
National Innovation Foundation
Honey Bee Network
Tamilnadu Innovates

TAMIL NADU INNOVATES

National Innovation Foundation

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

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

The book is divided in three parts. The mechanical innovations developed by innovators from Tamil Nadu 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 Tamil Nadu 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
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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 545 districts of the country.

NIF has filed 202 patents in India and seven in US and one PCT application. Out of these, 35 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.

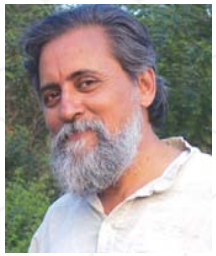
How can state government join hands with NIF?

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



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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 APJ Abdul Kalam

“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.

- Dr RA Mashelkar

PART I

INNOVATIONS
from TAMIL NADU

This section contains grassroots innovations originating from the rural/urban areas of Tamil Nadu

C Rajendran
Madurai

Chinna Ponni: A popular variety of paddy

Rajendran started his informal research for developing a better paddy variety in 1989. He soon identified and developed a variety of paddy called *Parani*. In 1991 he released it for use by the farmers in his neighbourhood. This variety had a maturity period of 105-115 days, excellent drought tolerance, resistance to pests and disease and higher yields giving much higher net profit per acre. Then he developed the *Visakam* variety which could withstand water logging due to heavy rainfall. But his experimentation finally paid off in 1994 when he developed a superior variety which he called *Chinna Ponni*.

People from all over Tamil Nadu started enquiring about this high yielding, drought resistant and disease resistant paddy variety and a few years ago, upto 1/3rd of Tamil Nadu's paddy growing area sowed the *Chinna Ponni* paddy variety. He received a National 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 2003 onwards to specifically focus on innovations from the people of unorganised sector.

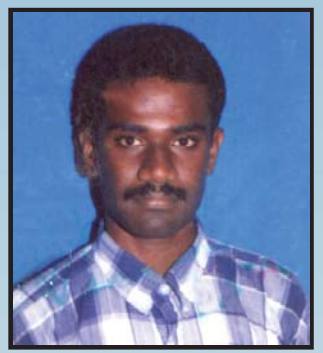
02

Simple coffee pulper

N Sudhakar
Dindigul

A coffee berry pulper has been developed by Sudhakar to extract the coffee seed separately without much damage to the fruit. This is a simple hand operated device, which is compact in size. It can be easily dismantled into small units, transported and assembled wherever it is needed for the purpose. In a round disc there are slots to fit the size of the coffee berry. The fruits are fed into the device through a side pipe. Operating the handles on either side rotates the wheels, which help in separating the pulp without damaging the coffee bean. The pulp will come out through another pipe and get collected. The capacity is up to 30 kilos in each operation, depending upon the diameter of the disc. For instance, a disc of one foot of diameter will operate up to 15 kilos of coffee beans at a cost of Rs 5,000 per unit, whereas a bigger disk of 1.25 feet diameter, whose capacity is for 20 kilos, will cost around Rs 6,500.

He received a Consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.



R Muruga Selvan
Thoothukdi

Spathe cutting instrument

'Spathe' is the part of the plant evolving into a flower. In the southern districts of Tamil Nadu there are millions of '*palmirah*' (*Borassus flabelliformis*) trees. The spathe of these trees yield a sweet juice used to make black sugar. Extracting this juice, however, is not an easy job.

The average height of a *palmirah* tree is about a 100 feet and a worker has to climb the tree more than three times a day to extract all the juice. Selvan has come up with a simple device to reduce this workload. His instrument has a long rod with a knife at the end, which is connected with an electric motor through wheels having teeth. The motor is connected with a timer circuit through which 12 DC current is passed. A small plastic box is attached around each spathe as well as at the bottom of the tree. When current is passed through the circuit the motor rotates, which causes the attached knife to make a small cut in the portion of the spathe. The timer circuit ensures that the motor rotates thrice every day and the sweet juice keeps flowing from the spathe.

Workers can easily collect the juice from the bottom plastic box without having repeatedly to climb the tree. He received a consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

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04

Relay switch

Ponnusamy
Virudunagar

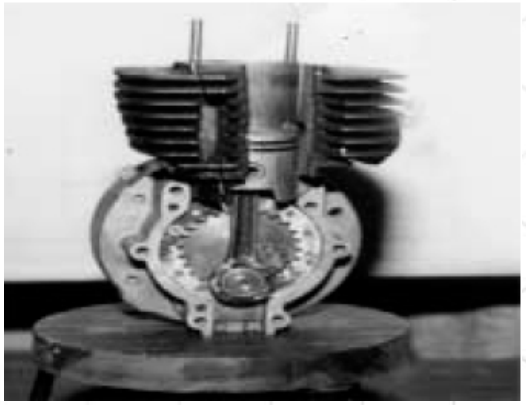
Ponnusamy, an illiterate farmer, has many innovations to his credit. He runs a motor rewinding workshop and owns two acres of land. Since his land is adjacent to the forest area, it is frequently subject to attack by wild animals. To protect it, he set up electric fencing around it. The voltage is enough to give a shock without causing fatal injury. However, a major problem was that the electric motor kept running even when the water in the well was exhausted. This affected the life span of the motor pumpset.

He invented a relay switch that automatically stopped the motor when there was no water left in the well or the tank. The switch however was also designed to stop in case of major electricity fluctuations. Ponnusamy had redesigned the coil to increase the voltage from 350V to 440V, rather than having the motor stopped, to ensure continuity of running. He received a Consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

Joshua Devathathan
Chennai

Conversion of circular motion to reciprocating motion

Joshua Devanathan has a surprisingly strong mechanical bent of mind for a Christian Pastor. He was very worried about the loss of power in the “Slider Crank” mechanism due to the side-thrust caused by the angular motion of the connecting rod with the crank. The Slider Crank mechanism is the most commonly applied mechanism in mechanical engineering for the conversion of reciprocating motion to circular motion. In his innovation the power transmitting end of the connecting rod does not move in a circular motion as before, but travels vertically up and down or horizontally to the sides, thus reducing the loss of power. His innovation is of particular use for both two and four wheeler automobiles, and for lathes, pumps, jigsaws, handtools etc. He received a Consolation award in NIF’s First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.



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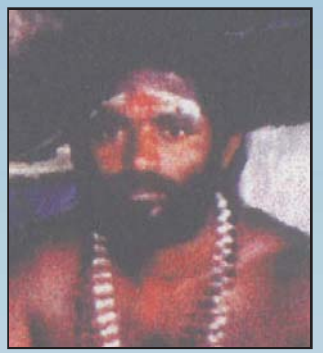
Environment friendly oil engine



M Akasi
Sivakasi

Akasi had set up a shop armed with a high-speed oil engine compressor, which generated sound and smoke pollution. The annoyed neighbours who complained about the same, demanded that he be shifted elsewhere. Akasi hence had to invent a silencer with minimum sound pollution and with lesser smoke emission levels. He first converted his high-speed engine into a low-speed one and increased the muffler size from 10 inches to 20 inches. Next, he cut three tin sheets, of 20 inches diameter each, and carefully welded them together, keeping a gap of two mm between the sheets. He also made holes similar to those he had observed in the old muffler. He fitted this new modified muffler into the silencer tube.

The advantages of this modification are that the sound and smoke produced are much less with this device and cleaner smoke is emitted, indicating lesser amount of carbon monoxide in the smoke. He received a Consolation prize in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

P L Banumurthi
Thiruvannamalai

Automatic saree border weft insertion: Combining tradition with modern

During his childhood, P L Banumurti and his family constantly struggled to make ends meet by weaving sarees. As an adult, he devoted his career to improving handloom systems to make weaving a profitable endeavor. Traditional *Korvai* or 'contrast' weaving involves intricate work where the design and the colour of the borders are often different from those of the main body of the sari. Three shuttles are needed: the weaver operates two, and an assistant operates the third. Banumurthi's automated system is similar to the "Catch Cord Technique drawing device for looms" (United States Patent 4616680, 1984) but developed independently, so that no assistant is needed and the productivity is increased. He has already installed one such device in Madurai district and trained about 15 women weavers with the help of SEVA.

He received a National award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

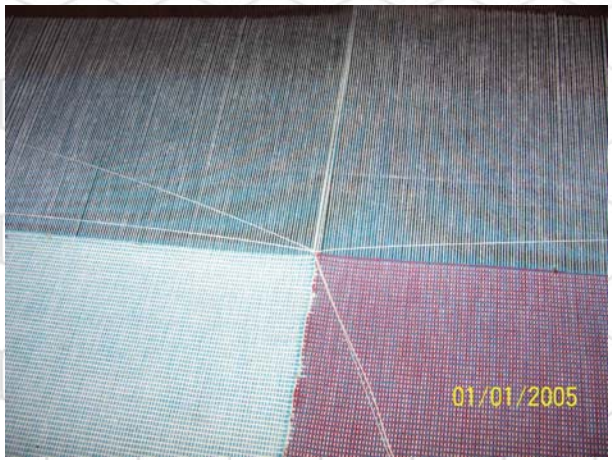
08

Continuous weft feeding looms

S Shanmugam
Salem

Shanmugam's inspiration for innovation comes from his desire to improve the livelihood of his traditional weaving community. Shanmugam first observed the time and manpower wasted in changing the pirn windings of power looms while working in his uncle's power loom centre. To address this problem, he built a modification to the shuttle loom that continuously inserts weft without frequent pirn change. In this new method, two weft cone stands are placed at the sides of the loom, and are specially arranged so that they can control yarn tension and electronic weft stop motion. This inexpensive and easy to maintain system increases productivity by 15-20% and increases fabric quality and reduces labour need. He got admission in not only polytechnic directly in second year but also in engineering college later due to his brilliance.

