugarcane based farm machinery

This multipurpose implement consists of a cultivator for land ploughing, seed metering device for sowing and manure application, blade harrows for earthing up and cutting blade for sugarcane harvesting. This can be conveniently attached to a 30-40 hp tractor. NIF has also filed the patents for both of his innovations on his behalf. He was given a Consolation Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007 for this implement (also see Honey Bee, 17(4) & 18(1):8-16, 2006 & 2007).

Ravishankar
Dakshin Kannada

Cement beehive

Conventionally, beehive boxes are made of wood. They are susceptible to damage by termites and other pests especially during rainy season, and human theft. To prevent these problems, Ravishankar has come up with beehive box made of cement mortar. The box costs one-fourth of the conventional wooden box and lasts longer. There are only few reports of such beehive boxes in the world. He has been using it for five years with very good results.

Root wilt and drought tolerant pepper variety

Root wilt is a serious problem in pepper and leads to severe loss in production. By chance Ravishankar, found *Hippali*, a wild long pepper variety, which smelled like pepper fruit and the roots of which were resistant to the wilt. He experimented by grafting *Hippali* as scion, on the stock of local cutivars viz. *Panniyur* in the year 2001-02. The newly developed variety is reported to be tolerant to wilt disease and drought, and matures in comparatively lesser time (within 2 years) with 30–40 spikes. The average dry pepper yield is 1.5 kg/year/vine.

07

Mysore Mallige: A unique paddy variety

M. Lingamadaiah*
Bangalore

Lingamadaiah, a graduate in law, is known for his variety '*Mysore Mallige*' in Karnataka, Tamil Nadu and parts of Andhra Pradesh. '*Mysore Mallige*' is developed through systematic recurrent selection by the innovator. It is an early bearing variety with a yield of about 36 quintals per acre (9000kg/ha). The innovator was facing pest and disease problem in paddy for many years and also was getting low milling recovery. He started multiplying the new paddy variety by selection procedure to get a pest and disease free variety with higher milling recovery. It yields more even without any extra input and is of short duration, is resistant to lodging and has milling recovery of about 80 percent. If grown organically, hardly any pest and disease attack is observed. He is growing this variety since 1994. It has covered 25-30 percent of paddy growing area in the region.

He was given a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Practices in 2002 and was also honored with Beeja Mitra award from GREEN Foundation (also see Honey Bee, 13(4): 5-9, 2002).

* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.

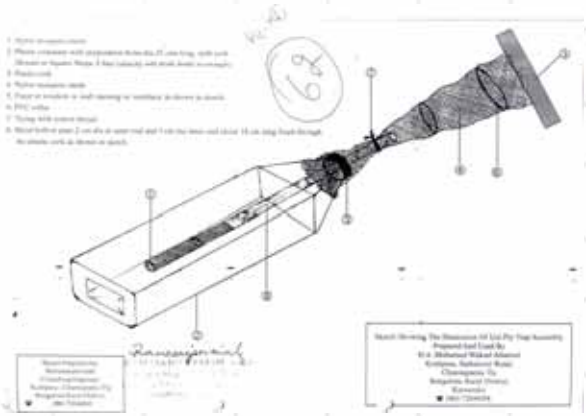
Mohammed Wakeel Ahmed
Bangalore

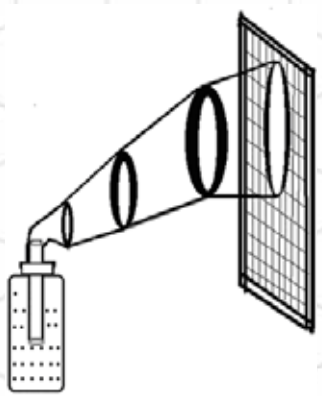
Uzi fly trap

One of the major problems faced by sericulture farmers is a tachnid fly, popularly known as Uzi fly (*Exorista bombysis*), which accounts for 15-20 per cent crop loss annually.

After studying in detail about the lifecycle and behaviour of the female Uzi fly, Wakeel designed the Uzi fly trap. The trap consists of a nylon mosquito mesh, a plastic bottle with perforation and a plastic cork attached to one end, a hollow metal pipe and PVC collars. Small holes are made in the plastic bottle, which is hung from the window of the silk worm rearing room. The pregnant female Uzi fly that gets attracted to the smell of the silkworm, enters through the holes and gets trapped. This innovation has been widely accepted by farmers as it is very cost effective and simple to use.

For his innovation, he won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 (also see Honey Bee, 14(1):12, 2003 and 16(2):7-11, 2005).





09

Silkworm-rearing tray

S. M. Mangali*
Gadag

Noticing the inconvenience caused by higher space needed by the conventional trays for silkworm rearing, their high cost, and labour requirement, Mangali got motivated to develop an alternative tray.

He modified and optimized the size, material, weight and arrangement of the silkworm rearing trays achieving increased cocoon rearing capacity. Using these trays it has become possible to double the capacity of the rearing rooms.

He has also come up with a convenient, adjustable and efficient hand weeder that can also be used for removing debris and inter-culturing.

He was given a Consolation Award during NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

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Shankara Patali
Dakshin Kannada

Use of buttermilk as coagulant for rubber latex

Rubber is usually sold in the form of sheets. The first step in rubber making is tapping latex from rubber trees. This latex is mixed with water to form a solution, which is coagulated into thin slabs of coagulum for which chemicals such as acetic acid or formic acid are also added.

Patali discovered that buttermilk was better than formic acid or acetic acid for the coagulation of natural rubber latex and used it instead of acids. The rubber sheets made through this process were found to be of superior quality and better in colour. Also, it was found that they became less susceptible to fungal attacks. Buttermilk, being a totally organic product, poses no side-effects or allergies to people handling them as in the case of acids or chemicals.

