National Innovation Foundation

Kerala Innovates

KERALA INNOVATES

National Innovation Foundation

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HONEY BEE NETWORK

Regional Collaborator
Peermade Development Society
Idukki

CONTENTS

KERALA INNOVATES

PREFACE

National Innovation Foundation (NIF) has been pursuing the mission of making India innovative and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. Till date NIF has been able to scout innovations and traditional knowledge practices from over 520 districts across India.

Thanks to the support of volunteers from Honey Bee Network, we have been able to discover many unsung heroes and heroines of our society who have solved local problems without any outside help.

Despite various constraints, NIF has put together a small book celebrating creativity, innovation and traditional knowledge from Kerala. 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 Kerala 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 Kerala 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 520 districts of the country.

NIF has filed 198 patents in India and seven in US and one PCT application. Out of these, 33 patents have been granted to grassroots innovations in India and four in US. NIF has funded 113 projects under MVIF to the extent of Rs.1.3 crores. Hundreds of technologies have diffused through farmer to farmer social network.

NIF has proved that Indian innovators can match anyone in the world when it comes to solving problems creatively. Where they perform better than rest is in generating more affordable sustainable solutions by using local resources frugally.

Those who see poor only as the consumer of cheap goods, miss the knowledge richness at the grassroots level. The Poor can be the Providers also.

The Grassroots to Global (G2G) model that NIF is propagating is all set to change the way the world looks at the creativity and innovations at grassroots.

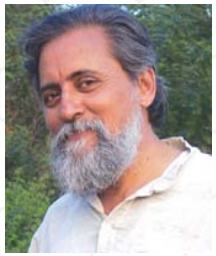
How can state government join hands with NIF?

a. NIF has no field extension unit nor does it want to have one. However, state government has several field functionaries in the area of agriculture, education, industry, rural development, women and child care, forestry, etc. There can be a very fruitful partnership between NIF as a

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 Kerala. 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

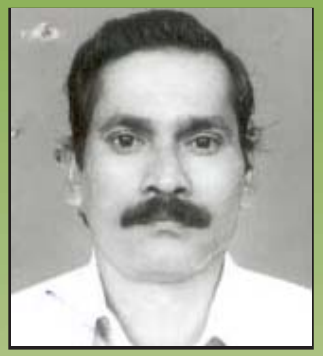
“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.

- Dr RA Mashelkar

PART I

INNOVATIONS
from KERALA

This section contains grassroots innovations originating from ignited minds of Kerala



Late M J Joseph alias Appachan
Kannur

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

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

B Mohanlal
Alleypey

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.

03

Mathew K Mathew
Kottayam

Solar mosquito destroyer

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.

04

Rain water syringe: A novel approach of water conservation

K J Antoji
Cochin

Antoji lives in the coastal area of Cochin, where the ground water is saline and ground water level is almost same as sea water level. Once, while he was watering his garden the hose pipe fell down and pierced the soil up to 30 cm due to water pressure. This triggered a thought in him about developing a rain water harvesting technique using pressure of water. After doing several experiments he came up with his innovation. In his system the roof top rainwater is stored in a pressure tank and with the help of PVC pipes water is lowered to a depth below sea water level. The pierced water recharges and dilutes the groundwater. When required, the water can be pumped out from the recharged well.

Thomson Augustine
Thrissur

Cost effective tyre re-treading

Usually tyre re-treading is done using steam based heating system, which needs about 1.5 tons of firewood to cure a 14 kg of matrix. Proper vulcanizing requires about 150° C temperature and 80 psi steam pressure. The tyres are directly exposed to heat, which results in reduction in life also.

The innovator has developed an electrically heated matrix system for tyre re-treading. The system has coil heaters with ceramic beads, digital thermostat control and timer to maintain constant temperature throughout the process for balanced curing. One can complete the operation in 18-20% of the cost of the conventional process by using the innovation. The innovator has been supported through MVIF of NIF. He has been granted an Indian Patent and has also sold over 100 machines throughout the country. NIF facilitated the technology licensing to Eastern Threads, a group company of Eastern Masalas.

06

Banana slicing device

Joy Augustine
Kannur

Joy Augustine hails from an agricultural family in Kannur. He noted the difficulty of slicing banana and after a long period of hard work and effort, he made a crude prototype for mechanical slicing of banana. The device has five cylinders to hold a banana in each and with the help of a blade set attached to the lower part of the device, bananas are sliced. There is a mechanism to reduce or increase the thickness of the banana slices. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

A T Thomas
Kottayam

Arrowroot grinding machine

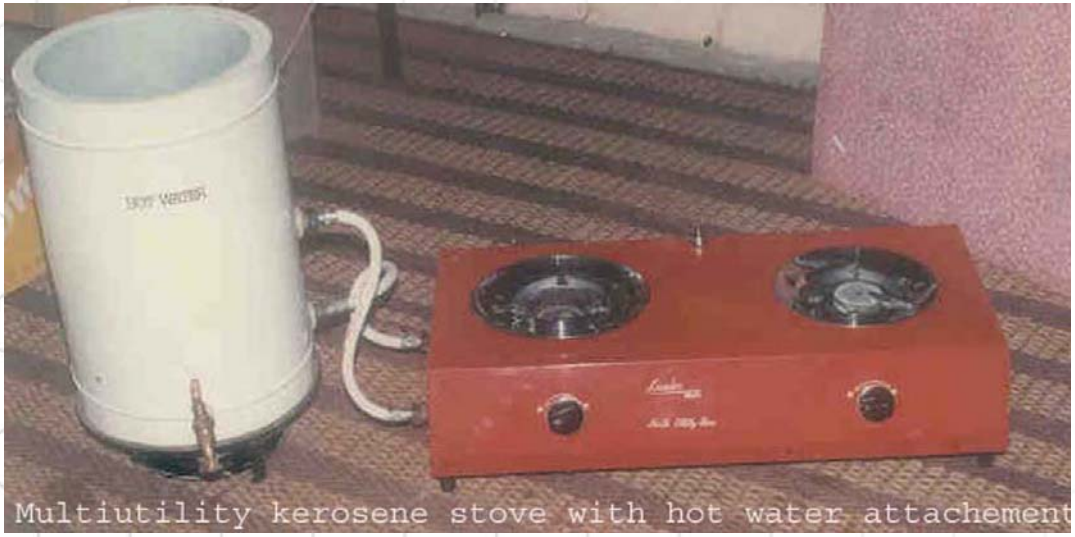
A T Thomas has plenty of arrowroot in his field, which he used to powder manually. However, he was not comfortable with the manual process as it was slow and hazardous. He pursued several experiments to develop a low cost, easy to use, hand operated processing machine. After several trials he developed a machine, which had a wooden roller with projections. The roller is powered by an electric motor. The arrowroot is crushed between the walls of the machine and the roller having projections to yield arrowroot powder. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

08

Multi utility stove

S J Joe
Calicut

S J Joe had developed a fuel-efficient multi-utility stove. Using this stove cooking can be done for 14 hours with one litre of kerosene. It has an in-built water jacket to generate steam, which can be used for cooking specific items. The stove comes with single, double and multi-burner units and gives a soft blue flame. Additionally, it is also smoke-free, which makes it very comfortable for the user. NIF gave him a National Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.



Multiutility kerosene stove with hot water attachement

09

Subha Rani Kurian*
Kottayam

Bicycle operated duplex pump

Subha has developed a bicycle operated duplex pump to meet the needs of high water table regions in the state, keeping the energy requirement within human capacity. Instead of hand operation the innovator has made the pump pedal operated as leg muscles are more powerful than hand muscles. The discharge of the pump was measured to be around 5000 lph while the stroke length was 14.3 cm. NIF gave her a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

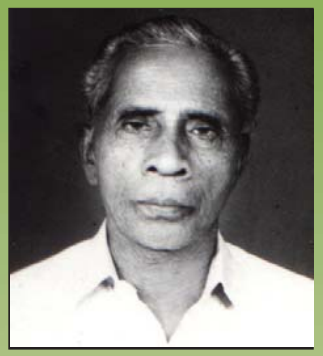
* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.

10

Machine for pulverizing red sandalwood

K X Benedict
Cochin

The idea for the innovation came when Benedict came across the sight of an old woman grinding sandalwood with a piece of rock to obtain a paste. The innovator spent three years researching and developing the machine completely unaided until he was funded by the Central Government of India to develop the final prototype. This device pulverizes the very hard red sandalwood to micro-fine (up to 50 microns) powder by feeding and rotating the timber against a revolving mill, which has thousands of cutters. It also generates very low sound while pulverizing. It does not require size reduction machines like cutters, slicers, disintegrators, etc. Through pneumatic force, the machine separates the micro-fine powder from the chips and wood particles that are poor in drug and colour value. The same machine can be used for very fine pulverizing of other hard timbers for Ayurvedic usage. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001 (also see Honey Bee, 12(3):15, 2001).



K Panickan
Kottayam

Insecticide for coconut trees

To prevent the attack of "*mandari*" (Eriophyid), a kind of insect that destroys tender coconuts, two plastic bottles of 200 mg capacity, filled with kerosene are hung with the help of a strong plastic yarn or twine yarn. One end of the plastic string is tied to the neck of one bottle, which should be kept open. The yarn is then placed at the neck of the tree, a little away from the flower bunch and tender coconuts, so as to allow the bottle to hang freely at one side. Another bottle should be tied to the other end of the string, standing at ground level. Approximately 75 per cent of the bottles are filled with kerosene, and by puling one side of the string the bottles will hang in the same height, just below the neck of the coconut tree. The string should then be tied up firmly onto the tree. The smell of kerosene generated by the swinging action of these bottles is enough to keep the mandari insects away.NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

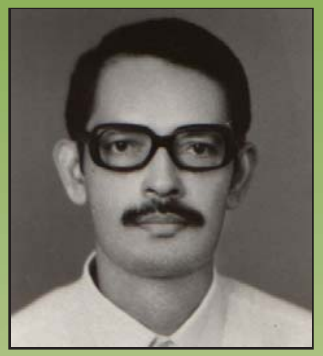
12

Water level indicator in bore wells

E K Markose
Thrissur

For the effective use of groundwater, proper monitoring is essential. The method used to indicate the water level in bore wells before this innovation was rather primitive: a special tape with chalk marks was inserted into the well but the measurement lacked accuracy. The innovator developed a device that produces a beep sound and a visual indicator glows when a probe touches the water. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

Natural convection drier for agricultural products



Dr P PThomas*
Thiruvananthapuram

To overcome the drawbacks of the conventional drier, the innovator created a machine in which the hot air is generated separately outside the drying chamber and is conveyed upward through a separate duct by natural convection. At the top of the duct an opening is provided for the entry of the hot air to the drying chamber where perforated trays are arranged one above the other. The hot air after entering the drying chamber tends to occupy the topmost layer just below the top covering sheet. As the hot air comes into contact with the wet material on the top tray, the temperature of the air drops, consequently, the density increases and the air flows down by percolating through the trays, where the wet material is placed. The cooler air, by the process of heat transfer, finally leaves the bottom of the drier. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

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

14

Floating toilet soap

C A Vincent
Thrissur

Vincent has been in the business of soap making for several generations. He observed many people taking bath in rivers and ponds loosing grip of their soaps, which often sink in the water. He conducted experiments in his soap manufacturing unit for about 14 years to develop this unique process of manufacturing soap that floats in water. The soap has a density of 0.878, TFM (Total Fatty Matter) as 73%, foaming stability as 0.1 cm and foaming power as 0.2 cm. Vincent has been doing quite a modest business by manufacturing and selling his soap.

