National Innovation Foundation

Andhra Pradesh Innovates

Honey Bee Network

ANDHRA PRADESH INNOVATES

National Innovation Foundation

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HONEY BEE NETWORK

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ANDHRA PRADESH 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 545 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 Andhra Pradesh. 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 Andhra Pradesh 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 Andhra Pradesh 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
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.

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.

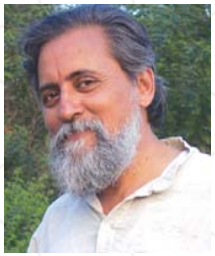
How can state government join hands with NIF?

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 State of Andhra Pradesh. Tremendously rich knowledge of biodiversity, minerals 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

“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 ANDHRA PRADESH

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

C Mallesham
Nalgonda

Asu making machine for Pochampally sarees

Usually, the process of making a 'tie and dye' silk saree in Pochampally tradition begins with the selection of silk thread. In the process of *Asu*, the threads are tied to a triangular stand and designs are drawn on this stand. Tying is done where required as per the design and the threads are then dyed in selected colours. Once dried and untied, the dyed silk threads are rolled into spindles. The spindles are used appropriately in looms and the saree is woven. The Laxmi Asu machine by Mallesham has relieved women from 8-9 hours of labour everyday. The machine will help weavers save time as it just takes 90 minutes to weave a saree with the machine as compared to the four hours required in the manual process. This has brought a revolution in the weaver community. The Indian Patent has been filed for the Innovation. The innovator has sold more than 500 units of the same.

Also see Honey Bee 19(3): 4-6, 2009 for his detailed profile.

M Narsimhachary
Nizamabad

Relighting fused tube lights

Narsimhachary while on a visit to the electricity department saw a huge pile of fused tube lights. He decided to make use of this otherwise 'waste resource'. He worked hard with determination and found a cheap and viable solution for relighting the fused tubes. He went a step ahead in eliminating the choke and starter by introducing a simple and effective circuit.

His innovation comprises a small PCB and one meter wire that can be easily connected to the ends of the tube light by any person. A patent application also has been filed by NIF on his behalf. NIF also supported him under the Micro Venture Innovation Scheme (MVIF) for commercialization of his technology.

Municipality of Nizamabad town is using his services for the last two years and has accrued substantial savings. Many villages, nearby and far, are approaching him for supply of his kit in hundreds. Five more municipalities of the state and a few from MP and Karnataka have also approached him for supply of sizable number of kits.

03

'*Kodisa*' for Controlling Rice Hispa: A Grassroots Innovation Valued Globally

Maniam Sitaraman
Khammam

Rice hispa is a dreaded plant disease that causes immense loss of rice yield in South and South East Asia. Maniam Sitaraman, a tribal farmer from Andhra Pradesh in India, has been practicing biological control of rice hispa pest (*Dicladispa armigera*) through his innovative use of a poisonous plant, for over a decade with effective results. This plant locally called '*kodisa*' (*Cleistanthus collinus)*, is found abundantly in forest area, all along the Eastern Ghats. He learnt the use of '*kodisa*' from his father, a cattle rearer by profession, who was a repository of knowledge on poisonous plants. However, a traditional practice of using crushed leaves of the plant had been in use for quite some time, by the Khoya tribe of Andhra Pradesh, to which Sitaraman belongs. The paste made out of leaves is used as an external application to cure ulcers on animals and humans. Further the pulp of the bark is used to treat wounds of domestic animals.

Sitaraman first learnt about the pesticidal property of the plant when he noticed dead rice hispa larvae along the water channel in paddy fields where the leaves of the plant were floating. Since then he started putting cut branches of this plant in his rice fields and observed that the damage caused by rice hispa pest had considerably reduced. The cost of controlling the pest has also gone down compared to the cost of chemical pesticides for which he used to spend Rs 1000 per acre.

Although there exists ample scope of developing it in to an herbal pesticide, Sitaraman admits the main constraint in using this innovative technique is that it is effective only when used in the early stages of disease incidence (Honey Bee: 11(2) 7, 2000).

Pedalling for Prosperity

P Ganeswara Rao*

The tribal farmers in Bhadrachalam area face severe difficulties in lifting water for irrigation, because of the unreliable supplies of fuel and electricity. Even in the areas where supplies are reliable, it is difficult for them to afford the ever-increasing cost of fuel. Concerned with these problems, Ganeswara Rao developed some efficient and low-cost pumps which can be operated manually.

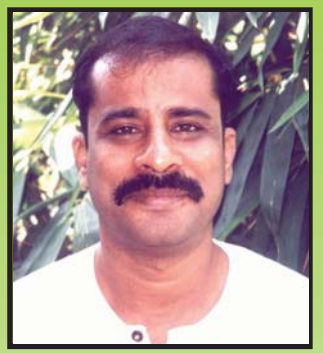
(i) **Hand-wheel pump**
This pump can be operated by turning a gear with hand. A person can sit over it while operating. Water can be pumped over to a height of 40 to 50 feet. To irrigate a three acre paddy field, one has to run this pump for eight hours. It costs around Rs 4000 and weighs about 20 kg.

(ii) **Water-wheel pump**
A water-wheel pump does not need any manual labour. It uses the flowing force of a stream to run itself. It can be fixed in any flowing stream having minimum two feet depth of flow. Depending on the velocity of the stream, it can pump water to a height of 50 to 90 feet. It can irrigate a three acre paddy field in a day. The pump costs around Rs 7000. When the flow in the stream is not sufficient to run the pump, it can be used as a hand-wheel pump.

(iii) **Pedal-wheel pump**
It is similar to hand or water-wheel pump with an added advantage of pedals. A person can operate it while sitting over it. Water can be pumped over to a height of 25 feet. A second person can also join in to run the other pedal. Water can be pumped up to 50 feet using both pedals at the same time. The pump costs about Rs 5500 (*See Honey Bee, 8(1):16, 1997).

05

Reviving Dyeing Skills



CV Raju*
Vishakhapatnam

C V Gopal Raju took up the task of stemming the erosion of skills of artisans of his village (Etikoppaka, distt. Visakhapatnam) who were beginning to migrate to urban areas to work as unskilled labourers. By starting a cooperative association called Padmavati Associates he sought to strengthen local traditions in making vegetable-based dyes. He has also developed new toys for which market is slowly emerging in India and abroad.

Raju drew the attention of artisans to the declining supply of raw materials for the manufacture of vegetable dyes. With the initial support from the National Tree Growers' Cooperation and the Forest Department of Andhra Pradesh Etikoppaka Vana Samrakshana Samiti (Forest Protection Committee) was established few years ago. It has tried to conserve those species of plants that are used for making dyes. The committee is protecting over 120 hectares of the forest land and several thousand *ankudu* (*Wrightia tinctoria*) tree saplings were planted by them.

Raju has helped conserve traditional knowledge and consequently the associated biodiversity as well. He has also augmented the traditional knowledge base through contemporary technical processes and institutional innovations. NIF also supported him under the Micro Venture Innovation Scheme (MVIF) for the commercialization of his technology. He won the State award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002 (Also see Honey Bee, 8(3):3, 1997).

* 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.

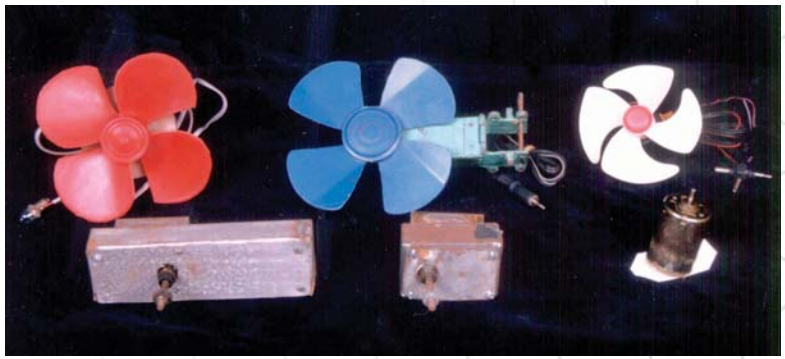
N V Satyanarayana*
Visakhapattnam

Wind-Blowing Invention

Satyanarayana has always been interested in inventing simple, low-cost appliances for the middle and the lower classes. He has innovated a micro-windmill-driven battery charger. This device harnesses wind energy to generate sufficient electrical potential to recharge batteries of cellular phones, Walkmans, palmtops, laptops, etc. He studied science and thus knew about various principles of energy and their applications.

