

India Innovates

National Innovation Foundation – India Ahmedabad

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National Innovation Foundation - India

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राष्ट्रपति भारत गणतंत्र PRESIDENT REPUBLIC OF INDIA



MESSAGE

I am happy to see the progress that National Innovation Foundation (NIF) has made in reaching out to more than 500 districts for mobilizing thousands of ideas, innovations, and traditional knowledge practices. Unfolding the innovative potential of millions of our people is the first step in marching towards truly inclusive development in the current Decade of Innovation. We now need to provide them mentoring and handholding support so that no dream for the larger social good remains unrealized.

It is well-known that unless innovators, investors and entrepreneurs join hands, the full potential of any innovation will not be harnessed. The transaction costs of bringing them together are very high. NIF should spare no effort to reduce these transaction costs with the help of other private and public stakeholders so that the journey of mind to market proceeds purposefully.

I am happy that NIF is bringing out the second revised edition of the book, "India Innovates" pooling together the examples of creative and innovative solutions for everyday problem. The importance of these solutions lies in generating frugal, affordable and accessible solutions for India and the world at large.

I realize there are still many problems, particularly faced by the women, which remain to be properly addressed. I am sure, NIF and other wings of Department of Science and Technology will work together to seek solution to those problems, reduce drudgery and improve the livelihood for women in the near future.

By tapping the creativity of children, youth and workers in the formal and informal sector, NIF has created a unique open innovation platform. Our society must pay more attention to the creative potential of common people and provide them empathetic financial, institutional and cultural support.

I wish all the innovators a promising future and hope that they will continue to find solutions to many persistent problems of our society and in the process make India emerge as a knowledge based economy.

(Pranab Mukherjee)

New Delhi 26th February, 2013

PREFACE



R. A. MASHELKAR, FRS Chairperson, Governing Council National Innovation Foundation, Ahmedabad mashelkar@nifindia.org

National Innovation Foundation - India (NIF) has been pursuing the mission of making India an innovative nation and the Indian Society, a creative society, since 2000.With the active support of the Department of Science and Technology, Government of India, NIF became an autonomous body in 2010. Till date NIF has been able to scout innovations and traditional knowledge practices from over 550 districts across India. Thanks to the support of volunteers from Honey Bee Network, we have been able to discover and celebrate many unsung heroes of our society, who have solved local problems without any outside help.

Our learning so far is simple and clear. There are a large number of knowledge rich people, who may not have been educated much, they may in fact be economically poor also, but they still have the ability to solve many a problems. The challenge really is to work out a strategy supported by conducive structures and effective systems, 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 the Indian economic development process more inclusive and sustainable.

This compendium is a tribute to the creativity and innovation at grassroots. This presentation is based on the series of innovation compendia prepared for every state of India at the request of Dr. Vijay Kelkar, Chairman, 13th Finance Commission and Member, Governing Council of the National Innovation Foundation - India. We hope this will inspire the formation of many policy and institutional initiatives to empower creative people to improve the quality of life of common people. It is my firm belief that such examples will act as a spur for the Government departments to look for creative efforts of their staff and users at the ground level. I hope that NIF will have the opportunity to work closely with different departments of the government and expand the knowledge base, add value to selected technologies and help their diffusion through commercial and non-commercial social channels. This will trigger a remarkable improvement in the livelihood of the majority of the people.

NIF would be very keen to forge partnerships with other international organisations, networks, government departments, academic institutions, private and public sector organization, civil society actors etc., to explore the possibilities of scaling up the 'Grassroots to Global' model. In the true spirit of 'Vasudhaiv Kutumbkam', a Sanskrit phrase, which means 'all world is one family', NIF would also be willing to share its learning with others who believe in the creativity at the grassroots.

We are grateful to the Honourable President of India, Shri Pranab Mukherjee for championing the cause of grassroots innovators and blessing this endeavour in this Indian Decade of Innovation.

BUILDING A BRIDGE WITH GRASSROOTS INNOVATORS IN INFORMAL SECTOR



ANIL K GUPTA Executive Vice Chairperson, NIF, Ahmedabad Professor, Indian Institute of Management, Ahmedabad anilg@nifindia.org To make the development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by the common people at village or semi-urban level. Many of these experiments lead to the development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often not be to solve just his/her problem. He may try to solve a community or somebody else's problem as well. There is generally 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 get constrained. To overcome this limitation, Honey Bee Network¹ with a handful of volunteers triggered a movement, twenty five years ago to scout, spawn and sustain the unaided innovations and outstanding traditional knowledge from the informal sector of our country.

Drawing upon the Network's experience, National Innovation Foundation – India (NIF) was set up in 2000 with the help of the 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 extremely 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 development, (c) Business development and Micro Venture Fund, (d) Intellectual Property Rights protection and (e) Dissemination, database development and ICT applications for managing Innovation eco-system.

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 Council of Scientific and Industrial Research (CSIR) and Indian Council of Medical Research (ICMR) besides other organizations. ICMR in particular supports research on such herbal healing knowledge, which has not been documented for the given purpose 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 which NIF mobilises pro bono help of law firms and patent attorneys.

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 the formal R&D system. A Micro Venture Innovation Fund (MVIF) has been set up with the help of Small Industries Development Bank of India (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. MVIF invests in those technologies for which market either does not exist or may be very limited, thereby making investments by conventional financial institutions unlikely. 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 providers. Lately, a few large corporations have also begun to engage with grassroots innovation system.

An 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 received from fifty-five countries for various technologies. NIF has succeeded in commercializing products across countries in six continents. It has facilitated licensing seventy cases of technology licensing with the help of partner agencies.

Commercialisation may not be the only channel of diffusion of technologies. To expand the pool of technologies available for social diffusion, NIF has operationalised Grassroots Technological Innovation Acquisition Fund (GTIAF) under which socially useful grassroots technologies would be acquired by paying a reasonable sum of money to the innovator. The technology would be diffused widely through local entrepreneurs by licensing them at low cost or no cost basis. NIF has already acquired the rights of about seventy technologies and detailed plans are being chalked out

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.

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. for their social diffusion.

The Poor as Providers, not just the consumer: What has NIF done?

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 1,74,000 ideas, innovations and traditional knowledge practices (not all unique, not all distinctive) from over 550 districts of the country. NIF has filed over 550 patents in India, seven in US and twenty seven PCT applications. Out of these, 39 patents have been granted to grassroots innovations in India and four in the US. Additionally, it has filed 19 applications under the Protection of Plant Varieties and Farmers' Rights Act, 12 Design Registrations and 15 Trademark applications. NIF has funded 183 projects under MVIF to the extent of Rs. 23 million. Hundreds of technologies have diffused through farmer to farmer social network. Some have diffused over more than a hundred thousand acres. NIF has proved that Indian innovators can match anyone in the world when it comes to solving problems creatively. Where they perform better than the rest is in generating extremely 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.

Even at present, the Honey Bee Network is the provider of the largest pool of open source technologies helping communities worldwide in sustainable agriculture, livestock, and management of other resources.

How can one join hands with NIF?

Government:

a. The 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 the government as a partner in dissemination, value addition and even commercialization through incentives, promotion through limited subsidies, or trial and demonstration through their existing channels of social connect etc.

b. The 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, colleges and universities can be motivated to scout creative and innovative people in their neighbourhood and send the entries to NIF. Examples

of innovations can also be included in the curriculum for the school and college education. Universities may also be mandated to add value to local grassroots innovations and to give a permanent place to such innovations from their region in their premises to inspire students and motivate them to co-create solutions along with the innovator.

d. Demonstrations and trials can be organized at various central/regional research stations and KVKs (Krishi Vigyan Kendras) so as to create awareness about the creative potential of common people.

e. The formal R&D institutions can be mandated to add value to the knowledge of innovative people and help in protecting their knowledge rights as a part of their contribution towards building up of an inclusive innovation system.

f. Innovations may be displayed on the government's website, with a reciprocal link to NIF's website, to put forward the creative face of the country before the world.

Private and Public Sector

g. Various companies can set up incubation centres or sanctuaries for ex situ or in situ support for grassroots innovation and outstanding examples of traditional knowledge.

h. Depending upon one's area of expertise, companies can join hands with the innovators and or NIF and help in commercial or social diffusion of innovations.

i) Professionals working in various sectors could be encouraged to volunteer or take sabbatical leave for working with the Honey Bee Network inspired grassroots innovation movement.

Civil Society actors:

j) Non Governmental Organizations (NGOs) and more importantly Non Governmental Individuals (NGIs) can help in sharing the ideas with the society drawing upon GTIAF technology pool as well as other public domain knowledge with NIF in respective areas of operation.

Academic institutions:

k) As advised by the Honourable President of India in the recent conference of Vice Chancellors of central Universities, universities and colleges could set up chapters of National Innovation Clubs or support groups to search, spread, sense or benchmark and celebrate the innovations in their hinterland. They can also join hands with innovators in adding value to local solutions, create live exhibitions and inspire students to learn from the creative masses.

I am very happy to acknowledge the recent MOU signed by NIF with a Tata Agrico company for diffusing a grassroots innovation. The innovator will manufacture the device and the company will market it. We hope to have many more similar initiatives in the future. A for profit company has been set up in collaboration with the Futures Group viz., Idea India Ka Innovation Pvt Ltd., to provide financial, design, manufacturing and marketing support to selected grassroots innovations. NIF will use a transparent system for sharing the benefits with the local communities and individual innovators besides other stakeholders. Nobody associated with NIF will get any personal remuneration from such transactions.

NIF has also signed MOUs with innovation related agencies of Malaysia, Mozambique, and Zimbabwe to share its insights with those countries for strengthening grassroots innovation ecosystems. It has actively participated in various conferences and meetings in many other countries with whom SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) has ongoing cooperation such as China, Namibia, Peru, and numerous other countries.

NIF is committed to support all such global efforts through mutually respectful partnerships in which creative communities and individuals can learn from each other and support diffusion of socially inclusive public domain innovations. It also seeks partnership with other actors who wish to provide grassroots-to-Global (g2G) opportunities to our innovator. NIF is supporting the evolution of the concept of Technology Commons in which people to people copying and improvement of IP supported innovations is not only allowed by also encouraged. But people to firm exchanges are supported through licensing and benefits sharing agreements.

I hope that NIF would be able to develop a functional, fruitful and fulfilling relationship with all who believe in inclusive social development based on people's knowledge and creativity.

We are just a mail/phone away

INDIA INNOVATES

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"Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful and richer in depth and content".

- DR. A.P.J. ABDUL KALAM

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

- DR. R.A. MASHELKAR

PART I innovations | ideas

A. AGRICULTURE/ FARM RELATED

This section contains only a selected sample of mostly awarded grassroots idea/ innovations originating from different parts of the country





Rapid Compost Aerator

Fertility value of well decomposed compost is well known. Decomposition can be hastened if the biomass is aerated, humidified and properly mixed. Dhonshi's machine is a tractor PTO driven machine, which can thoroughly mix and moisten the bio-waste, reducing the time of decomposition from three to four months to twenty to forty five days.

The machine can turn and pulverize a row of biomass of size 11 ft x 6.5 ft x 2.5 ft (i.e. total 400 ton) in an hour, and consumes 3.5-4.0 liter diesel per hour. The compost has better fertility value as compared to FYM and vermin-compost.





Tree pruner

Tree pruning is mostly done manually using knives. Tractor powered machines though available abroad are not affordable to medium farmers. This machine developed by Gurmeel Singh is a low cost alternative and can do top dressing as well.

The machine can prune trees of height 20 ft (top-down) while keeping blades vertical and can top dress the plants of height 12-15 ft. It can cover trees in a circle of 10 ft diameter from a point where tractor stands. It can prune 2000 ft long rows of trees at a spacing of 18-20 ft on both the sides of a road or in a plantation in one hour. The tractor consumes 3.5-4.0 liter diesel per hour.





MANSUKHBHAI JAGANI GUJARAT

Bullet Santi - Motorcycle Based Multipurpose Plough

Like many other drought prone regions, this region also has a severe shortage of fodder leading to decline in the availability of bullocks for farming operations. One of Mansukhbhai's friend approached him to find some solution to scarcity of draft power. Looking at the motorcycle his friend was riding, Mansukhbhai thought of adapting it as a ploughing machine. That's how 'Bullet Santi' was born. Innovation is not in the tool bar which was developed much earlier but the attachment in the motorcycle which has diffused widely in the area.

Using the chassis, drive and power of an Enfield Bullet motorcycle in front, the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. This meets various needs such as ploughing, weeding and sowing seeds. Bullet Santi can plough an acre of land in half an hour consuming only two litres of fuel. Innovator got a patent in India and USA. Given the fact, many other users and innovators copied this technology, he has appreciated the concept of 'Technology Commons' implying no restrictions for other innovators to copy and adapt. But commercial firms will need license from members of the 'Technology Commons'.

He had visited South Africa as a part of a delegation led by SRISTI on the invitation of Commonwealth Science Council to share his skills with his counterparts in Limpopo province. He has also developed a bicycle based sprayer which he assembled in South Africa also. He got a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. The innovator has been provided support for workshop development and also under MVIF scheme of NIF. Also see Honey Bee, 11(4) & 12(1): 29; 2000-2001.