He was given a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 (also see Honey Bee, 14(1):12, 2003 and 16(2):7-11, 2005).

11

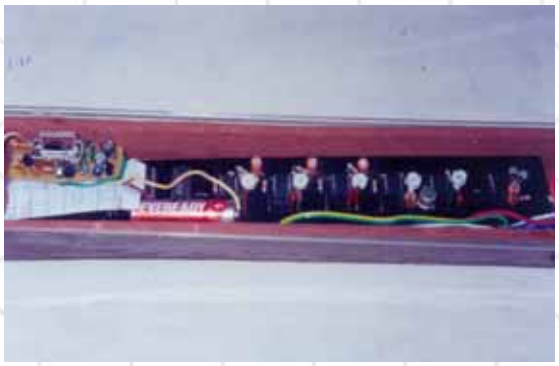
Electronic stick for the visually challenged

Sanket V Chitagopakar and Prashant V Harshangi
Gulbarga

Using this innovative stick, a visually challenged person receives signals indicating obstacles encountered in different directions around him, through a headphone. The moisture sensing electrodes sense the moist soil or stagnant water. It also has micro-switches to detect manholes.

Finally, in order to make the system more versatile, an anti-theft alarm is also incorporated to warn the user if the stick is being stolen. Other applications of this innovation could be its use by sewage workers, miners etc., or in the situations where light is dim/not available.

Sanket and Prashant were given award in the student's category in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 (also see Honey Bee, 15(4):4-9, 2004 and 16(3):14-15, 2005).



Jyothi Ravishankar
Dakshin Kannada

Two-in-one stove

While cooking on the traditional hearth, which is still prevalent in many houses in different parts of the country, much of the heat gets wasted making it unbearably hot near the hearth. Jyothi thought of developing a system of using this wasted heat energy and came up with this stove.

The innovation is a multipurpose utility stove, which captures the wasted radiated heat of a wood fired stove to simultaneously cook as well as heat water in a drum. The unit works on the principle that cold water flows down and hot water rises up. The arrangement consists of a stainless steel envelope on three sides of a wood fired stove and two pipes, which are connected to the stove. Cold water comes in from the bottom inlet pipe, gets heated and passes out of the hot water pipe into a stainless steel hot water container. A separate tap is attached to the hot water pipe on the side of the oven to collect hot water.

She was given a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 (also see Honey Bee, 14(1):12, 2003).

13

Arecanut husking machine

Narasimha Bhandari
Chickmagalur

Husking of areca nut is not an easy task. One person hour is required for husking approximately 1000 nuts. To improve the productivity, Bhandari has developed two different machines to process areca nuts. These machines are designed to peel areca nut of any size and are more efficient when compared to others available in the market. In the first manual husking machine, a wheel had to be rotated by hand, which made it slower than the second automatic machine.

For this innovation, he won a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 (also see Honey Bee, 12(2):11-16, 2001 and 14(4) & 15(1):11-15, 2003).

For better peeling of dry areca nuts, he modified the machine using the relative motion between the high-speed rotating cushioned discs. He has also developed many other technologies, such as hand pumps, pepper thresher, alternators, *papad* maker, single wheeled push carts, hydro-pumps, etc. NIF has filed a patent for this machine on his behalf.

Narayana Bhat
Dakshin Kannada

Dwarf, high yielding areca nut variety

High yielding areca nut trees grow up to a height of 13-16 meters. Climbing these trees is a risky job for which skilled labour is required. Considering the advantages of spraying of nutrients and harvesting the nuts, Bhat developed a dwarf variety of only 20-25 ft in height and with an average yield of 400-500 nuts. He crossed two different varieties taken from local research station and produced this dwarf variety. Why should not we involve farmers more actively in breeding programs? Their deep understanding can help recombining the available parent lines in more useful varieties than may be possible some times by efforts only at formal level.

He was given a Consolation Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002.

15

Highly efficient low wattage electric water heater

A. R. Shivakumar*
Bangalore

A. R. Shivakumar, who gets very indignant about wasting precious electricity, has developed a cost effective solution for heating water that reduces the load on the electricity meter.

In this system of water heating, cold water is made to enter from the bottom of the container. Normally the hot water rises to the top where from cold water enters. This makes conventional hot water geysers less efficient because heat is constantly lost. In the present arrangement, this is avoided. This method fundamentally challenges the way commercially available geysers operate where the water enters from the top and hot water is drawn from below.

He won a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 (also see Honey Bee, 12(2):11-16, 2001).

* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.

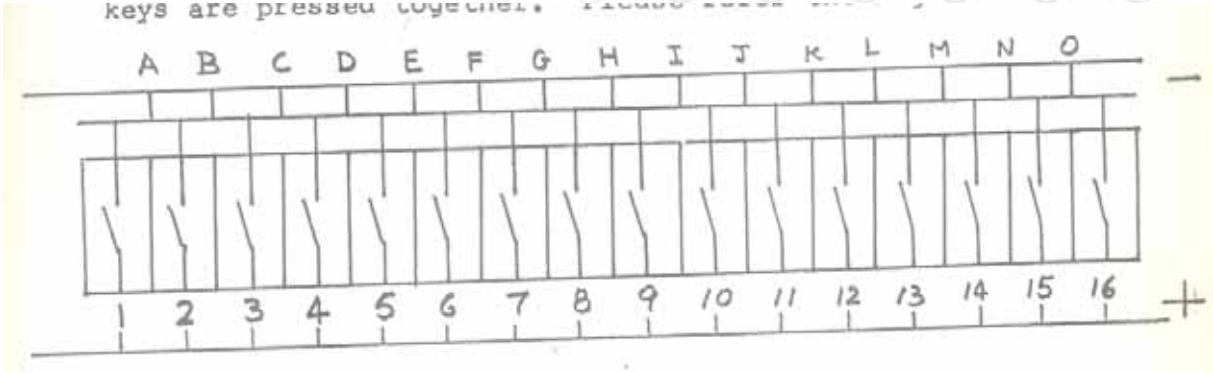
Sudarsana*
Puttur

Small computer keyboard

Sudarsana is a man full of ideas ranging from milking cows in a more comfortable position to pumping water.