The windmill is 3.5 x 3 centimetres wide. It produces direct current flow of up to one ampere at a potential difference of 12 volts. The current generated is sufficient to operate most of the portable electronic devices which are currently operated with the use of dry cell batteries. The mass production of the micro-windmill and promoting its use among the traveling public that uses electronic gadgets will help to conserve energy resources.

He won a National award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF also filed a patent for this innovation in the innovator's name.



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07

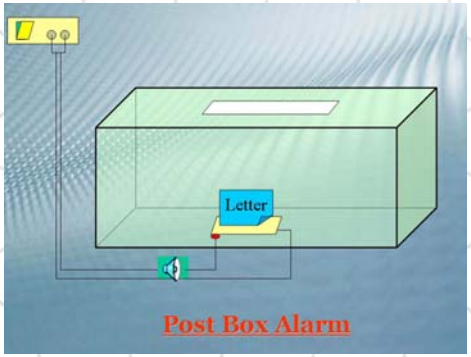
The Mail Woman

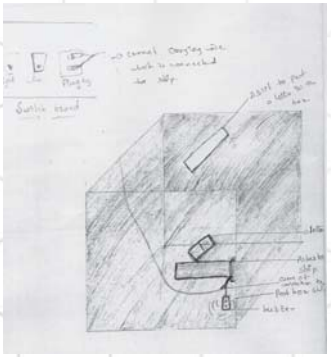
B Swetha
Warangal

Swetha is very keen to find solutions for the day-to-day problems occurring in the lives of ordinary people.

While studying in the twelfth standard she developed a blueprint for postbox alarm. It is envisaged as a simple device attached to a letter box which gives an audio or visual alarm as soon as something is dropped in the letter box. This can be effective for big farms or multi-storeyed houses, where the letter box is usually placed at the faraway main entrance and the letters are collected only when someone is getting into the house or the farm. It can also be helpful in normal houses when one is eagerly waiting for a letter from a loved one and does not know when the post will come!

Her idea won her an Award in the students' category in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. Earlier, in the First National Competition also she was awarded for theorising about an innovative pest control method in crops with the help of blue green algae.



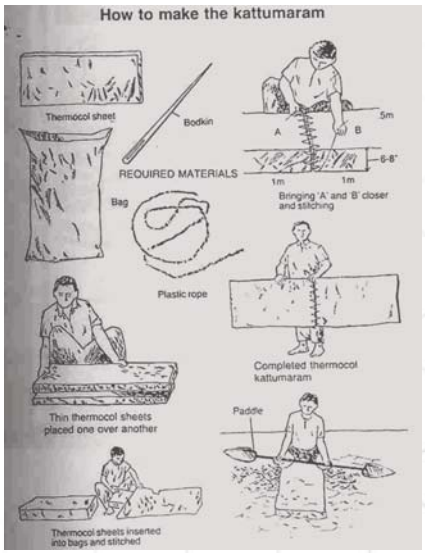


08

B Masoor Pahlwan
Adilabad

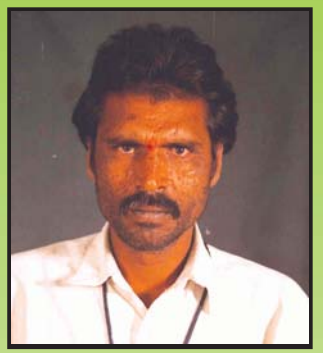
Thermocol Catamaran

This fabricated thermocol catamaran is light in weight, only nine kilos, and can be transported very easily on head load, by hand or on a bicycle. Even children can handle it conveniently. The catamaran, which is moved by a double paddle, moves faster than the traditional ones and covers a greater fishing area, thus increasing the fish catch. Ideal for inland fishing, the thermocol catamaran requires very little maintenance, except a periodical change of bags in which thermocol is packed. It can be easily done without any special skills. Because all the three dimensions of the catamaran are flat, the problem of entangled nets does not occur. Unlike the tin-made catamarans, it does not make any noise in the water and so the fish are not frightened away. He won a Consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001.



09

Bicycle operated pump



Vikram Rathore
Adilabad

Vikram has developed a cycle operated pump, which can be used for pumping water from rivers, ponds, wells and other water sources at shallow depth. The system comprises a bicycle, rim, belt-pulley, impeller and inlet and delivery pipes. The pump is portable, requires little maintenance. As it is made of locally available materials it is also affordable to the common man.

When he came up with the idea for this innovation, he was very poor and had to sell the *jowar* he had saved for food to buy an old cycle. Later an ITDA project officer of Utnoor came to know of his innovation and ITDA supported him to make an improved model of the pump.

The pump will be a boon for poor farmers who are unable to afford an electric or diesel run pump for irrigation in drought prone areas. The technology has not diffused so far. With the help of NIF, he has now obtained a patent of his device. He won a Consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.

U Krishna
Prakasam

Centrifugal sprayer

Farmer cum labourer Krishna owns around one and a half acre of dry land and also works as a hired labor on other farms to supplement his income. Always a creative person and an avid student, he draws the inspiration for his innovations from the problems he faces on his farm.

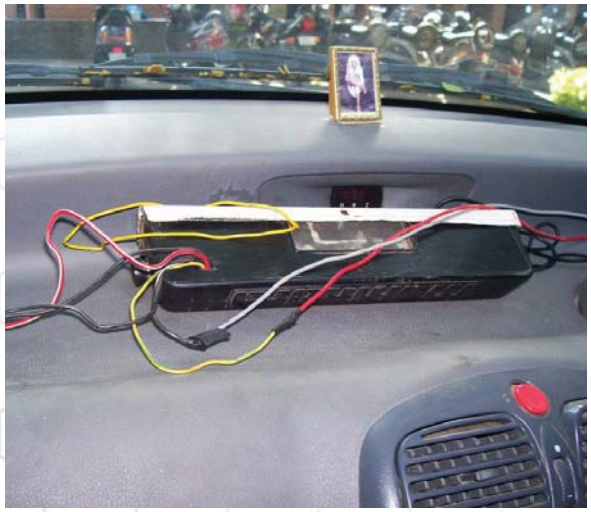
Unsatisfied with the performance of his battery powered pesticide sprayer, Krishna set about making an improved sprayer which could be operated manually. When the user pumps the handle up and down, the motion of the lever is converted into the rotary motion of the fan. The chemicals then flow from the tank to the fan and are converted from droplets into fine mist by its centrifugal force. He won a Consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF also filed patent for this sprayer in his name.

11

Speed governing device

M Bangara Raju
Kurnool

Over-speeding is one of the main causes of most road accidents. An over- speeding vehicle poses threat to its own passengers as well as other commuters. Bangara Raju has developed a speed governing device. This device works as speed monitor, gives audible alarm in case of exceeding the set speed limit and regulates the speed of the vehicle automatically by controlling the accelerator/throttle. Bangara Raju is a serial innovator and has other ideas and innovations to his credit too. NIF also filed patent for this device in his name. He has also been supported by TePP and another innovator viz., Satyanarayan.



K Linga Brahmam
Warangal

Gas operated iron

Washer men using coal iron press approached Linga Brahmam very frequently to get their coal iron press repaired. The main problem they faced was unavailability of coal. Electric iron presses were not an option for them because of irregular supply and higher cost of operation. To solve these problems, Brahmam developed the gas operated iron, which is simple in design and has low operating cost.