K R Chandran
Alapuza

Easier, faster and economical husking

Though K R Chandran could study only up to the fifth standard, he became a highly skilled workshop mechanic through experience and hard work. Chandran felt the need for a machine specifically for threshing coconut husk. The conventional manual method of beating the husk is cumbersome and gives a very low output. It also damages the fibre while separating the pith of the husk. Spurred by the request of the former industries minister of Kerala, Susheela Gopalan, to develop the coir-husking machine during her tenure, Chandran developed it after putting in years of consistent effort. The machine devised by Chandran can husk about 3,200 coconuts in a day. Only two people are required to operate this machine, compared to 17 people needed for operating a conventional machine.

Chandran had earlier developed a machine for threshing paddy, putting in one and a half years of experimentation, which has already become very popular in the his district. NIF gave him a National Award in its 2nd National Competition for Grassroots innovations and Traditional Knowledge in 2002. He was also supported by NIF through its MVIF scheme (also see Honey Bee, 14(1):3-7, 2003).

16

Septic tank baffle system

Rajesh T R
Thrissur

The septic tanks used in the country are generally big and take a lot of time to construct. They also occupy a lot of space. Given the increasing pressure on land, smaller and more efficient septic tanks are needed. Rajesh, a small construction contractor, has done just that. He has developed an ingenious baffle for septic tanks using commonly available PVC pipes and bonding cement instead of the concrete baffles that are generally used in conventional septic tanks, which reduces the costs. The tank size is also reduced significantly. Its small, compact size and simple design makes this unit a cheap and efficient device, which is also environment friendly.

NIF gave him a National Award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005. NIF extended him MVIF support for testing in the early stage of the technology. The technology has been successfully transferred to GMI Zarhak Ltd., a company based in Goa. Through this partnership a portable ready to install roto moulded septic tank with baffle has been recently launched in the market (also see Honey Bee, 15(3):5-8, 2004).

V J Joseph
Kasargod

Fungal control in honey bee

In 1984, chalkbrood (a fungal disease) had nearly wiped out the honey bee industry in Kerala. The disease affects the honey bee larvae eventually killing them. The bees that do survive become listless, weak and darker in colour. The queen bee stops laying eggs, ultimately leading to the death of the colony. No medicine had proved to be effective. The only option was re-queening with resistant bee stock, which was often not successful. V J Joseph, involved in bee-keeping since 1980, felt that there had to be some way of tackling the disease. He developed an indigenous herbal medicine to combat chalkbrood. The cost of medicine for curing a diseased colony housed in one box is Rs 150. This is quite cost effective since during the peak season (December-April), one can harvest 15-20 kg of honey from one box and sell it at about Rs 60 per kg. NIF gave him a National Award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005.

18

Washing-cum-exercise machine

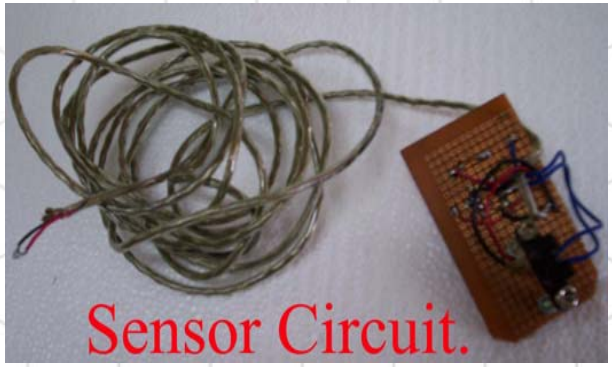
Remya Jose
Malappuram

Remya had to wash clothes when her mother had fallen ill. She thought of a simple, ingenious solution. She developed a washing machine after her Class X exams, which does more than just wash clothes. The washing-cum-exercising machine is made of metallic cabin, which has a perforated horizontal cylinder made of iron. The cylinder is connected to a pedaling system, which consists of a cycle chain, pedals and a seat. The clothes that are to be washed are put in the cylinder. The cabin is filled with sufficient water and washing powder is added. The clothes are left to soak for at least ten minutes. Subsequently, one needs to pedal for few minutes. This causes the cylinder to rotate with the clothes in it, cleaning them thoroughly. The water can be drained out and refilled and the process repeated. Finally, all water is removed. The clothes can even be dried (about 80% dry) by pedaling for some more time. NIF gave her an award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005 (also see Honey Bee, 15(4):4-9, 2004 & Honey Bee, 16(3):14-15, 2005)

P Krishnakant
Calicut

Speed restricting device

Since fourth standard, Krishnakant was so advanced in mathematics and had strong technical aptitude that he joined an institute for a 45-day electronics course intended for students in class ten or above. Since then, he has developed many projects such as a hydroelectric power plant, a transistor radio, an invisible intruder alarm, and a light activated switch. When he was in class XI, he developed the speed controlling device to limit the high number of accidents caused by speeding vehicles. This device is a microprocessor-based system, which limits the speed of a vehicle beyond a predefined value by restricting the fuel supply. When a driver increases his speed beyond a pre-set limit, he receives a warning from a buzzer unit and if he still persists, then the electronic valve blocks the fuel flow from the fuel tank to carburetor bringing down the speed. In the present innovation, an electronic solenoid valve is used, which has far greater precision and reliability than the mechanical based motor or actuator units fitted in conventional alternatives. NIF gave him an Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.



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Preventing accidents at a low cost: Side-stand gear lock system

K S Sudheer
Thrissur

Auto mechanic K S Sudheer developed a side-stand gear lock system to prevent two-wheeler accidents. His love for solving technical problems generated his interest in automobiles and innovation. Sudheer was inspired to build this side-stand gear locking mechanism after he witnessed a terrible motorcycle accident. An entire family was badly injured when their motorcycle side stand, which had not been pushed back after starting the vehicle, struck against an obstruction on the ground. Sudheer's retrofittable kit, costing just a few rupees, consists of a clamp, which restricts the engagement of gears when the side-stand is not removed. The interlocking mechanism is simple, easy to assemble, and affordable. Currently, this kit is configured for some models of Bajaj and Hero-Honda bikes, and it is also being developed for other models. NIF gave him a Consolation Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007. He was also supported through the MVIF scheme of NIF.

An improved disease resistant pepper variety -"*Kumpukkal*"

K T Varghese
Idukki

K T Varghese is an innovative farmer from Cheruvalikulam. In 1989, he faced severe incidence of quick wilt disease in his pepper plantation where almost all the plants got affected by the disease. He separated a few plants that remained unaffected and through vegetative propagation developed a disease resistant variety of pepper. It has a highly developed root system making it resistant to quick wilt and foot rot. It can also be grown in stony areas having less soil depth. The other advantages of the variety include stable yield, high oil content and more pungency than the local varieties.

Spices Board has also published about this pepper variety in its *Journal of Spice India*. The farmer has started diffusing the variety locally and in Malabar, Kozhikhode, Ernakulum, Punmudi, Trivandrum and parts of Karnataka and Tamil Nadu. NIF gave him a Consolation Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.

22

"*Wonder cardamom*"- a new variety of cardamom

Sabu Varghese
Idukki

Sabu has developed a drought-resistant cardamom variety- "*Wonder cardamom",* which can also be grown in rubber plantations at lower altitude. He developed the variety using seeds collected from a morphologically different plant followed by vegetative multiplication. The specialty of the variety is that it has branched panicles.

The yield per plant is 3.0 to 4.0 kg of dry cardamom compared to 2.5-3.0 kg in *Njallani*- the most popular variety of the region. Other important features of this farmer-bred variety, which have caught the attention of the scientific community, are: a) higher adaptablility to planting at lower altitudes and lower rainfall regions, which are traditionally known as non-cardamom belts and b) use as an intercrop in rubber plantations. The variety has diffused among places like Wyanad, Idukki, Kottayam, Kodaikanal (Tamilnadu) and Madakkara (Karnataka). NIF gave him the State Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.

Francis PA
Kannur

Papachchan style of pepper cultivation

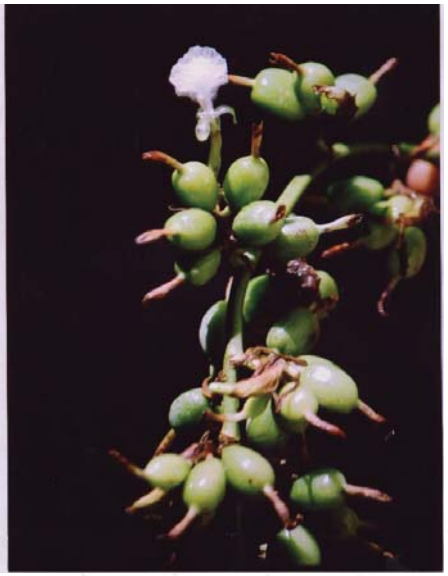
In Papachchan's agronomic practices, adequate natural drainage is considered best for pepper cultivation. He prescribes a two feet deep and one-foot wide trench along the border for isolating the pepper garden from other trees. No pits were taken up for planting. Pepper is grown as a pure crop in order to avoid intercropping losses. Planting material is prepared by cutting runners just below the nodes to restrict the plant to a single root. Jackfruit is considered as the best of the standards due to its timber value and manorial value of leaves. Saplings are planted close to standards so that the collar region is about three inches above the ground exposed to natural environmental conditions from the tender age so that the plants develop innate resistance. Mulching is used to reduce the erosion effects of raindrops and to conserve the soil. Mother vines are selected very carefully based on the past performance so as to obtain regular good yields, better growth and pest free cultivars. NIF gave him a National Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.