He received a National award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

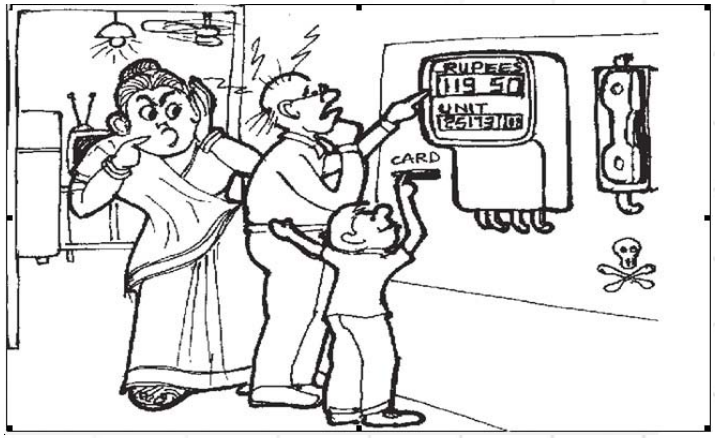


G Satish Kumar
Madurai

Idea: Minding money and saving electricity: Reading meters in rupees

G Sathish Kumar has been blessed with an insatiable curiosity since early childhood. He has already received numerous awards and accolades for his innovations. He developed an idea of developing electricity meters that display the amount of electricity consumed in terms of money (Rupees) rather than power units (Kilowatt Hours). This innovation might encourage consumers to keep tab on their energy expenditure and conserve power when possible. Satish also suggests enacting a “prepaid system” wherein customers could buy power units at the beginning of the month and check their balance on the meter, reducing consumption or purchasing more energy units as necessary. This prepaid system will also benefit energy companies, which can easily cut off power supply as the balance on the SIM card runs dry and restore it when the card is renewed.

He received an award under student’s category for his idea in NIF’s Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

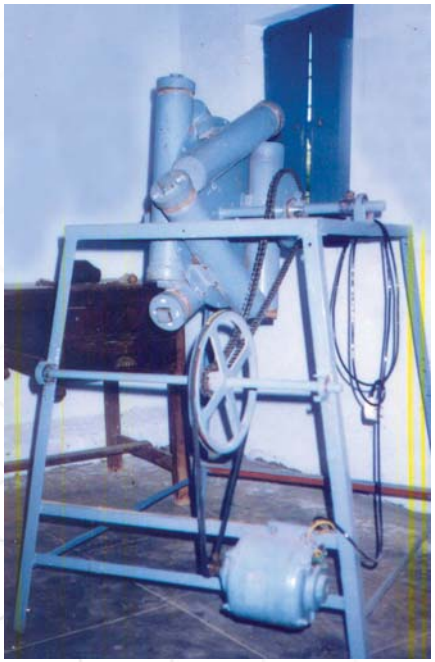


10

Dual purpose rotary huller

A N Manoharan
Madurai

Hulling is an essential part of food processing, especially in rural India. Unfortunately, the available mechanical hullers are very expensive and people are often forced to go to long distances for processing food grains. Manoharan from Madurai has found a low-cost, easy-to-maintain and operate dual-purpose rotary huller. The huller has six hollow cylinders with inset plungers, fixed in a triangular shape on each side of a circular disc. Since the six cylinders are not connected, one can grind six items at the same time. The hollow tube with the plunger arrangement is designed in such a way that the disc is equally balanced with the hollow tubes. Therefore minimum power is required to start and maintain the rotation of the circular disc with tubes. When the circular disc is rotated, the plungers pulverize the material put inside the hollow tube. The amount of heat produced during the process of hulling is reduced and so the original flavour of the product is maintained. The rotary huller can be operated manually or by using electricity.



It can be used to grind herbal and non-herbal products for medicines, animal waste for producing fertilizers and also mix and grind various grocery items. He received support from the Micro Venture Innovation Fund (MVIF) for developing the rotary huller. He also received the State award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined 2003 onwards to specifically focus on innovations from the people of unorganised sector.

N Sakthimainthan
Thiruvarur

Hand operated water lifting device

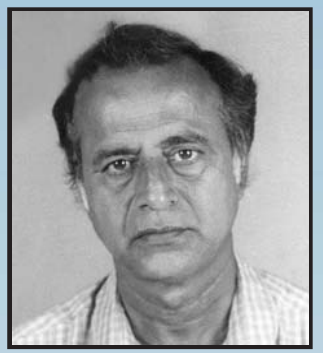
An efficient way of pumping water to meet requirements in a cost effective way is always a challenge in rural India.

Developed from locally available materials, this hand operated water lifting device is simple in design, delivers high discharge and is low cost compared to conventional hand pump, bucket pump, and bicycle operated pumps.

He received a Consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. NIF also filed a patent for this device in the innovator's name. The Innovation has been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.

12

Groundnut sowing practice



P B Mukunthan
Chinglepet

Mukunthan has developed a sowing technique for groundnut crop. The method involves creation of a raised bed with furrows on both the sides. The seeds are then dribbled in a triangular shape. The technique saves labor and conserves water without any loss in the yield of the crop. This method also reduces seed rate (10 kg of groundnut seeds are saved per acre) and cost of weeding. Water requirement is reduced by about 62% and this method facilitates faster irrigation and maintains good soil aeration. The crop is also easier to harvest compared to plants sowed conventionally. Mukunthan has been practicing organic farming for the past 15 years. His other innovations include the use of water hyacinth as green manure and for mulching and the design of a country seed drill, which delivers four seeds with nine inch spacing.

He received a Consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

13

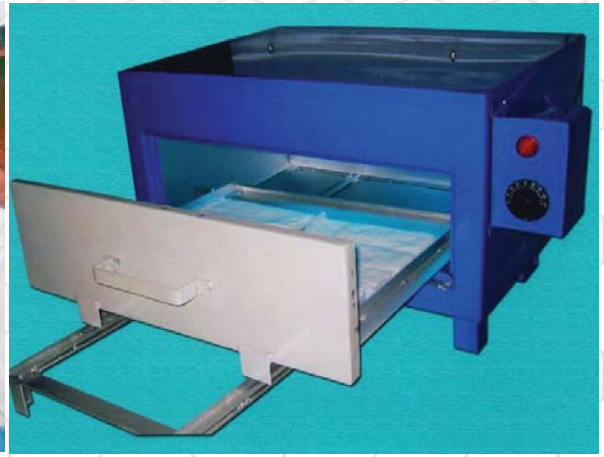
A Muruganandam
Coimbatore

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 Micro Venture Innovation Fund scheme of NIF, the innovator has been able to install over fifty units in seven states.



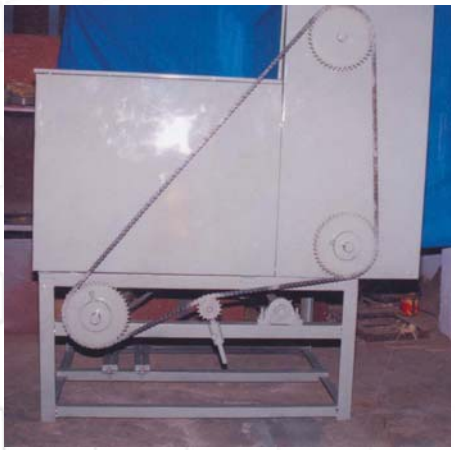
14

Garlic peeling and lemon cutting machine

M Nagarajan
Madurai

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

The second product is also used in pickle industry, but for cutting lemons. It is a cost effective machine, having innovative design, with continuous feeding system. It performs precise and standard cutting of large quantity of lemons in uniform shape and size. It can be operated by one person and cuts lemon into eight equal pieces. The innovator has been able to run a good business with the financial support of Micro Venture Innovation Fund and marketing effort of NIF. He received a National award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.



D Subramanian
Erode

A new valve modification for two-stroke engines

D Subramaniam has developed a two - stroke engine for two wheelers, which reduces petrol expenses and environmental pollution. The two-stroke engines cause leakage of petrol-air mixture and lead to environmental pollution and wastage of fuel running into crores of rupees. So Subramaniam decided to modify it to overcome this drawback. In his modified engine, the smoke outlet has been located at the top of the cylinder, so that the petrol mixture does not mix with the smoke and there is no possibility of leakage. For two stroke engines with more rpm, he has used two valves, at the top of the cylinder, which work alternatively as smoke outlets.

Subramaniam has also designed a new metric system for a clock and a new method of bio-gas production. He received a Consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

16

Palm/coconut leaf weaving machine

T S Pasupathy Marthandan
Tirunelveli

T S Pasupathy Marthandan, a farmer, has devised a mat-making machine that serves to reduce the drudgery of workers in the mat-making industry. This low cost machine, which may be operated by handle or pedal, can be adjusted for either crisscross knitting or V-shaped knitting and the mats turned out may be used for packing items such as fish, matches and jaggery. With minor modifications this machine can also be used for *korai pai* weaving (*korai pai* is a mat traditionally used as mattress).