The cost of the gas-operated iron per unit is only Rs 1700. Five liters of LPG gas could be used for 20 to 25 hours on an average. He has received a large number of orders from the washer men from his village. NIF has extended MVIF support for the innovator for further product development and subsequent commercialization.

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Device to regulate the gas supply in gas pipe

Shaik Mohammed Ishfak
Mahboob Nagar

While reading about accidents caused due to LPG leakages Ishfak decided to develop a device to prevent such mishappenings. After studying the problem, he concluded that there should be no gas in the pipe line when not in use. In most of the accidents, leakage takes place from the pipe only. After a number of trials he developed a system, which allows gas to flow from the cylinder only when the burner is on (i.e. gas is being used). When the burner knob is turned off, the gas supply from the cylinder regulator is also cut off.

He has also come up with idea of a battery operated safety system for railway passengers.

Jyothi
Vishkhapatnam

Three tier harnessing system of energy of the chulha

Jyothi has developed a three-tier energy harvesting system. She has a shelf above the cooking oven made of bamboo strips. The paddy is kept on the shelf for drying and heating. This makes it easier to thrash them. Less drudgery and faster output are the bonus along with harnessing the energy. The third tier is a bag of seeds hung above the shelf, smoked and mildly heated everyday so that pests are kept away. She was discovered during the 21st Shodh Yatra in Araku Valley. Variants of this technology are used now by many people in the region who instead of shelf use a sieve as second tier.

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Email informer/ Documentation/cheque authentication system

Late T Sony Roy*
Hyderabad

The email informer could report to the concerned person about the receipt of an email through different modes of communication such as phone, printout, computer messages, fax, cellular, pager, post or telegram.

Document authentication system is related to the Biometric technology in general and automatic authentication of important papers / documents in particular. The present patented invention suggests a technique that is simple, easy to use, economical, clean, portable and gives quality fingerprint impressions. With the help of this, public could give finger print impression on any document or card as easily as making a signature with a pen which would cost much lesser than the cost of ink.

He was an innovative thinker and had many other ideas also. He won the State award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge 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.

V Atchara, Nellore
K Preethi, Chennai

Low cost respirometer

This simple device made by the young girls can measure the residual volume, tidal volume and peak volume of lungs during respiration. It can also help anybody to monitor their breathing during rest, after exercise, during yoga and also while sleep. This device can be up graded by using an analog to digital converter and storing the data in a computer. The two girls won the first prize in IGNITE 07- the national competition for students' ideas and innovation in 2007. NIF has also filed a patent for the same.

17

Glider from scrap

P Mallikarjun
Karimnagar

Mallikarjun, a scooter mechanic, has made a single seater glider by assembling parts of old scooters. The frame is made of lightweight iron and the canopy of the glider is made of paper cotton. The innovator claims that the glider can fly upto the height of 100 meters and can clock speed between 60-80 kilometers per hour.

K Samhith
Secunderabad

Digging tool for archaeologists

Generally archeologists, on site, work with brushes to gently remove the soil over the embedded artifacts or fossils to unearth them without damage. This process is time consuming and involves a lot of hard work. Samhith, a young student, has developed battery operated machine with a motor to mechanise this process. The power of the motor, which rotates a brush, is just sufficient enough to clean the soil gently. Using this device, a person only has to maneuver the brush around the embedded arefact/fossil thereby increasing the work output.

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Portable air cooler

Basa Prakash
Karimnagar

Basa Prakash owns a small watch shop. Small working space in his shop prompted him to develop a small cooler. This portable cooler, made from acrylic, has the provision to prevent short circuits. The blades of the fan are made of aluminium. This portable cooler can be operated both with electricity and battery. It can be placed at one side of a table providing cool air flow sufficient enough for a single person working in a congested area. He has also made another palm top version of the air cooler.

Ingenious ideas from creative minds

Cell phone based security system

Marri Rajalingam, Karimnagar
Rajalingam has developed a mobile phone based security system, which informs a preset mobile phone number about the theft of the mobile when the thief changes the sim card after the present one has been invalidated.

Automatic Sprinkler System

P Vijay Kumar, Visakhapatnam
Vijay Kumar has come up with an automated sprinkler system, which doubles up as a drip system too. The entire assembly has been designed for saving water. Not requiring any skilled person for operation and maintenance, the system regulates the flow timing as per the requirements.

Maintaining cleanliness on the railway station rail tracks

Patan Saida, Guntur
Patan ideates a locking mechanism in the trains that locks the toilet doors automatically when it approaches a railway station. This would prevent people from using the toilet while the train is stationed preventing soiling of the tracks.

Pump powered by canal water

K Mallikarajuna Rao, Khammam
Mallikarajuna has developed a water turbine to lift water, which is powered by the flowing canal water. He has also developed a portable hand pump to lift well water, a

liquid measuring jar and an electronic stethoscope.

Sorting mechanism in a chilli powder making machine

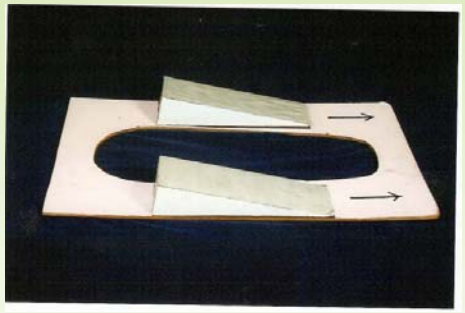
Nazeer Ahmed, Mahbubnagar
Nazeer has incorporated an automatic sorting mechanism in the chilli grinder. This enables proper assortment of chilli powder according to its granularity. This is one of the most distinctive innovations in this field.

Remote operation of irrigation motors with cell phone

T Rambabu, Krishna
Using mobile phones, Rambabu has developed a system to switch on/off irrigation pumps.

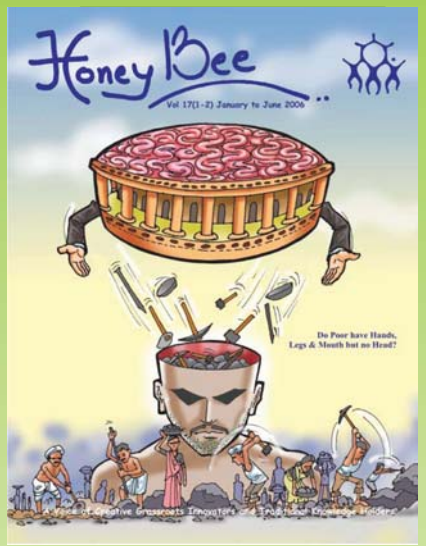
Boom sprayer

Sayed Shubani, Guntur
This is jeep mounted boom sprayer where multiple sprayers are attached to the boom. They have a belt driven mechanism and are operated using two motors (3hp & 5hp).



Comfortable commode

K Kishan Pawar, Medak
Pawar has modified the seat of the traditional Indian commodes by raising the heel of the foot rest. This makes the squatting posture less strenuous on the knee joints and also makes getting up easier.



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Deworming the cattle

The seeds or the bark of *'kolamukhi* (*Holarrhena antidysenterica*), are powdered and mixed with the bran of rice or gram and fed to cattle suffering from dysentery or intestinal worms. This mixture is supposed to kill these worms, which get excreted with the dung. The cattle are given the extract of the leaves of *Aristolochia bracteoleta* to remove intestinal worms (Honey Bee, 8(2): 9, 1997).

Increasing milk yield

Four to five fruits of *'nalla jidi ginjalu'* (*Semecarpus anacardium*) are soaked in a mud pot for two days. These are then ground and mixed with rice or rice-bran, and fed to the cattle. This is believed to increase the milk yield. The other alternative is a mixture made from the roots of *'chettu veela'* (*Algeria nervosa*), roots of *'paradu teega' (Algeria pylosa),* Palm-jaggery, turmeric and *'vamu or ajma''* (Honey Bee, 8(2): 9, 1997).