24

White flowered cardamom variety

K J Baby
Idukki

KJ Baby has developed a white flowered variety of cardamom from *Vazhuka* type of cardamom cultivars bearing purely white flowers. This variety has high productivity than other cardamom varieties in the region and can be grown in waterlogged areas as well. The variety has wider adaptability to different shade conditions apart from having higher production with good quality than other locally popular *Mysore* and *Vazhukka* cultivars viz., *Njallani*, *Green-bold*, *Palakkudi* and *Veeraputhara* varieties. It has sturdy plants, robust tillers and deep root system, which makes it resistant to various biotic and abiotic stresses. The variety has diffused among Idukki and Wayanad districts of Kerala, Chikmagalur district of Karnataka and some parts of Tamil Nadu. NIF gave him a National Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.



Sebastian Joseph
Idukki

New cardamom variety –"*Njallani*"

Sebastian Joseph, a marginal farmer, with the help of his son Rejimon Joseph developed a new variety of cardamom through selection from *Mysore* type of cardamom followed by multiplication through clonal propagation. He called his selection *Njallani* after the ancestral name. It was observed that the new variety had 120-160 capsules, which were larger in size too, as compared to 30-35 in the local variety. The ripe capsules could also be harvested in only two years compromising neither on quality nor on quantity of the yield. The industrious farmer has recently developed another cardamom variety, which is yet to be named, and which he says it can even be grown in the plains and not just hilly terrains. This variety is supposed to have made the largest contribution to Indian cardamom exports. NIF gave him a National Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001(also see Honey Bee, 12(2):11-16, 2001).

26

New Nutmeg variety – "*Kadukkamakkan Jathi*"

Abraham Mathew
Kozhikode

The new 'jaiphal' (nutmeg - *Myristica fragrans*) variety is the result of systematic selection from the seedlings planted at Kallanode from a collection of seeds originally procured from Sri Lanka in mid 1940s. The new variety bears large fruits. As compared to 150 dried nuts per kg of local varieties, the number in this variety is 90 dried nuts per kg. But more importantly, the quality of japatri or mace (dried fibrous aril, covering the testa of the fruit) obtained is much better. Further, since the tree is a dwarf type, farmers can grow 100 nutmeg trees along with 100 coconut palms in half an acre (0.2 ha) plantation area. He won the prestigious Kerala Kesari award from the Government of Kerala in 1995 as the Best Farmer. Besides this, he has also been awarded by NABARD as the best Model Farmer in the state and with KAMADA Krashaka award. He has received appreciation from several other organizations including All India Radio, Calicut. NIF gave him a National Award in its 2nd National Competition for Grassroots innovations and Traditional Knowledge in 2002.

K C Kuriakose
Palakkad

Propagation of rubber by budding

For Kuriakose farming has been a lifelong passion. He has standardized a technique of budding called as Young Budding. He got interested in budding after reading about it in an article. He persisted with different materials and methods and found that budding using buds from tender shoots of about 20-25 days old was very encouraging.

Budding success in Young Budded plants is 95-98% whereas in Brown Budding it is only 60-80%. In the Young Budding technique, the root system remains more or less intact, which ensures better growth and helps the trees resist strong winds. This also gives them greater protection against drying out in the initial years. The saplings become ready for planting in 10 months and the method saves labour as well as costs. The Budded plants become ready for tapping in five years as compared to the seven or more of Brown Budded plants. The technique is economically viable and can be applied on a commercial scale as a method of vegetative propagation in rubber.

There have been disputes about Kuriakose's claims to be the original innovator of the technique. However, The Rubber Research Institute of India vide their communication earlier commended the improvements made by him in the young budding technique and endorsed his claims. Subsequently, NIF gave him a National Award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005.

28

Kandakayam system - a new innovation in vanilla cultivation

George Mathew
Kottayam

George Mathew has developed a new method for the cultivation of vanilla in order to get more yield as well as some other advantages. Using this method the farmers can decide the exact place to grow the shoots and pods. The total length of the stem can be controlled to 18 metres thereby reducing the load on the supporting tree and since the stem is not entangled, the problem of disease is minimized. New unwanted sprouts and suckers are also averted. About 2500 plants can be grown per hectare. Supporting trees need not be interconnected for reinforcement and the expenditure on labour is also reduced. Lesser rainfall during November to February does not affect the yield adversely. The plants start yielding within one year, bunches of pods spring up from many nodes of the same branch and 20 to 25 fruits are obtained from each bunch. NIF gave him the State Award in its 2nd National Competition for Grassroots innovations and Traditional Knowledge in 2002.

Tom C Antony
Kottayam

A new nutmeg variety

Antony has been experimenting with patch budding in nutmeg trees for a long time. The high-yielding variety of budded nutmeg developed by him is a boon for the farmers, nutmeg is a perennial crop and low investment is required for cultivation.

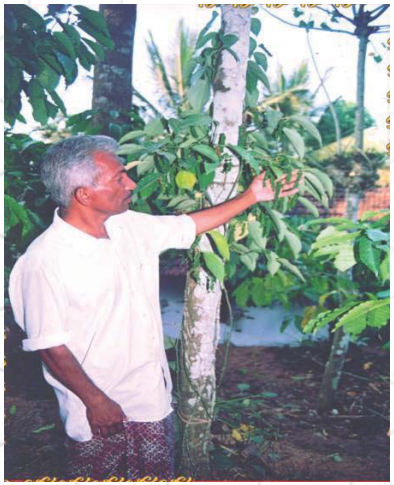
Usually it takes 100-120 nutmegs and 800 to 1000 nutmeg mace to weigh one kg. As against this, it takes only 80-100 nutmegs and 300-350 mace of the budded variety to weigh one kg. A 15-year-old tree yields 3500 to 5000 nutmegs in a year. The scion of nutmeg tree is budded to the stock of a forest variety and yields within four years. In the ordinary nutmeg, the sex can be determined only after flowering, which takes 6-8 years. This problem does not arise in the budded variety. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

30

Quick wilt resistant varieties of pepper

A Balakrishnan
Waynad

Almost after eight years of continued trial and observation, Balakrishnan has developed two high yielding pepper varieties *viz. Ashwati* and *Suvarana*. For developing both these varieties through crossbreeding a local variety *'Cheruvally'* was taken as the male parent and '*Uthrankotta'* and *'Karimunda'* as the female parent for *Ashwati* and *Suvarna* respectively. The *Ashwati* variety gets matured at 7 months and S*urvarana* at 8 months after flowering. The number of berries per spike are 200 and 90 for *Ashwati* and *Survarana* respectively. Dry yield per vine (5kg) and dry recovery (50%) are same for both the varieties and they are resistant to wilt and tolerant to drought.



Joy Peter
Idukki

New cardamom variety- "*Panikulangara Green Bold No.1*"

Joy Peter has developed a high yielding variety of cardamom from land race *Vazhukka* type of cardamom through selection followed by vegetative multiplication. This variety, which matures at 75-80 days after flowering, is less prone to disease and pests. Its green and dry capsule yield are 1500 kg/acre and 375 kg/acre respectively. The percentage of flower dropping is also found to be lesser than the traditional variety. The capsules are bolder and the ripe ones retain green colour and size even after drying. These characters help to fetch good market value. Based on the performance, the former Director of Spices Board officially released the variety for distribution with the name: *Panikulangara Green Bold No. 1.*

32

New variety of white gourd resistant to Yellow Mosaic Virus

Joy A S
Thrissur

The innovator has developed a yellow mosaic virus resistant white gourd variety by crossing a local variety with a resistant variety developed by Kannichaye Narayanan, a farmer staying near his village. The viral disease in plants grown by Narayanan, appeared only at the fag-end of the plant's life span. This variety is claimed to be 90-95 per cent resistant to viral disease. The average yield ranges between 240-250 q/ha and is suitable for summer season.

Biju Varghese
Kottayam

Retrofitted car for physically handicapped

While traveling with his friend, Biju, at the age of 20, was hit by a speeding bus. He ended up with a damaged spinal cord and both legs totally paralysed. One day on National Geographic channel, he saw how the huge sophisticated US President's plane, 'Air force One' being navigated by the pilot just by using his hand. He observed that mere fingers were controlling all the major operations. This triggered a thought in him to devise the modification kit for car. After discussing it with local car mechanics he came up with this device. With this new device, the retrofitting, brake, accelerator and clutch controls can be actuated with a single hand. The clutch is operated with the palm making it possible to apply full strength downwards. The accelerator is operated with the forefinger, while the middle as well as adjoining finger takes care of braking. NIF gave him a National Award in its 4th National Biennial Competition for Grassroots innovations and Traditional Knowledge in 2007.

34

Reciprocating hydraulic prime mover for water lifting

Noushad K T
Malappuram

The idea of utilizing the energy in streams and brooks came to Noushad's mind after he went to a science fair while in school. There he saw a model showing the rain water just draining off into the sea through the streams and brooks. Ever since, he thought of utilizing this free energy, which was simply being wasted. He worked upon this and came up with a reciprocating hydraulic prime mover for water lifting. A tank is placed or a dam is made in any small stream or brook. Inside this there is a float, which is made of two aluminum dishes welded together. When the water level in the tank reaches a certain height, water enters the float through four valves, which open when two wheels at the back of the float strike against certain iron sheets attached for this purpose. Filled with water the float sinks. Once it reaches the bottom, due to the force of gravity and atmospheric pressure a siphonic valve at the bottom of the float opens and water in the float is pushed out of the float and the tank through a pipe and the float rises up again. The whole process is repeated. The force produced by this motion up and down can be used for lifting water to a certain height. This device works automatically as long as water level is maintained. NIF gave him a Consolation Award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005.

P K Ravi
Idukki

Pepper thresher

Once Ravi was faced with a financial crisis and the work in his workshop came to a standstill. To supplement his income he developed a pepper thresher for farmers in his region, which has a large number of pepper plantations. The electric powered thresher developed by Ravi consists of a feeding hopper made of iron sheet, a rotating wire-loop type threshing drum and a concave metal sheet with perforated bottom, all of which are mounted on the main frame. The harvested pepper spikes are directly fed to the hopper, in the rotating drum. The threshed pepper passes down through the perforations and gets collected at the berry outlets. The machine also has the facility of manual operation.

The Spices Board (Ministry of Commerce and Industry, Govt. of India) has recognized his innovation and included it in the Board's subsidy scheme. NIF gave him a Consolation Award in its 3rd National Competition for Grassroots innovations and Traditional Knowledge in 2005. He was also supported through the MVIF scheme of NIF.