ANNASAHEB UDGAVI KARNATAKA

Chandraprabha water gun

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

An additional 400 gm of weight has been added to his water gun (also called as rain gun), to achieve a balanced shaft movement. At the outlet, a groove has been provided for fixing nozzles of different sizes to throw water at different radial length as needed. A locking system to prevent the sprinkler head from throwing water into neighboring fields (that is, beyond the range) has been introduced. The water gun has the ability to cover as much as 140 feet radius and can even be used to apply compost/biogas slurry on the crops. He was given a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2001 for the water gun (also see Honey Bee, 12(2):11-16, 2001). He did try to license his technology to a company but did not get any sustained income from that. NIF has supported him again through TePP program of DSIR so as to improve the efficiency of water gun/rotor sprinkler afresh. The innovator has been provided support for workshop development.





Multi-purpose sugarcane based farm machinery

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







Semi-circular Check Dam

The innovator from Saurashtra, a semi-arid region, prone to water scarcity had often been asked by villagers to do some thing about conserving water in a seasonal rivulet nearby. This led him to build a semi-circular dam using local materials, labour, and at minimal cost.

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His path breaking innovation consists of a modular check dam built using the arch shaped bunds in sequence. The innovator was inspired by the strength and durability of arches used vertically in constructing railway bridges during British times. He used locally available materials such as stones, river sand and deployed one mason and four labourers to build the dam. The low cost dam was built in 4 days and at a total cost of Rs 10,000. This dam has made the area a green haven. This design is also being successfully replicated in a few regions in Maharashtra as well as Gujarat. Innovators like Premji Bhai, Vriksha Mitra have replicated this design in many villages.



Vanraj-10 HP Tractor

His next major innovation, developed over 15 years was a compact yet powerful 12HP "convertible" tractor. The front axle is so designed that it can work as both three wheel as well as four-wheel tractor. One can change the front assembly quite easily depending upon the need. The three-wheel option helps in maneuvering turns as well as navigating undulating surfaces with ease while four wheels is much better for transportation. The tractor is built with an adjustable wheel base for various inter-culturing operations. The farmer can repair the unit with minimal effort or skills. With the help of NIF, GIAN West and SRISTI, Bhanjibhai has obtained a patent for this tractor in India. Patent for front assembly has also been granted in USA. GIAN West and NIF facilitated its testing and certification at CFMT&TI, Budni. He was also supported under the Micro Venture Innovation Fund scheme of NIF. Technology was also licensed to two entrepreneurs but some how their enterprise did not succeed much.

In addition, he has also developed a bullock operated sprayer and tried to build vertical axis windmill in vain. He won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002 for both of his innovations.





MANSUKHBHAI PATEL GUJARAT

Chetak - The Cotton Stripper Machine

To ease the tedious manual process of separating cotton from the unopened and semi-opened shells of a rainfed cotton variety grown in Gujarat, Mansukhbhai developed a cost effective machine to remove cotton (indigenous varieties of cotton like V 797, Guj 21 and Vagad) from shell efficiently and make it ready for ginning. Processing by stripper also helps in improving the quality of cottonseed extracted and ensures higher returns to the farmers. He is the first Indian Grassroots Innovator to have a US patent for his technology. SRISTI and GIAN West facilitated the patent process. He is one of the most successful innovator cum entrepreneur. With a small investment of about Rs six lacs under TePP ten years ago through GIAN West, he has now set up four different industrial units with combined turnover of more than Rs 20 crore annually. A student of NID worked also with him for six months. His innovation journey has been full of struggle but he succeeded in overcoming all the problems. He is currently a member of Board of Directors of SRISTI.

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He won a National Award in NIF's Second National Competition for Grassroots Innovation and Traditional Knowledge in 2002. Also see Honey Bee, 8(2):3-4, 1997 and Honey Bee, 14(2):19, 2003.







DHARAMVEER HARYANA

06

Multi-purpose processing machine

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

With this device, the innovator uses the specially designed pressure cooking chamber to extract the essence from Aloe vera. Being a compact portable unit, it can be quickly and easily transported and used anywhere, to process herbs and deliver on demand. The present machine has a capacity to process 100 kg of Aloe vera per hour. The innovator was supported for production and commercialisation through GIAN North from the Micro Venture Innovation Fund at NIF. The innovator has been provided support for workshop development under MVIF scheme of NIF. One unit has been sent to Kenya on a pilot basis for application feasibility study in the country. NIF also engaged designers to improve the aesthetics of the machine, (photo below on the right)









Sugarcane bud chipper

Challenged by an engineer to make a machine that can remove buds from the sugarcane for the plantation purpose so as to minimize losses as well as time, money and seeds, Roshanlal came up with this implement. The device consists of a self made platform, semi circular cutting blade, linkage system and a handle. By pressing the handle, the unit removes the bud from the node, which is then used for planting/ tissue culture. As per CIAE, the technique has been found to be novel though they have suggested some ergonomic feasibility study. A patent has been filed in the name of the innovator by NIF. He has also been supported under the Micro Venture Innovation Fund of NIF for test marketing and commercialization of his innovation. The innovator has been provided support for workshop development and also under MVIF scheme of NIF.

Roshanlal is a serial innovator and has innovated/improvised various devices and implements like sugarcane set cutter, sugarcane harvesting tool, traveling iron, automatic spray pump, timer for three-phase motor etc.







Tractor operated reaper windrower with reel

Many times, in a standing crop, soybean pods shatter due to non-availability of labourers for harvesting the crop in time, leading to reduced yield and loss. To address this problem, Bhagwan Singh developed a reaper windrower machine. He developed a self propelled reaper windrower in 2005, which he later modified into a front mounted attachment for tractor with the support of NIF.

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In this machine windrowing unit facilitates gathering of harvested crop at the center of the machine. It has a cutting width 2.25 m and field capacity of 0.35 ha (at forward speed 1.93 -2.10 km/h). As per the tests in Soybean crop at CIAE (ICAR) Bhopal, the harvesting losses have been found to be quite low at 1.04% with negligible uncut losses





PREMJIBHAI PATEL GUJARAT

Seed broadcaster

There are few people who may have done so much for tree plantation as Premji bhai has done. He began with his seed-broadcasting spree on motorcycles through which he scattered tonnes of seeds of trees on the roadside. When that became a constraint in speed and scale, his son suggested that he used a vehicle. It is then he conceived a seed broadcaster.

This is petrol-driven mechanical blower, which could be mounted on the back of a jeep and can broadcast seeds up to distance of 15 meters. If the winds are strong, the vehicle on which it is mounted has to be moved slowly and vice versa. This blower can also be used to broadcast seeds along the railway tracks. He has used this to broadcast millions of seeds in different areas. If just one in thousand seeds grew into a tree, he must have planted more than five crore trees already. It is for nothing that he is called Vriksha Mitra. Apart from SRISTI Samman, he also got several regional and national awards. He is an extraordinary role model for the youth.



Check dam

Premjibhai has replicated in hundreds, the semi-circular check dam design developed by Bhanjibhai of Junagadh, with some location specific improvements. He won a National Award in NIF's Third National Competition for Grassroots Innovation and Traditional Knowledge in 2005.





LATE M J JOSEPH ALIAS APPACHAN KERALA

Tree climber: a grassroots innovation going global

M J Joseph had developed a device under the guidance of his father that helps in climbing coconut or areca nut trees. The palm climber consists of two metal loops that are meant for holding the legs. There is a film made on his innovation by Discovery Channel and is very popular on Youtube.com. Few years back, 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).





N SAKTHIMAINTHAN TAMIL NADU

Hand operated water lifting device

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

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

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







MD. FAIJUL HAQUE Assam

Paddy Thresher

Faijul noticed time consuming and laborious conventional method of paddy threshing either manually by beating against stone or by draught animal. After some trials he developed a thresher which can thresh without chopping the straw of the moist crop. The thresher can be operated by 5 hp electric motor or tractor PTO.

It has average feed rate of 600 kg/h, however can support feed upto 900 kg/h and has 96.56% threshing efficiency, 89.06% cleaning efficiency, 0.632% broken grain proportion, 0.283 % spilled grain percentage, 0.359% blown grain percentage and 1.627% unthreshed grain percentage.







AMRUTBHAI AGRAWAT GUJARAT

Aaruni- The Tilting Bullock Cart

In a traditional two-wheel bullock cart, part of the load is borne by the draft animals on their shoulders and neck. Moreover, the harness makes it difficult to negotiate sharp bends or turns in the road. This causes galls on the neck of the bullocks, which affect not only the efficiency of the animals but also their stamina. This cart overcame this shortcoming by having four wheels to balance the load. More importantly, the cart has a tilting mechanism that was based on the rope and pulley system originally, but was replaced with jack system and later gear system. The cart can be tilted by a lever located alongside the cart driver. The purpose of tilting is to distribute manure or Taas (powder of semi- weathered rocks found in Saurashtra and very rich in minerals) directly into the furrows rather than doing the same manually. Since this activity is generally done in summer, the tilting mechanism reduces the drudgery a great deal. This feature was later incorporated in two-wheel cart also for those who could not afford four-wheel cart. GEDA (Gujarat Energy Development Agency) had provided subsidy for initial promotion of 32 carts. This was the first grassroots technology licensed in Honey Bee network to three different entrepreneurs for five districts and the entire license fee was shared with the innovator. SRISTI/GIAN filed a patent for the same in 1998. The innovator has been Provided Support for Workshop Development.



Wheat Sowing Box, Pulley With Stopper and Others

With water table going down and length of rope to pull water increasing, women (who have to often perform this arduous task) have to face a lot of drudgery while pulling water through conventional pulley. Many times while pulling water, women/ men feel tired and have to pause to catch their breath. Bucket some times fall into the well. Indian civilization developed a bunch of hooks to get such a bucket out of the well but could not devise any mechanism so that bucket does not fall into the well. Honey Bee network had posed this problem to a network of innovators and then Amrutbhai came out with this innovation more than a decade ago. He attached a stopper over the pulley so that by the backward movement of rope, lever will press it automatically and would not let it slip. Now the person can take the rest as long as one wishes, without having to keep holding the rope. The innovation is available in three models - Ganga, Narmada and Saraswati. For this innovation he won Asian Innovation Award in 2000 and a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. An attempt was made to diffuse this pulley with the help of SEWA in a few hundred cases. Much more remains to be done. Apart from these two, Amrutbhai has made numerous other devices like Bund maker (bumper) to make bunds in the field for facilitating irrigation, Santi-multipurpose agricultural attachment, Groundnut digger (mini kaliyu), blades for the kaliyu, wheat sowing box among other things.










SHAMRAO PARHATE MADHYA PRADESH

Shivraj multipurpose agricultural equipment

Mechanic Shamrao Parhate is a multidimensional serial innovator par excellence, and over the years, he has developed numerous useful innovations. His notable inventions include technique to stop wobbling of wheels in four wheelers, modified drip irrigation system, energy generation through transportation, and welding spark protector technology.

Parhate, who lives in the soybean and cotton belt of Madhya Pradesh, observed that sowing, plowing, weeding and harvesting were labour intensive agricultural operations. Scarcity of labour and the high costs of mechanization were problems faced by the farmers. Parhate developed a non-mechanized multifunctional tool. 'Shivraj' is a multipurpose tool frame drawn by a pair of bullocks to which various implements can be attached for different operations like shallow ploughing, inter culturing, weeding, sowing, residue collection, groundnut digging and soybean harvesting. With some modifications it can be used for spraying operation also.

He was given a Life time achievement award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.







NATTUBHAI WADHER GUJARAT

Cotton boll picking machine

Nattubhai got an idea of mechanical picking of cotton during the year 1982 but took much longer to operationalise it. He wished to make a machine that would not only pluck cotton balls but also separate the cotton from the balls so that the labour cost could be saved.

It cost him around Rs 30,000/- to prepare the first working model. The device is attached in the front of a tractor. The device (1576/MUM/2010) is run over the rows of cotton plants and the cotton balls are pulled off the plant and stored in a chamber having two rolling rubber belts. Lot of work remains to be done to make this effective and GIAN and NIF have been supporting it.





MADANLAL KUMAWAT RAJASTHAN

Improved Multi crop Thresher

Farmers across India require a reliable machine that achieves threshing with minimal grain breakage and clean output for a variety of crops. The innovator has developed a versatile thresher that can meet these needs. The modified farm implement reduces setup time to less than 15 minutes to switch over from one crop to another, and achieves minimal breakage. Its latest variant can also handle groundnut apart from threshing other cereals and pulses.

Madanlal won a Consolation Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. The innovator has been supported with working capital needs of his enterprise under the Micro Venture Innovation Fund of NIF. The innovator has been provided support for workshop development under MVIF scheme of NIF. More than a hundred farmers have bought his thresher. He was also featured among 50 pioneers of change in the country by India Today, 26 June 2008. A patent has been filed for his innovation.









KALPESH GAJJAR GUJARAT

Energy Efficient Oil Expeller

Conventional oil expeller machines using screw press mechanism require more maintenance, space and energy than the design that he has developed. This oil expeller, which can crush all kinds of seeds, uses planetary gear system coupled with screw press, saves power by 40 per cent when compared to the conventional oil expellers of the same capacity. It has higher production efficiency, which has been achieved by providing an improved and energy efficient transmission mechanism in a very compact design. Occupying just a third of the space of a conventional expeller, this machine is low on maintenance too. Having gone through a lot of struggle in life, he has come up a long way in his life. His technical knowledge deeply impressed a professor from MIT during a workshop of grassroots innovators at IIMA. Maximum international queries have been received for his technology at NIF and GIAN West. But being an incorrigible improviser, he is never satisfied and thus delays in delivery are a rule rather than exception. This affects the real demand of his technology. He has developed a lot of other machines for construction industry and other related industries.