Prevent shedding of flowers

Mrs Parijatamma, Putturu

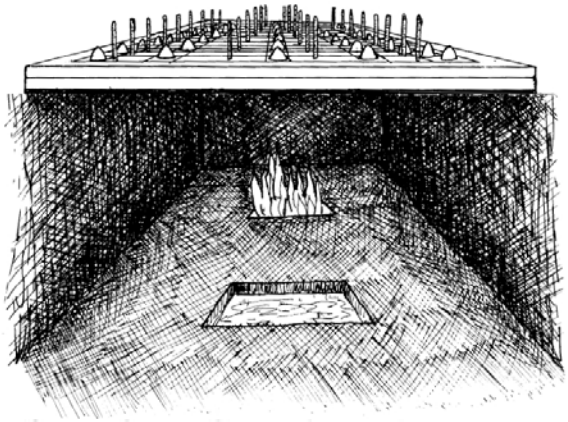
Shedding of flowers in '*sorakaya*' (bottlegourd), '*gummadi*' (pumpkin) plants causes a great loss to the farmers. It can be controlled by using cooked rice fermented overnight. Early in the morning, the fermented rice is tied in the branches near the flower

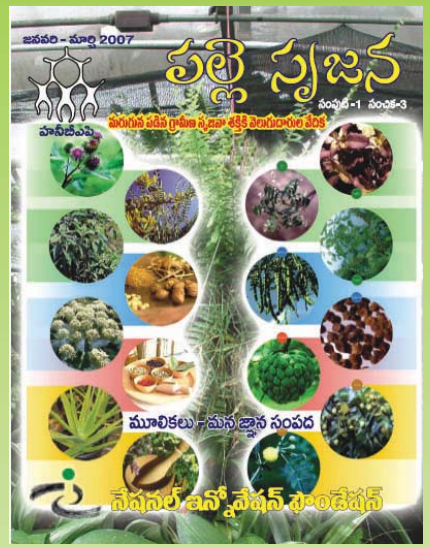
buds. It is believed that within two to three days, the shedding of flowers is controlled and the plants yield well (Honey Bee, 9(1): 12, 1998).

Hatching Eggs: Batulu Narsayya's Way

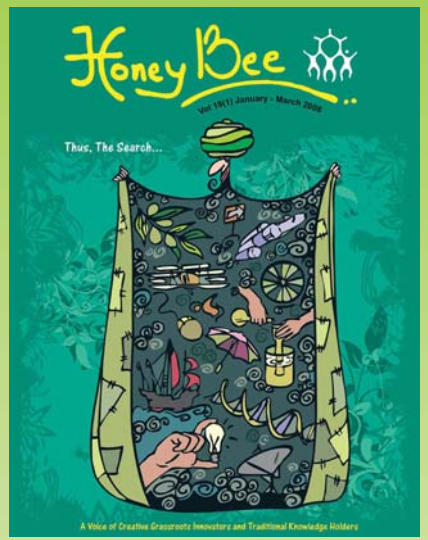
Batulu Narsayya, Nalgonda

Narsayya has established an imaginatively constructed hatchery. Initially he hatched about 5000 to 7000 eggs without using a mechanized incubator. The hatchery was housed in an independent hut, other than the one he lived in. Inside this hut he had dug two pits about 20 to 23 cm deep, about 360 cm long and about 300 to 330 cm wide (about 7.0 square metres). Within the pits he had scooped out what could be called sub-pits. In two places at the base of the pit where he had dug deeper trenches he placed a fireplace and water respectively for maintaining temperature for hatching. Over the primary pits he placed a frame on which he placed the eggs. Under this frame was another frame covered with a large cardboard bearing 18 holes per pit. Each hole in the cardboard had a rubber stopper with a thermometer inserted into it. What Narsayya was doing was to maintain a constant temperature within the pit for hatching the eggs just as in an incubator.





Palle Srujana (Telugu)
102, Vayupuri, Sainikpuri Post
Secunderabad - 500 094
Andhra Pradesh
ganeshpogula@hotmail.com

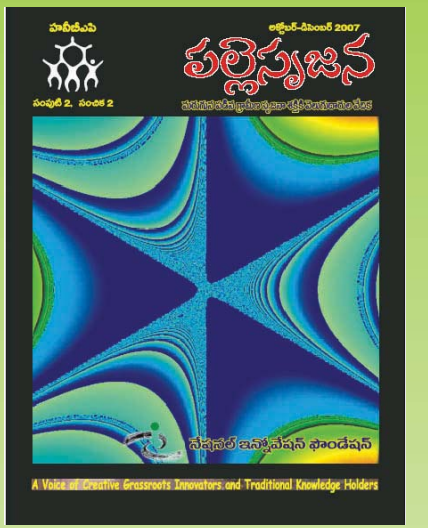


The thermometers were uniformly distributed across the pit. The temperature within the pit could be controlled by adjusting the flame in the sub-pit. He adapted the normal (for duck eggs) 28-day cycle of hatching. Both Narsayya and his wife took turns in monitoring the temperature inside the hatchery. The hatching rate ranged from 40 to 80 percent depending on the quality of eggs (Honey Bee, 6(2):8, 1995).

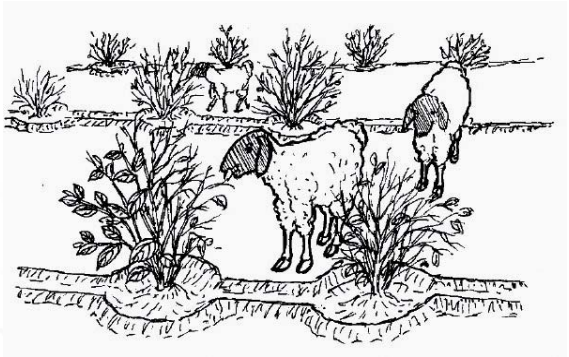
Grassroots Biotechnology for Banana!

S Venkatesh, S Lingamayya, & S Bhaskar, Cuddapah

Three farmers from Chandragiri village have come up with an innovative practice of banana propagation. Few years ago, they heard about the Tissue Cultured Banana Technology wherein a cell/tissue from the plant, under laboratory conditions, grew up to a whole plant. These farmers collected rhizomes from the uprooted plants and separated cormlets from the mother rhizome. These cormlets are placed in a 12 X 10 cm size polythene covers with a pot mixture of Tank silt and FYM. In a week after planting sprouting takes place. The seedlings thus raised are ready for planting in the main field after two to two and half months. The chief advantages of this method are quick and easy propagation, good establishment of seedling in the field without any mortality, uniformity in growth, development and good bearing. About four to ten cormlets can be had from one mother rhizome. Moreover, farmers can save a good amount on seedling cost by using this method (Honey Bee, 17(3):13, 2006).



Sheep Grazing to Defoliate Jasmine Leaves



Two major species of Jasmine (*Jasminum sambac* (L.) Ait. and *Jasminum grandiflorum* L.) are grown in the Cuddapah district. After the bloom period, in the month of November, the shrubs are subjected to moisture stress by withholding irrigation and subjected to nipping to remove apical buds. Chemical defoliation is costly and if not administered properly, can lead to death of the plants. Hence, farmers here follow the indigenous technique of sheep grazing for pruning leaves in Jasmine. The procedure is easy, entails no extra cost and gives higher yields (Honey Bee, 17(3):13, 2006).

Calotropis to Fight Red Hairy Caterpillar in Groundnut

Prasanthi, Chittoor

She uses leaves of *Calotropis procera* (Ait.) R. Br to control red hairy caterpillar. The latex of *Calotropis* leaves has toxic properties and interferes with pupation, growth and reproductive activities when consumed by the red hairy caterpillar. Thus it acts as a herbal pest control agent in groundnut crop (Honey Bee, 19(1):15, 2008).

21st Shodh Yatra
2nd June to 9th June 2008
Araku Valley, Vishakhapatnam, Andhra 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 21st Shodh Yatra, over the period of eight 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. For complete report see Honey Bee 19(3): 9-11 & 21, 2008.