36

Low-cost manual milking machine

V A Johny
Ernakulam

In order to reduce human effort in milking the cows, need of mechanization was felt by Johny. He looked for the available machines for milking the cows and found that the prices were beyond the limit of small farmers. He developed a simple manually operated machine, which works on the principle of vacuum. It consists of a pump with a valve, plastic tubes and rubber bushes. One end of the pump is attached to the udders of cow and the other to a milk container. It helps milking the cows without causing them any irritation. Another innovator, Raghav Gowda from Karnataka has also developed a similar machine with slightly different design and set of materials. NIF gave him the State Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

Narayana Namboothiry*
Alappuzha

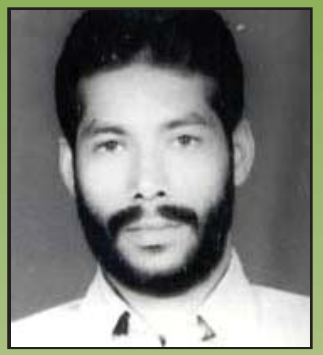
Multipurpose prime mover

Narayanan Namboothiry has been developing cost effective technologies for solving day to day problems from locally available scrap materials. One of his innovations is a multi-purpose prime mover powered by a 1.5 hp electric motor. It can be used for cutting heavy and light wooden pieces, for grinding metals and wood, buffing/polishing metal and wood, carving, turning, drilling and rimming in wooden or light metallic jobs. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

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

38

Low cost handpump



Ouseppachan Anchukandathil
Idukki

The innovator was in search of a cost effective hand pump for lifting water from the water reservoir to the overhead tank of the house. After working on his requirement for days he came up with the present low cost hand pump, which can deliver water up to a height of 200 ft through a one inch diameter pipe. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

Mathew V Mathew
Ernakulam

Kerosene stove with gravity feed fuel tank and cylindrical wick

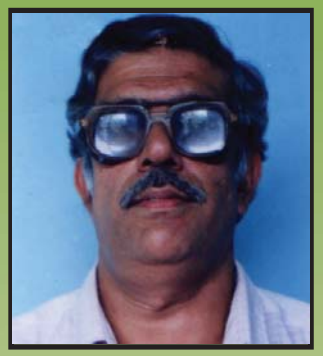
Existing kerosene stoves work through pressure generated by pumping or by keeping the fuel tank at a higher level than the stove. Mathew was worried about the accidents caused due to explosion as a result of pressure and pollution due to smoke, sound and odour. To prevent this he developed a kerosene stove, which consists of a burner set with gravity feed fuel tank and cylindrical wicks. This has also reduced in the fuel consumption. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

40

Development of a new coagulant

K K Thomas
Thrissur

Thomas could study up to the 6th standard only due to the poor financial condition of his family but he continued on carrying out chemical experimentations and reading informally. His thirst and vigor for doing something new resulted in his development of a new coagulant for rubber latex. He has invented a new coagulant i.e. Formalic acid for rubber latex coagulation in a very cheap way. The technology is now used by many natural rubber latex producers and as a result a large number of rubber planters have benefited. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.



P J Abraham
Idukki

Cardamom drying chamber

Abraham had to stop his studies in 10th standard due to the financial problems of his family. Even after this he did not give up his inquisitiveness and curiosity and learned a lot by conducting experiments informally. As a result of this he came up with a cardamom drying chamber, which is very useful for farmers. During drying in this chamber, cardamom can retain its natural green colour. Cardamom is just filled in a container and not spread over a large area. It therefore saves time, space and labour. The main part of the drying chamber is an air blower run by a 1 hp motor. NIF gave him a Consolation Award in its 1st National Competition for Grassroots innovations and Traditional Knowledge in 2001.

42

Automatic bathroom cleaner

Adarsh B and Suresh
Calicut

Adarsh and Suresh noticed that the public bathrooms remain perpetually dirty because the users don't flush water after using the toilet. This happen sometimes unknowingly or unwillingly due to users being in a hurry. Sometimes it is also because of the reason that regular cleaning is not done properly. The system developed by Adarsh and Suresh can clean the urinal system automatically after use. It also wipes the surface with brushes incorporated in the system. Thus the device cleans the public bathrooms automatically and without involvement of much labour.

Beam balance for blinds

Hemayan AK,
Sruthi ME, Vishnu R
& Sanjay M
Kozhikode

For taking part in a science exhibition held in their school, the students developed a beam balance for blinds. In this balance a semi-circular plastic tube containing some mercury is attached to the balance. Due to the difference in the weight, tilting of the balance to either side results in the movement of mercury column to that side. If the weight becomes equal on both the side of the balance, the mercury column comes in the center. This results in the completion of the circuit facilitated by a nail pin and an alarm is rung. Likewise, movement of mercury column to either sides of the balance also results in alarms via completion of circuit facilitated by the nail pins attached to the circular tube at different position on the tube.

16th Shodh Yatra
27 December 2005 to 2 January 2006
Kumuly to Kattappana, Idukki

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 16th Shodh Yatra, over the period of seven days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country (also see Honey Bee, 17(1) & (2): 9-13 & 30, 2006).

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 the 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

Source: NIF database

Uses of *Abrus precatorius* L. (Kunnikuru)

NIF database

Uses from Kerala

Baldness
Extract the juice from the leaves of *Abrus*, bitter snake gourd and liquorice and mix the ash of ivory and sesame oil. Apply the mixture on the scalp
- Suseela Rajan, Idukki, Kerala

Nervous disorder
Mix powder of tender seeds in milk and take orally
- Rani Mathew, Idukki, Kerala

Uses from other states

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

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

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

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

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

Dog bite
Mix half of the seed with curd and take it twice a day for two-three days
- Indrasingh Rana, Udham Singh Nagar, Uttarakhand

Uses from Classical Codified Literature

Dried leaf and root powder are 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 *Achyranthes aspera* L. (Thumba)

NIF Database

Uses from Kerala

Headache
Apply the leaf and inflorescence paste on the forehead
- Leelamani Devarajan, Idukki, Kerala

Intestinal worms
Extract juice from the inflorescence, boil it with milk till it becomes thick. Take it orally with a little amount of asa-fetida
- Sarasamma Rajappan , Idukki, Kerala

Uses from other states

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

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

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

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

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

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

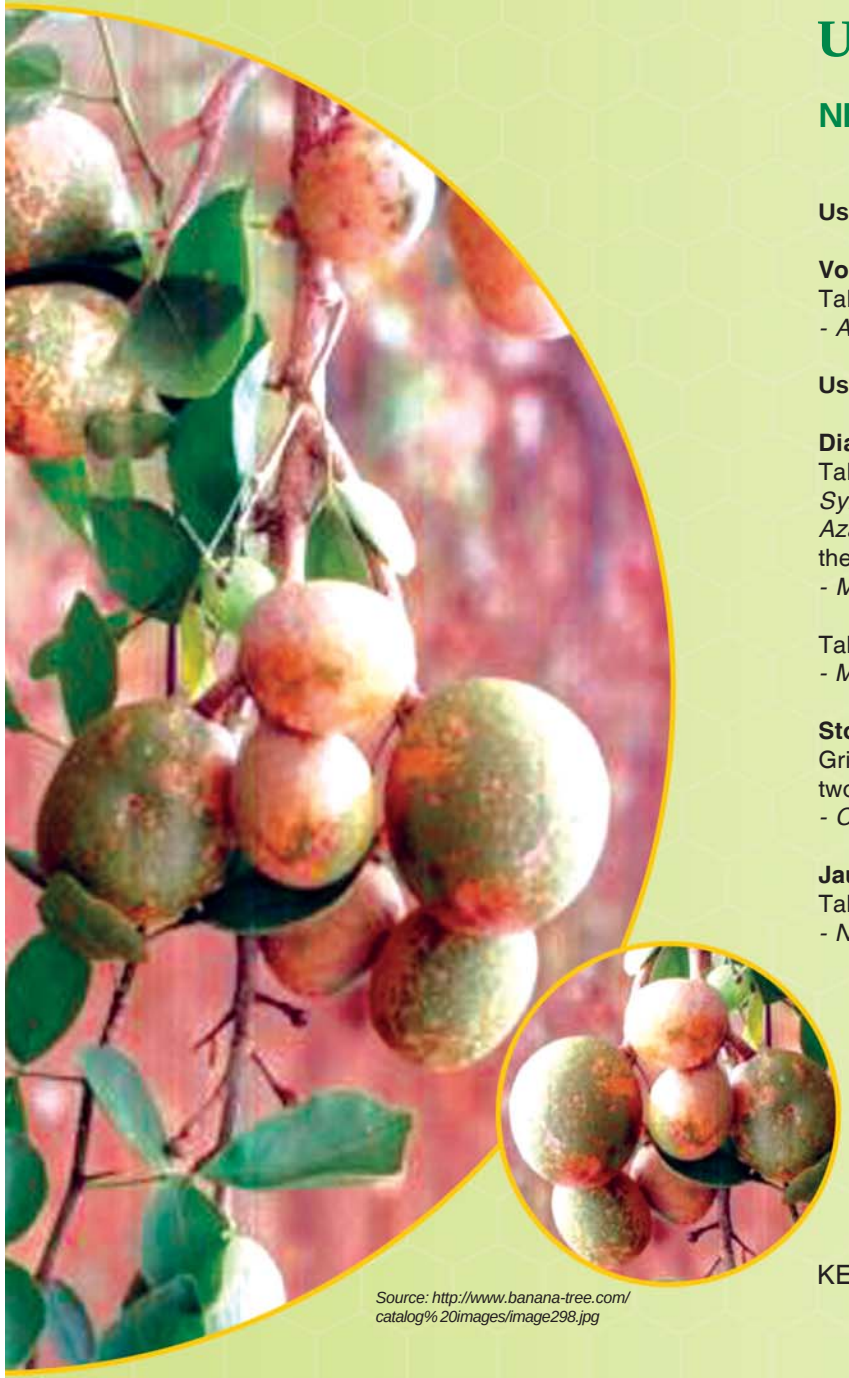
Abscess
Apply the root paste topically
-Ravi Uraav, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Dried aerial parts are taken orally in the case of diabetes[7]; powder made from the dried plant is given orally to treat whooping cough[8]; decoction of the plant is used as laxative[9] and is also applied externally on boils and pimples[9].

Product 'Cystone'[10] is made from this plant, which inhibits calculogenesis by reducing stone-forming substances like oxalic acid, calcium hydroxyproline and prevents urinary tract infections. Thirty five patents have been found on the medicinal applications of *Achyranthes* mainly for curing laryngopharyngitis[11], and bronchial asthma[12].