He has obtained a patent for this machine. NIF also has filed a patent in USA for the same. He won a National Award in NIF's First National Competition for Grassroots Innovation and Traditional Knowledge in 2001.







BACHUBHAI THESIA 'KHOPDI' GUJARAT

Tractor That Goes Round!

Ever seen a four wheeler rotating on its axis? Well, Bachubhai has made a tractor to do so. His innovative tractor, which can do all the normal functions of any other tractor, can do something that no other tractor or even any four wheeled machine can do i.e. to rotate at 360 degrees on its axis. With a unique steering mechanism, the innovator has been able to give the tractor very small turning radius that enables it to rotate easily. Bachubhai is a maverick innovator who has made so many innovations that villagers call him 'khopdi' or a brainy fellow. He won a National Award in NIF's Fifth National Biennial Awards Function in 2009.





GOPALBHAI SURATIYA GUJARAT

Hand Driven Pump Sprayer

When family did not appreciate his tinkering with farm implements to modify them, Gopalbhai started working on his ideas in the night when family was asleep. He has designed and built a manual sprayer powered by the motion of cycle wheels of the pulling cart. One can adjust the distance between nozzles on the boom as well as the height of the spray boom as per the orientation of the crop. It is easy to maintain and repair. The unit can spray an acre of land in six hours of operation. He has obtained a patent for this sprayer, which was facilitated by GIAN West and NIF. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. The innovator has been provided support for workshop development.

In addition, he has recently built a cow dung cup which can be used to house the bouquets or seedlings. Experiments in SRISTI-Sadhbhav-Sanshodhan natural product lab have shown not only growth advantage for the seedling but have also shown economy in water use since it stores moisture longer.





YUSUF KHAN RAJASTHAN

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Groundnut Digging Machine: From Deserts to the Sea Shore

Rajasthan has predominantly sandy soil which is quite suitable for groundnut cultivation. The yield of the crop is affected as up to 20% of the pods are left underground during harvest. Complete digging out of all the groundnut pods from the soil is not possible as manual labor is scarce, costly and other means are not available.

Yusuf has revolutionized groundnut digging with this sturdy rugged desert unit which is retrofitted on a standard 35HP tractor. The unit consumes four litres of diesel per hour and digs out groundnuts from one hectare a day. The unit can also be run on uneven terrain and can be used to sift out small stones, solid residue and garbage from fields and country roads.

Yusuf won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. He has been supported under the Micro Venture Innovation Fund of NIF for commercialising his innovation. The innovator has been provided support for workshop development and also under MVIF scheme of NIF. In 2006, the technology was licensed to a Vizag based company called Ardee Hi-Tech Pvt. Ltd. The licensee wanted to use the concept of groundnut digger to develop a sea beach cleaner. He has also helped in scouting five other innovators from his village and nearby. He was short listed in 2005 for Asian Innovation Award among 12 innovators from Asia, by The Wall Street Journal and also attended the award function in Singapore. A patent was filed for his innovation.







YUSUF KHAN RADHEY SHYAM TAILOR NATHULAL JANGID RAJASTHAN

Trench Digging Machine

While on a trip, the innovators noticed labourers manually digging the ground to make long trenches to lay telephone cables, taking months to complete the work. This inspired the innovators to build a mechanized equipment to dig trenches rapidly.

The trench digging unit developed by the innovators can be fitted to any tractor. The unit has a hydraulic lever to adjust digging depth and to maneuver the running unit, a planetary gear system, and motion converter unit to achieve speed reduction and deliver power from the tractor.

The machine can dig narrow and deep channels evenly, on hard and soft soil conditions. In one hour, it can dig a pit 65 meters long, 6 feet deep and 14 inches wide, while consuming only 2.5 liters of diesel per hour. The equipment costs less than half that of imported models. It is even used by the local telephone department to lay cables. Radhey Shyam and Nathulal won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







MUSHTAQ AHMAD DAR JAMMU & KASHMIR

Tree cum Pole climber

It is a small portable device that makes climbing trees/poles simple and easy. What is remarkable about this innovation is that it uses body weight to lock the climbing steps and is very light, low cost and easy to maintain.

NIF has filed a patent for the same in the name of the innovator and has provided incubation assistance through the GIAN Cell J&K. The innovator has been provided support for workshop development. The technology was also licensed to an entrepreneur in Ahmedabad (India Innovatix), who has come up with an improved version of the climber in consultation with the innovator. Talks are on with parties in Kashmir and elsewhere to develop and use it as a climber for different electricity poles.



Walnut cracker

Walnut cultivation and trading is one of the major sources of income for people of J&K. Manual cracking of walnuts involves lots of time and drudgery. Mushtaq, who has been engaged in this activity for several years, noticed that trading of walnut without the skin gives more value. But the process is cumbersome and involves too much labour.

He thought about simplifying the process and came up with a walnut cracking machine, which cracks walnuts by compressing them between two rollers one of which is powered. This roller gets drive from a motor after proper speed reduction. Mushtaq initially made rollers and other components of wood, which were later replaced by Nylon and in other version by Aluminum after getting value addition support from TePP through NIF. This innovation is also incubated at GIAN J&K for further R&D and commercialization. A patent for the same has also been filed in the innovator's name.

Almond cracker

It is a motorised machine that cracks almond nuts and separates nut and the shell easily. This process is otherwise done manually. The machine has a feed-in hopper section, grading section, rollers and the outlet. The device has a considerable speed as compared to the manual process and does not damage the nuts. This machine has the potential to rejuvenate the ailing almond industry in Kashmir. For this machine, he has been supported under the Micro Venture Innovation Fund (MVIF) scheme of NIF supported by SIDBI.

Mushtaq received the Jammu & Kashmir State Award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge. He was also provided an Innovation Fellowship for a year under the CSIR-NIF MOU.





RAGHAV GOWDA KARNATAKA



Manual milking machine

Safe milking of cows/buffaloes is a requirement across rural India and this product is an efficient step in that direction. It is a low cost, manually operated device that helps farmers to milk the animal hygienically and also reduce drudgery in the process.

The machine has simple controls and can be easily operated by women as well. The creation of suction and low vacuum makes it suitable for other applications also. NIF has been giving marketing support to the innovator. The innovator has been supported under MVIF scheme of NIF. As a result, this machine has also been sold to customers in Philippines, Uganda and Ethiopia apart from India. Raghav was given State Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005 for the machine (also see Honey Bee, 15(4):4-9, 2004).







V A JOHNY KERALA

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Low-cost manual milking machine

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 First National Competition for Grassroots innovations and Traditional Knowledge in 2001.







GANESHBHAI DODIYA GUJARAT

Motor Cycle Mounted Sprayer

To overcome the problem of labour shortage the innovator has devised an insecticide sprayer mounted on a motorcycle. This sprayer is powered by the engine of the vehicle. As the motorcycle is driven between the crop rows, the pump sprays pesticides on the crop. A student of IIT Bombay tried to improve the design of the sprayer but by taking power from the wheel instead of engine, he disappointed the innovator. Further work needs to be done to improve it.

He got a Consolation Award in NIF's Third National Competition for Grassroots Innovation and Traditional Knowledge in 2005.







NARASIMHA BHANDARI KARNATAKA

Arecanut husking machine

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

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

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











A T THOMAS KERALA

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 First National Competition for Grassroots innovations and Traditional Knowledge in 2001.







SUBHAS VASANTRAO JAGTAP MAHARASHTRA

Tricycle Mounted Sprayer

Carrying heavy cylinders of pesticide on the back and spraying continuously by hand on the fields is a tedious and back breaking practice. The major problems are the weight of the spray pump the farmer has to carry on his back and secondly, the irritation and skin diseases caused due to direct contact with the posterities present innovation is a spray pump mounted on a tricycle. The advantage of the device lies in its easy manoeuvrability and ease of operation. The product can be effectively used in fields with hard soil, low crop length and a distance of three to four feet between the rows for e.g. cotton, peas etc. The innovator was given a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







U KRISHNA ANDHRA PRADESH

Centrifugal sprayer

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

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





VIKRAM RATHORE ANDHRA PRADESH

Bicycle operated pump

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

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

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





MULUBHAI SENJALIYA GUJARAT

Mini Tractor/Multi Utility Farming Machine

Mulubhai has assembled a mini-tractor unit, which is a compact contraption and uses the stationary 4.5 HP tractor engine, a four-speed and reverse gearbox and the transmission system of a Matador 307. The tractor can be used for shallow ploughing, inter-culture. One can attach cultivator, shallow blade harrow or a seed-cum-fertiliser drill. A unique feature of this machine is the spraying mechanism comprising a pressure pump and fabricated booms, attached with nozzles on both sides of the machine, which can be operated with the engine power to provide a uniform pesticide spray. Easy maneuverability, low maintenance cost, one tonne load carrying capacity and fuel economy (one litre of diesel per hectare of cultivation) add to the utility of the device.





NOUSHAD K T KERALA

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Reciprocating hydraulic prime mover for water lifting

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 Third National Competition for Grassroots innovations and Traditional Knowledge in 2005.







LATE GANESAMURTHY ASARI TAMIL NADU

Shaving, cutting and grinding: Three innovations for sugarcane farmers

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

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







RAM PRASAD BENIWAL HARAYANA

Safe Chaff Cutter

Rural India is witness to many accidents due to use of unsafe equipment and some times careless work practices. When a chaff cutter is running, users sometimes use their hands to pull out the chaff stuck in the machine. The absence of safety features or design provisions to handle such functional needs cause heavy injuries.

The innovator has upgraded the existing motor driven chaff cutter with addition of gear combination to control the pressure rollers and cutting action at the time of entanglement of fodder to avoid any accident.

A safety attachment is developed for the chaff cutter by using an old gear box of thresher and propeller shafts used in cars and trucks. This attachment helps in controlling the forward and backward movement of rollers. This helps in smooth and regulated operation in machine when there is chaff entanglement in between the rollers (a clutch based locking system is developed by another innovator, Kamruddin Saifi in western Uttar Pradesh. It helps in detaching the motor from the chaff cutter through a clutch and applying instantaneous breaks through a foot pedal).









P J ABRAHAM KERALA



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.





RAMDAS MADHAVRAO JAGTAP MAHARASHTRA

Raisin Grading Machine Reaches Peru

Grading of raisins involves sorting by size. These are mainly meant for exports. To produce raisins, bunches of grapes are first brought from the vineyards to the raisinmanufacturing units. They are then processed according to the variety of raisins to be made. These raisins need further processing cleaning, removal of debris, and grading into various sizes. The grading is generally done by visual inspection and normal sorting only.

This innovation is a single unit that removes dust and twigs and grades raisins by size. The machine consists of three motors and three sieves, blower, a belt and pulley mechanism and a rubber brush. With this device, the operator is safe from exposure to the dust from the blower. This machine helps in removing the drudgery involved in cleaning every single raisin and grading it accordingly. NIF through GIAN West has provided the incubation assistance for this technology. NIF has also facilitated the sale of one unit to a customer in Peru.







GOPAL DAVE RAJASTHAN

Multi-seed Drill

This seed drill can be used to sow different kinds of seeds at a time. The flow of quantity of seed is regulated by a simple mechanism of setting up of taper worm and check nut. The process of seeding remains unaffected irrespective of the position of the plough at uneven ground surface due to the attachment of a flexible rod connected with to the drill. The innovator has been supported under MVIF scheme of NIF.

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FOTO SINGH UTTAR PRADESH



Paddy planter: work in progress

Foto Singh has designed a manual paddy seedling planter. With the back and forth movement of the machine, mechanical fingers are actuated, which pick seedlings from the tray and transplant these into the puddled soil bed. The machine currently enables farmers to plant three rows of paddy at once, but design improvements could eventually increase this figure to five, nine, or even eleven rows at a time. SRISTI and NIF facilitated its on-field testing in Gujarat before farmers and based on their suggestions, the machine is being modified to suit the local needs.







K R CHANDRAN KERALA

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 coirhusking 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).





K X BENEDICT KERALA

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Machine for microfine pulverizing of red sandalwood

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).





LATE ANNEGOWDA KARNATAKA

'Chandrike' cocoon stand

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

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







JOY AUGUSTINE KERALA

Banana slicing device

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 First National Competition for Grassroots innovations and Traditional Knowledge in 2001. The innovator has been supported under MVIF scheme of NIF.







Pedal Operated Paddy Thrasher

The innovator has come up with a pedal operated paddy thrasher that is available at less than one-fifth of the cost of conventional paddy thrashers, while delivering twice the output. Using this thrasher, a person can thrash 1000-1200 kg of paddy in a day, which makes it quite efficient for village use.







RADHEY SHYAM SHARMA MADHYA PRADESH





The bullock operated sprayer is pulled by a pair of bullocks and gets the drive from the ground through a gear box and belt pulley system. From the gear box it is then taken to the pump through sprocket and chain drive. When the operator shifts the lever to a higher gear, the frequency of strokes of the pump increases as a result of which more pressure develops in the container. The spray fluid, thus, atomizes into fine droplets with a wider swath. He has been supported under the Micro Venture Innovation Fund of NIF for test marketing of his innovation. Patent in the name of the innovator has also been filed by NIF.