The mat-making machine comprises a frame, two palm-leaf folders, a roller, a cross-pave section and two pedal levers. It enables a skilled operator along with an unskilled person to produce about six mats of the size 2x4 feet in one hour. With a capital investment of about Rs 10,000 and a working capital of about Rs 2,500 required for the raw material of leaves, one can earn a net income of about Rs 75 per day (this earning is calculated after deducting interests on capital, rent, maintenance, sales commission, etc.). With manual mat making one can barely earn Rs 25 a day. This machine means increased productivity and revenue for those engaged in weaving mats from leaves; this also equips them to compete with the manufacturers of cheaper plastic mats. He has also developed a leaf splicer, which binds leaves in thin strips required for weaving mats. He received a National award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002.

R Jayaseelan
Virudhnagar

Coconut husker

Anybody involved in growing and selling coconuts would vouchsafe for the fact that husking them is certainly one of the more tedious parts of the job. Jayaseelan has developed a simple labour saving mechanical device for husking coconuts. This device runs on a 1.5 hp motor and has two sharp blades attached to a cylindrical metal rod, which is useful in husking more coconuts as compared to the manual effort. With this device the husk can be separated into four pieces still leaving some coir fibres in the nuts. He has developed several modified and scaled up versions later.

He received the State award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

18

Crossing in coconut trees & Air energised pressure cooker

K R Duraisamy
Erode

Duraisamy had produced hybrid coconuts crossing tall and dwarf coconut varieties. He used to keep the seedlings up to three years in the nursery, then put them in sacks filled with soil for one month before planting in the main field. He claims that if such a method is adopted, the planted seedlings start yielding within two years by this method.

Duraisamy noticed that a lot of heat was wasted through the exhaust of the engine used for pumping water. He took an old oil engine and used it as a compressor. The exhaust of the oil engine used for pumping water was taken as input in the compressor. He took a pressure cooker and made two holes at the bottom. He then led hot compressed air through one of the holes in the cooker, which came out through the other hole. The container in the cooker acted as a heat exchanger. The cooker was thus ready to cook food through the heat of compressed air.

He has also made a modified stove with three different heating plates using central chamber heat, and also capturing wasted heat though oil chambers around the stove.

He was supported under the Value Addition, Research and Development (VARD) fund of NIF. He received a Consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

S Nanda Kumar
Coimbatore

Increasing mango yield through cross-pollination

Nanda Kumar has developed a simple practice to increase mango yield by planting sunflower plants on the bund of mango orchard. When mango trees are at the flowering stage, sunflower plants are cultivated on the sides of bunds. Honeybees, which are attracted by the sunflower, also rest on the mango flowers. This facilitates cross-pollination. The yield of mangoes is therefore increased. He received a consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

20

Control of Eriophyid mite in coconut

K Chellamuthu, Erode
&
V S Samyappan,
Kunninathur

Eriophyid mite is prevalent in most coconut growing regions of South India. This pest has spread from Kerala to Tamil Nadu.The nuts shrink and become small in size, which affects their marketability. Further minute cracks and dryness is found on the husk, which makes the husking operation difficult. Consequently, the coconut growers incur considerable loss.

To solve this problem, K Chellamuthu has developed a herbal formulation, which prevents this mite in a natural way. He takes equal amounts (one kg) of leaves of Custard apple (*Annona squamosa*), turmeric rhizome, *peenari changu* (*Clerodendrum inermi*), *chothukatralai* (*Aloe vera*), *nochi* (*Vitex negundo*) and *neem* (*Azadirachta indica*) kernel. All the ingredients are ground into a paste by adding sufficient water. This way about five litre of juice is extracted. This is diluted with another 15 litre of water. This herbal extract is administered into the crown region at the rate of two litre per palm after the harvest of nuts. This can be repeated once in two months i.e. during each harvesting time. K Chellamuthu has been awarded SRISTI Sanman in February 2000 (Honey Bee: 11(3):6, 2000). He received a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. SEVA and SRISTI have extended Micro Venture support for testing and commercialization of this herbal pesticide.

Samyappan also uses *Aloe vera*, *Vitex negundo* and neem cake against eriophyid mite in coconut. He applies these ingredients around the trunk of the tree followed with the covering of cowdung slurry (Honey Bee: 11(1):16, 2000)

P K Jeyakrishnan
Erode

Mini tractor drawn ridger weeder

This ridger weeder, which can be attached to a mini tractor, performs the weeding as well as earthing up operations simultaneously. Hence, there is no need for a separate weeding operation prior to earthing up. The ridger is developed as an attachment to the three point hydraulic linkage of the mini tractor and comprises an upper main frame, a central shank and a ridger bottom.This unique ridger-weeder saves operational cost and time by more than 60 per cent. Since, it helps in trash mulching and obviates the need for burning the same, it also contributes towards conserving moisture and improving organic content in the soil. He received a Consolation award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002.

22

Plant protection practices

V K Jayaveeran
Madurai

a) Discolouration in *bhindi* (*Abelmorchuos esculentus*) & Chilli leaf spot and Powdery Mildew Disease

Juice is extracted from the leaves of *Prosopis juliflora* and diluted with water. When *bhindi* pods are discoloured (light yellow or white) the same extract is sprayed on the fields. It is also sprayed in Chilli (Capsicum spp) fields two months after planting for controlling the leaf spots and powdery mildew disease. For spraying one acre, three litre of leaf extract suffices.

b) Pests and diseases of Paddy
Sacks filled with eight kg of 'neem' cakes are immersed in irrigation channels to control stem borer, gall fly and bacterial wilt. The 'neem' cake is used 18 to 20 days after planting and has to be supplemented every 25 days.

c) Green Algae
For controlling algae in irrigation wells that choke the foot-value of pumps, one bundle of dried paddy straw (about 20 kg weight) is chopped into small particles and immersed in the water.

He received a Consolation award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001.

V Antony Samy
Tirunelveli

New acid lime variety

Antony Samy used his considerable experience in acid lime cultivation and developed a new variety of acid lime (*Citrus aurantifolia*) by grafting rootstock of wild citrus with an ordinary Edward citrus variety. The grafted plants are drought tolerant, short in stature and resistant to quick wilt. These plants grow fast and need less water. Moreover, 90% of its fruits are of the first grade quality as compared to 60% in the popular variety. The plants start bearing fruits from the third year onwards as opposed to the fifth year in local varieties and the yield is higher at 30,500 kg per hectare compared to 20,500 kg per hectare for the local variety. The fruits are bigger in size, juicier and tastier and thus are more suitable for pickle and other processing industries. This variety fetches a good price in local markets. Sixty-two year old Samy is the moving spirit behind the Small Farmers Agricultural Engineering Service Centre, which has been active in Puliangudi (Kerala) since 1975.

He received a National award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

24

A new cardamom variety- PNS Vaigai

P N Surulivel
Theni

P N Surulivel has been cultivating cardamom and coconut for long. He has developed a new variety of cardamom, which has significantly higher yield and recovery percentage than the popular local variety. He has also been appreciated and awarded by the Spices Board, Cochin for his efforts in 2003. He was very successful in selling his bold and green colored cardamom in *Satvik*- the traditional food festival organised by SRISTI in 2006 at almost twice the local price. He received a National award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

Late Ganesamurthy Asari
Cuddalore

Shaving, cutting and grinding: Three innovations for sugarcane farmers

Ganesamurthy Asari was born and raised in a sugarcane-farming district. He ran a tractor repair shop and was very keen to develop practical, low-cost solutions for the problems faced by the farmers in that area. He had developed three useful implements to help sugarcane farmers. The first invention is a tractor operated stubble shaver, which enables farmers to cut stubble closer than possible with the conventional swinging blade models. The second is a power tiller operated stubble shaver that operates in a manner similar to the tractor-based model described above. The third innovation is a sugarcane trash grinder that crushes wastes to particles ranging in size from 2-20 mm, increasing the speed of the composting process and preparing easily digestible fodder for animals.

He received a National award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

26

Effective sound speaker system

Pakkyanathan
Perambalure

Pakkyanathan, who has been running the business of renting music sound system observed the poor attenuated vibratory motion and acoustic sound wave with the existing sound speakers. To overcome these problems and to achieve a dramatic sound effect, he designed a circular speaker assembly with stainless steel material. The speakers are artfully presented in subtle curves and stunning finesse. They give better dramatic sound effect and desired strong bass for extra punch. He has been short listed for recognition in the Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices.

Abdul Razzak
Madurai

Rice steep draining cooking vessel

Abdul noticed the drudgery involved in discarding the gruel after boiling the potted rice in conventional cooking, especially in marriage functions and other public functions where people are required to drain the starch water once the rice gets boiled. Moreover, modern rice pressure cooker don't facilitate the draining of starch water, which contains more carbohydrates that causes blood sugar and high BP. Hence the innovator came up with an idea to provide perforated plate and outflow pipe at the bottom of the conventional vessels, so that one can easily drain starch water once the cooking is over. He has been short listed for recognition in the Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices.

28

Tapioca-set cutter

Duraisamy presently runs a tea shop. Twenty three years ago, he earned his living as a labourer in tapioca planting operations. He then observed that when sickle was used, the tapioca sets were not properly cut, leading to fungal attack and resulting in poor germination. To overcome these problems, he designed the tapioca-set cutter machine, which has been in use for the last twenty three years.