Pressing two keys instead of one on a computer keyboard has been a perennial problem. Sudarsana has designed a keyboard that has double the number of keys than in an ordinary keyboard but with each key having only half the original key width. This has reduced the keyboard to half its size. Each key is a single switch, which closes the electronic circuit avoiding the signal from an accidentally pressed single key to be registered with the computer. To type a letter, two keys are pressed together, which completes the circuit and the signal for that particular letter gets registered in the computer.

He won a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 for his idea (also see Honey Bee, 12(2):11-16, 2001).



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17

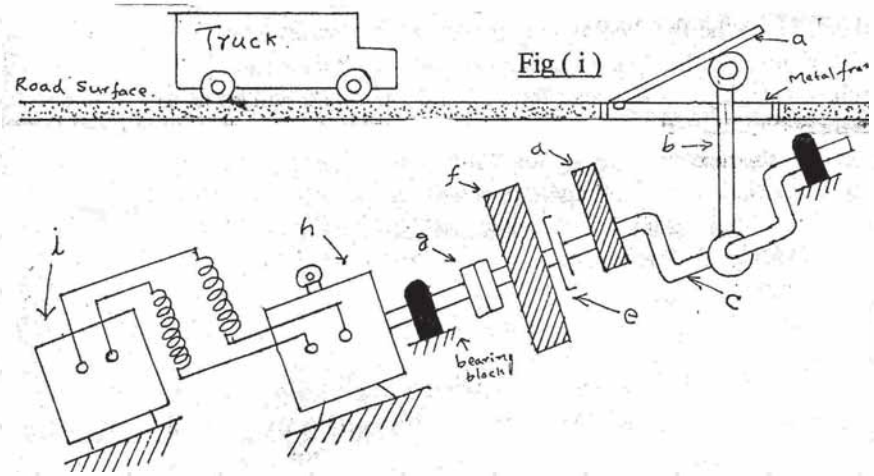
Generating electricity on National Highways

A.D. Nagendrappa*
Bangalore

Nagendrappa has designed a simple method to harness energy on the highways. When vehicles would hit the speed-breakers, they would press down, move levers and rotate a dynamo thereby generating electricity in the process.

An inclined metal plate is hinged and fixed to a metal frame and a connecting rod, which is connected to a crankshaft, and this in turn is connected to a flywheel similar to a one that is used in a bicycle. When the connecting rod moves, it makes the crankshaft rotate the flywheel thereby rotating the generator to produce electricity. Kanak Gogoi, Assam has developed a working model of rumble strips to achieve the similar purpose.

He won a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 for his idea (also see Honey Bee, 12(2):11-16, 2001).



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A. I. Nadakattin
Dharwad

Tamarind cultivation under dryland conditions and Water harvesting techniques

A man of multiple talents, Nadakattin has many innovations to his credit. To irrigate his tamarind fields he harvested rainwater in the bore wells and channeled it to the farm ponds that he had dug up, to be used later for irrigation. He also made a pit between four tamarind trees, containing dried leaves, twigs, poultry and fish manure along with some salt and sand. The rain water gets collected in the pit, seeps in slowly and becomes available to the roots of the tamarind plants.

He has developed a tamarind seed separator so that the pulp can be used for various preparations. The list of his other innovations includes tamarind slicer that slices 2.5 quintals of tamarind in an hour, a tamarind harvester, a seed cum fertilizer drill, a plough blade, lifting cart, water boiler, deep plough etc. (also see Honey Bee, 11(4) & 12(1): 11-12; 2000-2001). He was given State Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

19

Edible perennial brinjal variety

P. R. Krishna Prasad*
Mysore

Using grafting technique, Prasad has developed two brinjal varieties- the tall tree type and the bushy type, which bear fruits throughout the year. Both varieties are high yielding and resistant to bacterial and nematodal attacks, and drought. The varieties can be cultivated on roadsides or as an ornamental plant in front of restaurants. They provide fuel for farmers as well (also see Honey Bee, 12(3):13, 2001).

He was given a Consolation Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.

B. S. Dinesh
Shimoga

Mukkadaka decoction to control hoppers in paddy

Brown plant hoppers attack the leaves of paddy, gradually turning these to brownish white colour. These leaves appear as if the entire area has been burnt. Dinesh has made a herbal formulation to control paddy hoppers and other insect pests by using the decoction of leaves of a local herb *Mukkadaka* (*Lasiosiphon eriocephalus* Decne.). Decoction of a kilogram of *Mukkadaka* leaves is prepared in 10 liters of water, filtered and diluted in 1:10 ratio. It is then sprayed twice, once during nursery stage and then after transplanting paddy. The decoction is also effective against crabs, which otherwise cut the plants at a very tender stage. He was given a Consolation prize in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 for the development of this herbal formulation (also see Honey Bee, 9(2):8, 1998).