GOPAL MALHARI BHISE MAHARASHTRA

Bicycle Weeder, Bicycle Tiller and Bicycle Harrow

For those who cannot afford bullock weeder, a small tractor or even motor cycle driven weeder, cycle based plough is a very handy device. A steel fork is connected to the axle and the other end carries different kinds of attachments. Separate attachments for weeding and tilling or a harrow are attached to the working end, using bolts and nuts. The implement is very easy to operate and is ideally suited to the needs of marginal farmers who cannot afford to maintain bullocks. Bhise won a consolation award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF also facilitated the patent application filing for the same. The innovator has been provided support for workshop development.







MADHAV MAHAJAN MAHARASHTRA

Mango Nipper

Farmers all over India need a simple device that can reach tall branches of trees to cut and harvest thousands of fruits per day. This innovative device with unique shape and cutting action can be used to harvest fruits quickly, saving time and increasing output.

The novelty lies in the design of replaceable cutting blades and hooking angle given to the oval shaped ring that assists in harvesting the fruits on upright branches. It is light weight, durable and suitable for harvesting fruits like mango, safota, guava, orange, etc. He won a consolation prize in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.







ARUN KUMAR KAMBOJ UTTARAKHAND

Biogeyser: Harnessing heat of biodigestion

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

After rigorous trials he came up with a system for getting warm water by utilizing heat evolved in exothermal reactions during decomposition of organic wastes. A Pipe line containing water is passed through a heap of organic wastes. Water can be warmed up to 60-70° C after storing for a period of 24 hrs (morning to morning). The amount of water that can be warmed up depends on size of the heap. He dedicated the innovation to his father and called it 'Chandan-Biogeyser'. He won a consolation award in NIF's Fifth National Biennial Competition Awards in 2009.








Stethoscope to detect pest in lemon

Root cutting pests harm the lemon plants resulting in reduction in the yield. These insects live below the surface about 3-4 cm deep in the soil and cut the roots up to a feet depth. To trace the activity of such pests Chakradhar has innovated a novel tracking system using a stethoscope. With the stethoscope he is able to ascertain the level of activity of the pests and accordingly take remedial pest control measures. This is especially helpful in the morning. This innovation has become popular in the region and been covered by local media also apart from a mention in the bulletin of Tree for Life Organisation, USA. Who would have imagined such a use of stethoscope. He has also done many other innovations and has a very experimental attitude towards life.



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IMLI TOSHI NAMO NAGALAND



Bamboo processing machinery, water pumps, electric hydro generators and others

Originally hailing from Mokokchung, Imli Toshi is a 27 year old serial innovator currently residing in Dimapur. After his BSc in Geology he has been self employed. Toshi always had a keen interest in machineries and automobiles, which led him to develop many of his innovations. The idea of his first innovation came into his mind while he was washing his car. For this he needed to go to the waterfall just near his house for filling up his bucket with water every time. Then he thought of the possibility of diverting the water to his car-washing place. These thoughts resulted in the development of an innovative low discharge energy pump, which is a novel combination of a vane pump and spiral bladed water turbine. The innovation submerged in flowing water can lift water up to a height of one meter. For this innovation he was awarded in NIF's Third National Competition of NIF for Grassroots Innovations and Traditional Knowledge Practices in 2005.



He has also developed a Bamboo processing machinery/lathe for the removal of nodes and outer surface. One unit has even been purchased by the Nagaland Bamboo Mission. Using bamboo powder, which is a by product of this machine, he developed a composite material which he used in further developing a small electric hydro generator and a low cost bamboo wall. Among his other innovations some of the notable ones are bamboo strip making machine, weed uprooter for hilly region, egg-boiler and hot-water filter, incense stick making machine etc.

Toshi has been supported financially by NIF for development and dissemination of a few of his technologies. The innovator has been provided support for workshop development and also under MVIF scheme of NIF.







RAM KUMAR PATEL MADHYA PRADESH



Motorised weeding machine

Being a soya bean cultivator himself, Ram Kumar Patel, who owns nine acres of land in the Karkvel village of the Narsinghpur district of Madhya Pradesh, has always been sensitive to the problems of the fellow cultivators. One of the most irritating problems for the farmers in a soya bean field is that of the presence of weeds. Getting rid of the excessive growth of weeds in the fields requires a lot of monetary input and hard labour. This problem has been aggravated by the shortage of farm labourers in the area.

In 2000, he developed a motorised weeding machine, which uses 2 to 2.5-hp engine of the Rajdoot motorbike. It consists of used iron angles, gears, chain sprocket, a clutch box and tines. The clutch lever is positioned between the handle bars. One can change the gap between two tines while weeding; so the area covered in one movement of the machine can be altered to correspond to the different levels of weed concentration. Another useful feature of the weeding machine is that a small sprayer can be operated through it. The machine removes weeds from one hectare of land in around five hours. It costs Rs 3,000 without the Rajdoot engine and Rs 20,000 with it. Earlier, he used to spend Rs 500 for removing weeds in an acre of land towards the cost of hiring labourers. Now, he just has to bear the cost of petrol for the engine, which comes around Rs 70. Thus, one can save about Rs 400 per acre.

The agricultural department of Madhya Pradesh government gave Patel a certificate of appreciation for developing this machine. He was given a Consolation award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002.







HAZARILAL OJHA RAJASTHAN

Seed-cum-Fertiliser Drill Machine

To overcome glitches in the single-boxed, seed-cum-fertilizer drill machine, Hazarilal Ojha hit upon an idea of making a double-boxed machine instead.

Ojha's machine comprises three main parts — the box, a cultivator and an arm wheel. The machine is able to drill the fertilizer and seeds together, but delivers them separately, in a single drive and to different levels. The machine not only saves seeds and fertilizer, but also supports optimum growth of saplings.

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







P K JEYAKRISHNAN TAMIL NADU

Mini tractor drawn ridger weeder

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





R JAYASEELAN TAMIL NADU

Coconut husker

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

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







Herbal Growth Promoter

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

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The innovator has been supported under the Micro Venture Innovation Fund of NIF for commercialising "Kamaal". The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied to the garden in Rashtrapati Bhavan. The innovator has been provided support under MVIF scheme of NIF. He also won a consolation award in NIF's Fourth National Biennial Competition Awards in 2007.







BUDHADEBA SAHU ORISSA

Herbal Fruit Ripener

Budhadeba Sahu is a 57 years old farmer and agricultural labour. He observed that the leaves of a particular plant (name withheld due to IP reasons) had an inherent tendency of being 'hot', which he thought could probably be utilized to ripen bananas and mangoes. He experimented with these leaves. These worked wonderfully well and since then he has been using this herb to ripen fruits like banana and mangoes. This practice was taken up for validation under the NIF-CSIR JIC scheme under nutraceutical category by Central Food Technological and Research Institute (CFTRI), Mysore.

The result shows that it not only ripens the fruits early but also preserves their nutritional value in comparison to the available chemical ripeners. NIF filed a patent in his name and also appreciated him for his efforts in its Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.







• Glan 1997





NIF was formed by Department of science & technology Govt. of India to build a National register of green grassroots and outstanding traditional knowledge, build dialogue between excellence in formal and informal science & help in making India a global leader in sustainable technology.

GIAN was set up with the help of the Gujarat Government after an international conference on Creativity and Innovation at Grassroots held and IIMA in 1997. The need was felt for an organisation that would incubate the innovations and convert them into enterprise. The aim is add value to the knowledge, innovations and the activities mobilised by the network and generate a new model of poverty alleviation and generating jobs.

SRISTI was formed in 1993 after the honeybee network had expanded considerably and the need for organisational support was felt to make its publications and other activities independent. SRISTI helped in converging the innovations in the technical, educational and institutional domains of knowledge.

Honey Bee Network was started in 1989 at IIMA (Indian Institute of Management Ahmedabad). Honey Bee network tried to address the three inadequacies in our conduct so that an ethical and accountable relationship is forged between the formal and informal sectors of knowledge.

- We seldom share our work with people in local language thus peventing them from critiquing our understanding.
- We rarely acknowledge the knowledge providers and thus make creative and knowledge rich people anonymous.
- We hardly ever share the gain, honour and wealth with the people whose knowledge and innovations made that possible and thus exploiting their generosity.

PART I innovations | ideas

B. POWER/ ENERGY RELATED

This section contains only a selected sample of mostly awarded grassroots idea/ innovations originating from different parts of the country



MEHTAR HUSSAIN, MUSHTAQ AHMAD ASSAM

Low cost Windmill

Looking for a low-cost alternative to diesel or electric or manual way of pumping water into the fields for the winter crops, the two brothers from Assam devised a simple windmill made up of bamboo and tin sheets. The brothers found that continuous pumping by hand involved a lot of effort and drudgery. Using diesel pumps was a big drain on their economic resources. While the working principle of the windmill is similar to conventional ones, the use of low cost, locally available material like bamboo instead of costlier metals for the framework and the direct drive to do automatic pumping of water from the tube well is the innovator's contribution. NIF awarded the innovation in its Sixth National Award Function 2012 and also filed a provisional patent application in India. The innovator has been provided support for workshop development.

From Assam to Gujarat: Transfer and Development of Technology by Gujarat Grassroots Innovation Augmentation Network-West



This innovative windmill found its use in the salt pans in the Little Rann of Kutchch. The salt farmers showed a lot of interest in the windmill and subsequently an experimental demonstration was made near Dhangadhra, Little Rann of Kutchh, in association with Ahmedabad based NGOs working for empowerment of salt farmers in Gujarat, in January 2008. Based on the feedback received, GIAN W developed a multi-directional model, which it got installed at Little Rann of Kutchh with the help of VIKAS and at Sasan Gir through AKRASP for pumping water from tube well for irrigation in April 2008. With the help of an innovator, Bhanjibhai Mathukia, a static wind mill was also installed in the village Kalawad, Junagad district of Gujarat for trial by GIAN W in July 2008. Looking at its potential in Gujarat, GIAN –W has installed fifty units in the salt farming area of Amreli in Gujarat for pumping up brine water and also for simple farm irrigation purposes. with support of Alstom Foundation.





RAISINGH DAHIYA RAJASTHAN

Biomass Gasification System

There are lots of villages in the country which are still not electrified or are receiving power erratically. Given the limited global supply of fossil fuels, search for renewable energy has been on the top of the sustainability agenda. Dahiya has developed an efficient biomass gasifier adjudged to be outstanding by leading energy research organizations. Users of biomass gas (producer gas) as a fuel generally complain of choking in the engine after running for a certain period of time. The innovator has changed the conventional design of gasifiers especially the filters and cooling unit to get clean gas, ensuring smooth operation of engine at low operational cost. He makes gasifiers in the range of 5-50hp as per the need of customer. The wood requirement has been claimed to be 30-35% lower than conventional gasifiers. NIF has been providing marketing support to the innovator as a result of which one machine is in the process of being sent to Germany.

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









DINESH ASHODIYA GUJARAT

Variable Speed Generator

Wind mills generally are not helpful in generating electricity when the velocity of the air reduces below a certain level. A possible solution has been developed by Dineshbhai in his magnet type generator, which works particularly well in winds with low cutting speed. The output of the generator is also independent of the variations in the wind speed and is constant. He won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007. NIF also filed a patent for the technology in the innovator's name.







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.







G K RATNAKAR KARNATAKA

Modified hydro Electricity Turbine

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

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







BHARATBHAI AGRAWAT GUJARAT

Modified Wood Stove

Traditional wood stoves do not use the heat optimally and also emit much smoke and pollutants due to incomplete combustion. Bharatbhai fitted an exhaust chute to a wood stove and noticed that a lot of heat was still coming out, which made him infer that non-utilization of heat was the major fault in existing wood stoves. He decided to facilitate better heat utilization through sufficient air supply and a better channel for burning. To improve it further, he developed a mechanism for simultaneous heating of multiple vessels using the same heat source. Bharatbhai made the first model of this stove in 1999, then after a few modifications, he came up with this multi-purpose stove, which two multi-level burners and a single fuel feeding point.

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He has built many devices. The list includes a lemon cutter, innovative windmill for lifting water from wells, 5 HP power tiller cum tractor, which can be rotated at 360 degrees and many more equipment besides the stove. He won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007.





V JAYPRAKASH KERALA

Efficient coconut shell / wood stove

Jayprakash has incorporated a secondary burning chamber in the stove to allow maximu combustion of the hydrocarbons, released by the burning of biomass. He has also developed several models. The combustion efficiency is in the range of 37.67% when wood is used as a full and 29.48% when coconut shell is used.









C SENTHIL KUMAR TAMIL NADU

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ed Iel

Efficient Wood Stove

The walls of this stove have been insulated using bricks made from special clay, which reduce heat loss. Different variants of the same have been developed for household and commercial use. He has sold over 5000 units of different versions of these stoves though there is a scope for further value addition and improvement in the efficiency.







GHULAM MOHAMMAD SHEIKH JAMMU AND KASHMIR

Modified Kerosene Stove

Ghulam Mohammad Sheikh has designed a modified kerosene stove (Pat. App. No. 207/DEL/2012) using pipes, arranged in such a way that there is no need of an additional fuel tank. It is believed that the stove has higher thermal efficiency due to preheating of kerosene (stored in the pipes) and less chances of explosion due to distribution of pressure in large area.