The tapioca cutter consists of a wooden frame, bottom cutting blade and top cutting blade. It is manually operated and within an hour, 1,200 tapioca sets can be cut by using this machine. Duraisamy is able to cut and transplant the tapioca sets over five acres in a day using this cutter. (Honey Bee, 16(1):21, 2005)

Duraisamy
Erode

Mobile sewing machine

RK Siva & Arumugam
Thanjavur

Arumugam and Siva are tailors, who take the sewing machines to the doorstep of the community. It is usually difficult to transport the leg operated sewing machine from place to place and the smaller hand operated machine is also not convenient. They have mounted the sewing machine on a bicycle. An iron strip is fitted to the triangular section of the bicycle. The sewing machine is attached to the iron strip at an appropriate position. A foldable seat can also be attached to the cycle, so that the person can sit and use the machine. The machine can be assembled for a cost of Rs. 10,000, which includes a new sewing machine and a new bicycle. It was found to be very useful in the tsunami affected areas, both to reach out to people and as a source of employment. (Honey Bee, 16(4):14 & 17, 2005)

30

Drought tolerant new Moringa variety

Alagarasamy
Dindigul

Alagarasamy developed the new drought resistant variety through cross-pollination of two local varieties. He selected the desirable plant type based on phenotypic characters and then observed the performance of the variety for four years. He mass multiplied the plant through an innovative propagation method of air layering. He named his new moringa variety as “Pallapatti Alagarsamy Vellimalai Murugan (PAVM)” Moringa.

Over the last nine years he has sold more than 10,00,000 grafted seedlings of Moringa to about 3,000 farmers in Dindigul, Madurai and Coimbatore districts. And as a result, this variety covers over 6000 acres in these districts. Micro Venture Support has been extended through SEVA for mass multiplication of air layered seedlings. Apart from SRISTI Samman in 2006, he also received the Citi Goup Micro Entrepreneur Award 2007 in December 2008.

Mookan
Madurai

Increasing body immunity and controlling digestive disorders in animals

Mookan, a herbal healer, prepares herbal bolus exclusively for animals for increasing body immunity and to control all digestive disorders.

The method of preparing the bolus is given below.

(a) Equal quantities (50g each) of the plants *Kandankathri* (*Solanum surattense*), *Thumbai* (*Leucas aspera*), *Kuppaimeni* (*Acalypha indica*), leaves of *Veeli* (*Cadaba farinosa*), *Peruthumbai* (*Leucas martinicensis*), *Usilai* (*Albizia amara*), *Thulasi* (*Ocimum tenuiflorum*), *Avarampoo* (*Cassia auriculata*), *Moongil* (*Bambusa arundinacia*), *Puliampirandai* (*Vitis setosa*), *Thuthi* (*Abutilon indicum*), *Musumusukkai* (*Mukia maderaspatana*), *Kolunchi* (*Tephrosia purpurea*), *Manjanathi* (*Morinda tinctoria*), *Veliparuthi* (*Pergularia daemia*), *Nilavembu* (*Andrographis paniculata*), *Virali* (*Dodonaea viscosa*), *Mavilangam* (*Crateva adansonii*) are taken, dried in shade, pounded well and stored.

(b) Equal quantities (10g each) of *Thippili* (*Piper longum*), *Seeragam* (*Cuminum cyminum*), *Sombu* (*Foeniculum vulgare*), *Perungayam* (*Ferula asafoetida*), *Valmilagu* (*Piper cubeba*), *Sukku* (*Zingiber officinale* – dried), Pepper (*Piper nigrum*), Chillis (*Capsicum annuum*), *Kasakasa* (*Papaver somniferum*), *Lavangam* (*Cinnamomum zeylanicum*), Fenugreek (*Trigonella foenum-graecum*), *Omam* (*Trachyspermum ammi*), and seeds of coriander (*Coriandrum sativum*) are taken and pounded well.

(c) An inflorescence of Banana (*Musa paradisica*), unripe fruits of *Kaleathi* (*Ficus tinctoria*) 100g, Guava bark (*Psidium guajava*) 100g, *Sotru katralai* (*Aloe vera*) 100g, *Pirandai* (*Cissus quadrangularis*) 500g, Onion (*Allium cepa*) 250g, Coconut (*Cocos nucifera*) one,

Garlic (*Allium sativum*) 100g, *Kollankovaikilangu* (*Corallocarpus epigaeus*) 100g are taken.

All the above materials are ground and mixed along with other items mentioned above (a) and (b) and made into bolus each of 100g. Finally the bolus is dusted with turmeric powder. This bolus can be stored for three days. The bolus is given twice daily for three days in the morning and evening.

SEVA has tested this practice and found it effective in 2800 cattle and sheep in the breeding tracts of *Katchakatti* black sheep, *Vembur* sheep, *Umbalachery* cattle in Madurai, Thoothukkudi and Nagapattinam districts respectively. Animals started to take grasses or feed by the second day of the treatment. The intake of drinking water also increased considerably. In sheep, normal weight gain became noticeable and its dung also became solid. In cattle, the droppings of animals became normal and solid as the loose motion got arrested. The intake of water and feed increased after the treatment. In a few cases, the repeat breeding problem was overcome and the animals conceived after natural crossing or artificial insemination. The milk yield also increased up to three litres per day in cows, which earlier had poor digestion or less feed intake.

N Ponnusamy
Dindigul

Control of Blue Tongue disease in sheep

During rainy season, sheep farmers in Tamil Nadu suffer economic losses due to the blue tongue disease wherein mass death of sheep is noticed. The symptoms of the disease are: ulcer in the mouth, oozing of puss like substance from the mouth and lameness. Animal suffers loss of appetite and dies of starvation. If the sheep is lifted the hairs in the body fall off. In severe cases the animals die in a fortnight or so. This disease is caused by a virus where mosquitoes act as vectors.

Ponnusamy, who maintains 40 sheep in his village near Oddanchathiram, Dindigul district, has devised a treatment for the disease. He administers banana smeared with gingelly oil for two to three times orally. Also the leaf pulp of *Aloe vera* is administered daily, which can continue for some days even after the animal recovers. He suggests administering *Aloe vera* as a preventive measure to check further spread of infection among other animals. Ponnusamy received SRISTI Samman Award in 2006.

Preventing crop loss caused by Paddy Earhead bugs

The plant called "*peyurunjan*" or "*sannambu*" (*Cycas cercinalis*) is available in the Western Ghats as a wild plant. This plant during the time of flowering releases obnoxious odour. Farmers of Puliangudi, Vasudevanallur and Sivagiri areas of Tirunelveli District use this odour to keep away the earhead bugs away. They usually collect the flowers of the plant during December – January, the panicle initiation stage in the paddy crop. These flowers are cut into small pieces and covered and tied with wet cotton cloth. These cloth bundles are again covered with straw and fixed on the top of the sticks (at 3 to 4 feet height), which are placed in two or three spots of an acre of standing paddy land. Dew fall in the early morning during winter months helps to emit obnoxious odour that repels the earhead bugs away from the paddy field, which otherwise cause severe economic loss to paddy farmers. Thiru Gomathinayagam, Vivasiyigal Seva Sangam (Farmers Service Association), Puliangudi village is instrumental in practicing this knowledge and disseminating to other farmers. He received SRISTI Samman earlier for his services.

Community
Tirunelveli

Relay Cropping

S Vel Murugan, Madurai

During 'karthigai'-'margazhi' (November-December) groundnut is sown as irrigated crop. Generally, bengal gram, cowpea are grown on the bunds. After 45 days when groundnut is weeded second time, seeds of cotton are planted and gypsum is applied in the field. Within three months, the groundnut can be harvested along with the oil seeds and pulses. Later on, the cotton is picked. When farmers stagger the planting dates for these crops, the costs of ploughing, making ridges and furrows as well as weeding and spraying can be reduced considerably. They can take advantage of three harvests in a single season.
Honey Bee, 4(2&3):16, 1993

Seed treatment methods

V R Iyyappan, Reddiapatti village

(a) *Paddy*: A gunny bag filled with paddy seeds is kept immersed in a water trough for 12 hours then the seed bag is immersed in diluted biogas slurry for another 12 hours. This increases the resistance of seedlings to pests and diseases.
(b) *Maize*: Seeds are soaked in cow urine for 12 hours before sowing.
(c) *Banana*: The suckers are kept in hot water for a few minutes before planting.
(d) *Chilli*: Seeds are immersed in biogas slurry for half an hour. This promotes vigorous growth and increases disease resistance in seedlings.