NATIONAL INNOVATION FOUNDATION, INDIA

The Seventh 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 Seventh National Competition started on February 1, 2009 and entries will be accepted 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. (Gurivanda)

Source: NIF database

NIF Database

Use from Andhra Pradesh

Leucorrhoea
Take seed powder (1g) along with rice starch in the night orally for fifteen days.
- Bezwada Venkateswarlu, Prakasham, Andhra Pradesh

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 roots' 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. (Kukurdanti, Dusar chettu)

NIF Database

Uses from Andhra Pradesh

Headache
Apply the plant paste on the forehead
- Samaredi Jinnu, Vishakhapatnam, Andhra Pradesh

Dog bite
Apply the leaf and root paste over the bitten area. Also take one spoonful paste once a day
- Gollori Govardhan, Vishakhapatnam, Andhra Pradesh

Toothache
Chew the fresh roots
- Arjun K, Vishakhapatnam, Andhra Pradesh

Uses from other states

Toothache
Make a paste of roots along with three black pepper . 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]; and 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 *Alstonia scholaris* (L.) Br. (Likiua chettu)

Source: http://www.mytho-fleurs.com/images/Fleurs_du_Vietnam/Alstonia_scholaris.jpg

NIF Database

Use from Andhra Pradesh

Chest Pain
Take one spoonful bark powder along with water
- Kora Minnana, Vishakhapatnam, Andhra Pradesh

Uses from other states

Headache
Extract juice from the bark (20g) and take it orally
- Prishila Tuddu, Hazaribag, Jharkhand

Stomachache
Extract juice from the bark (20g) and take it orally
- Prishila Tuddu, Hazaribag, Jharkhand

Gastric problems
Grind few leaves with black pepper. Take the paste orally before food
- Indra Kanta Ojha, Sibsagar, Assam

Fever
Grind bark (50g) into a powder and take it with water thrice a day
- Kutuva Birhorni, Koderma, Jharkhand

Uses in Classical Codified Literature

The bark is used to cure skin diseases and rheumatism[13]; the root juice is taken with milk to cure leprosy[13]; fresh bark is put in water to draw out the latex in it, which is taken orally in case of tuberculosis[14]; dried powder is administered orally to cure diarrhoea[15]; and bark extract is useful in case of intestinal worms[16]. 'Ayush-64 cap./tab.'[17], prepared from the plant, is effective as an anti-malarial compound both for treatment and prophylaxis. Fifteen patents have been found on its medicinal uses as an antipyretic[18].

Uses of *Andrographis paniculata (Burm.f.) Wall. ex Nees* (Ardun)

NIF Database

Use from Andhra Pradesh

Acidity
Take the whole plant decoction orally
- Kairange Buddhu, Vishakhapatnam, Andhra Pradesh

Uses from other states

Fever
Take the decoction (one cup) of plant orally twice a day for two to three days
- Ramratan Chauhan, Shekhpur, Bihar

Gastric complaint
Take the plant juice (one cup) in the morning.
- Jaiydhan Murm, Hazaribag, Jharkhand

Wound
Boil the whole plant powder in coconut oil and filter the oil. Apply the oil after cleaning of wound.
- Amirdaraj Kaani, Tirunelveli, Tamil Nadu

Skin disease
Take one spoonful of the whole plant powder daily
- Kousalya, Puducherry

Uses in Classical Codified Literature

Decoction of the whole plant is given orally for fever[19]; hot aqueous extract is useful as anthelmintic[20]; and infusion of the plant is externally applied to cure skin infections[21] and orally given as febrifuge in malaria[22]. Livup capsules[23] and Detox[24] tablets are effective liver vitalizers and help in addressing liver complaints. Fourteen patents have been found on its medicinal applications like for treating osteoporosis[25] and for hepatoprotective[26] property.

Source: http://commons.wikimedia.org/wiki/File:Andrographis_paniculata_(Kalpa)_in_Narshapur_forest,_AP_W_IMG_0867.jpg

Uses of *Boerhaavia diffusa* L. (Atika mamiti)

Source: SRISTI database

NIF Database

Use from Andhra Pradesh

Nausea
Take the root juice (half cup) orally.
- Chattu Lachanna, Vishakhapatnam, Andhra Pradesh

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 *Boerhaavia* (5g), one small onion, a small piece of ginger and a spoonful of cardamom and take it orally
- Hasina Khan, Margav, Goa

Uses in Classical Codified Literature

The leaf juice is given with milk to get relief from cataract[27]; decoction of the plant is given orally to purify blood[28]; the plant extract is used as diuretic[29]; and decoction of the leaves is applied externally in case of skin infections[30]. 'Liver-kidney care'[31] 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[32], hypertension[33]etc.

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

NIF Database

Use from Andhra Pradesh

Asthma
Mix the flower powder and *triphala churna* in 1:4 proportion. Take one spoonful of the mixture along with honey thrice a day for forty days.
- Teki Suresh Kumar, Srikakulam, Andhra Pradesh

Uses from other states

Ear ache
Put the latex in the ear to cure the pain
- R. C. Chowdhary, Nagor, Rajasthan

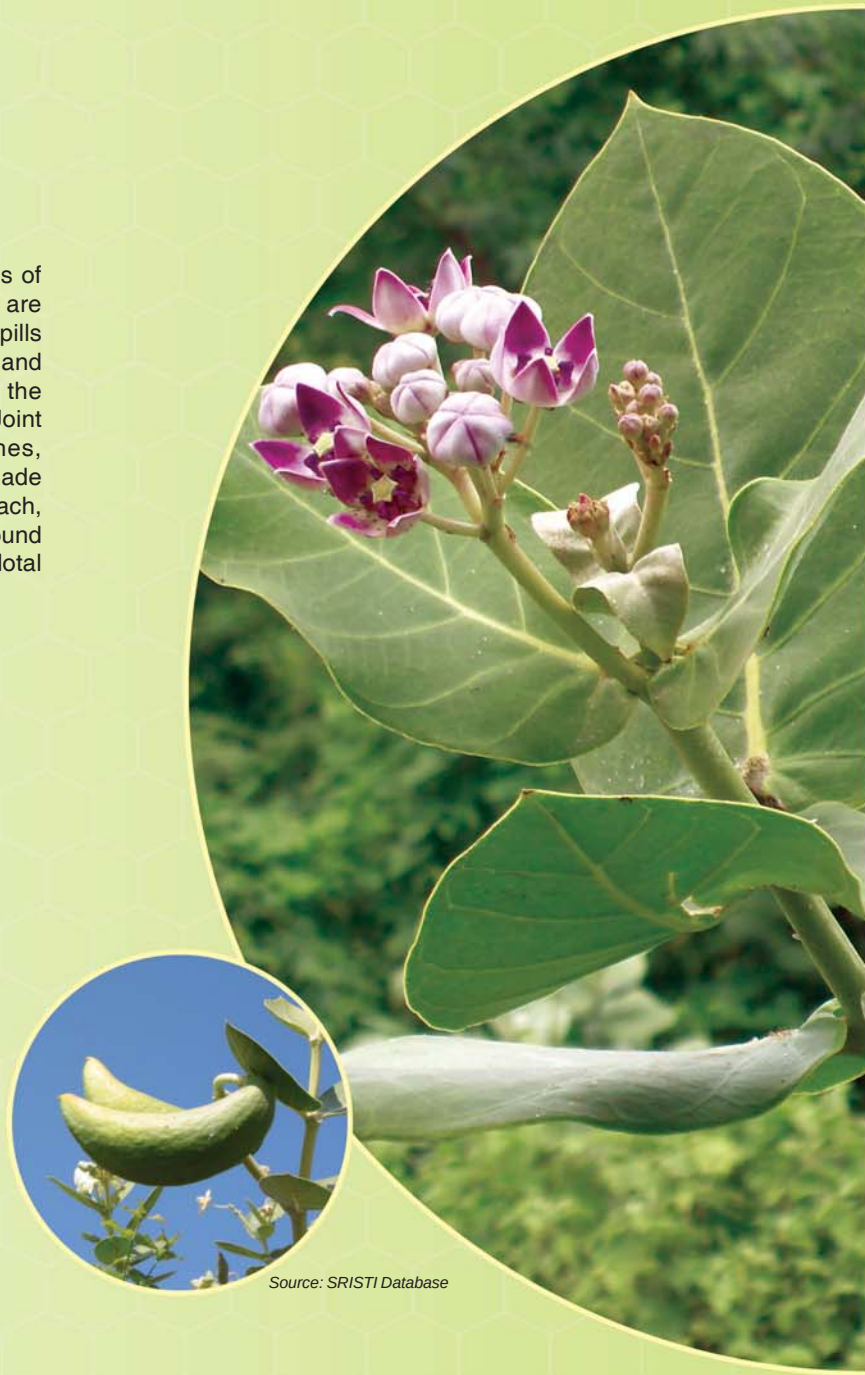
Stomachache
Smear mustard oil on a leaf and warm. Apply it over the abdomen for immediate relief
- Chawda Chanduben Jawanji, Gandhinagar, Gujarat