LATE SARFUDDIN AMANUDDIN KAZI Pumpless Stove MAHARASHTRA

In order to provide the poor a safer and economical alternative to the commonly available stoves, Kazi came up with this innovation. The kero gas stove comprises a tank for the kerosene oil, a burner, and a facility for providing light. This stove burns with a blue flame and does not blacken vessels. It is safer than conventional stoves as after initial pumping to light the stove, stable pressure is maintained in this stove. While ordinary stoves use brass burners that need a lot of maintenance, the kero gas stove uses a burner made by Beed casting. This burner also ensures lower fuel consumption as it does not cool as quickly as the brass burners. NIF with the help of GIAN also supported him through its Micro Venture Innovation Fund.







JYOTHI RAVISHANKAR KARNATAKA

Two-in-one stove

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

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

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





S J JOE KERALA

Multi utility stove

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.





SAMEERUL HASAN LIYAQATI UTTAR PRADESH

Improved stove with kerosene heating

Sameerul has developed a modified stove, which does not require pumping. It has a few novel features to achieve efficacy with minimum carbonaceous deposits in the burner for cleaning. The novelty lies in the placement of the cylinders and the use of the fuel heating coil that creates a liquid-gas mixture to create pressure in the tank as well as the provision of a pressure gauge and safety valve that he has provided in his stove. This stove saves fuel and also the labour involved in pumping air. It does not blacken the vessels that are placed over it.

He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.





GHULAM RASUL BIHAR

Solar cycle along with FM, radio and charging facility

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Move over petrol and electricity operated two-wheelers for here comes the solar cycle, working on solar batteries. Using a 12 V motor, the cycle gives a speed up to 30 km per hour, good enough for a joyful city ride. It also has a tape recorder and FM radio for listening pleasure apart from a plug point, which enables the stored energy to be used for charging/operating various small devices.





GANESH GHIMIRE ASSAM

Solar boat

The innovator had seen solar boats but found many inadequacies in their functioning. He developed a submersible motor attached with propeller for the solar boats with lighter material like aluminum instead of iron. He has also modified the steering control system. The modifications have improved the transmission efficiency of the boat.

NIF helped the innovator to fabricate a 10 seater model for Lumbini Water Parks in Bangalore. Renewable energy being so much in need, such innovations require a lot of encouragement.

Ganesh Ghimire has also developed an 'auto walker' which runs with the help of two small battery operated 36 watt DC motors. The device has been provided with a three way speed control and runs smoothly at a comfortable speed.





NRIPEN KALITA ASSAM

'Zero' head water turbine and portable Muga/Eri reeling machine

The innovator worked on the basis that the conventional turbines have poor efficiency due to partial submergence of blades. To improve it, he arranged the blades spirally keeping the axis of the turbine parallel to the flow direction. The turbine is completely submerged below the flow of water. The water passing through the turbine forces the turbine to rotate with low speed but at a high torque. A generator is used to extract the electrical energy. A submersible pump is also coupled in the turbine set for irrigation purposes. For this innovation the innovator was awarded in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.

NIF facilitated the technology license to a Tinsukia based businessman. The deal though did not work out well and further improvements in the technology are called for. The innovator has been provided support under MVIF scheme of NIF.

The innovator has also developed a portable Muga/Eri reeling machine. It works similar to the traditional spinning of 'drop needle' or 'charkha'. For this he was supported under the MVIF scheme of NIF. NIF helped in the standardization of design at the Design Dept. IIT Guwahati.







LATE KAMBEL CHULAI MEGHALAYA

Low-cost, Environment-friendly Crematorium: Technology & Tradition

Kambel Chulai was a Class III dropout from Jowai in Meghalaya. He had to join an automobile workshop as an apprentice in his early teens due to financial constraints and since then has moonlighted in many roles.

In 1988-89, Kambel first observed that the traditional method of cremation was highly polluting, time consuming, very costly and also difficult during the rainy season. In order to eliminate these problems he started work on a low cost crematorium. In 1995 he developed a conceptual model and in 1999 the prototype of his innovation was developed with the help of the Sein Raij (the local social and religious organization), which had initially rejected the idea as they did not want technology to take over tradition.

The low cost environment friendly crematorium is a long structure, open at one end and connected to a 36 feet high chimney at the other end. The chimney has a cover that can be operated from outside for controlling the intensity of the flames inside the crematorium. Only Rs. 200 worth of firewood is used in this as against Rs. 3000 worth of firewood utilized in the old cremation practice. Cremation time has been reduced to less than 1 ½ hours as compared to 8-9 hours in the old traditional cremation method. Smoke and fume emitted during cremation has been reduced by 90% in his new crematorium compared with the amount emitted in the old traditional method. This low cost environmentally friendly crematorium is a boon to the cremation practice of his fellow tribesmen as it has eliminated the resources required in the process by more than 80%.

The first cremation took place on June 21, 2003, exactly a month following the first crematorium inauguration. Now, almost 80 per cent of cremations in Jowai town take place in this structure. The government of Meghalaya has woken up to the positive side of this invention and is helping the Sein Reij with financial aid to build the second crematorium in Jowai. He was awarded in NIF's Third National Competition for Grassroots innovations and Traditional Knowledge Practices in 2005.





ASHOK KUMAR SINGH UTTARAKHAND

Compressed air engine and the idea of an efficient freewheel

Ashok Kumar had an idea of developing a water lifting pump for hilly regions without using fossil fuel. The main components of his device as proposed are water tank, pipe, hydram, compressed air tank and pump. Compressed air is used to power the movement of piston in the pump and thus lift the water. This concept earned lots of applaud from many senior technicians.

Ashok has also suggested modification in the design of flywheel used in engines to prevent fluctuation in the energy. He proposes that instead of metallic flywheels, a shell of metal sheet can be developed and filled with properly compressed clay. Based on some experiments done by him, he says that metal/clay ratio of 1:1 can serve the purpose and it will not reduce the engine life significantly. It can help in saving ample amount of money and metal. The idea needs further testing.



PART I innovations | ideas

C. TRANSPORT RELATED

This section contains only a selected sample of mostly awarded grassroots idea/ innovations originating from different parts of the country



B MOHANLAL KERALA

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

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 in built 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. The innovator has been provided support under MVIF scheme of NIF. He was given the National award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.








HAR NARAYAN PRAJAPAT RAJASTHAN



Hari Narayan has developed a small kit (Pat App No: 1410/DEL/2009) comprising a piston and calibrated nozzle, which can be fitted in the fuel line between the carburetor and the entry to the cylinder head.

The attachment introduces additional air before the charge (mixture of air and atomized fuel) is compressed. This results in increased combustion efficiency and thereby the mileage of vehicle. It has been tried in four stroke engines. NIF has extended support for trial marketing under its MVIF scheme. The trial results have shown promise.







SIB SANKAR MANDAL ASSAM

Modification in Auto Engine for Increasing Mileage

Sib Sankar has modified the engine, transmission system and wheels of auto-rickshaw to make it more efficient (Pat App No 1811/KOL/2008). The intake air and charge are preheated using exhaust gas. The gear ratios and wheel size have also been changed to improve the efficiency of the vehicle. Facilitated by NIF, IIT Guwahati has tested the modified engine and has confirmed that it gives around 35 per cent higher mileage than the conventional engines.

He was also invited to make a presentation at a workshop organized by IIMA at TATA Innovation Awards. Sib Shankar with the help of his brother Jai Shankar has also developed a helical spring shock absorber for rickshaws and a noodle making machine.





BHAGWAN SINGH VISHWAKARMA MADHYA PRADESH

Modified silencer

Bhagwan Singh has modified the silencer of the two-wheeler. Part of the exhaust gas is used to pre-heat the intake air leading to increased combustion efficiency of the engine, which ultimately leads to increase in mileage in the range of 25 to 30 per cent and reduction in the noise of the vehicle. NIF facilitated the testing of his silencer at BITS, Mesra, Ranchi, which corroborated the claims of the innovator. NIF also filed a patent in the name of the innovator for this technology.

He has developed many other items like battery operated bicycle, a multi-purpose harvester, multi-purpose jogging machine, amongst others. He won an award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009 for his modified silencer







KANAK GOGOI ASSAM

A maverick inventor: Hover craft, amphibious craft, rumble strip for generation of electricity, car running on compressed air engine

The innovator is a 47 year old self made business man who attained his present status in life due to his grit and hard work and a 'never say die attitude'. After setting up his family in a comfortable financial position, he started a workshop in 1996 at his house to fulfill his childhood dreams of pursuing creative experimentation. He employed three workers and dedicated his workshop fully to R&D works only. From then on he has come up with a lot of innovations to his credit.

Some of the important innovative devices developed so far are: Hover craft, amphibious craft, rumble strip for generation of electricity, small three wheel car TrigoX, gravity bicycle, treadmill bike, hybrid car (electricity, solar and petrol), car run with compressed engine etc.

The innovator has received offers from countries like the United States for possible technology transfers for his technologies. With the assistance of NIF the innovator has also attended a conference around Fab Lab organized by the Massachusetts Institute of Technology at Chicago USA in 2007. He was given the National award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.











MOHAMMAD SAIDULLAH BIHAR

Amphibious bicycle & others

Saidullah's penchant for innovations has made him lead such a rich life that it can inspire generations to come. He made the amphibious bicycle in mid 1970s to cross over from one place to another during a flood in the region. Thereafter he has been churning one innovation after the other over the years with his latest being an amphibious rickshaw. Among his many innovations a few that can be mentioned are a mini tractor, key operated table fan, fodder cutter operated centrifugal pump, spring loaded bicycle, mini turbine etc.

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The serial innovator, Saidullah was given the Life Time Achievement Award at the hands of the then President of India, in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.









NISHANT RAY BIHAR

Novel gear mechanism

The innovator has come up with this device to reduce the hard work involved while riding a bicycle/rickshaw uphill. The new gear mechanism enables a person to pedal backwards and yet move the cycle forward, thereby reducing effort and fatigue. It also prevents the reverse motion of the vehicle on slopes.

He was given a consolation award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.





LATE DWARKA PRASAD CHAURASIYA UTTAR PRADESH

Can you dare to dream of crossing the English Channel

Late Dwarka Prasad Chaurasiya even in his late seventies, did not loose his passion for innovation. He demonstrated his prowess by bicycling in sea from Nariman point to Chaupati more than two decades ago. He has also walked on water with floating shoes with a near religious zeal, pushing himself to the edge of his physical, emotional and financial capabilities.

on cycle: Chaurasiya could

The amphibious cycle and shoes, made by him, can help not only in removing aquatic weeds, but also in vending provisions to communities living around water bodies, have new water sports and drag things in water bodies. Chaurasiya's water walking shoes are made of a lightweight material, thermocol. The shoes, which provide sufficient buoyancy and maneuverability, are 3 feet long, 10-inches wide, and 8 inches thick. He could inspire young and old with his vivacity and commitment to pursue his dreams.

He won the State Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. A BBC team also covered his innovations for their program in January 2007. He had also been widely covered in different print and audio-visual media, both locally and nationally. Though his economic condition had remained precarious all this while.









KANAK DAS ASSAM

Bicycle which runs faster on the bumpy roads

Normally speed of the bicycle reduces when there is a bump on the road. But the bicycle developed by Kanak Das uses the rider and terrain induced forces to propel it forward. He has also developed a kit which can be retrofitted to any normal bicycle. Most shock absorbers are designed to dissipate the energy. In this cycle, the energy of the springs is harnessed as supplemental force to propel rear wheel. Using the same principle the innovator has also developed an E-bike, a modified electric bicycle that utilizes terrain induced force (movement), for charging the battery.

Kanak Das is a serial innovator and has also developed a number of innovations like a power tiller, wrench for unlocking the fly wheel of diesel pump, pedal rickshaw with gear to ride on inclines easily etc.

He was given the National award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002 and was supported for a year under the NIF-CSIR Fellowship scheme. He could easily become a role model for others in his region, if supported properly. He could in fact be a hub of an 'innovator based incubator' model in which he could provide fabrication and design support to many other innovators of his region.





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! He was given a consolation award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.





ABDUL RASHID DAR JAMMU & KASHMIR

Self Empowerment of a Differently Abled: Adapting a Car at Negligible Cost

Born in a family of nine, Abdul Rashid had a difficult childhood. He got affected with polio at an early age, which rendered his left leg totally dysfunctional and the right one around 60 per cent useless. His father worked as a tailor and died when Rashid was only sixteen years old. He had to struggle with his own physical limitations, and had to get his five sisters married off, because his brother had shied away from his duties and left the family.

Since Rashid could not go to school, he learnt tailoring and even started training others interested in the job. Till now, he has trained around fifty people who have in turn trained many more. His wife is also a tailor and both of them work hard to maintain a decent earning. All the adverse conditions in his life made Rashid stronger and determined to fight.

He always wanted to meet his sisters and their family but was limited in movement because of his physical condition. Public transport was cumbersome and did not allow him much flexibility of time. At the same time, he wanted to be free from dependence on others for his movement. He wanted to purchase a car so that he could move around freely without anybody's help. He approached Maruti Company for making a suitable attachment for him. The price quoted by them was almost 90,000 Rupees, which Rashid was unable to pay. Therefore, he decided to buy a second hand car and modify it himself. Spending only Rs 100, Rashid attached a rod to the clutch pedal so that it could be pressed. He also put a small hook to hold the pressed rod (and the clutch) so that he could free his hand and change the gear. Once the gear is changed, the rod is unhooked and the clutch released. This is the simple functioning of the mechanism.

Rashid was discovered by a young enthusiastic journalist Javed and felicitated during the 19th Shodh Yatra in Anantanag.