http://farm4.static.flickr.com/3110/3128051024_13289cc181.jpg?v=0

http://flickr.com/photos/91314344@N00/2194792843

21

Control of brown plant hopper in paddy

Basav Raj Santeshivara
Hassan

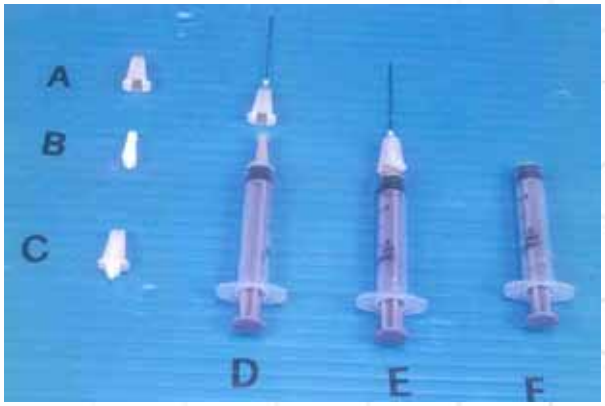
Brown plant hoppers that attack the leaf of paddy are known to jump from plant to plant when something obstructs them. By making use of this behavior, Basavaraj could find a solution to get rid of them. During the day time, he holds a stick parallel to the ground and walks slowly commoving the top of the paddy plants from one end of the field to the other. This disturbs the hoppers settled on the top, and as he walks forward with the stick, the hoppers jump from plant to plant and finally to the fire set or pesticide (preferably herbal ones) sprayed at the end of the field. If a person walks in the night with a torch in hands, attracted by the light, the hoppers simply follow the light for a fair distance. He has also developed several organic farming methods like effective composting through coir pit and gober gas slurry. He was given a Consolation prize in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 (also see Honey Bee, 9(2):8, 1998).

Tamper proof locking device

N Krishnamurthy*
Bangalore

The tamper proof locking device made by Krishnamurthy has a locking arrangement such that once locked, it cannot be unlocked by another means other than destroying it. Any attempt to tamper with it will also be known. This device has male and female components comprising a locking rib and a spring system terminating in a fuse point. The male and the female components are made to press fit accurately so that after the lock is operated, there is no dislocation. It was used to design syringes, which could not be used after one use. It was developed much before a multi-national company brought such syringes in the market.

In cases of electricity meters, gas cylinders, flow measurement meters, products on warranty, sealing of insurance parcels or ballot boxes such a device could prove extremely useful. He was given a Consolation Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 (also see Honey Bee, 12(3):13, 2001).



* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.

23

Single bullock drawn cart

Karpanna Gownder
Mysore

Karpanna Gownder has designed a single bullock drawn cart made of iron and having two yokes. Instead of wood, which is traditionally used, he uses iron pipes that act as a "mooki" (harness). Both sides of the mooki are fixed to the yoke. The cart moves once the pipe is bolted. Another unique feature of this cart is that, to reverse the cart, the bullock just needs to be tied on the opposite side. For this, the mooki is just released and pushed backwards and bolted. This cart can also unload itself on both sides. This is a great boon to farmers who have small fields and saves a lot of cost as it needs only one bullock in the place of two.

He was given a Consolation Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

Late S. Harishchandra Shetty
Puttur

Latex less jackfruit- Somapady variety

Using grafting technique, Harishchandra developed a latex less jackfruit variety for which he won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002. The fruits obtained, in this particular variety, are totally gum less with a very good taste and colour. Their texture and aroma is also quite unique. He has distributed more than one lakh gum less jackfruit seedlings all over the state and also to other states like Tamil Nadu, Kerala and Andhra Pradesh (also see Honey Bee, 14(1):3-7, 2003).

25

Foldable talking stick for the blind

Wazeer
Tumkur

This innovation is a foldable stick for the blind, which can alert a visually impaired user about the presence of water or a pit ahead, through a pre-recorded voice system. On perceiving public movement close by, with the help of a toggle switch and using a pre-recorded voice, one can even request the public in the vicinity to move away. The walking stick also has a provision for a light to alert the people about the movement of the visually impaired user. NIF has also filed a patent for the device in the innovator's name.

Davalsab Mahamadgows
Dharwad

Auto stopper for LPG gas stove

Imagine your mother or father is alone at home and is away in the garden watering the plants. She has kept a dish in the pressure cooker on the gas requiring one whistle. But the whistle sound does not reach the garden. The dish gets over cooked and the gas is being burnt unnecessarily. To solve these problems, Davalsab, 16, a young student has come up with an auto stopper, which senses the whistles and at preset numbers, gives an alarm and turns off the knob of the gas-stove. This machine is thus able to count and display the number of whistles a pressure cooker has made.

NIF is working on the technology to help refine it further and optimize it to assist the creative and concerned student. NIF has also filed a patent for the technology in the student's name.


The 12th Shodh Yatra

12th Shodh Yatra
25 December to 31 December 2003
Malnad region, Karnataka

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 12th Shodh Yatra, over the period of seven days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country.

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.** 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. (Gulganji)

Source: NIF database

NIF Database

Use from Karnataka

Gynaecological disorder
Eat two leaves twice a day till the ailment gets cured
- P.D. Walikar, Bagalkot, Karnataka

Uses from other states

Baldness
Apply the seed paste on the scalp along with honey
-Mangilal Purohit, Churu, Rajasthan

Mouth ulcer
Apply the green leaf juice on the ulcers
- Chhitar Lal Gurjar, Sawai Madhopur, Rajasthan

Stomachache
Take the seeds (100g) with ghee or butter for relief
- Kalpana, Trichy, Tamil Nadu

Knee pain
Take the seeds (6g) with milk for 14 days
- Pavan Mehra, Sikar, Rajasthan

Uses in Classical Codified Literature

Dried leaves and root powder is given orally in case of eye complaint[1]; decoction of young leaves is given orally for cough[2]; leaf powder is given orally in case of urine problems[3]; seed extract is used in sciatica[3]. It is one of the ingredients of 'Tranquil'[4] for reliving stress and anxiety. Ten patents have been found on the applications of *Abrus* as natural sweetener[5], oral contraceptive[6], etc.