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[34]; 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[35]; and warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain[36]. 'Muscle & Joint Rub'[10] is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'[37], 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 [38], and bronchial asthma[12].



Source: SRISTI Database

Uses of *Datura metel* L. (Ummetta)

Source:www.jungleseeds.comimagesDaturaBS.jpg
& www.steve.gb.comimagesplantsdatura_metel_%5Bflower%5D.jpg

NIF Database

Use from Andhra Pradesh

Dandruff
Put three-four leaves in boiling coconut oil. Filter the medicated oil and apply lukewarm oil on the scalp.
- Bezwada Venkateswarlu, Prakasham, Andhra Pradesh

Uses from other states

Alopecia
Smear the leaf juice on the head and leave for 30 minutes
-Bansi Ghosal, West Midnapur, West Bengal

Headache
Chew and spit the seeds for instant relief
- Ganesh Das, Sirohi, Rajasthan

Asthma
Take a seed soaked in water orally initially. Gradually increase a seed every week for five weeks
- Rani Farhat, Hazaribag, Jharkhand

Stomachache
Put the warm leaves on the belly
- Anil Kumar Mahato, Hazaribag, Jharkhand

Backache
Boil the roots (20g) in mustard oil (250g), filter and massage with the oil
- Ramji Chink Badaik, Gumla, Jharkhand

Arthritis
The leaf paste is applied on the aching part
- Divakar Pathak, Lohardaga, Jharkhand

Uses in Classical Codified Literature

One fruit is filled with 10g *Piper longum* L. and burnt. About 5g of this ash is given with honey, morning and evening, for 5 days to cure malaria[35]; the thumb is kept inserted within the fruit to treat finger felon[39]; and the root paste is applied externally on poisonous bites[40].

'Muscles & joint rub'[10], is a highly effective medicine for backaches, muscular sprains and joint pains made from the plant. 'Unicough syrup'[17] is used to cure bronchitis, cough/cold and asthma.

Uses of *Ficus benghalensis* L. (Marri)

NIF Database

Use from Andhra Pradesh

Bleeding gums
Brush the teeth with the powder of prop roots and clove
- Teki Suresh Kumar, Prakasham, Andhra Pradesh

Uses from other states

Whooping cough
Grind the bark into a fine paste and take one spoonful orally
- Priyanka Kumari, West Champaran, Bihar

Stomachache
Tie warmed leaves on the stomach to get relief from pain
- Gajanand Maharaj, Jaipur, Rajasthan

Backache
Massage the aching part with the mixture of the latex and mustard oil
- Chen Singh Charan, Nagor, Rajasthan

Wound
Apply the mixture of leaf ash and coconut oil topically
- Priyanka Paramanik, Purulia, West Bengal

Sprain
Smear lukewarm bark paste on the site of the sprain
- Arun Ghosh, Bankura, West Bengal

Uses in Classical Codified Literature

Aerial roots' paste mixed with salt after filtering is taken once a day in the morning for 8 days in case of diabetes[47]; decoction of plant is applied externally on wounds and ulcers[20]; and the latex is given orally to cure bronchitis[48].

'Anti-Dandruff shampoo'[10], a product prepared from this plant in combination with other plants, is used to keep hair healthy and dandruff free. Product 'KLD Lotion'[44], a multiherbal ayurvedic preparation using *Ficus*, is effective in many skin ailments such as acne marks, pimples, burns - sunburns, nappy rash etc. 'Litina'[45], a herbal toothpaste made from this plant along with other plants, is good for the gums and the teeth. Four patents have been found on medicinal applications of *Ficus* for antitumor[46] medication, wound healing[47] etc.

Source: NIF database

Uses of *Mimosa pudica* L.(Siggu chettu, Lajkudi)

Source: http://www.biodiverciudad.org/admin/minipedia/imagenes/MimosaPudica.jpg

NIF Database

Uses from Andhra Pradesh

Stomach ulcer
Take one spoonful of the root paste once a day
- Boyiana Sanyasi, Vishakhapatnam, Andhra Pradesh

Pain & inflammation
Crush the fresh roots of the plant with *Bogi chettu* (*Abutilon indicum* (L.) Sw.) in equal proportion. Prepare pea sized tablets and shade dry. Take two tablets twice a day for three days.
- Gemmala Petna Rao, Vishakhapatnam, Andhra Pradesh

Uses from other states

Piles
Take two tablets prepared from the root paste and honey twice a day
- Samira Kumari, Sitamarhi, Bihar

Toothache
Apply the stem juice on the aching tooth in the morning before taking food
- Karnua Pame, North Cachar Hills, Assam

Weakness
Take the plant juice along with sugar candy
- Bhagwati Lal Kumawat, Chittorgarh, Rajasthan

Cuts & wounds
Apply the leaf paste topically
- George Vellapally, Kollam, Kerala

Uses in Classical Codified Literature

Decoction of the plant is useful for soothing teething problem[48], ulcers, aches and pains[49]. The leaves ground with mustard seeds are offered to cure dysentery[50]. Leaf paste is applied externally to cure cuts and wounds[51]. Styplon[10] is the product useful for bleeding gums, bleeding haemorrhoids, epistaxis, abnormal uterine bleeding, hematuria, hemoptysis etc. Uri-Flush[52] is a multi-herb formulation that has been indicated for the maintenance of kidney health. Seven patents have been found on its medical application like for antiviral[53] activity and for treating psoriasis[54].

Uses of *Moringa oleifera* Lam. (Munagakaya)

NIF Database

Use from Andhra Pradesh

Dog bite
Mix the bark powder with powdered roots of *kukurdanti* (*Achyranthes aspera* L.) and roots of *dhatura* (*Datura* sp.). Prepare the tablets of this mixture and take one tablet in a day for three days
- *Srigam Raghu, Vishakhapatnam, Andhra Pradesh*

Uses from other states

Asthma
Take the root juice (30g) orally along with an equal amount of ginger juice
- *Sanjay Singh Uplana, Nagda, Madhya Pradesh*

Diabetes
Take the leaf juice orally
- *Rahul Kumar Mahato, Gopalganj, Bihar*

Joint pain
Take the bud curry to reduce the pain
- *Sanjay Singh Uplana, Nagda, Madhya Pradesh*

Sprain
Apply the leaf poultice over the affected part
- *Dhanmantari Patel, Sundargadh, Orissa*

Poisonous bite
Pound seeds with equal amounts of ginger, black pepper and lindi pepper and add cold water. Take the mixture orally
- *Ganesh Madhukar Shanbhag, Sholapur, Maharashtra*

Ulcer
Make pills from the leaf paste. Take one pill for three days early in the morning after light breakfast
- *Sukumar Nath, North Tripura, Tripura*

Backache
Take the leaf decoction orally
- *Marykutty Thomas, Idukki, Kerala*

Uses in Classical Codified Literature

Juice of bark is given orally along with a pinch of safetida and salt[42]; dried fruit is eaten to combat diabetes[55]; powder of the plant is administered orally to cure asthma[56]. Product 'Sugan Nutrimix'[57] is a ready mix preparation where *Moringa* is mixed with pulses, spices and other natural ingredients to make it rich in nutrients, minerals, protein etc., and to enhance its taste. This powder can be consumed in it is natural form or can be mixed with staple food. 'Pain Massage Oil'[10] is a herbal oil, which provides relief from neuromuscular pain. Twelve patents have been found on its medicinal uses such as for anticancer[58] and antidiabetic[59] properties.