(e) *Cotton*: Seeds are mixed with a solution containing cow dung slurry and diluted lime before sowing. Source: Honey Bee 8(2): 7, 1997

Storage of grains

Thavasinathan, Kanyakumari

While storing green gram, black gram and grains, powdered '*vasambu*' (*Acorus calamus*) is mixed with the grains for protection against storage pests. Honey Bee, 6(3):10, 1995

Cactus as pesticide

M A Chinnathambi, Melur

Cactus of any variety such as *kodikaali* (*Euphorbia nivulia*) or *madakalli* or *thirugukalli* (*Euphorbia tirucalli*) is cut into pieces and immersed in water. Ensure that the water is just enough for the cactus pieces to float. Let the pieces ferment for 15 days. The extract is then filtered. A litre of the solution is taken and sprayed. The pesticide helps control the leaf curl disease in chilli, *konthalai* (little leaf, a viral disease) in brinjal, the mosaic disease in ladyfinger, fulgarid (brown jassida) in paddy and sucking pests in cotton. Honey Bee, 13(2): 8, 2002

See Honey Bee*, 3(2):19, 1992; 3(3&4) 3: 1992; 5(3):14, 1994; 6(4):10, 1995; 7(3):10, 1996; 10(1): 6, 1999 for more cactus related practices*

Control of Mushrooms in Acid lime

Anthonisamy, Tirunelveli

During rainy season there is usually a growth of mushrooms in the collar region of the trees of acid lime. If these mushrooms are not controlled it will lead to death of trees. Farmers in this area usually apply Bordeaux mixture for control of mushrooms. Bordeaux mixture needs four to five days to suppress the growth of mushrooms. Anthonisamy has found an alternative method of control by using locally available materials. Two kgs of *Aloe vera* and one kg Garlic are crushed and ground well by adding little water to make it as a paste. This has to be smeared over the affected collar region of trees. This practice is reported to control mushrooms within three hours. He also uses this mixture for control of earhead bugs in paddy or sorghum. He mixes one kg each of *Moottanarielai* (Coleus *aromaticus*) and tulsi (*Ocimum sanctum*) in 100 liters of water and adds it to the existing mixture. This ensures protection of grains from earhead bug attack better than synthetic pyrethroids recommended by agricultural department. Honey Bee, 16(2):17, 2005

Human hair as a fertilizer

P Subbiah, Dindigul

Waste hairs can be collected and applied to vegetable, fruit and ornamental crops to increase the yield. A round pit is dug around the plant or tree for the purpose. For ornamental plants, 1/2 kg of hairs are to be used and for fruit trees, one kg. In the case of fruit trees, application is to be done one month after planting and also 45 days before fruiting. The hairs are dispersed during the last plough for vegetables like tomato and brinjal. Honey Bee, 9(2):9, 1998

Transplanting method in sugarcane to reduce water requirement

Bharathidasan
Sivaganga

Many farmers in Sivaganga district during 1980's opted for sugarcane cultivation as a private sugar factory was procuring cane on regular contract basis. In the initial years sugarcane cultivation was profitable but later on farmers realized that the water table was getting reduced gradually. Water scarcity resulted in reduction in the areas of irrigation. Bharathidasan then developed a practice, which reduced not only water requirements but also the labour costs.

In ordinary method of raising sugarcane farmers prepare beds and channels. The beds are of 11/2' width raised to a height of 11/2'. The seeds setts are placed horizontally for germination. Each bed is spaced at every 4 feet and water is allowed to enter each bed from main irrigation channel. Bharathidasan merges 2 beds so that the width of the bed increases to more than 4' (4+11/2' + 11/2'). The beds are irrigated alternatively. This practice reduces water consumption by 50%. It also reduces labor cost for weeding and intercultural operations. It reduces the number of setts from conventional requirements of 30,000 into 15,000 (single budded setts). The space between the beds (alternatively) is filled with sugarcane trashes and it serves as good manure after composting *in situ*.

By this method sugarcane ratoon can be continued up to eight years as compared to three to four years in the conventional method. For placing seeds setts 22 labourers are required in the conventional system as compared to just four laborers in the new method. The innovator has been awarded SRISTI Samman.


படிக்காதோரின்
அருவியென பொங்கட்டு
WELCOME

10th Shodh Yatra
22 December to 30 December 2002
Thoduvedgam Ashram to Sevapur, Madurai

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 10th Shodh Yatra, over the period of nine days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country (also see *Honey Bee, 14(1):18-19, 2003*).


Network.

14th Shram and Shodh Yatra
19 January to 24 January 2005
Nagapattinam District

The fourteenth Shodh Yatra had been planned in Kerala. But after the tsunami hit coastal Tamil Nadu, it was decided to postpone the Shodh Yatra and instead undertake a Shram and Shodh Yatra in Tamil Nadu. The work was planned and co-ordinated by SEVA, Madurai, the regional collaborator of the Honey Bee Network. The villages Tharangambadi, Kuttiandur, Vellakoil, Pudhupettai, Perumalpettai, Thalampettai, Chandrapadi and Kesavanpalayam in Nagapattinam district, which had suffered a great deal were chosen for service through our labour.

Twenty five Shodh Yatris from Gujarat participated in this yatra. These included four grassroots innovators - Amrutlal Agrawat, Bhanjibhai Mathukiya, Ganeshbhai Dodiya and Parbatbhai Vaghani, three foreigners (fellows, AASTIK), six farmers/villagers from Jungadh and Bhavnagar Districts, four students from Gujarat Vidyapeeth and four staff members from SRISTI. From Tamil Nadu, 15 students of Engineering College, Madurai joined for the Shram Yatra. Ten volunteers of SEVA, Madurai were also present to constantly support us throughout the relief work.

Read the complete report in *Honey Bee, 16(2):12-13, 2005*

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. (Kndumani, Pirantai uppu)

Source: NIF database

NIF Database

Uses from Tamil Nadu

Migraine
Apply the plant paste on the forehead
- Muthumari V, Dindigul, Tamil Nadu

Stomachache
Take seed powder with ghee or butter for relief
- Kalpana, Trichy, Tamil Nadu

Uses from other states

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

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

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

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

Uses in Classical Codifed Literature

Dried leaf and root powder is given orally in the case of eye complaint[1]; decoction of the young leaves is given orally for cough[2]; leaf powder is given orally in case of urine problems[3]; and seed extract is used in sciatica[3].

It is one of the ingredients of 'Tranquil'[4] medicine for reliving stress and anxiety. Ten patents have been found on the applications of *Abrus* mainly as a natural sweetener[5] and oral contraceptive[6].

Uses of *Adhatoda vasica* (L.) Nees (Adathodai)

NIF Database

Uses from Tamil Nadu

Tuberculosis
Take leaf decoction (100ml) on an empty stomach thrice a day for 48 days.
- K Saroja, Chidampa, Tamil Nadu

Throat pain
Take dry leaves (500g) along with *Piper nigrum* L. (10g), *Piper longum* L. (100g) and *Trachyspermum ammi* L. (10g) and grind them into a fine powder. Take one teaspoon of the powder with honey thrice a day.
- Murugesan, Tirunelveli, Tamil Nadu

Uses from other states

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

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

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

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

Sprain
Ferment the leaf decoction and take it orally
- Gopinath Pradhan, Nabarangpur, Orissa

Uses in Classical Codified Literature

Decoction of the plant is taken orally to cure asthma[7]; leaves (500g) are decocted in water (5l) until a dark brown mass is obtained and two spoonful are taken with honey thrice a day for 2-4 days to cure fever[8]; rheumatic patients should warm the leaves and apply on the body[9]. Product 'Menstri Care'[10] prepared from the plant is an effective medicine for women's health problems. 'Diakof'[11], a herbal medicine uses *Adhatoda* along with other plants for treating cough. Ten patents have been found on its medicinal applications mainly for cough[12] and asthma[13].

Source: NIF database

Uses of *Areca catechu* L (Pakkumaram)

Source: http://www.pacsoa.org.au/palms/Areca/catechu03.jpg

NIF Database

Use from Tamil Nadu

Burn
Apply the paste of young nut topically
- *Bhoothathan Kanni, Tirunelveli, Tamil Nadu*

Uses from other states

Migraine
Gurgle with fruit decoction to get relief from pain
- *Naganath Durga Chogule, Sholapur, Maharashtra*

Eye ailments
Put the tender fruit juice in the eyes
- *Ajitha Saji, Idukki, Kerala*

Dental care
Brush the teeth with seed ash
- *Amit Kumar, Gopalganj, Bihar*

Dysentery
Take the root decoction orally
- *Purna Kanta Shyam, Sibsagar, Assam*

Corn
Mix husk ash with mustard oil. Apply the paste topically
- *Bhula Hira, Sibsagar, Assam*

Uses in Classical Codified Literature

Dried bark powder is taken orally to cure asthma[14]; leaves are used as antipyretic[15]; powder of tender seeds is boiled in coconut oil and applied in case of burns[16]. Product 'Lukol DS'[11] tablet contains *Areca* as one of the ingredients and is useful in leucorrhoea and related symptoms. 'Himplasia'[11], a product made from this plant, is useful for treating prostate disorders. Seven patents have been found on the medicinal uses of the plant mainly as an antidiabetic[17] and as an antiviral[18].

Uses of *Boerhaavia diffusa* L. (Mookanathi)

NIF Database

Uses from Tamil Nadu

Gas trouble
Take the roots of *mookanathi* (50g), *arugampul* (*Cynodon dactylon* L.) (50g), bark of *murungai* (*Moringa oleifera* Lam.) (100g), leaves of *Veli paruthi* (*Pergularia daemia* (Forssk.) Chiov.), few cloves of garlic and ginger (20g). Grind them to extract the juice. Add honey (500ml) to it. Treat the concoction with a heated rod and consume it twice a day for three days.
- M. Lingam, Madurai, Tamil Nadu

Veterinary practice

Maggots in wound
Apply the root paste along with limestone topically
- Jeyapaul, Madurai, Tamil Nadu

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

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

Uses in Classical Codified Literature

The leaf juice is given with milk to get relief from cataract[19]; decoction of the plant is given orally to purify blood[20]; the plant extract is used as diuretic[21]; decoction of the leaves is applied externally in case of skin infections[22]. 'Liver-kidney care'[23] 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[24], hypertension[25] etc.