Uses of *Achyranthes aspera* L. (Utranigida)

NIF Database

Uses from Karnataka

Tuberculosis
Take two spoonful of leaf juice of *Achyranthes, Adhatoda vasica* (L) Nees, *Tinospora cordifolia* (Willd.) Miers ex Hk. f. & Th. (in equal proportion) with a spoonful of honey
- Laxminarayan S. Sastry, Bangalore, Karnataka

Itching
Apply the paste made from plant ash, lime, turmeric powder and cow's urine on the infected part
- K. Lakshmana Shetty, Dakshin Kannada, Karnataka

Uses from other states

Toothache
Make a paste of roots along with three black pepper seeds. Apply it on the aching tooth
- Susanta Kumar Manjhi, Birbhum, West Bengal

Piles
Apply the plant paste topically
- Satyen Chatterjee, Murshidabad, West Bengal

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

Asthma
Take the ash of dried branches orally
- Chandrasingh Chaudhary, Nandurbar, Maharashtra

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

Uses in Classical Codified Literature

Dried aerial parts are taken orally in the case of diabetes[7]; powder made from the dried plant is given orally to treat whooping cough[8]; decoction of the plant is used as laxative[9]; decoction of the plant is applied externally on boils and pimples[9]. 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* for curing laryngopharyngitis[11], bronchial asthma[12] etc.

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

Uses of *Adhatoda vasica* (L.) Nees (Sinha parni)

NIF Database

Source: NIF database

Uses from Karnataka

Asthma
Take the leaf juice orally
- Jyothi Bhatta, Chikmagalur, Karnataka

Cough
Take the leaf juice orally with a little sugar
- Jyothi Bhatta, Chikmagalur, Karnataka

Uses from other states

Asthma
Inhale the smoke of dried leaves
- Susanta Kumar Manjhi, Birbhum, West Bengal

Tuberculosis
Take the leaf juice orally with a little honey
- Mahesh Bijarania, Nagor, Rajasthan

Malaria
Take the leaf decoction orally with jaggery
- Mahesh Kumar Khangar Purohit, Sirohi, Rajasthan

Constipation
Take the leaf decoction orally with honey
- Pradip Kumar, Bulandshahar, Uttar Pradesh

Uses in Classical Codified Literature

Decoction of the plant is taken orally to cure asthma[13]; leaves (500g) are decocted in 5 litres of water until a dark brown mass is obtained and two spoonful are taken with honey thrice a day for 2-4 days to cure fever[14]; rheumatic patients should warm the leaves and apply on the body[15]. Product 'Menstri Care'[16] prepared from the plant is an effective medicine for women's health problems. 'Diakof'[10] a herbal medicine uses *Adhatoda* along with other plants for treating cough. Ten patents have been found on its medicinal applications mainly for cough[17] and asthma[18].

Uses of *Aegle marmelos* (L.) Correa (Bilpatri)

NIF Database

Use from Karnataka

Toothache
Take a spoonful of powder of three leaves each of *Aegle marmelos*, *Azadirachta indica* A. Juss., *Ficus religiosa* L. and clove (5g) and *Trachyspermum ammi* (L.) Sprague ex Turrill. (50g) orally
- A. T. Meharwade, Haveri, Karnataka

Uses from other states

General debility
Take the fruit regularly
- Arun Ghosh, Bankura, West Bengal

Dysentery
Take the leaf powder orally along with a little salt
- Surjit Singh Sardar, Purulia, West Bengal

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

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

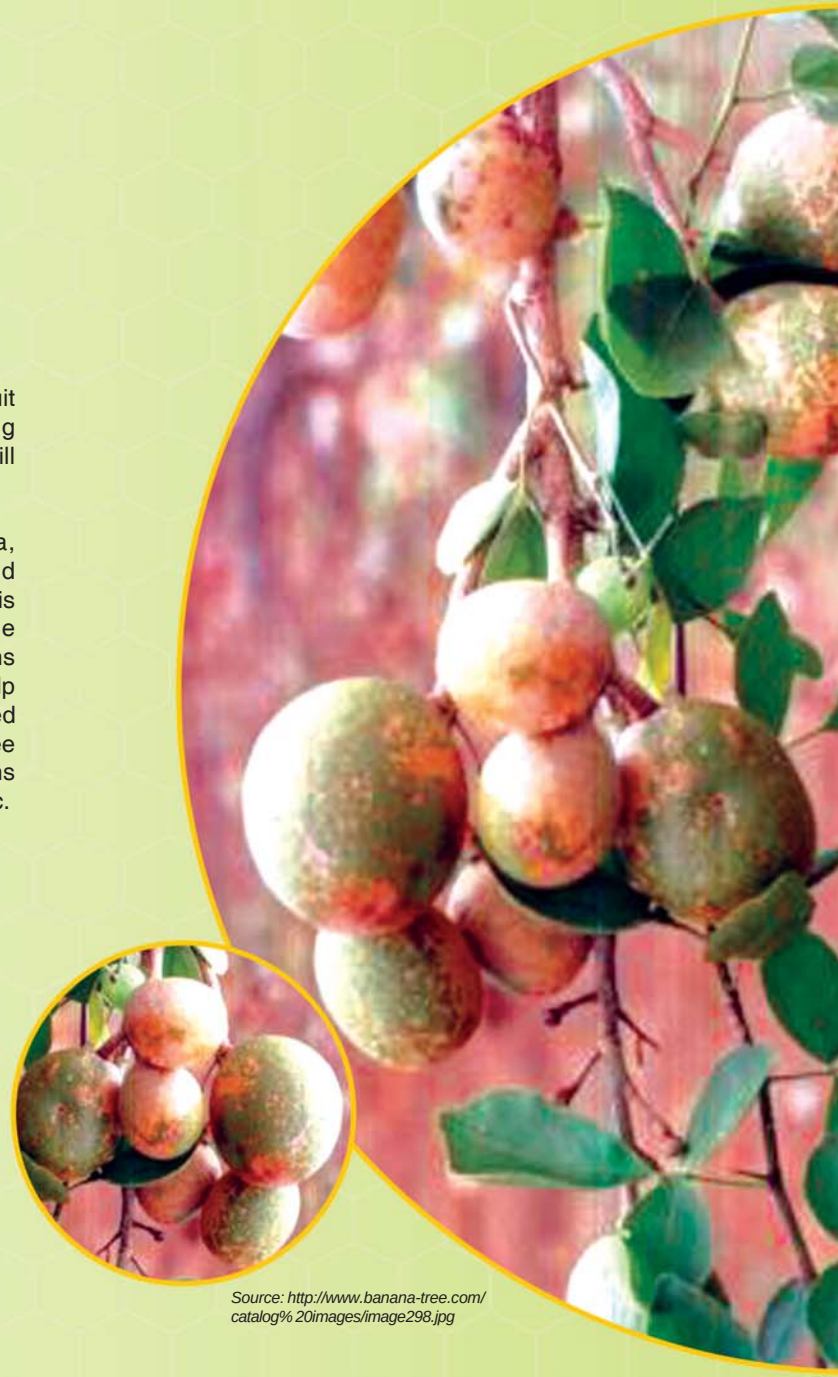
Menorrhagia
Take the leaf paste orally
- Rani B. Bhagat, Pune, Maharashtra