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



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

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

NIF Database

Use from Kerala

Vomiting
Take the decoction of root orally
- Alice Kunjachan, Idukki, Kerala

Uses from other states

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

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

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

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

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

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

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

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

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

Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis[8]; 10g fruit pulp is given before sleep to overcome morning sickness[13]; and fruit rind is applied externally on hair to kill head lice[14].

Sweet fruit slices of 'Bael'[10], prepared from *Aegle* are used in diarrhoea, dysentery and GI disorders. It has digestive and carminative properties. Lukol's[10] tonic is made from this plant along with other plants. It improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system also help control leucorrhoea. 'Bilwa'[15], a product of *Aegle* is used as a medicine to cure a number of diseases. Fifty three patents have been found on the medicinal applications of *Aegle* mainly for curing diabetes[16], gastric ulcer[17] besides novel uses as herbal catalytic composition (US 6012417) for pollution control in automobiles.

Uses of *Areca catechu* L (Adakka)

NIF Database

Uses from Kerala

Gray hair
Apply the leaf paste on the scalp
- *Leelamma Kuttappan, Idukki, Kerala*

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

Uses from other states

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

Eye ailments
Put the nut paste in the eyes
- *Sunita Kumari, Sitamarhi, Bihar*

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

Burn
Apply the paste of raw seeds topically
- *Bhoothathan Kanni, Tirunelveli, Tamil Nadu*

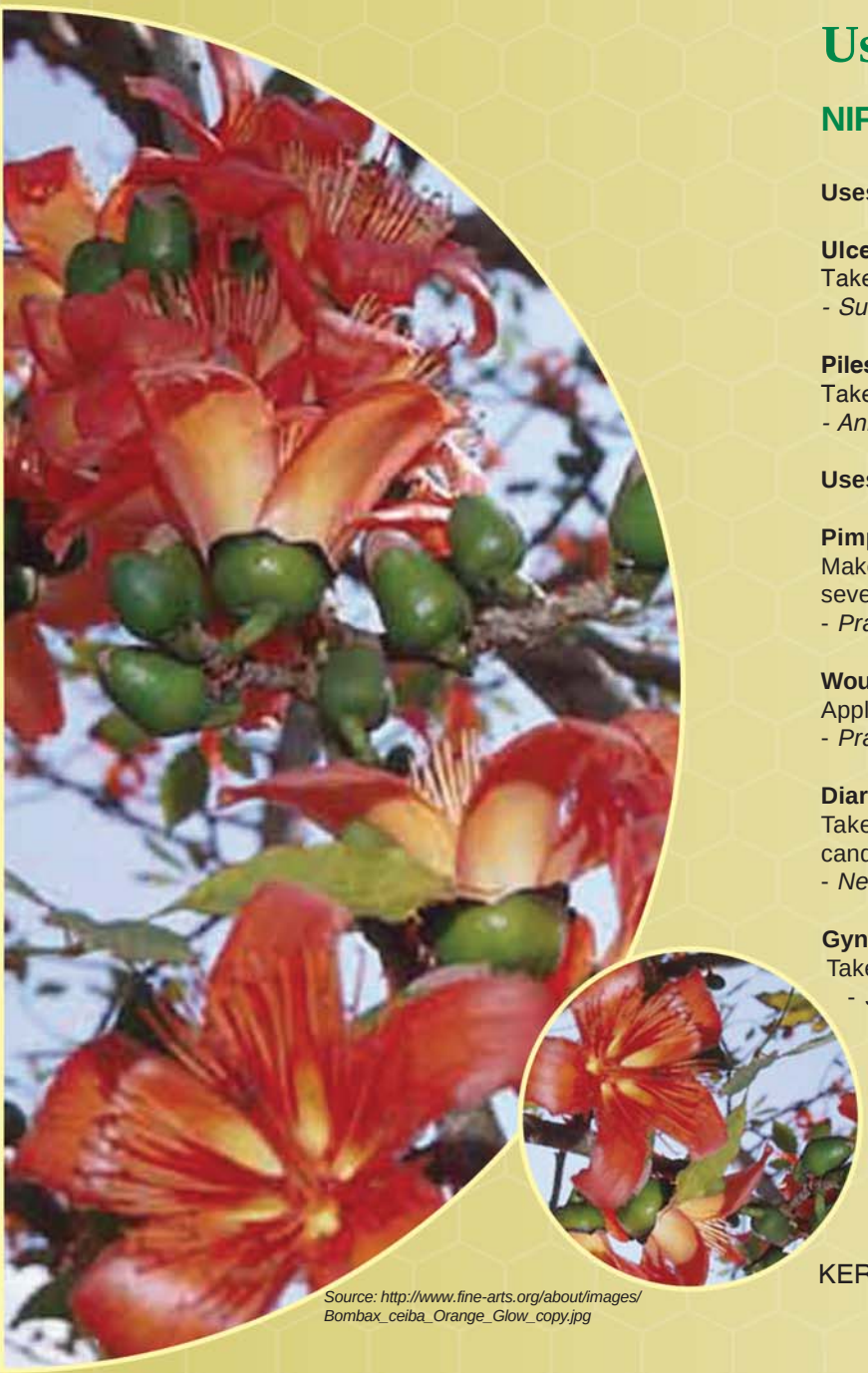
Dysentery
Take the root decoction orally
- *Purna Kanta Shyam, Sibsagar, Assam*

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[18]; leaves are used as antipyretic[19]; powder of tender seeds is boiled in coconut oil and applied in case of burns[20]. Product 'Lukol DS'[10] tablet contains *Areca* as one of the ingredients and is useful in leucorrhoea and related symptoms. 'Himplasia'[10], 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[21] and as an antiviral[22].

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



Source: http://www.fine-arts.org/about/images/Bombax_ceiba_Orange_Glow_copy.jpg

Uses of *Bombax ceiba* L. (Mocha)

NIF Database

Uses from Kerala

Ulcer
Take powdered gum along with milk
- Sulekha Jabber, Idukki, Kerala

Piles
Take the flower decoction orally
- Annakkutty Joseph , Idukki, Kerala

Uses from other states

Pimples
Make a paste of thorn with milk. Apply on the pimples for seven days
- Pravin Kumar Sharma, East Champaran, Bihar

Wound
Apply the fresh bark paste topically
- Pravin Kumar Sharma, East Champaran, Bihar

Diarrhoea
Take a spoonful of leaf juice along with some sugar candy for four days
- Neha Kumari, East Champaran, Bihar

Gynaecological disorder
Take the gum powder (5g) with water for five days
- Jugeshwar Ram, Hazaribag, Jharkhand

Constipation
Take the bark powder (3g), coriander powder and jaggery with water
- Devaram, Sirohi, Rajasthan

Piles
Take the root paste (10g) with water for seven days
- Antaryami Pradhan, Angul, Orissa

General health
Few flowers are soaked in a glass of water overnight. Filter and take the water the next morning to give a coolant effect to the body
- Mukta Kumavat, Sikar, Rajasthan

Uses in Classical Codified Literature

Decoction of the bark is given orally to combat fever[23] and of the heartwood is given for controlling diabetes[24]; and bark juice is administered to reduce stomachache[25].

Product 'Acne-n-Pimple Cream'[26] is prepared from *Bombax* along with other plants to treat pimples and skin eruptions. 'Evecare'[10], a multi herb product made from this plant, has a regularizing influence on the menstrual cycle. Eight patents have been found on the medicinal applications of *Bombax* mainly for skincare[27], AIDS[28] etc.

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

NIF Database

Uses from Kerala

Toothache
Apply the latex on the teeth
- Theyamma Varkey , Idukki, Kerala

Wart
Apply the latex topically
- Theyamma Varkey, Idukki, Kerala

Uses from other states

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

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

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

Stomachache
Smear mustard oil on a leaf and 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[29]; 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[30]; warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain[31]. 'Muscle & Joint Rub'[10] is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'[32], 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 [33] and bronchial asthma[12].

Source: SRISTI Database

Uses of *Carica papaya* L. (Pappayam)

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

NIF Database

Uses from Kerala

Ringworm
Apply small fruit pieces topically
- Marykutty Thomas, Idukki, Kerala

Constipation
Take fruit to get relief
- Leelamani Devarajan, Idukki, Kerala

Intestinal worms
Take unripe fruit to get rid of intestinal worms
- Leelamani Devarajan, Idukki, Kerala

Uses from other states

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

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

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

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

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

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

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

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

Veterinary practice

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

Uses in Classical Codified Literature

Decoction of the flower is used as cardiotonic[34]; bark powder is applied externally on wounds[3]; decoction of the bark is given orally to get rid of intestinal worms[35]; beverage of the fruit is taken orally to cure diarrhoea[36]. Natural moisturizers and creams[37] are prepared from *Carica* in combination with other plants. Thirty patents were found on its medicinal uses as an antiallergic[38] and for prevention of cancer[39].

Uses of *Cassia fistula* L. (Konna)

NIF Database

Uses from Kerala

Eye disease
Apply the leaf paste on the eyes
- Chinnamma, Idukki, Kerala

Sores
Make the leaf paste using the water in which rice has been cleaned. Apply the paste topically
- Sulekha Jabbar, Idukki, Kerala

Uses from other states

Mouth sore
Juice extracted from the plant is kept on a banana leaf and the leaf is burnt. The ash is then applied on the affected part
-Purna Borah, Golaghat, Assam

Dysentery
Equal amount of bark of *Cassia*, *Mangifera indica* L., *Psidium guajava* L. and *Spondias pinnata* (L. f.) Kurz. is ground into a fine paste. Two spoonful of this paste are administered orally
- Niru Patangia, Sonitpur, Assam

Ringworm
Paste of the scrubbed tuber is applied on the infected part of the body for a few days
- Kumar Chandel, Hamirpur, Himachal Pradesh

Cough
Skin of the fruit is chewed in the morning
- Santoshben Gamar, Banaskantha, Gujarat

Stomachache
Decoction of the fruit and jaggery is taken orally
- Bhagwati Lal Kumawat, Chittorgarh, Rajasthan