Source: SRISTI database

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

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

NIF Database

Use from Tamil Nadu

Whooping cough
Take the seed ash along with honey orally
- R. Sundari, Dingdigul, Tamil Nadu

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

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

Uses in Classical Codified Literature

Bark is used as poultice for pimples[26]; and bark juice is given orally to cure intestinal worms[27]. 'Lukol'[11] 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[28], skin care[29] etc.

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

NIF Database

Uses from Tamil Nadu

Intestinal worms
Take the leaf juice orally along with some honey
-Kalpana, Trichy, Tamil Nadu

Headache
Mix the latex with limestone powder and apply the paste on the forehead.
- S. Amirthavalli, Kulamangalamm Post, Tamil Nadu

Uses from other states

Stomach disorder
Grind the leaves with turmeric and make tablets. Take one tablet orally till the ailment gets cured
- P. D. Walikar, Bagalkot, Karnataka

Knee pain
Take the leaf juice orally
- Jyothi Bhatta, Chikmagalur, Karnataka

Earache
Put the latex in the ear
- R. C. Chowdhary, Nagor, Rajasthan

Stomachache
Smear mustard oil on a leaf and apply it warm 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

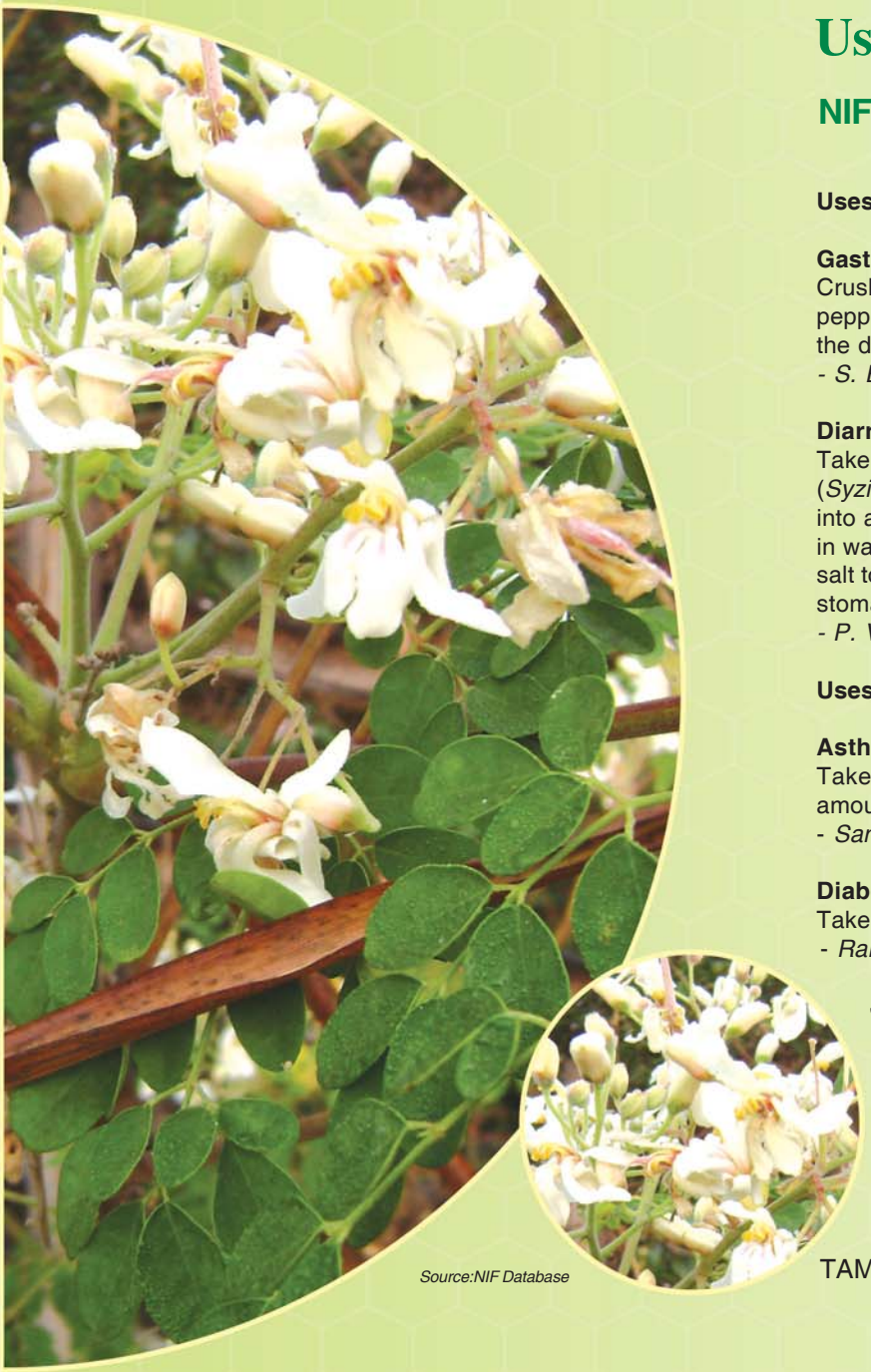
Itching and irritation
Warm the leaves smeared with mustard oil and make a bandage on the affected body part for two to three days
- Sukkhi Devi, Udham Singh Nagar, Uttarakhand

Migraine
Heat the leaf and extract the juice. Put two-three drops in the nostril in the opposite side of the head having pain
- Indiravati Rana, Udham Singh Nagar, Uttarakhand

Uses in Classical Codified Literature

Plant extract is used as bronchodilator[30]; flower buds of *Calotropis*, along with black pepper seeds and salt, are crushed to make pills the size of small peas. Two pills are taken twice daily for three days to cure malaria[31]; warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain[32]. 'Muscle & Joint Rub'[11] is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'[33], 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 [34] and bronchial asthma[35].

Source: SRISTI Database



Source:NIF Database

Uses of *Moringa oleifera* Lam. (Murungai)

NIF Database

Uses from Tamil Nadu

Gastric trouble
Crush the bark of *murungai* (50g), garlic (25g), black pepper (10g) and betel leaf (10g) and extract juice. Take the decoction (25ml) of this juice twice a day
- S. Bhuvanendiran Kaani, Nellai, Tamil Nadu

Diarrhoea
Take the dried bark of *murungai*, cashew plant and *naval* (*Syzigium cumini* (L.) Skeel) in equal quantity. Grind it into a fine powder. Soak two spoonful of powder in water (200ml) for three hours. Filter it and add some salt to it. Take the preparation thrice a day on an empty stomach.
- P. Veluchamy Kaani, Tirunelveli, Tamil Nadu

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 *Piper longum* 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

Uses in Classical Codified Literature

Juice of bark is given orally along with a pinch of asafetida and salt[16]; dried fruit is eaten to combat diabetes[36]; powder of the plant is administered orally to cure asthma[37].

Product 'Sugan Nutrimix'[38] 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'[11] is a herbal oil, which provides relief from neuromuscular pain. Twelve patents have been found on its medicinal uses such as for anticancer[39] and antidiabetic[40] properties.

Uses of *Sphaeranthus indicus* L. (Kottakarthai)

NIF Database

Use from Tamil Nadu

Obesity
Take the juice of flowering heads (100ml) with milk (100ml) orally
- *Susila Vaidy, Vellore, Tamil Nadu*

Uses from other states

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

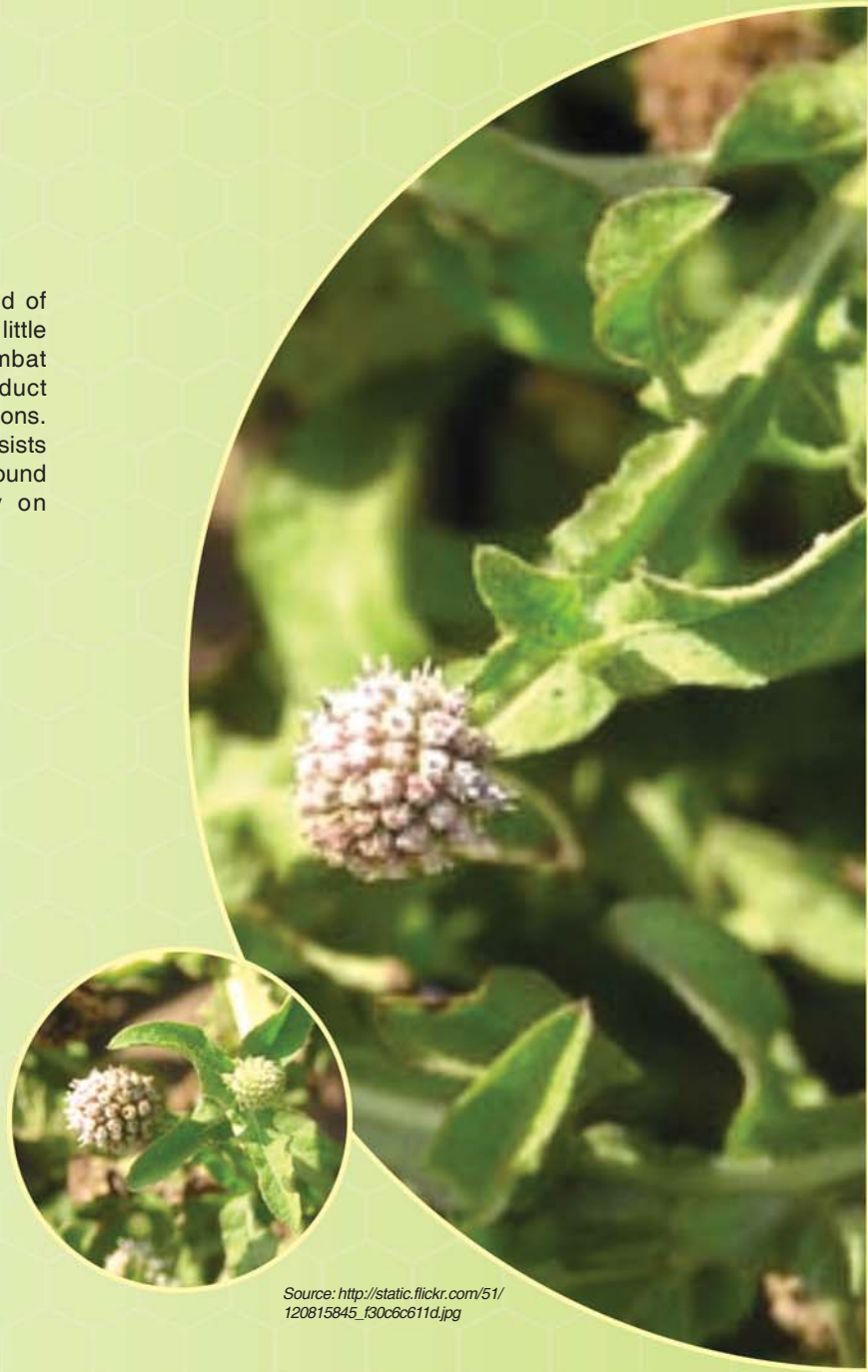
Bodyache
Apply the flower juice on the body
- *Tarun Suri, Muzaffar nagar, Uttar Pradesh*