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

Uses in Classical Codified Literature

Burnt fruit pulp is used in rheumatic arthritis[8]; 10g fruit pulp is given before sleep to overcome morning sickness[19]; fruit rind is applied externally on hair to kill headlice[20].

'Bael'[10], prepared from *Aegle* is used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. Lukol's[10] 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'[21], 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 diabetes[22], gastric ulcer[22] etc.



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

Uses of *Boerhaavia diffusa* L. (Kommegida)

Source: SRISTI database

NIF Database

Use from Karnataka

Abscess
Apply the leaf paste on the infected part
- P. D. Walikar, Bagalkot, Karnataka

Uses from other states

Kidney stone
Boil the whole plant (50g) in water (600-700ml) along with three crushed black pepper seeds and one spoon of sugar till the solution reduces to one-third. Filter and take it orally
- Rani B. Bhagat, Pune, Maharashtra

Jaundice
Take the root juice orally
- Rani B. Bhagat, Pune, Maharashtra

Conjunctivitis
Take the root decoction (50g) orally once a day
-Ramnarayan Gameti, Udaipur, Rajasthan

Cough
Cook the leaves of *kommegida* (5g), one small onion, a small piece of ginger and a spoonful of cardamom and consume it orally
- Hasina Khan, Margav, Goa

Uses in Classical Codified Literature

The leaf juice is given with milk to get relief from cataract[24]; decoction of the plant is given orally to purify blood[25]; the plant extract is used as diuretic[26]; decoction of the leaves is applied externally in case of skin infections[27]. 'Liver-kidney care'[28] made from this plant works synergistically on the liver and kidney to heal and prevent infections in both the systems. Fourteen patents have been found on various medicinal applications of *Boerhaavia* for different ailments mainly for liver disorders[29], hypertension[30] etc.

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

NIF Database

Use from Karnataka

Hair lice
Apply the leaf juice on the scalp
- P. D. Walikar, Bagalkot, Karnataka

Uses from other states

Acidity
Tie poultice made from cooked lukewarm flowers over the abdomen
-Madhav Rao Shankar Rao Patil, Jalgaon, Maharashtra

Cuts & wounds
Apply the bark juice topically
- Dinesh Bediya, Ranchi, Jharkhand

Toothache
Apply the resin powder on the affected gums
- Bhomabhai Damor, Banaskantha, Gujarat

Joint pain
Take the resin powder with milk
- Devaram, Sirohi, Rajasthan

Uses in Classical Codified Literature

Bark is used as poultice for pimples[31]; bark juice is given orally to cure intestinal worms[32]; dried flower powder is administered orally as diuretic[29]. 'Lukol'[10] has a stimulatory action on the endometrium and improves uterine circulation. 'Hair Loss Cream'[4] improves tensile strength of hair and increases hair density. Ten patents have been found on its medicinal uses for bone disorders[33], skin care[34] etc.

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

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

Source: SRISTI Database

NIF Database

Uses from Karnataka

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

Uses from other states

Ear ache
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 bronchodilator[35]; 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 3 days to cure malaria[36]; warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain[37]. 'Muscle & Joint Rub'[10] is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'[38], 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 activity [39]and bronchial asthma[12].