Will the state authorities approve his design and open the doors of independence for many more similarly constrained people?





BIJU VARGHESE KERALA

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. Automotive Research Association of India has certified the attachment to be suitable for fifty three car models of thirteen automobile brands in India.







MUJIB KHAN RAJASTHAN

Overcoming Disability: Improving Car's Accessibility

Mujib Khan, an automobile mechanic, has limited functioning in his legs as a result of an attack of polio in his childhood. He lives with his wife and four children and has never let his disability stop him from living a productive life. He is constantly searching for ways to retain his independence and inspire other handicapped people to live with self-respect.

His quest to make a vehicle accessible to handicapped drivers started with tinkering with his parent's Maruti surreptitiously. The innovation lies in the modification to the accelerator, brake and clutch arrangement so that the controls are transferred to hand by use of levers, wires and linkage mechanism. Comfort, simplicity and ease of operation are the other features embedded in the controls, and drivers without disabilities can also operate the vehicle in a conventional fashion. He has retrofitted over six dozen vehicles in this fashion to date.

He won the State Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. He has also been supported under the Micro Venture Innovation Fund scheme of NIF for test marketing of his innovation. The innovator has been provided support under MVIF scheme of NIF.





KAMAL NARAYAN PRADHAN HIMACHAL PRADESH

Modifications in gears

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

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







THOMSON AUGUSTINE KERALA

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 retreading. 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 provided support under MVIF scheme 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. He was given the Kerala State Award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.







K S SUDHEER KERALA

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

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 sidestand 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.





DHANJIBHAI LALJIBHAI KERAI GUJARAT

Modified Scooter for the Handicapped

Not content being dependent on others for his transportation, Dhanjibhai, a lower limb physically challenged person, decided to move ahead and do something for himself and people like him. He modified a scooter to suit his needs. The front seat has been removed to accommodate him, the rear brake has been extended in form of a lever so that he can operate it with his hand and two extra wheels have been used at the back for maintaining the balance of the vehicle. Despite his physical limitations he has proved that where there is a will there is a way.

He runs an electrical repairing workshop and extends the range of cordless telephones also. He won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







MOHAMMAD SHEIKH JABBAR MAHARASHTRA

Variable Gear System for Cycle Rickshaw

Jabbarbhai succeeded in developing a new gear system wherein he fitted a doublechain and a double-sprocket mechanism in a rickshaw. He modified the existing free wheel by fitting a pawl lifter instead of a spring. The new gear system makes the task of pulling the rickshaw less strenuous. He has also developed a disc-brake system that is attached to the rear end of the rickshaw and an improved shock absorber system, which reduces the discomfort caused by the bumps on the roads.

NIF gave him a National award in the Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005 and supported him with a small investment from the Micro Venture Innovation Fund. NIF has also filed a patent in his name on his behalf.





KAMRUDDIN CHOUDHARY RAJASTHAN

Multi-purpose Bicycle

For over two and a half decades, Kamruddin has engaged himself in improving the design of the common bicycle to make it more comfortable, useful and safe and above all as a means for earning a livelihood. He modified an ordinary bicycle by adding tools and accessories as well as making it a mobile work platform to service diverse village needs. It has tools for carpentry and blacksmithy. Revenue can be generated by providing various services such as sharpening of blades, drilling, motor winding, sawing etc.

Kamruddin had filed a provisional patent application and later a complete patent application was filed by NIF on his behalf. NIF sanctioned support under the Micro Venture Innovation Fund for concept testing of the multipurpose bicycle in the rural market. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.









LATE RADHEY SHYAM MISHRA LATE MEWARAM JANGID RAJASTHAN

Camel Driven Bus

Late Radhey Shyam Mishra worked as a manager and a caring teacher at B L Kala Bal Mandir Montessori School. His co-innovator late Mewaram Jangid is remembered as a caring friend and skilled carpenter. The camel driven bus was dreamt of by Radhey Shyam as a means of safely transporting students to and from school through the desert. Mewaram brought the idea into fruition with his technical skills in 1972. The driver of the bus steers from atop the camel and the students are pulled in a fourwheeled double-decker bus behind. This bus, which can transport 80 students, is an environment friendly and affordable solution for mass transportation in desert areas. Seven such buses are still used to transport over 400 students to Bhanwarlal Kala Bal Mandir School.

They were appreciated in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.







RAMBILAS SHARMA HARYANA

Gas Based Trolley

Starting out as a vendor delivering LPG cylinders, this innovator first developed a LPG gas based motorcycle. Then he moved on to develop a water pump powered by TVS moped engine running on LPG.

Apart from achieving a high energy efficiency of Re 1.00 per hour of operation, the innovator addressed several technical issues by custom designing a gas inlet, building a new carburetor to facilitate combustion of gas in the engine, using a bicycle freewheel and chain for cranking the engine.







KALPITA PATIL MAHARASHTRA

Magnetic Shock Absorber

Kalpita, then a school student, developed an idea for a magnetic shock absorber for automobiles and two-wheelers, which makes use of the magnetic repulsion between dipoles to achieve shock absorption. This shock absorber can eradicate the problems faced in the spring shock absorbers due to friction and other factors. It could also reduce the maintenance costs as it would not need repairing, changing of springs or dealing with leakage problems as in the case of spring or oil shock absorbers. For this idea, Kalpita won a consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.





ATTAR SINGH ALIAS PAPPU AHALAWAT HARYANA



Solar Powered E-bike

The innovator had difficulty in transporting fodder from far away fields to his home for the cattle. Inspired by an electric bicycle that he saw on the road, he decided to build his own version of an e-bike powered by the sun to cut down on energy costs.

Using roof mounted solar panels to charge the batteries; the innovator developed his e-bike fitted with a three phase motor at the rear. The solar bike comprises a bike frame (Todi frame), set of batteries, 3-phase motor and power controller (48 V DC 3 Phase AC) to drive the rear wheel.







RANJIT SINGH JAGDEV PUNJAB

Low Cost Electric Bike

Annoyed by fuel guzzling, pollution creating motor bikes, Ranjit Singh wanted to provide an environment friendly bike within an affordable price range. He developed an electric bike successfully in 2003 at a cost of Rs. 6000/-. After scrupulous research and development he could develop a two seater electric bike in 2005; which costs Rs. 9000/- and which can run 40 km after a full charge.

When many international and large companies are introducing much costlier bike of this kind, should not state help such small scale producers in getting testing done and commercialise the technology. NIF will join such efforts.





ASJADBHAI DHUKKA GUJARAT

25

Customised Tricycle For The Lower Limb Physically Challenged

Understanding the needs of his father for transportation, Asjadbhai came up with this battery operated tricycle. The motor operating on a 24 V battery gives it reasonable speed and enough power to move through sandy terrains also. The vehicle has been customised with low height adjustable push back seats, newspaper and water bottle carrier and a safety lock to prevent backward motion on slopes. Additionally, the side arm support can be lifted up to enable the rider to climb up the seat easily. The vehicle offers a very comfortable ride to the traveller.

He was given a consolation award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.





PART I innovations | ideas

D. UTILITY/ OTHERS

This section contains only a selected sample of mostly awarded grassroots idea/ innovations originating from different parts of the country



C MALLESHAM ANDHRA PRADESH

Asu making machine for Pochampally sarees

Usually, the process of making a tie and dye' silk saree in Pochampally tradition begins with the selection of silk thread. In the process of Asu, the threads are tied to a triangular stand and designs are drawn on this stand. Tying is done where required as per the design and the threads are then dyed in selected colours. Once dried and untied, the dyed silk threads are rolled into spindles. The spindles are used appropriately in looms and the saree is woven. The Laxmi Asu machine by Mallesham has relieved women from 8-9 hours of labour everyday. The machine will help weavers save time as it just takes 90 minutes to weave a saree with the machine as compared to the four hours required in the manual process. This has brought a revolution in the weaver community. The Indian Patent has been filed for the Innovation. The innovator has sold more than 500 units of the same. The innovator has been provided support under MVIF scheme of NIF. HE was given a National Award in NIF's Fifth National Biennial Competition in 2009.

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









UDDHAB K BHARALI ASSAM

A serial inventor: Pomegranate de-seeder, arecanut peeler, bamboo splitting machine and other innovations

Bharali is a serial innovator who has achieved a lot in life notwithstanding the constant challenges and struggles that life has thrown at him. When he started his engineering degree course, the Assam agitation started and he had to drop out. after a few months. When he had barely finished part 1 of his AMIE in Chennai, his father expired and he had to go back to N Lakhimpur and take over his debt ridden workshop to look after the family. From then on as a result of his grit, creativity and perseverance he has managed to reach the position that he is in today.

A few of his innovations from a list of 100 are:

Pomegranate De-seeder

Bharali has designed and developed a pomegranate deseeder, which separates the granules of pomegranate from the outer cover and thin inner membrane without damaging the seeds. It has a capacity of deseeding 50-55 kg of pomegranate per hour. The machine has been exported to two countries, viz. Turkey and USA. DSIR, Gol has provided support to the innovator for developing value added product under TePP scheme through National Innovation Foundation, Ahmedabad.





Arecanut Peeler

Annoyed by the injuries caused while peeling the areca nuts manually, the innovator has designed and developed an areca nut peeling machine. The machine has a capacity of peeling 100-120 nuts per minute. The technology has been licensed to entrepreneurs based in several states.

Cassava peeler

The cassava peeling machine developed by Bharali is a portable electric machine that can process up to five kg of cassava in as many minutes. NIF facilitated the technology licensing to a Guwahati based entrepreneur. One unit has even been sold to a customer based in Kenya.

Bamboo processing machines

Bamboo processing by hand is a very time consuming and difficult process. Looking at this need Bharali has developed an assembly of machines that can perform operations from splitting long lengths of bamboo, sizing, surface finishing and polishing etc. These units have been installed with the help of NIF in CFC (Common Facility Centre) of the NERCRMP (North Eastern Region Community Resource Management Project) at North Cachar hills.

The innovator has also come up with a garlic peeling machine, tobacco leaf cutter, paddy thresher (licensed to an entrepreneur based in Guwahati), safed musli peeling machine, Jatropha de seeder, passion fruit juice extractor, trench digger, chopper for cattle and fisheries feed and portable dheki among other innovations. For many of his innovations the innovator was supported under the MVIF scheme of NIF.

He is an excellent example of public spirited innovator whose experience can easily inspire technical and non technical students all over the country. The innovator has been provided support for workshop development also under MVIF scheme of NIF.









MANSUKHBHAI PRAJAPATI GUJARAT

Earthen Kitchen Products

Tawa/pan: Non-stick tawas have become an essential part of our kitchens to prepare low oil food. But these non-stick pans made of metal are quite costly. Their nonstick coating also does not last long. Blending traditional and modern technology, Mansukhbhai has developed a clay tawa with a black non-stick food grade coating. Being non-metallic, the rotis, dosas and other items cooked on it give a different taste and feel much better. The paint gets into the clay pores and thus does not come off despite prolonged use. He was also supported under the Micro Venture Innovation Fund scheme of NIF.

Mitticool: It is a fridge for the common man that does not require electricity and keeps food fresh too. Mansukhbhai came up with Mitticool, a fridge made of clay, working on the principle of evaporation. Water from the upper chambers drips down the side, gets evaporated, leaving the chambers cool. This keeps food, vegetables and even milk fresh naturally for days. He has received national and international exposure and the recent issue of The Economist carried a story in which his innovation was mentioned. Lot of queries have come from around the world for his Mitticool, including from the world's third largest company in Germany.

Cooker: It is a pressure cooker made from clay. Food cooked in clay vessel has different taste from the food cooked in the conventional vessels. He got a National award in NIF's Fifth National Grassroots Innovations and Traditional Knowledge Awards 2009. The innovator has been provided support for workshop development.







LATE YENKHOM MANGI SINGH MANIPUR

Kouna mat making machine

Y. Mangi Singh, a 63 year old physically challenged person, was able to provide the much needed impetus to the traditional Kouna (water reed) mat making industry in Manipur. Kouna is synonymous with the exotic craft tradition of Manipur; the unique feature is that Manipur is the only place where Kouna is grown and extensively used in local crafts. More than 4 lakh people in the unorganized sector are engaged in the state crafts industry and more than 180 items are made using Kouna.

This manual machine, which can even be operated by a low skilled worker or a physically challenged person can weave two mats per day. The quality of the mats produced is better than those produced by traditional methods.

The innovator has been financially supported for product development and market research. NIF has also engaged local designers, Nehru Yuva Kendra, Central Crafts office etc., for value addition and dissemination of this technology. He was given the Manipur State Award in NIF's Sixth National Biennial Competition Awards in 2012.






N JILATOMBI SINGH, BHAGAT SINGH, S KENNEDY SINGH MANIPUR

Penao

Pena is one of the most popular musical instruments of the Meitei community and is used in a variety of social and cultural events. The uniqueness of Pena lies in its distinctive sound, which is quite different from any other fiddle and string instruments.

The innovators have modified the original pena into penao (Pat app no 1332/KOL/2011), changing the number of bundle strings and modifying the bridge arrangement. This arrangement allows the Penao to play a wide range of musical notes, without losing the original and distinctive sound of the traditional Pena.





MOHAMMAD ROZADIN BIHAR

Cooker for coffee

Conventionally, the pressure cookers have been used for making food only. However, the innovator has modified the normal cooker and made it into an espresso coffee making machine.