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[41]; juice of the fresh leaves is mixed with little amount of milk and sugar and consumed to combat cough[41]; and the plant acts as a diuretic[42]. Product 'Diabecon'[11] minimizes long-term diabetic complications. 'Geriforte'[11] facilitates respiratory functions, and assists cardiovascular functions. Six patents have been found on its various medicinal applications mainly on inflammatory disorders[43] and cancer[44].



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

Uses of *Strychnos nux-vomica* L. (Eddikunchera, Kanchurai)

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

NIF Database

Uses from Tamil Nadu

Insect bite
Prepare tablets from the paste of the bark of the plant, roots of *Pongamia pinnata* (L.) Pierre and ripened fruits of *Tamarindus indica* L. Take a tablet once a day.
- Pongavanam. K, Dindigul, Tamil Nadu

Stomachache
Keep the fruit on a fire for a while. Levigate it on a stone. Apply the paste on the stomach.
- K. Nagammal, Keerappakkam, Tamil Nadu

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

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

Veterinary practice
Bloat
Mix the juice of tender leaves and fruits of bitter cucumber with buttermilk and give 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[45]; 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[46]. *Nux-vomica* is a common homeopathic remedy for indigestion, vomiting, diarrhoea, cramps, constipation, colds, and headache[47]. Twenty-one patents have been found on the medicinal uses of *Strychnos* for joint pain[48] and viral diseases[18].

Uses of *Vernonia cinerea* (L.) Less. (Seetheri senghameer)

NIF Database

Use from Tamil Nadu

Nervous disorder
Take a spoonful of the paste of the leaves of *seetheri senghameer* and *Solanum torvum* Sw. once a day.
- *Latuma Nagounder, Trichi, Tamil Nadu*

Uses from other states

Headache
Grind the plant (10g) with an equal amount of garlic and boil in coconut oil (100ml) till quarter of the solution remains. Filter and add camphor (10g) powder. Apply this oil topically on the aching part.
- *Anvy Moly Tom, Wayanad, Kerala*

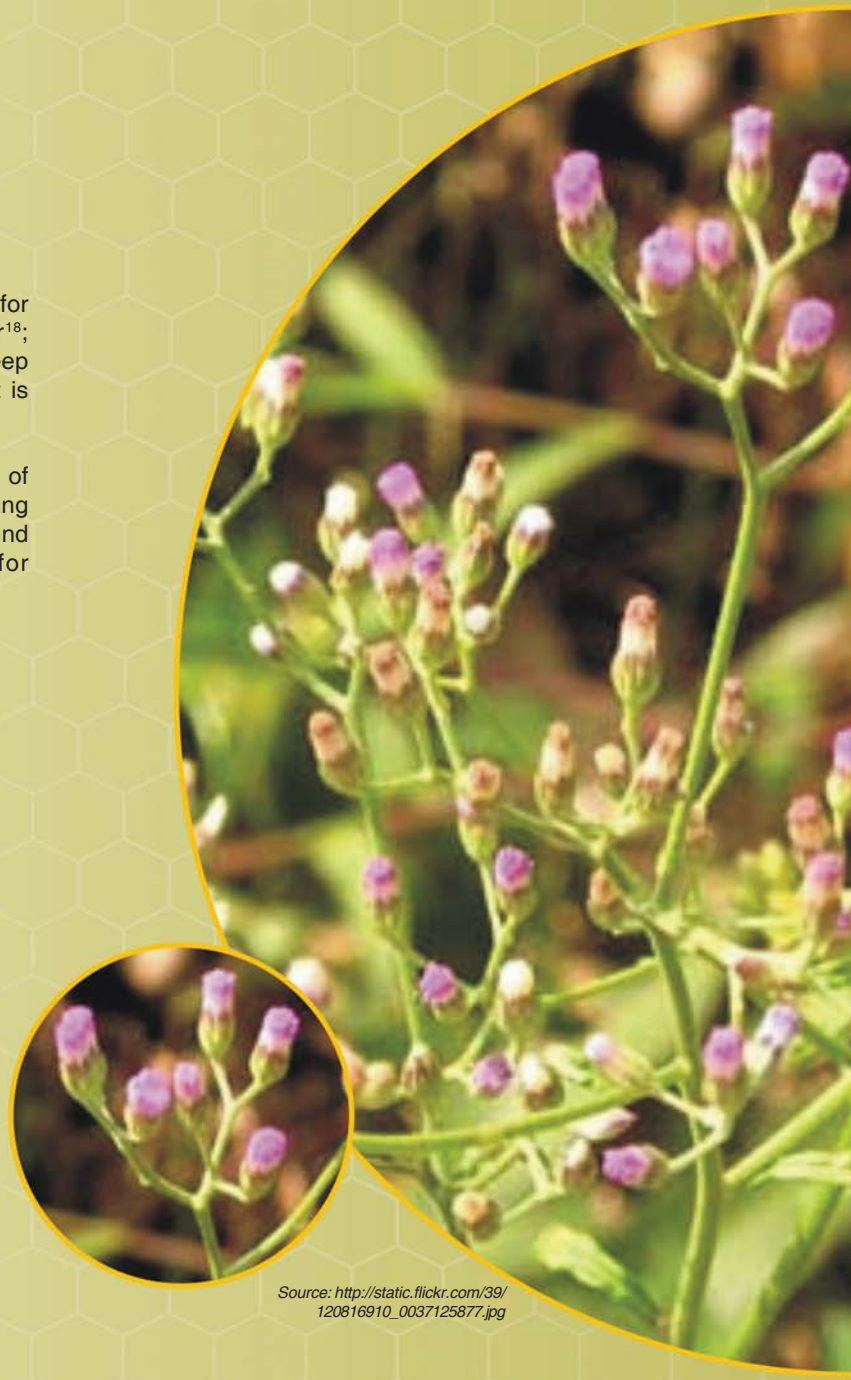
Diabetes
Grind the roots (10g) into a fine paste and take it with sugar candy (10g).
- *Pavan Mehra, Sikar, Rajasthan*

Psoriasis
Take the seeds (5g) with warm water.
- *K.L. Lakshmana Shetty, South Canara, Karnataka*

Uses in Classical Codified Literature

Powder of dried flowers is consumed with hot water for conjunctivitis[49]; the whole plant is used for fever[18]; decoction of the dried aerial parts is given orally to keep blood pressure normal[50]; and decoction of the plant is administered orally to cure jaundice[51].

'Cystone'[11] is prepared from *Vernonia* in combination of other plants, which inhibits calculogenesis by reducing stone-forming substances. Five patents have been found on its various medicinal applications such as for stimulating hair growth[52].



Source: http://static.flickr.com/39/120816910_0037125877.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, it is not harmful to nature and human beings. It also controls sucking pests like white fly, heliothis, aphid etc.

SRISTI KRUSHAK

Popatbhai Rupabhai Jambucha, Gujarat

It is an excellent remedy for leaf curl disease. Besides controlling the disease it increases the vigor of the plants by increasing overall growth.

SRISTI SURAKSHA

Community Knowledge, Gujarat

It is a very efficient treatment for termite and acts as a vitaliser to the affected crops. To control termites the herbal formulation is mixed with sand and spread in the field. Some times it is released in the field along with the flow of irrigation water. In some cases, it is also drenched in the affected part of the plant and sprayed on the vegetation to repel termites.

SRISTI PRAYAS

Community Knowledge, Gujarat

It is a highly effective formulation to act as a herbal growth promoter, which stops shedding of flowers as well as increases the overall growth of the plant. This formulation strengthens the plants internally and enables them to withstand extreme weather conditions. Constant use of this formulation increases the yield and reduces the toxic content in our daily diet.