Uses of *Holarrhena antidysenterica* Wall. (Korchi)

NIF Database

Use from Karnataka

Tumor
Grind the bark (5g) along with a spoon of cumin and a cup of buttermilk, filter the solution and take it orally
- N. S. Narayanmurthy, Shimoga, Karnataka

Uses from other states

Liver disorder
Take the decoction of the bark orally
- Priyanka Pramanik, Purulia, West Bengal

Diarrhoea/dysentery
Take the bark juice orally
- Ambika Singh Sardar, Purulia, West Bengal

Intestinal worms
Take the leaf juice orally to kill worms
- Ambika Singh Sardar, Purulia, West Bengal

Bodyache
Grind the bark in water. Take some quantity orally and apply the rest on the body
- Devaram, Sirohi, Rajasthan

Malaria
Grind equal amount of leaves of *korchi* and *Cyperus rotundus* L. into a fine powder. Take one spoonful orally to combat the disease
- Chandan Kumar, East Champaran, Bihar

Dysentery
Take the bark paste (10g) along with a spoonful of honey
- Kundan Kumar, East Champaran, Bihar

Anaemia
Take the bark paste along with a little salt orally
- Robert L. Hnamte, Aizawl, Mizoram

Uses in Classical Codified Literature

Dried bark powder is given orally to cure stomachache[40]; seeds are ground into a powder, 5-10g of the powder is given with water as an antidote and a paste of the seeds is also applied locally to relieve pain and swelling on poisonous bites[41]. 'Diarex vet'[10] is used for diarrhoea in cattle. 'Kutajarista and Kutajavaleha'[38] are the most popular preparations used in diarrhoea, dysentery, colitis and bleeding problems. Thirteen patents have been found on its medicinal applications mainly for gastrointestinal disorders[42].

Source: http://www.motherherbs.com/pcat-gifs/products-small/kudsappalai.jpeg

Uses of *Strychnos nux-vomica* L. (Kanjira)

Source: http://www.horizonherbs.com/images/products/Strychnos_nux_vomica.jpg

NIF Database

Use from Karnataka

Herpes
Grind the seeds of *kanjira*, roots of *Jatropha curcas* L. and resin of *Acacia catechu* Willd. along with ghee and make a paste. Apply the paste on the infected part
- K. K. Avadhani, Uttara Kannada, Karnataka

Uses from other states

Diabetes
Take a spoonful of dried plant powder orally with water
- Patel Singh, Hissar, Haryana

Eczema
Boil the plant in the oil of *Calophyllum inophyllum* L. Filter the solution and apply on the infected part
- P. Gopalkrishnan Nair, Thiruvananthapuram, Kerala

Rheumatism
Grind vine of *Aristolochia indica* L. (10g) and mustard seeds (5g), and mix with bark juice (210ml). Apply this mixture on the aching joints
- Murugesan, Tirunelveli, Tamil Nadu

Veterinary practice

Bloat
Mix the juice of tender leaves and fruits of bitter cucumber with buttermilk and take it orally
- Jevayaben, Dang, Gujarat

Uses in Classical Codified Literature

The roots are used to cure fever[3]; dried seeds of the plant are used for treating indigestion[43]; the root bark is ground with turmeric and applied externally on dropsy[3]; the stem bark is roasted on fire, powdered and made into a paste with ghee and is applied externally on cuts and wounds[44]. *Nux-vomica* is a common homeopathic remedy for indigestion, vomiting, diarrhoea, cramps, constipation, colds, and headache[45]. Twenty-one patents have been found on the medicinal uses of *Strychnos* for joint pain[46] and viral diseases[47].

Uses of *Vitex negundo* L. (Lakkagida)

NIF Database

Uses from Karnataka

Ulcer
Take the leaf juice orally
- P. D. Walikar, Bagalkot, Karnataka

Skin disease
Apply the paste of leaves, bark and cow's urine on the infected part
- K. Lakshmana Shetty, Dakshin Kannada, Karnataka

Uses from other states

Rheumatism
Put some lukewarm leaves on the aching joints
- Naganath Durga Chogule, Sholapur, Maharashtra

Ear pain
Boil the leaves in mustard oil, filter and use as an ear drop
- Bhagat Ram, Kangra, Himachal Pradesh

Stomachache
Mix the leaf powders of *Vitex negundo*, *Cocculus hirsutus* (L.) Diels. and *Bombax ceiba* L. in equal proportion and consume orally
- Yusuf Khan, East Champaran, Bihar

Muscular pain
Apply some lukewarm leaves smeared with mustard oil on the affected part
- Savita Kumari, Gopalganj, Bihar

Veterinary practice

Wound
Apply the leaf paste topically
- Nageshwari Devi, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Smoke of the leaves is inhaled to get rid of cough[8]; in case of diarrhoea flowers are used[48]; extract of the plant is taken as a diuretic[8]. 'Muscle & joint rub'[10] is a highly effective medicine for backache, muscular sprain and joint pain. 'Dental Cream'[10] is specially formulated toothpaste that tightens and reduces swelling of gums, stops gum bleeding, prevents toothache, decay and controls bad breath. 'Atharva Nirgundi Siddha Tail'[49] is useful in arthritis, joint pain, relieves oedema. Thirty-five patents have been found on its medicinal applications like for rheumatic arthritis[50].

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, without being harmful to nature as well as human beings. It also helps in controlling sucking pests like white fly, heliothis, aphid etc.

SRISTI KRUSHAK

Popatbhai Rupabhai Jambucha, Gujarat

It is an excellent remedy for leaf curl disease, which not only controls the disease but simultaneously increases the vigor of the plants by increasing its 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 is spread in the field, some times it is released in field with the flow of irrigation water. In some cases it is also drenched in the affected part of the plant as well as 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 also 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.

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. Gauli & Jeevalbhai M. Gauli, 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 immunity in poultry. 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 & 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 & 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 KARNATAKA

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

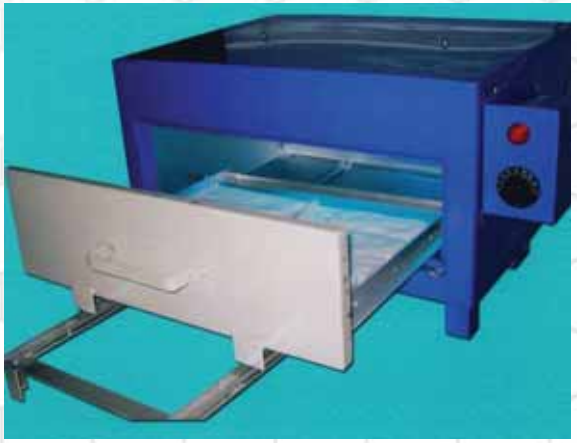
A. Muruganantham
Tamil Nadu

Sanitary napkin making machine: An option for women entrepreneurship

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 MVIF scheme of NIF, the innovator has been able to install over fifty units in seven states. NIF has filed a patent for the technology in the innovator's name.