The modified cooker is used to boil water and generate steam. It is then passed through a modified delivery system, attached to the lid, to a jar containing milk, coffee and sugar. In five minutes frothy, tasty coffee gets ready!

The modified cooker has been in great demand and even tea stall vendors from nearby districts have bought it for their shops. The innovator has been provided support under MVIF scheme of NIF.. He was also given a National Award in NIF's Fifth National Biennial Competition in 20009.









VIRENDRA KUMAR SINHA BIHAR

Pollution controlling device

For operating a welding machine, the generator used by the innovator emitted a lot of flue gases and also produced unwanted noise. To solve this problem, the innovator retrofitted a cylindrical container to the exhaust pipe of the engine. The specific arrangement of different types of fins in the cylinder filters out the particulates and allows the clean air to pass, resulting in very low emissions and thus controlling pollution and reducing noise.

BIT Mesra, Ranchi has confirmed considerable reduction in the proportion of carbon monoxide and carbon dioxide in the flue gases after adding the device instead of conventional muffler. The temperature of the flue gas was also reported to be significantly reduced. The testing was facilitated by NIF. The innovator has been provided support for workshop development.







SHEIKH JAHANGIR SHEIKH USMAN MAHARASHTRA

Two-wheeler Based Spray Painting Device, Washing Machine & Flour Mill

The innovation is a painting device that can be easily mounted on a two-wheeler scooter and carried to a customer's place. Deriving power from the two-wheeler's engine to run the compressor, this device lends flexibility of usage to the painter. This innovation won Sheikh Jahangir a consolation prize in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF also filed a patent application for the same and supported him through the Micro Venture Innovation Fund. The innovator has been provided support for workshop development. He has also made a scooter mounted washing machine and a scooter mounted flour mill. His scooter mounted flour mill was featured in the block buster Hindi movie 3 Idiots.











ABDUL RAHMAN SHEIKH JAMMU & KASHMIR

Improved Iron Cutter

Abdul Rahman Sheikh, a mechanic aged 50 years has developed an iron cutter (Pat app no 640/DEL/2012) capable of performing four kinds of motions and cutting iron precisely from different angles. Its cutting range varies between one to eight inch (pipe, guarder etc) and it can cut flat sheets of any length. He was discovered during the shodhyatra in Anantnag in June 2007.





A MURUGANANDAM 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.1.50 to Rs. 2.00 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. The innovator has been able to hundreds of units of the machine in different parts of the country. The innovator has also been provided support under MVIF scheme of NIF.







MATHEW K MATHEW KERALA

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. He was given the Kerala State Award in NIF's Fifth National Biennial Competition Awards in 2009.







PARESH PANCHAL GUJARAT

L RALTE & L SAILO MIZORAM

USMAN SHEKHANI CHHATTISGARH

Bamboo splint making machine

Bamboo sticks are major raw materials used in the Agarbatti industry. For making incense stick, electricity operated high capacity machines are available, which are suitable for industries but not for rural poor who make strips and sticks using knife.

Paresh Panchal has developed a set of two machines i.e. Bamboo strip and incense stick making machine, which are used to make incense sticks from bamboo pieces. The first machine is used to slice the bamboo pieces of definite size and length. The slices cut are then fed in the stick making machine to produce the sticks. The capacity is about 30 kg/day (2000 sticks of 2 mm thickness per kg). The blade life is about 10000 kg sticks (10-12 months). Easy to operate & maintain, most suitable for the rural/tribal people/SHGs.

Ralte and Sailo have developed a manual machine, which can slice bamboo strips and also make splints from the strips. One needs to load the bamboo piece onto the machine and slide the cutter to and fro using a handle. This results in 1.2 mm thin strips of bamboo. About 50 of these strips are then stacked together and loaded onto the machine vertically. The cutter is again moved to and fro resulting in splints of 1.2 mm thickness.

Usman Shekhani has developed a specialized bamboo cutter to cut bamboo strips into small pieces for preparing incense sticks (Agarbatti) and toothpicks. It consists of a wooden bracket, high speed steel blades, adjustable screws and spring loaded pushing roller. The quality of the output is good, the machine is portable, requires no electricity and maintenance cost is minimal. It also increases the efficiency of bamboo workers as 2000 sticks can be manufactured per hour using this device whereas previously this work was done manually. Usman Shekhani has sold thousands of pieces of this machine and trained people in using it.







PREM SINGH SAINI HARYANA

Telephone Operated Remote Switch

The innovator observed the difficulty of farmers in their homes at night, who need to go to faraway fields, as per availability of power supply, to switch the motor on or off for pumping water.

The innovation uses the power of a mobile phone on existing networks to enable the farmer to know of electricity status and remotely switch the pump on or off as required, while sitting in his home itself. This "mobile phone operated switch" is an instrument box with an attached mobile phone and modified circuit which can toggle a device between switch-off and switch-on conditions, besides letting the user know the status of the remote device.

Only authorized users having the specific mobile number can operate the system. Sitting at home, traveling thousands of miles away, the farmer can know if electricity is "on' or 'off' at pump house. He can turn the pump on or off at will without spending any call charges. He would know of the status of electricity supply, and pump status and control functions just by the number of rings. The innovator has been provided support under MVIF scheme of NIF.



Electronic Robot & Talking Poster

The innovator has developed an electronic robot that can be used in hazardous areas for command and control. This unit can be controlled by a TV remote and can 'see' and maneuver around obstacles, take photographs as required, detect fire, smoke and monitor humidity levels. The functional versatility and degrees of freedom is achieved by its 10 wheels, powered by 5 motors using custom electronics embedded with more than 40 ICs, 200 transistors, 900 resistors, dedicated sensors and intelligent control systems.

The innovator has also developed two other applications that respond to human presence and deliver the desired function on demand. The first innovation is a guest welcome system installed at entry points in any building which can detect motion and give out the welcome address thereby surprising and delighting the guest. It also greets the guest while going out. It is programmed to be uni or bi directional, has audio volume control and as a standalone unit, it can be powered by battery or conventional electricity.

Extending the envelope of automated communication, the second innovation is a "talking poster", which suits the learning style of some users who are unable to read the content of a poster. The content is delivered via audio as a pre-recorded message when the person come in and stands in the line of sight of the poster. NIF helped the innovator in procuring orders from a Mumbai based company, which has deployed the posters among its MFI and Cooperative Bank clients for sharing information about loans schemes among potential clientele. The posters in various language versions have been installed in states like Andhra Pradesh, Maharashtra, Orissa etc.







ARVINDBHAI PATEL GUJARAT

Auto Air Kick Pump

This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle, particularly two-wheelers, having kick start or auto start mechanism. One can fix the problem on the spot so that the vehicle can reach the nearby gas station or repair shop.

This device converts the compressor of two-wheeler into an air pump. A pinch of polymer granules is also inserted in the tube to seal the leakage. The user can kick and fill air in the tube. This may last for a few kilometers to reach a puncture repairing shop. An entrepreneur from Mumbai has taken non-exclusive license for this technology and has sold more than 2500 pieces so far, mainly in North Eastern India. Another technology licensing has been initiated by NIF North East cell, IIT Guwahati. Recently, with the help of GIAN West, another technology transfer to a different entrepreneur in Mumbai has been facilitated. For this device, he won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. The innovator has been provided support for workshop development.





The Natural Water Cooler, Auto-compression Sprayer and Handy Tongs

We already have refrigerators that operate on the principle of heat transfer and earthen pots that work on the principle of evaporation to cool water today. Arvindbhai has combined both features. In his natural water cooler, water is passed through cotton string covered copper coils, which are continuously being moistened by a dripper. Evaporation of water from lining on the coil cools the water inside. He has obtained a patent for this cooler, which was facilitated by SRISTI/GIAN West. He was also supported under the Micro Venture Innovation Fund scheme of NIF for commercialisation of this technology. GIAN West also facilitated the technology transfer of this cooler to entrepreneurs.

He has also made an auto compression sprayer, which utilizes the jerk produced while walking to create air pressure for spraying pesticides. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005 for this prototype. The innovator has received the patent for his device, which was facilitated by GIAN/NIF. Under the NIF-CSIR JIC, further development of this technology was also attempted.

He has also made simplified and efficient tong for lifting heavy vessels. He was also supported under the Micro Venture Innovation Fund scheme of NIF. He got an Appreciation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.



LATE NITAI DAS GUPTA WEST BENGAL

Waland- Amphibious Cycle Rickshaw

This boat shaped rickshaw, which can accommodate four persons, was developed by the innovator in 1954. The direction of this rickshaw is controlled by a handle attached to the front wheel. The speed in water and on land is estimated to be 8 km/ hr and 30 km/hr respectively.



5-Gear Bicycle

This innovative bicycle having five gears was developed by the innovator in 1958. Two persons can ride this bicycle. Of the five gears, two gears were specially incorporated to enable a comfortable ride on hilly terrains.

Motor Cycle Driven Ambulance

Transport of the sick and injured persons to health facilities in rural areas is a major concern due to the lack of motorised ambulances. Methods currently used such as carrying on a crude stretcher or in wheel barrows or carts, are slow and uncomfortable, leading to unnecessary delays and discomfort of the patients.

To address these problems, the innovator came up with a motorcycle driven ambulance way back in the seventies. The ambulance, which has all facilities of a conventional one, can be easily detached from the motorcycle.



Four Wheeler Vehicle Driven By Four Persons

The innovator developed this vehicle in 1997 when he was requested to come up with a special manual vehicle that can carry four persons, for a road show in south India. The vehicle consists of four wheels and two frames and has eight non-changeable gears. The steering and a brake, which applies to all four wheels simultaneously, are provided in front to the driver on the left.



AGASTYA NARAYAN SHUKLA DELHI

Advance toothbrush

This toothbrush has an integrated toothpaste dispensing mechanism. The toothpaste is filled in the body of the brush. By rotating the knob at the bottom of the brush, the paste is pushed out on the bristles. Thus only the required amount of paste is used. He also has developed a safety valve for pressure stoves and has conceived numerous other useful ideas. He won the State award in NIF's Fifth National Competition for Grassroots Innovation and Traditional Knowledge in 2009. NIF also supported him under the Micro Venture Innovation Fund and got his stove tested at IIP, Dehradun.







JAHANGIR AHMAD JAMMU & KASHMIR

Electrical Painting Brush

Electrical painting brush is an automatic gadget for painting walls. This brushing system has a low powered motor that pumps paint through a plastic pipe into a specially designed painting brush which is controlled by the painter. The invention can be widely used by painters. It increases the output and the quality of painting as well. Since the brush is not required to be dipped in the paint drum, the wastage of paint is also prevented. Jahangir developed a proof of concept after getting support from NIF. He was given a National Award in NIF's Sixth National Biennial Competition Awards 2012.







MOHAMMAD IDRIS UTTAR PRADESH

Bicycle operated horse shaver

Horses, mules, sheep, camels need to have their hair/wool cut regularly. Many owners have difficulty in getting this done as the electric/motor powered shear units are expensive, and far and few in the towns. In addition, hand shears do not achieve uniform cutting action.

Idris has developed a bicycle-powered horse shaver in which the power of the bicycle rotary drive is transferred via speed cable to the clippers to cut the hair. The bicycle operated horse shaver removes the drudgery of combing, sorting, gradual cutting and giving final touch to the animal's hair, which takes hours when done manually. This unit can make the owner self-reliant in doing this essential function, while retaining the basic functioning of the bicycle. This is a detachable arrangement whereby the bicycle can be used as usual without any problem after detaching the chain that drives the speed cable. His innovation was featured also in the block-buster Hindi movie, '3 ldiots'

He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







SWAYAMBHOO SHARMA RAJASTHAN

Tax at Source: Hand Pump with Attachment for Filling Animal Trough

Lack of surface water sources and falling water table has made availability of clean drinking water a major problem in Rajasthan. For human beings, the need gets addressed to some extent but for animals this need is much less appreciated.

Swayambhoo Sharma came up with an interesting solution to address the drinking water needs of animals. He developed an arrangement such that every time people pump water for their use, 20 per cent of pumped water will directly go to fill animal water trough. Since most people feel lazy in filling drinking water trough for stray animals, this innovations solves this problem by a kind of tax at source. Another problem faced in hand pumps is that a single person finds it very difficult to pump and at the same drink water (without a vessel with him/her). Chandan, then a first year student at IIMA came out with an idea of storing water in the body of the hand pump so that having pumped, one could use a tap and drink water like any other tap. Yusuf and Madan Lal Kumawat, two other innovators combined the idea of Chandan and Swayambhoo Sharma and developed a hybrid model. This made it possible for storing water for animal to drink in a trough dug in the ground and at the same time provided two pipes, one for drinking with lesser outflow and other, bigger one for filling the bucket. If bigger tap was used for drinking by hand, then lot of water was spilled over and was wasted.







MOHAMMAD AMINUDDIN AHMED ASSAM

Dual security alarm and mobile phone based systems for industrial establishments and infra-red signaling device for railways

The dual security alarm is a two-way alarm system, which signals from a main station to sub stations and vice versa. It can also give simultaneous alarm signal to any other desired remote location. Once the alarm is set off, only the operator in the main station can switch off the alarm, signaling that the message has been received. The system is specifically designed for oil drilling sites and can be very useful for the sites where loud noise and congestion problems persist. With the assistance from NE cell of NIF, innovator has supplied 15 units to ONGC. This was funded through MVIF. For this innovation he was awarded in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

Another innovation by Ahmad is the solar power operated automatic audio-visual alarm system for railways. Out of the three units, one is placed near the level crossing and rest two are placed about 3 - 5 km away from the level crossing on either side of the railways track. When an approaching train crosses any of the units placed along the track, it sends a signal to the unit placed at the level crossing, which switches on the hooter and the flasher to alert the level crossing users. The hooting and flashing continues till the train completely crosses the level crossing. NIF has facilitated evaluation of this technology at North East Frontier Railways. He has also developed mobile phone based vehicle security system to prevent unauthorized starting/ theft incidence.