SRISTI SHAKTI

Community Knowledge, Gujarat

A herbal growth promoter, which helps in production of excellent quality organic food grain. Constant use of this formulation not only increases the yield but also reduces the toxic contamination in our food and environment.

Herbal Formulations for Livestocks and Poultry~

Coccicure

Sudakarbhai K. 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 poultry immunity. It cures symptoms like greenish diarrhoea, conjunctivitis, nasal sputum, drop in egg production and respiratory distress in poultry. About 30g/100 birds for 0-4 weeks & 60g/100 birds for 4-8 weeks may be administered for seven days in stress or for three days before and three days after expected stress.

Mastiherb

Ukhardiyabhai S. Raot, Dang, Gujarat

Mastiherb is a unique intramammary herbal medication for curing mastitis in animals. Clinical trials indicated efficacy of the medication over subclinical mastitis; clinical mastitis and chronic mastitis. It was also validated in case of mastitis due to *Staphylococcus aureus*. The dose rate was found to be single intra mammary infusion for minimum three days after adequate standardization.

~These formulations are based on traditional knowledge of farmers and developed by Sadbhav-SRISTI Sanshodhan Laboratory (www.sristi.org). These products are licensed to Matrix Biosciences Pvt. Ltd, Hyderabad, Andhra Pradesh. The benefits are shared with the knowledge providers, communities, nature, those who add value and other stakeholders in the knowledge and value chain.

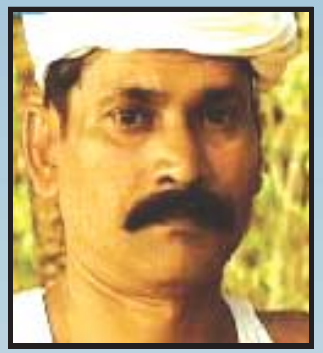

Take the road less travelled...

PART III

INNOVATIONS
for TAMIL NADU

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

01



Late M J Joseph alias Appachan
Kerala

Tree climber: a grassroots innovation going global

M J Joseph had developed a device under the guidance of his father that helps in climbing coconut or areca nut trees. The palm climber consists of two metal loops that are meant for holding the legs. There is a film made on his innovation by Discovery Channel and is very popular on Youtube.com. Recently, both the innovator and his father unfortunately passed away. NIF gave him a Consolation Award in its 2nd National Competition for Grassroots innovations and Traditional Knowledge in 2002. NIF also supported him through its MVIF scheme and gave him marketing support. NIF facilitated sale of his climber to customers in USA, Maldives, Thailand, Australia, Brazil, Mexico etc. (Also see Honey Bee, 13(4): 5-9, 2002 and 17(1) & (2): 14, 2006).

02

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 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.

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

Reversible reduction gear for marine diesel engine and Z- drive propeller

B Mohanlal
Kerala

Mohanlal has a small workshop for repairing fishing boat engines. He used to observe the inconvenience of the local fisherman while fishing with the existing petrol start kerosene run engine. These had inbuilt gearbox and the diesel engines had long tail propeller system without gearbox. The kerosene run engines consume high amount of fuel and pollute the water, which affects the reproductive capacity of fish. On the other hand the diesel engines powered systems do not have gear system for better maneuverability. Apart from this the beach landing was very difficult while using the conventional inboard marine diesel engines.

After rigorous research and development he could develop a gearbox and manually tiltable Z-drive system for small capacity diesel engine to overcome the above said problems. The state fisheries body, MATSYFED, is now partnering with the innovator for promoting the product among local fishermen.

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.

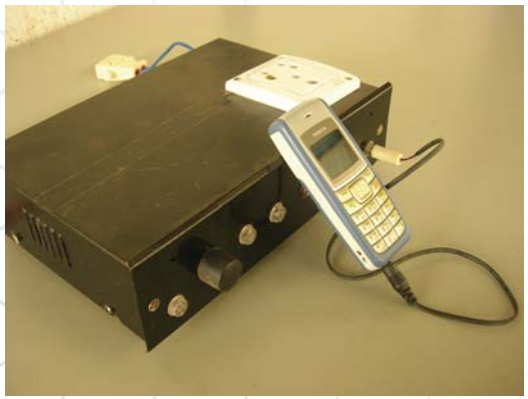
06

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 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

Solar mosquito destroyer

Mathew K Mathew
Kerala

Mathew K Mathew was interested in developing an environment friendly mosquito destroyer since his childhood. Soon after completing his studies he started working on his dream. It took him more than a decade to come up with the solar mosquito trapper cum destroyer. This device makes use of the smell from the septic tank to attract the mosquitoes. Once the mosquitoes get trapped inside the device, the heat built up inside the device, as a result of direct sunlight exposure, kills them.

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 in 2002. As a result of NIF's facilitation, he also obtained patents for his tractor in India and USA.

10

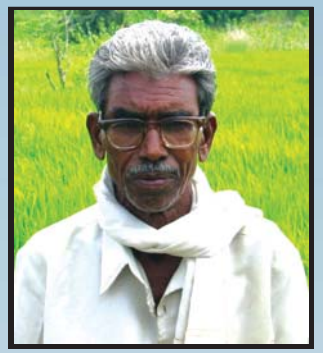
Biomass gasification system

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 complain 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 variety 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 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.

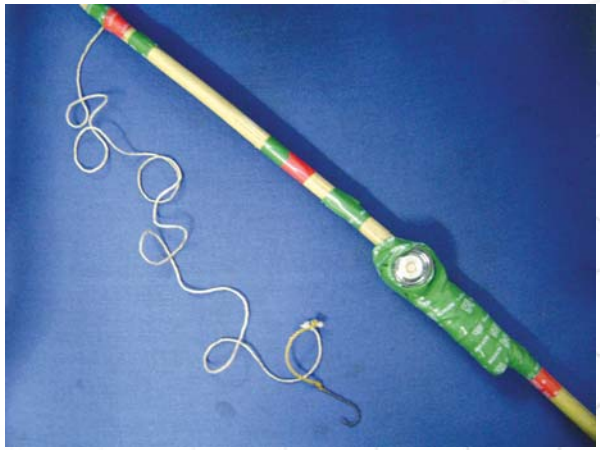
The innovator won a Consolation Award in NIF's Fourth National Competition in 2007. He has also been supported under the MVIF of NIF for commercialising "*Kamaal*". The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied for use in the gardens in the Rashtrapati Bhavan with encouraging results.

13

Sanjay Karmakar
Jharkhand

Fishing rod with light and sound alarm

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



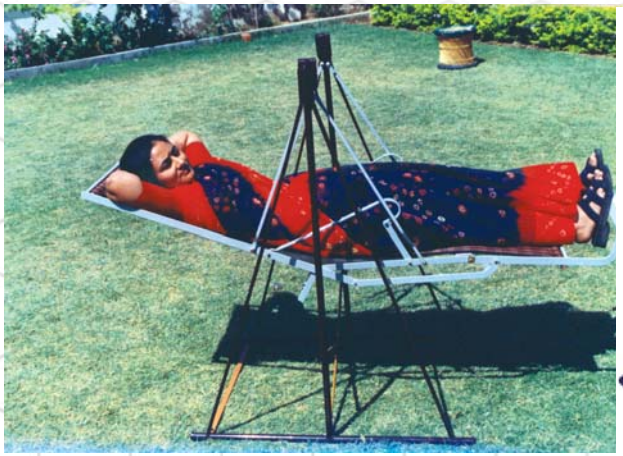
14

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.



Late S Harishchandra Shetty
Karnataka

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 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).

16

Mysore Mallige: A unique paddy variety

M Lingamadaiah*
Karnataka

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 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.

K Balakrishna
Karnataka

Power generation through sewage/slow moving water

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.

18

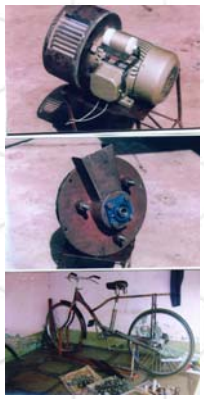
Arecanut husking machine

Narasimha Bhandari
Karnataka

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 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.



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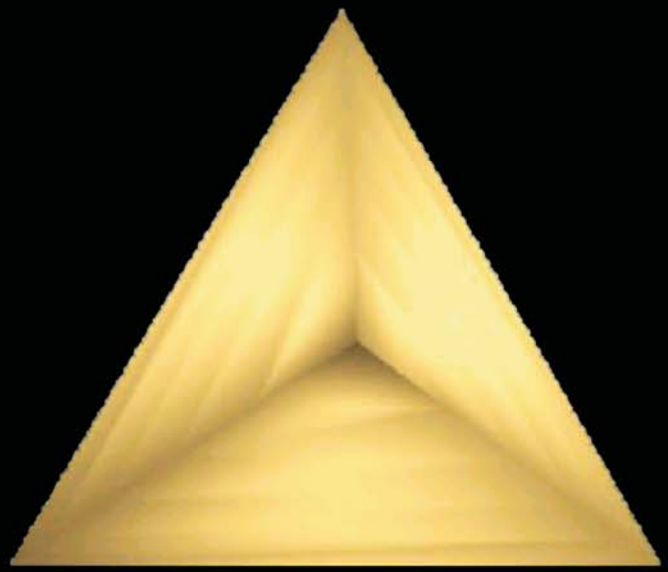

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