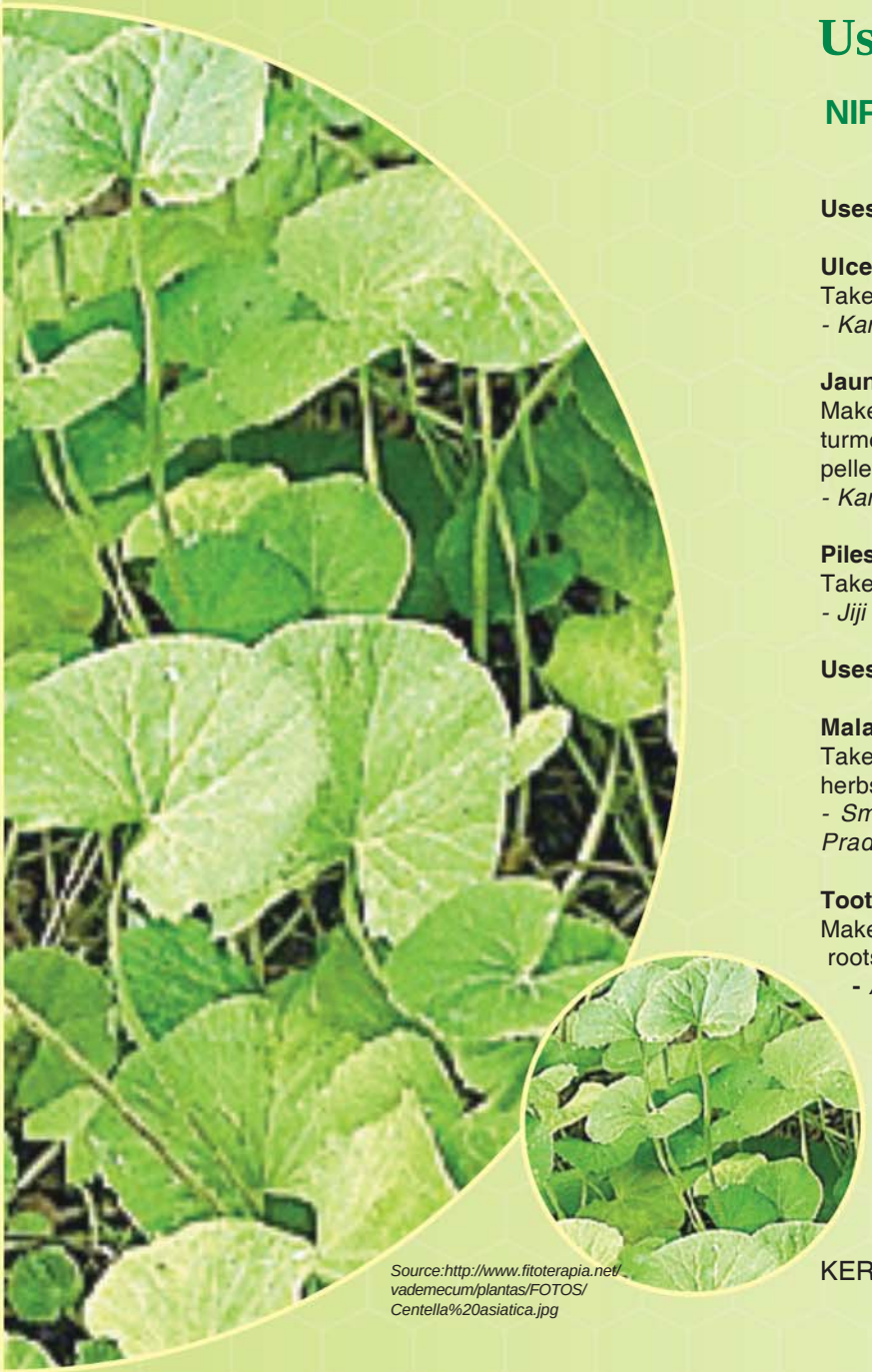
Uses in Classical Codified Literature

Powder of dried bark is applied in case of leucoderma[40]; fruit juice is taken in jaundice[41]; fruits are used as diuretic[41]; root powder is applied in skin diseases[41].

Pilex[10](Vein care) helps support metabolic processes involved in maintaining the vascular system's integrity for optimum health and appearance; Purim[10] (Hemo care) is used for blood purification. Six patents have been found on the medicinal applications of *Cassia fistula* including antiviral[42] applications.

Source: http://www.bh-froe.com/ZC/images/Cassia_fistula.jpg

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



Source:http://www.fitoterapia.net/vademecum/plantas/FOTOS/Centella%20asiatica.jpg

NIF Database

Uses from Kerala

Ulcer
Take the leaf paste along with buttermilk
- Kanchana Sasi, Idukki, Kerala

Jaundice
Make leaf paste along with little amount of cumin and turmeric and prepare small pellets. Dissolve one pellet in a cup of milk in the morning and take it orally
- Kanchana Sasi, Idukki, Kerala

Piles
Take pounded leaves regularly on an empty stomach
- Jiji Jacob, Idukki, Kerala

Uses from other states

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

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

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

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

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

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

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

Insomnia
Include the whole plant paste in daily diet
- Khiroram Barman, Borpeta, Assam

Uses in Classical Codified Literature

Fresh juice of aerial part is used as brain tonic[43]; powder of aerial parts helps to control high blood pressure[44]; whole plant is diuretic[41]; plant paste is applied as a poultice in case of bone fracture[41]. 'Herbal Tea'[45] is mainly indicated as a health drink. 'Mentat'[10] improves mental functions, mental quotient, memory span, and concentration ability and stress threshold. More than three hundred patents were found on its medicinal applications mainly as an anti-depressant[46].

Uses of *Ficus benghalensis* L. (Vatam)

NIF Database

Uses from Kerala

Acne
Apply the leaf paste topically after adding little butter
- Theyamma Varkey, Idukki, Kerala

Fistula
Grind leaves along with a medium sized bottle gourd. Take it orally after adding buttermilk
- Sahyadri SHG, Idukki, Kerala

Uses from other states

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

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

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

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

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

Uses in Classical Codified Literature

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

'Anti-Dandruff shampoo'[10], a product prepared from this plant in combination with other plants, is used to keep hair healthy and dandruff free. Product 'KLD Lotion'[49], a multiherbal ayurvedic preparation using *Ficus*, is effective in many skin ailments such as acne marks, pimples, burns - sunburns, nappy rash etc. 'Litina'[50], a herbal toothpaste made from this plant along with other plants, is good for the gums and the teeth. Four patents have been found on medicinal applications of *Ficus* for antitumor[51] medication, wound healing[52] etc.

Source: NIF database

Source:NIF Database

Uses of *Moringa oleifera* Lam. (Murinna)

NIF Database

Uses from Kerala

Leucoderma
Take the curry of the leaves of moringa, pumpkin and spinach
- *Rama Radhakrishnan, Idukki, Kerala*

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

Kidney problem
Make decoction of the root along with little black pepper. Take it orally
- *Mariamma Jose, Idukki, Kerala*

Uses from other states

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

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

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

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

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

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

Uses in Classical Codified Literature

Juice of bark is given orally along with a pinch of asafetida and salt[20]; dried fruit is eaten to combat diabetes[53]; powder of the plant is administered orally to cure asthma[54].

Product 'Sugan Nutrimix'[55] is a ready mix preparation where *Moringa* is mixed with pulses, spices and other natural ingredients to make it rich in nutrients, minerals, protein etc., and to enhance its taste. This powder can be consumed in it is natural form or can be mixed with staple food. 'Pain Massage Oil'[10] is a herbal oil, which provides relief from neuromuscular pain. Twelve patents have been found on its medicinal uses such as for anticancer[56] and antidiabetic[57] properties.

Uses of *Phyllanthus emblica* L. (Amalakam)

NIF Database

Uses from Kerala

Gray hair
Wash the hair regularly with the fruit decoction
- *Sulekha Jabbar, Idukki, Kerala*

Headache
Make bark paste using the water in which rice has been washed. Apply the paste on the forehead
- *Sulekha Jabbar, Idukki, Kerala*

Uses from other states

Diarrhoea
Take the juice of amla with an equal quantity of lemon juice orally
- *Bina Chaudhry, Kamrup, Assam*

Gynaecological disorder
Take one spoonful of the powder of amla, tapioca and cumin (in equal proportions) orally to cure the disorder
- *Guna Ram Kanikar, Golaghat, Assam*

Diabetes
Take two spoonfuls of the powder of amla, *Terminalia chebula* Retz., *Terminalia bellirica* Roxb. (in equal proportions) orally
- *Pritam Chand, Kangra, Himachal Pradesh*

Cough/cold
Prepare powder from fruits (4) and *Glycyrrhiza glabra* L. (10g). Take 5g of this powder with a glass of water
- *Ved Prakash, Faridabad, Haryana*

Jaundice
Take one spoonful of the powder of amla fruit, ginger, black pepper and turmeric (in equal proportions) orally along with honey
- *Nagarmal Bagaria, Nagor, Rajasthan*

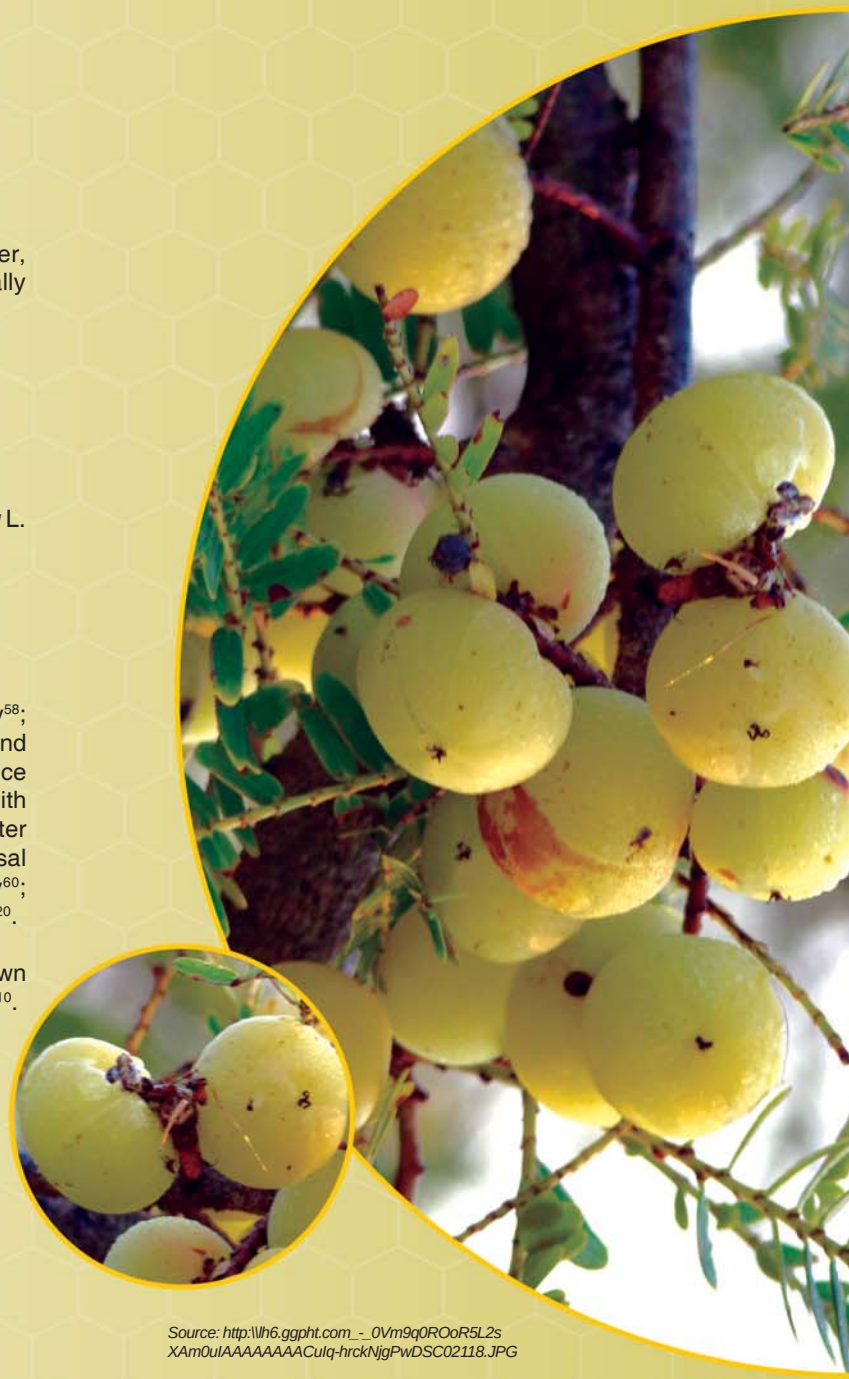
Wounds
Apply the pounded leaves topically
- *Sevaram Bhaskar, Dhamtari, Chhattisgarh*