Source:NIF Database

Uses of *Plumbago zeylanica* L. (Chitramool)

Source: http://www.plantoftheweek.org/image/plumbago1.jpg

NIF Database

Use from Andhra Pradesh

Wound
Apply the root paste topically
- *Boyiana Sanyasi, Vishakhapatnam, Andhra Pradesh*

Uses from other states

Eyesight
Take two spoonful of root powder with water to improve eyesight
- *Ramabandhu Mahajan, Jalgaon, Maharashtra*

Stomach disorder
Pound the roots and prepare tablets. Take three tablets orally with ripe banana
- *Rani B. Bhagat, Pune, Maharashtra*

Arthritis
Boil roots of *Plumbago* and *Rauvolfia serpentina* (L.) Benth. ex Kurz in mustard oil. Massage lukewarm oil over the aching part
- *Sukhal Manjhi, West Champaran, Bihar*

Uses in Classical & Codified Literature

The paste of the whole plant is applied externally on any kind of skin diseases[60]; extract of leaves and root is administered orally to alleviate arthritic pain[61]; and the plant acts as a good digestive[62]. Product 'Muscle & Joint Rub'[10] is highly effective for backaches, muscular sprains and joint pains. 'Citrakadi gutika'[37] is used to cure diarrhoea associated with abdominal pain and chronic colitis. Four patents have been found on its medicinal uses mainly for skin diseases[63] and gastrointestinal disorders[64].

Uses of *Sphaeranthus indicus* L. (Bithali, veta kadri)

NIF Database

Uses from Andhra Pradesh

Bodyache
Apply the whole plant paste mixed in lukewarm oil
- *Ventala Buddhu, Vishakhapatnam, Andhra Pradesh*

Headache
Apply the whole plant paste on the forehead
- *Arjun K, Vishakhapatnam, Andhra Pradesh*

Uses from other states

Headache
Take two spoonful of the leaf juice orally
- *Vilas Shantaram Patil, Jalgaon, Maharashtra*

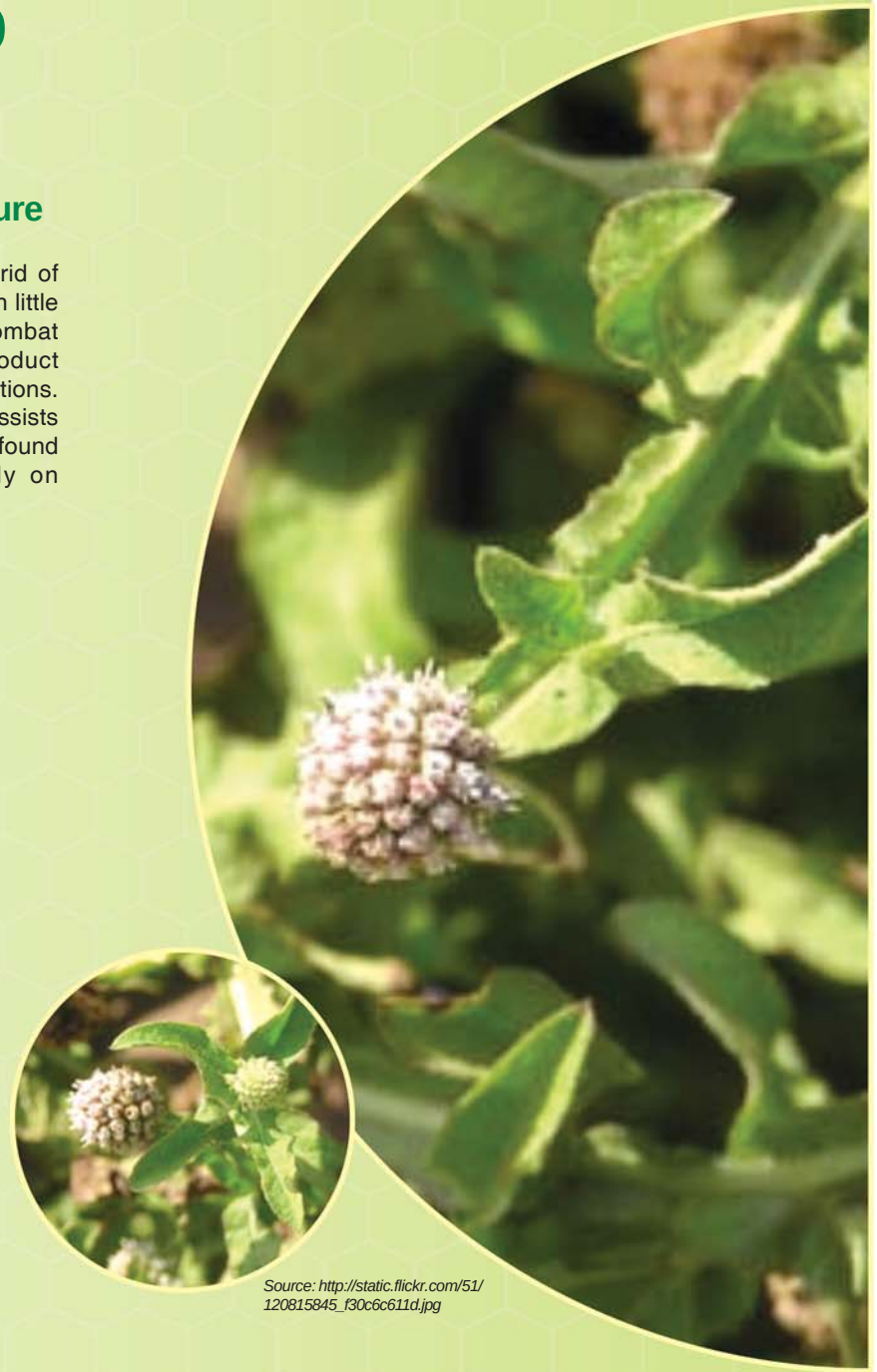
Bodyache
Apply the flower juice on the body
- *Tarun Suri, Muzaffar nagar, Uttar Pradesh*

Fever
Take two spoonful of the leaf juice orally
- *Vilas Shantaram Patil, Jalgaon, Maharashtra*

Stomachache
Chew the fresh leaves for immediate relief
- *Vilas Shantaram Patil, Jalgaon, Maharashtra*

Uses in Classical & Codified literature

Extract of the dried aerial parts is taken to get rid of indigestion[65]; juice of the fresh leaves is mixed with little amount of milk and sugar and consumed to combat cough[65]; and the plant acts as a diuretic[66]. Product 'Diabecon'[10] minimizes long-term diabetic complications. 'Geriforte'[10] facilitates respiratory functions, and assists cardiovascular functions. Six patents have been found on its various medicinal applications mainly on inflammatory disorders[67] and cancer[68].



Source: http://static.flickr.com/51/120815845_f30c6c611d.jpg

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.