02

Garlic peeling and lemon cutting machine

M. Nagarajan
Tamil Nadu

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 MVIF and marketing effort of NIF. Nagarajan won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005. NIF also filed patents of the machines on his behalf.

03

Sandeep Kumar
Bihar

Bicycle that can be carried in a bag

A gritty and hard working graduate, Sandeep made this folding bicycle, which can be assembled and dismantled easily in a very little time. When dismantled and folded, the bicycle becomes portable such that it can be put in a bag and carried along!

04

Hand operated water lifting device

N Sakthimainthan
Tamil Nadu

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.

Sakthimainthan won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. NIF also filed a patent for the device in his name. The innovation has also been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.

Dharamveer
Haryana

Aloe vera gel extractor

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

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

06

Mobile operated switch and multi-media poster

Prem Singh Saini
Haryana

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. Patent was filed by NIF in the innovator's name for this technology, which also won him a National Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. 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.

07

Imli Toshi Namo
Nagaland

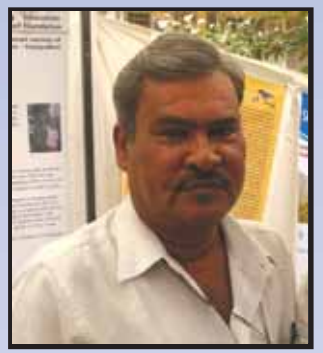
Hydro generator using bamboo composite

Energy generation and pumping water for irrigation is a widespread rural need.

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

08

Auto air kick pump



Arvindbhai Patel
Gujarat

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 existing air inside the compressor, so that, while kick starting, this air is utilized and transferred to the tube. A pinch of polymer granules is also inserted to seal the leakage in the tube.

Arvindbhai won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices 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.

Bhanjibhai Mathukiya
Gujarat

Vanraj- 10 HP Tractor

This innovation, developed over fifteen years, is a compact yet powerful 10 HP "convertible" tractor. The front axle is designed facilitating its deployment as a "three wheeler" at low speed for farming operations and a "four wheeler" at higher speeds for transporting goods to the market. The tractor is built with an adjustable wheel base for various inter-culturing operations, thereby enabling the farmer to repair the unit with minimal effort or skills.

For the tractor, Bhanjibhai won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002. As a result of NIF's facilitation, he also obtained patents for his tractor in India and USA.

10

Biomass gasification system

Rai Singh Dahiya
Rajasthan

There are lots of villages in the country which are still not electrified or are receiving power erratically. Crude oil is not a very likely solution as it is depleting and the price is also going higher day by day. Use of biomass as a fuel therefore appears to be a good solution!

People using the biomass gas (producer gas) as a fuel generally complains of choking in the engine after running for a certain period of time. The innovator has changed the conventional design of gasifiers especially the filters and cooling unit to get clean gas, ensuring smooth operation of engine at low operational cost. On an average the biomass requirement is one kg/kW-h and the costs of 10 kW, 25 kW, 30 kW and 35 kW biomass gasifier system are Rs. 1, 25,000, Rs. 2,00,000, Rs. 3,00,000 and Rs. 3,25,000, respectively.

Scientists from TERI (The Energy Research Institute) have confirmed its uniqueness and over fifty users have confirmed its operational practicability. The innovator has sold over fifty units after getting MVIF Support from NIF through GIAN North.

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 varierty has an average yield of 40 – 45 quintals per hectare with short grains, high rice recovery (80 %), better aroma and cooking quality in comparison with the parent ones. Most remarkable feature of the variety is the thinness of grain. It has been included as a standard reference for thinness by Protection of Plant Variety and Farmers' Right Authority (PPVFRA).

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

12

Herbal growth promoter

Ishwar Singh Kundu
Haryana

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 Practices in 2007. He has also been supported under the MVIF 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.

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.

14

Maruti Jhoola- the health care chair

Sakrabhai Prajapati
Gujarat

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 market, an entrepreneur has been engaged. Lot of cost was spent on packaging and transportation of the chair. It is now being redesigned and the cost may come down.

Yusuf Khan
Rajasthan

Groundnut digging machine

Harvesting groundnut is a tedious process. While digging nuts, sometimes upto 20 per cent 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, expansive 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 of one hectare per 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 won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005. He has been supported under the MVIF of NIF for commercialising his innovation. In 2006, the technology was licensed to a Vizag based company, Ardee Hi-Tech Pvt. Ltd. This license was targeted for its application as a sea beach cleaner. NIF also filed a patent on behalf of the innovator for the machine.

16

Bullet Santi-motocycle based multipurpose plough

Mansukhbhai Jagani
Gujarat

For small farms that lack acess to tractors and can't keep bullocks, motorcycle driven plough, also called '*Bullet Santi*' is a low cost alternative.

Using the chassis, drive and power of an Enfield Bullet motorcycle in front, the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. This meets various needs such as plouging, 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 has 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**'. NIF filed a patent on his behalf for the implement and also gave him a National Award in its First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

Amrutbhai Agrawat
Gujarat

Aaruni - the tilting bullock cart

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

18

Trench digging machine

Radhey Shyam Tailor
Nathulal Jangid
Yusuf Khan
Rajasthan

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 a pit 65 meters long, 5 feet deep and 14 inches wide, 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.

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