Poisonous bite
Chew 3-4 root pieces along with a leaf of *Areca catechu* L. to get relief from the effect of poisonous bites
- *Anna Gangavarn, Osmanabad, Maharshtra*

Uses in Classical Codified Literature

Bark and fruits are used in diarrhoea and dysentery[58]; fresh juice of the fruit, mixed with pure cow's butter and honey, is administered to cure obstinate hiccough[58]; juice relieves pain in urine trouble[58]; pulp (2-3g) is eaten with warm milk to get rid of headache[59]; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding[8]; fruits are taken orally to reduce acidity[60]; decoction of the fruit is taken to increase blood count[20].

Phyllanthus is one of the main ingredients of well known medicines 'Triphala, Chavanprash and Amla hair oil'[10]. Seventy six patents have been found on its medicinal uses such as for diabetes[61], liver disorders and immune deficiencies[62].



Source: http:\\lh6.ggpht.com_-_0Vm9q0ROoR5L2s XAm0uIAAAAAAAACuIq-hrckNjgPwDSC02118.JPG

Uses of *Solanum xanthocarpum* Schrad. & Wendl. (Kantakarichunta)

Source:SRISTI Database

NIF Database

Use from Kerala

Toothache
Inhale the fumes of the seeds burnt in coconut shell
- Ramathayu, Idukki, Kerala

Uses from other states

Eye pain
Put a couple of drops of the fruit juice in the eye to get rid of pain
- Kamlesh Patil, Jalgaon, Maharashtra

Mouth ulcer
Take the fruit juice orally with a little salt
- O. Ibobi Devi, Bishnupur, Manipur

Throat pain
Take the root decoction orally along with honey
- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Fever
Take the root powder orally to cure fever
- Kamlesh Patil, Jalgaon, Maharashtra

Take the fruit juice orally along with honey
- Shijagurumayum Sandhyarani Devi, Bishnupur, Manipur

Ear pus
Put 2-3 drops of the root decoction in the ear
- Kamlesh Patil, Jalgaon, Maharashtra

Vomiting
Take the root juice orally with some honey
- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Uses in Classical & Codified literature

Extract of dried flowers is administered orally to cure fever[9]; extract of fruit and seed is taken orally to combat cold[63]; the plant acts as a gastric stimulant[9]. Product 'Diakof'[10] and 'Koflet'[10] made from *Solanum* is beneficial for both dry and productive cough. Five patents have been found on its various medicinal uses such as bronchial asthma[64] and cancer[65] etc.

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

NIF Database

Uses from Kerala

Stomach disorder
Take the leaf curry
- *Cici Unni, Idukki, Kerala*

Cardiac problem
Take the leaf decoction orally after adding little black pepper powder
- *Rani Mathew, Idukki, Kerala*

Jaundice
Take the decoction of the leaves of *Tinospora*, sugarcane, neem bark and grapes orally along with honey
- *Suseela Rajan, Idukki, Kerala*

Uses from other states

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

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

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

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

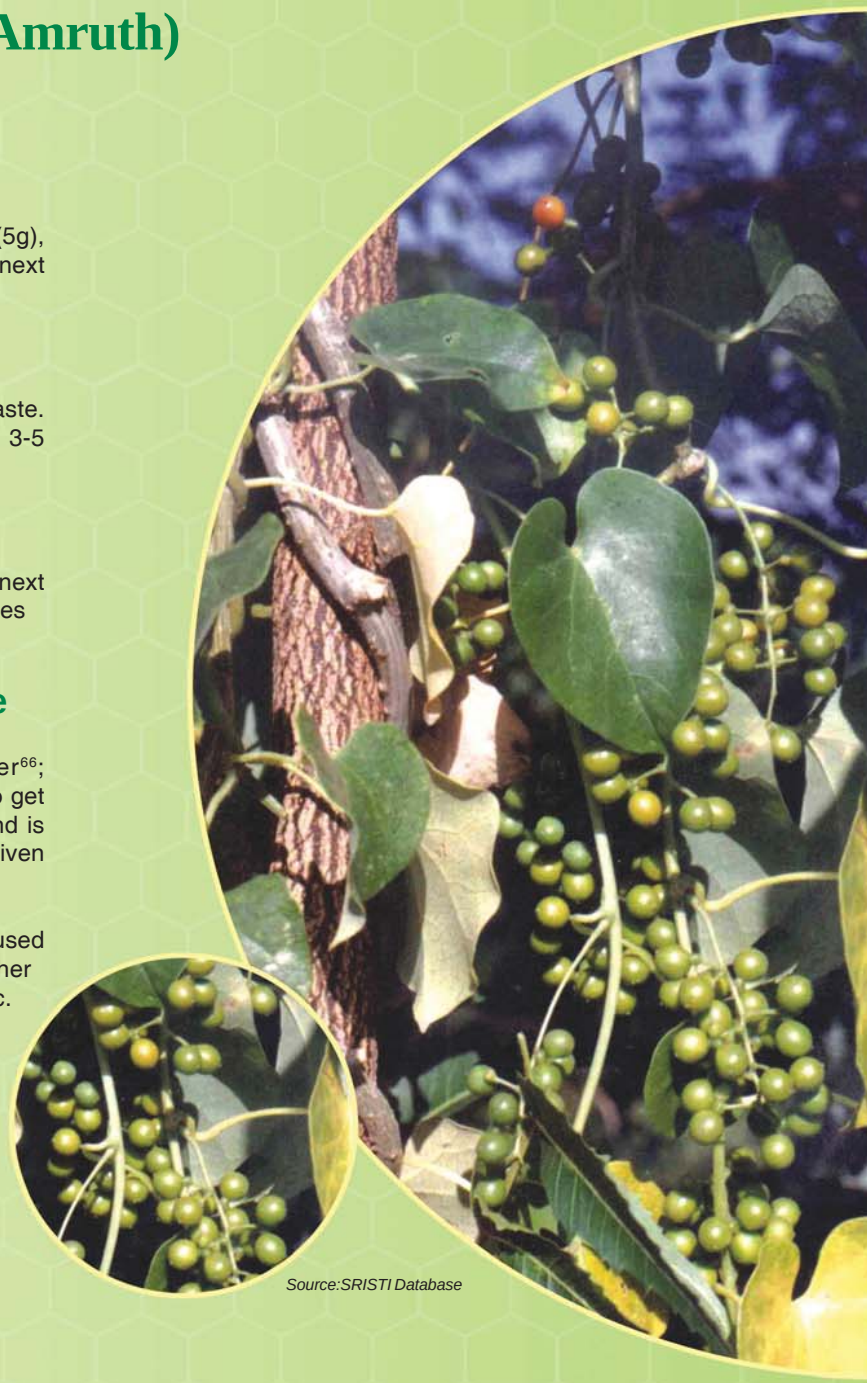
Piles
Boil, dry and grind the whole plant (50g) into a fine paste. Make tablets and take one tablet thrice a day for 3-5 days
- *Pukhram Angouba Singh, Bishnupur, Manipur*

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

Uses in Classical Codified Literature

Powdered roots are taken to cure mouth ulcer[66]; powdered plant is administered orally with honey to get relief from stomach disorder[63]; the stem is bitter and is used as anthelmintic[41]; and decoction of the plant is given orally to cure diarrhoea[67].

Tinospora is a well known medicinal plant and is used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon'[10] etc. More than a hundred patents were found on its medicinal applications mainly as an antiallergic[68] and for cancer[56].



Source:SRISTI Database

Promotion of knowledge based enterprises and lateral markets

National Innovation Foundation in association with regional collaborator Peermade Development Society initiated a massive campaign through women self help groups to mobilize knowledge, innovations and practices among women. In this exercise more than ten thousand traditional knowledge practices were documented (many were quite common) from the field of cosmetics, nutraceauticals, health care, cooking etc., from just one block of a district in Kerala. This exercise has indicated the immense potential of knowledge at the grassroots, which can be converted into products and viable enterprises for augmenting livelihood options for rural women.

Initially four products having commercial potential were taken up for enterprise development. All knowledge holders of the four products were constituted as a single SHG named Amala and SSI registration was done. Nutrient supplement, baby massage oil and incense stick are the products selected for the initial intervention. The products were tested and standardized. All products were made available in the market under the brand name SAHYA.

The products were formally launched on August 11, 2007 in an auspicious function, attended by large number of women including the innovators. Amala enterprise was supported through the MVIF scheme of NIF.

Herbal hair oil

Valsamma Thomas
Idukki

Valsamma resides in a small village called Mattukatta. She is 47 years old, married with three daughters. Valsamma was suffering from chronic headache since her childhood, which was usually followed by high fever. She consulted many doctors and took all kinds of medicines – both allopathic and Ayurveda, but in vain. The condition got worse as the years went by. Sometime in 2002, she had a brainwave and prepared oil using different varieties of herbs and started applying the same on her head before shower. After having done this for a period of time she was completely cured.