NATIONAL INNOVATION FOUNDATION, INDIA

IGNITE 09- The National Students' Competition

Co-sponsors

Honey Bee Network

CBSE

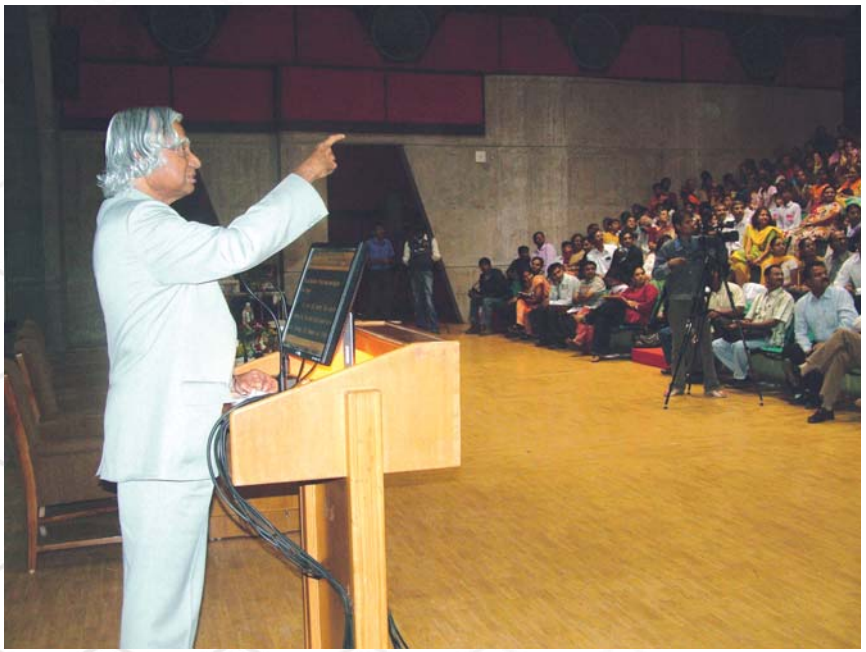
SRISTI

IIM-A

IGNITE is a national competition of ideas and innovations of school children organized by NIF. It is open fill August 31, 2009. The awards will be announced on October 15, 2009, the birthday of Hon'ble former President of India, Dr. A.P.J. Abdul Kalam; celebrated as Children's Creativity and Innovation Day. The awards will be given by Dr. Kalam at his convenience soon after. Those who can not submit entries till August can submit later also for the next annual competition.

NIF will provide support for patenting and incubating innovative projects in all deserving cases. All school going children up to class XII of any school (and even out of school) can participate in the competition either by sending their entries through post to our address mentioned below or through email at ignite09@nifindia.org (For more details, please log on to www.nifindia.org).

Children can submit entries in any or all of these categories: a) ideas of technologies not yet developed, b) innovative products developed by the students (does not matter if these are crude or just proof of concept), c) problems identified in their neighborhood with which we have lived for long without solving them, and d) traditional knowledge practices learned from elders. Please note that the projects guided by teachers/ parents will not be accepted.



IGNITE 2009
National Innovation Foundation,
Bungalow No 1, Satellite Complex
Prem Chand Nagar Road,
Ahmedabad 380 015
ignite09@nifindia.org
www.nifindia.org

PART III

INNOVATIONS
for ANDHRA PRADESH

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

01

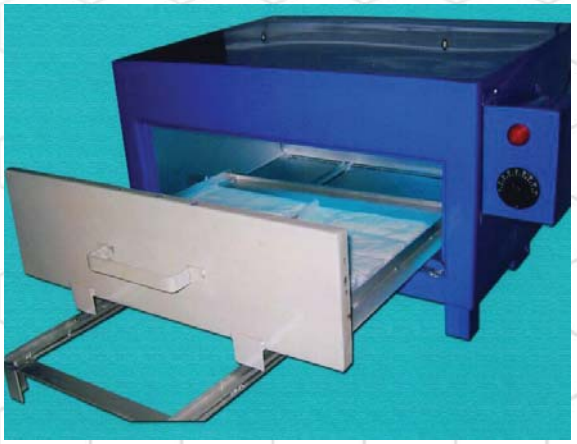
A. Muruganantham
Tamil Nadu

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.



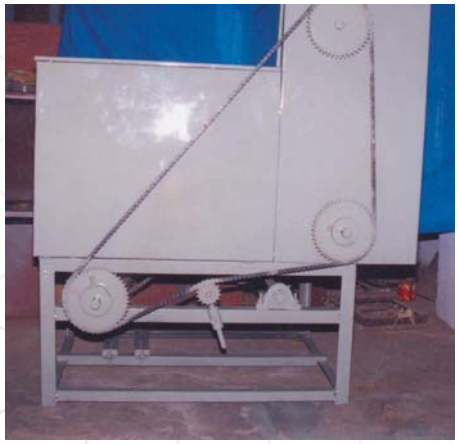
02

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.



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.

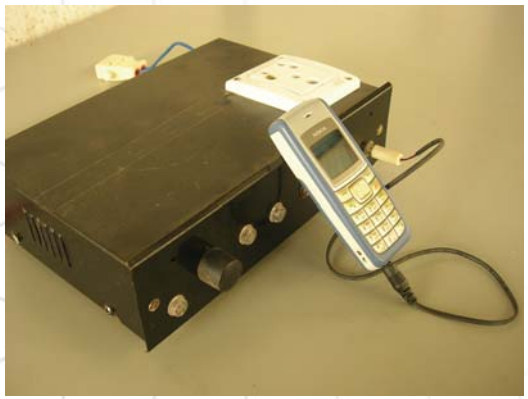
06

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

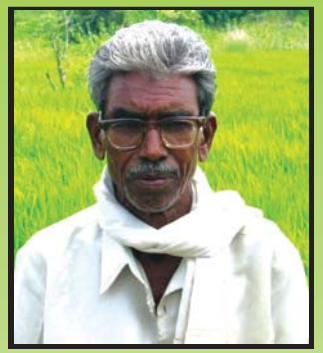
Biomass gasification system

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.

13

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.

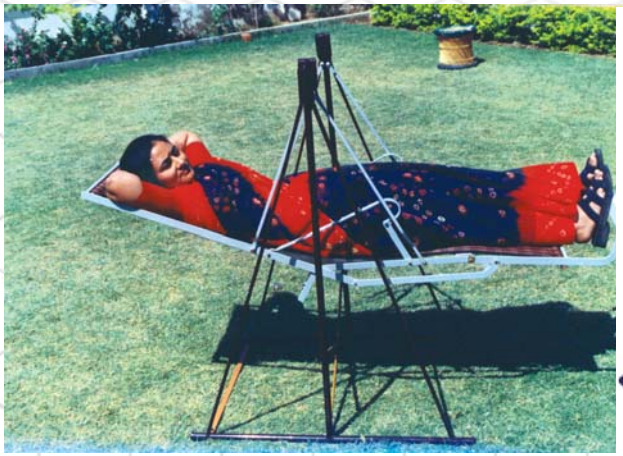
14

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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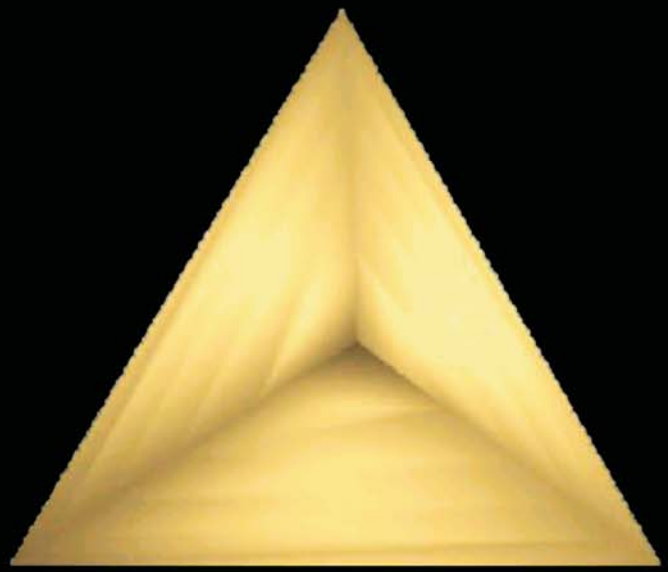

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