In 2006, she was honoured with “SRISTI Samman Award” in appreciation of her efforts. In the same year, she was also provided with an MVIF support of Rs 25000/- to commercialize the oil. With that amount, she began to produce the oil in large quantities and did quite a good business. People came to her from all over the State to buy the oil. She was ready to refund the loan amount completely in two months period though the loan was for a period of six months. As the demand for oil increased, Valsamma’s income too rose higher; she even bought a brand new car with her income.

In 2006 she received an award for her hair oil from Ayyappankoil Grama Panchayath and the news about it appeared in all the news papers. In 2007 she also received the prestigious ‘K.R. Narayanan Study Centre Award’ for the oil. All these recognitions and awards gave wide publicity for her hair oil and at present she has regular customers from Kerala, Andra Pradesh, Tamil Nadu and even from Gulf countries.

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.

PART III

INNOVATIONS
for KERALA

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

01

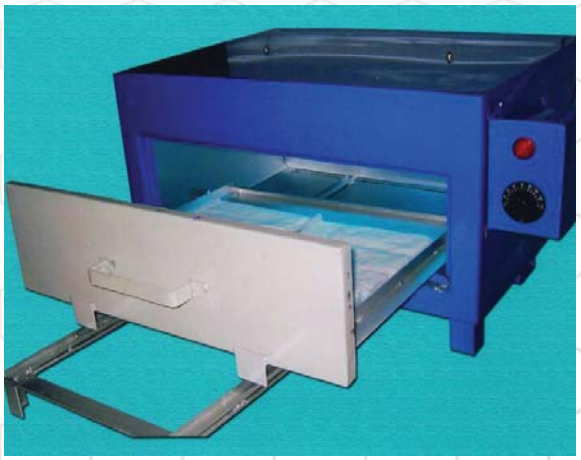
A. Muruganantham
Tamil Nadu

Sanitary napkin making machine: An option for women entrepreneurship

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

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

The innovator prefers to sell the napkin making machinery only to self-help groups of women. He has also designed a napkin vending machine such that one can put a coin and get a pad. With the support from the MVIF scheme of NIF, the innovator has been able to install over fifty units in seven states. NIF has filed a patent for the technology in the innovator's name.



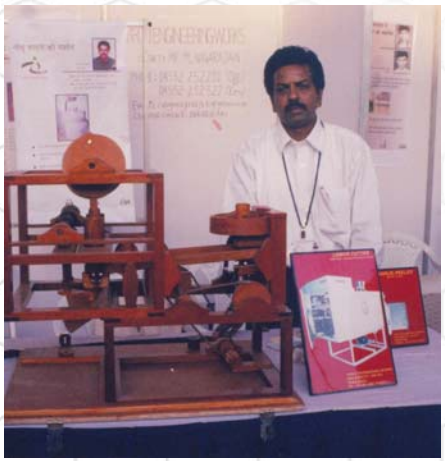
02

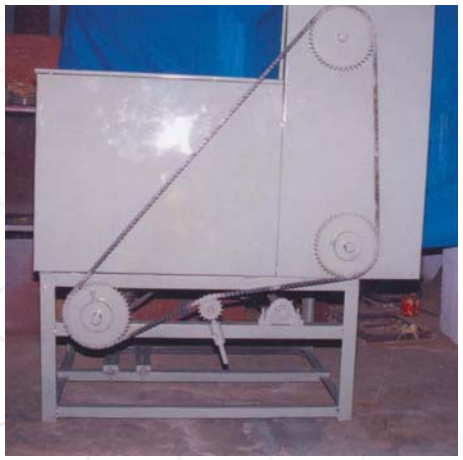
Garlic peeling and lemon cutting machine

M. Nagarajan
Tamil Nadu

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

The second product is also used in pickle industry, but for cutting lemons. It is a cost effective machine, having innovative design, with continuous feeding system. It performs precise and standard cutting of large quantity of lemons in uniform shape and size. It can be operated by one person and cuts lemon into eight equal pieces. The innovator has been able to run a good business with the financial support of MVIF and marketing effort of NIF. Nagarajan won a National Award in NIF's Third National Competition in 2005. NIF also filed patents of the machines on his behalf.





03

Sandeep Kumar
Bihar

Bicycle that can be carried in a bag

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

04

Hand operated water lifting device

N Sakthimainthan
Tamil Nadu

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

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

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

Dharamveer
Haryana

Aloe vera gel extractor

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

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

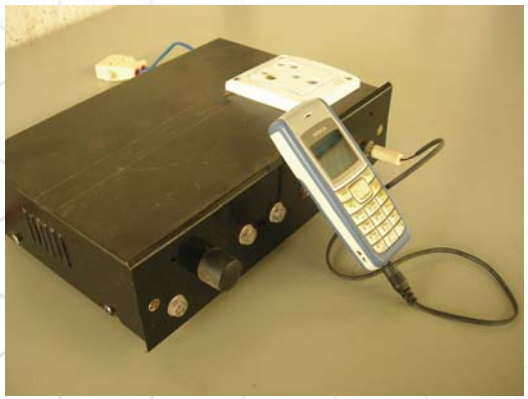
06

Mobile operated switch and multi-media poster

Prem Singh Saini
Haryana

Imagine a village where the farmer has the luxury of being able to stay at home and switch his irrigation pump in the faraway field on or off as required during the day or at night. This is made possible by this innovation, which uses the power of mobile telephony to trigger electrical control switches.

The farmer can remotely know the status of the pump in his cell phone and turn the motor on or off by calling the particular configured number. It activates the switching by certain number of rings and hence incurs no call charges. Patent was filed by NIF in the innovator's name for this technology, which also won him a National Award in NIF's Fourth National Competition in 2007. Prem Singh has developed several other innovations, one of which is the viewer triggered multi-media poster. If any agency wants to communicate some graphic message with different language audios or videos, this multi-media poster can be very useful. NIF facilitated a Mumbai based company to purchase two hundred units of the talking poster worth around eight lakh rupees for diffusion in various states. These were made available in five local languages.



07

Imli Toshi Namo
Nagaland

Hydro generator using bamboo composite

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

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

08

Auto air kick pump

Arvindbhai Patel
Gujarat

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

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

Arvindbhai won a National Award in NIF's Second National Competition in 2002. NIF, apart from filing a patent in his name, facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs.

Bhanjibhai Mathukiya
Gujarat

Vanraj- 10 HP Tractor

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

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

10

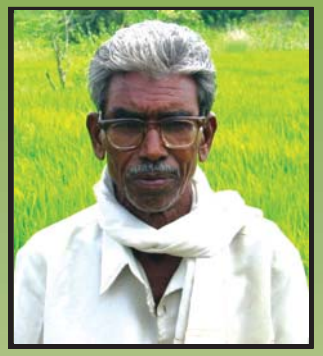
Biomass gasification system

Rai Singh Dahiya
Rajasthan

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

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

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



Dadaji Ramaji Khobragade
Maharashtra

HMT: An improved paddy variety

Khobragade selected and bred the HMT rice variety from the conventional 'Patel 3', a popular variety developed by Dr. J. P. Patel, JNKV Agriculture University, Jabalpur. He succeeded after five years of continuous study and research on a small farm owned by him without any support from the scientific community. This varierty has an average yield of 40 – 45 quintals per hectare with short grains, high rice recovery (80 %), better aroma and cooking quality in comparison with the parent ones. Most remarkable feature of the variety is the thinness of grain. It has been included as a standard reference for thinness by Protection of Plant Variety and Farmers' Right Authority (PPVFRA).

He won a National Award in NIF's Third National Competition 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.

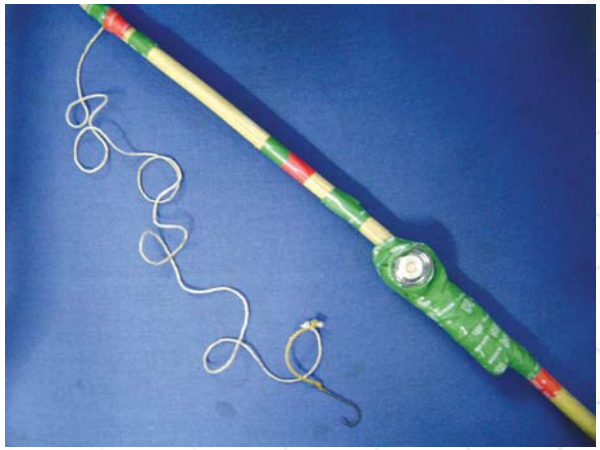
The innovator won a Consolation Award in NIF's Fourth National Competition in 2007. He has also been supported under the MVIF of NIF for commercialising "*Kamaal*". The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied for use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



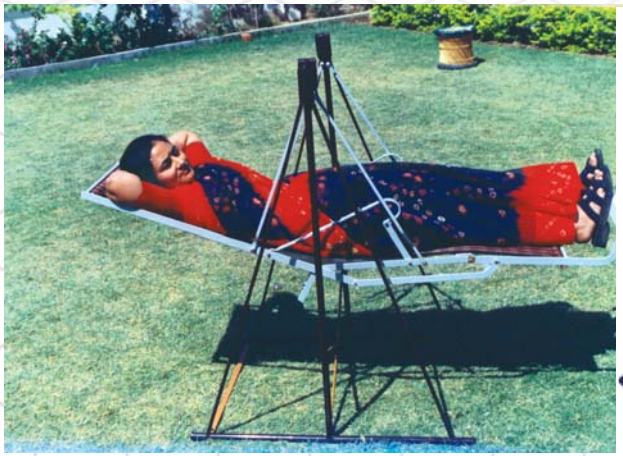
14

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

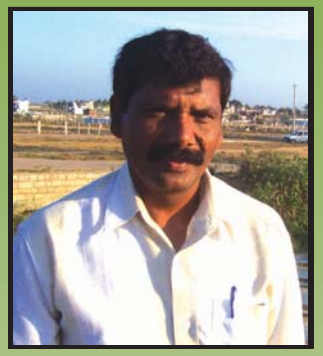
Mysore Mallige: A unique paddy variety

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

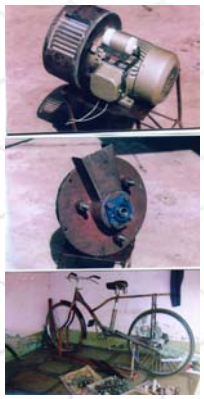
Arecanut husking machine

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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