M NAGARAJAN TAMIL NADU



Garlic peeling and lemon cutting machine

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

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









K LINGA BRAHMAM ANDHRA PRADESH

Gas operated iron

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

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







SHAIK MOHAMMED ISHFAK ANDHRA PRADESH

Device to regulate the gas supply in gas pipe

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

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









Hand pump with a modified plunger

The plunger design of a hand pump has been modified by the innovator, which has resulted in substantial increase in the efficiency. The change of material has also helped in reducing the cost and weight as well.

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BIT Mesra, Ranchi tested the same at NIF's instance and found that the hand pump with the modified plunger gave 69 percent more discharge than the hand pump with the conventional plunger for the same number of strokes and head.





K J ANTOJI KERALA

25

Rain water syringe: A novel approach of water conservation

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.







DEEPAK BHARALI ASSAM

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Extra-weft insertion in hand loom fabric ornamentation device

Conventionally the task of the insertion of weft threads needed to make a variety of designs is done manually by tying knots, which is tedious, cumbersome and time consuming. The thread is also wasted in the connection between one motif to another.

The device consists of three components; base frame, magnet-bearing shaft and specially designed bobbin. These components can be fitted to any hand loom Jacquard machine. The innovation reduces the time required for making designs to one third of the time required in traditional way.

IIT Guwahati has been looking into the design issues in this technology and it is likely to make a major impact on the similar looms in coming years. The innovator has been provided support under MVIF scheme of NIF. He was given Assam State Award in NIF's Fifth National Biennial Competition Awards in 2009.









ABDUL RAZZAK TAMIL NADU

Rice steep draining cooking vessel

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









GHULAM MOHAMMAD MIR JAMMU & KASHMIR

Singing Lantern

The singing lantern is basically a modification in the conventional kerosene lantern widely used in Kashmir and elsewhere. The innovator has converted it into a rechargeable battery operated lamp and has also incorporated a radio receiver in its base. So this can be used for providing light and also be used for listening music or news. The look of conventional kerosene lamp gives it a unique design edge.







GOPAL KUMAR SALUJA HARYANA

Ceiling Cooler

While costly airconditioners and aircoolers have been around for years, this innovator has developed a unique 'ceiling cooler" by upgrading the ubiquitous ceiling fan.

The ceiling cooler comprises the ceiling fan, a submersible water-pump with motor, a cylindrical water container having arrangement for continuous water drip, as used in desert coolers. Four spokes made from valves of old engine are welded to cross bars for adjusting and making the unit leveled.









UMESH CHANDRA SHARMA ASSAM

Interlocking bricks

Umesh Chandra is a simple metric pass who makes a living by selling sand stone chips, cement etc., to villagers for constructing houses. At the time of constructing his own house, Sharma had to face a lot of problems with the masons. Hiring them was not only expensive but also very problematic as they often went out to look for better opportunities.. He then started thinking of a simple way to make bricks without the help of these masons and came up with the interlocking bricks.

The materials used for making the bricks are concrete, cement and sand of specific shape and size, taken in required proportion and mixed with water to form a homogeneous mass. Interlocking is achieved by projections and depressions in the blocks on the upper and lower faces of the brick. The utility of the interlocking bricks is that it facilitates construction even by unskilled labor, reduces consumption of mortar, labor and construction time.

NIF facilitated a visit by faculty from Design dept. IITG along with a few students who made suggestions for improvement on quality and design. The innovator was supported through the MVIF scheme of NIF for enterprise formation.







CV RAJU* ANDHRA PRADESH

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Reviving Dyeing Skills

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

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

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

* 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.















P L BANUMURTHI TAMIL NADU



Automatic saree border weft insertion: Combining tradition with modern

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

He received a National award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. The innovator has been provided support under MVIF scheme of NIF.









S SHANMUGAM TAMIL NADU

Continuous weft feeding looms

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

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








PAKKYANATHAN TAMIL NADU

Effective sound speaker system

Pakkyanathan, who has been running the business of renting music sound system observed the poor attenuated vibratory motion and acoustic sound wave with the existing sound speakers. To overcome these problems and to achieve a dramatic sound effect, he designed a circular speaker assembly with stainless steel material. The speakers are artfully presented in subtle curves and stunning finesse. They give better dramatic sound effect and desired strong bass for extra punch. He received a consolation award in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2009.





LATE GOBINDA CHANDRA GOGOI ASSAM

Ldrop auto protector: the two-way anti-locking device

After reading about a reported burglary case at Guwahati, where burglars locked inmates inside a room (having L-drop) from the outside, while ransacking the house in 2000, the innovator came up with the two way anti locking device as a solution. The device prevents the door being locked from outside or from inside depending upon the user's wish. It can be used by a person whether he is inside or outside the room and can be adaptable for all types of doors. The innovator claimed that it is very helpful for the rooms/ toilets used by mentally challenged patients and persons suffering from epilepsy as unauthorized/accidental locking can be prevented. The innovator was awarded in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2005.





SATISH DEB CHHATTISGARH

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Motek treadle press

Satish Deb (30) is a young man from a modest but tight-knit family. He learned about various aspects of the printing process from the treadle printing press kept at his home. In his efforts to save his family's printing press business from obsolescence, he has developed a technology that has the potential to rejuvenate treadle printing presses, which were losing ground to computers and new high quality printing technologies. Motek is a low cost, cutting- edge, up gradation tool for old letter press printing machines. The innovation lies in the unique combination of screen printing with letter press machines. The cost of the retrofitted Motek India Treadle press is much lower than that of buying a new offset printing press. Further, it prints over five times more efficiently than the treadle press alone.

He won a National award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007. NIF also supported him under the Micro Venture Innovation Fund.









MADAN MOHAN VERMA DELHI

Jewelry making machines

The innovator has indigenously developed an automatic jewelry making machine that can make chains weighing from 4g to 30g in different designs. The machine can perform sixteen operations at a time and complete a chain in 3-4 minutes. Apart from this, he has also developed a few other smaller machines to ease his jewelry making process.

He won the Delhi State Award in NIF's Sixth National Biennial Competition Awards 2012.







SUBHASH DAS AND AMLAN BHATTACHARYA ASSAM

Badminton stroke practicing machine

The beginners require assistance in playing badminton without having to pick up the shuttle cock every time it falls. Looking at this requirement, the innovators have developed a simple machine for practice which does not require an additional player on the opposite side of the net. The innovation essentially includes a motorized belt mounted on pulley with grooves holding shuttle cock in each groove. Once the belt goes on the top and moves downwards, the shuttlecocks fall one at a time to be hit across the net.







SAKRABHAI PRAJAPATI GUJARAT



Maruti Jhoola- The Health Care Chair

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.

*The innovator is a professional as per the rules of NIF, which were redefined earlier to specifically focus on innovations from the people of unorganised sector. It is ergonomically designed and serves the purpose of seating as well as exercising for a person weighing up to 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. For this chair, he was also supported under the Micro Venture Innovation Fund scheme of NIF. To facilitate marketing, 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.







MILONJYOTI DAS ASSAM

Egg incubator

Eggs need controlled heat and humidity to incubate properly. The innovator has developed an incubator, which is made up of plywood lined with thermocol. The unit is divided into two chambers. It can be heated by electric light as well as the kerosene lamp. The kerosene lamp is used in case of power failure. There is a regulator to control the intensity of the light.

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NIF has facilitated the marketing of a few units in the surrounding area and to DRDA, Sibsagar along with one unit to a NGO in Manipur. The innovator has also been supported under the MVIF scheme.





KARUNA KANT NATH ASSAM

Manual wood cutting machine

Cutting of wood effectively and efficiently is achieved by this machine. The equipment is cost efficient, and can be manually operated with both hand and foot pedal options. Most importantly it is portable, and can be taken to any worksite and has more productivity compared to manual sawing.

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This equipment consumes lesser time and labour compared to available saws and has a mechanism and linkages similar to manually operated sewing machine. The work of three labourers can be done by one labour using this machine. The innovator has also developed a multi bobbin charkha and a bamboo cross cutter. He has been supported under the MVIF scheme of NIF and has been doing modest business in the area.

Karuna was awarded in NIF's Third National Competition of Grassroots Innovations and Traditional Knowledge Practices in 2005.





GHONAKANTA GOGOI ASSAM



Multi purpose wood-working machine

Small carpentry workshops have difficulty in purchasing and using multiple machines due to high initial costs, space constraints and maintenance considerations.

This multipurpose machine with minimal footprint, is built to address all major workshop needs, allowing completing the sequence of wood-working operations in one place, and allowing better control on finished product.





NASIM AHMED ASSAM



Bamboo polishing machine

Nasim has developed a machine that polishes bamboo sticks used for making bamboo curtains and mats. The bamboo sticks are rubbed mechanically for smoothing. It can polish 100 kg of bamboo sticks at a time within 90 minutes. It reduces labour cost many folds. Only one labour is required for running the machine and adjusting the bamboo sticks.





C A VINCENT KERALA

Floating toilet soap

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.





ANIL KAMDAR GUJARAT



Buttonhole Stitching Machine

Normally, buttonhole stitching in shirts is one of the most tedious and time consuming tasks. This particular machine addresses this problem adequately. It has been modified from an old embroidery machine and can stitch buttonholes automatically relieving the tailor of the pains to do it manually. It has an automatic thread cutting mechanism also and can make buttonholes as per the required shape, size and design. Through NIF and GIAN West support, the machine has been considerably redesigned. Since original machine was fabricated using various old and junk parts, it did not perform in a consistent manner. Availability of old imported Japanese machines has affected the market of his machine adversely.

He got a Consolation Award in NIF's Third National Competition for Grassroots Innovation and Traditional Knowledge in 2005. He has obtained the patent for his machine through GIAN West.





PROBIN KALITA ASSAM

Weft thread making machine

Weaving involves the interlacing of two sets of threads at right angles to each other i.e. the warp and the weft. Generally it has been done through a tedious manual process. Prabin Kalita innovated a wooden machine, with which yarn can be reeled efficiently for making the weft of Muga cloth. The Cotton belt reduces breakage and tearing of threads while processing.

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NIPUL BEZBORA BIPUL BEZBORA ASSAM

Innovative fan blades made of bamboo

The innovators have developed a double-layered four blade fan for blowing air. They had originally made the fan in order to separate rice and husk in the winnowing machine. It is a unique fan with specific geometry, size, number and the offset arrangement of the blades with respect to each other. Unlike normal fans having set of blade circumferentially on the axis, it has two set of larger and smaller blades located circumferentially on the same axial shaft. Vortex created by this fan seems to have much higher power than the conventional fans.

Department of Energy, Tezpur University, showed that its performance is almost at par with that of the conventional pedestal fans (electrically operated) of higher sweep. The brothers were awarded in NIF's Third National Competiton for Grassroots Innovations and Traditional Knowledge Practices in 2005. The brothers, popularly known as 'Vishwakarma' in their village, have also come up with a bamboo rickshaw, bamboo umbrella and a locking arrangement for power tiller.







SUKHRAM MISTRI JHARKHAND



Portable welding machine

To enable an appliance/device to be welded either requires the device to be carried to the place of the welding or the welding machine to be taken to the place where the requirementis.Eitherwaymostofthetimeitisquitecumbersome.This welding machine has made work easy. It works well on low voltage using a single phase electric supply. NIF facilitated the testing of the device at BIT, Mesra, Ranchi, which has suggested some changes in the materials.





KHIMJIBHAI KANADIA GUJARAT



Innovations in Plenty

The 65-year-old retired primary school teacher Khimjibhai Kanadia has more than 50 innovations to his credit, all of which reduce the drudgery in various mechanical tasks and improve work efficiency.

One of Kanadia's most famous innovations is Kittanal. It is a hollow cylindrical piece of PVC pipe with an elliptical opening at one end. Though it looks a very ordinary device, it is highly effective in filling plastic bags with soil, which are used for growing saplings. Kittanal has won widespread accolades from different quarters, like the forest department of Gujarat, the paper and pulp industry major Ballarpur Industries and the Ahmedabad-based non-governmental organisation Self-Employed Women's Association.

Some of his other important innovations include a gum scrapper for collecting gum from trees; paniharino visamo, an apparatus to ease burden of rural women who carry pots on their head, and a sprayer to reduce pesticide wastage. His innovations won him the State Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. For more information on Khimjibhai Kanadia's innovations also see Honey Bee, 9(1):7, 1998.











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Motorised String Winder

All kite flying enthusiasts will accept that winding the string is a difficult process and takes time, after the kite is cut. Rightly identifying the need of kite flyers, Pareshbhai has made an automatic thread winder, which uses two small batteries. Easy and speedy operation, it winds 500 yards of thread in 30 seconds.

For this winder, he was supported under the Micro Venture Innovation Fund of NIF. A patent was also filed in his name. He got a Consolation Award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007. The innovator has been provided support for workshop development and also under MVIF scheme of NIF.







LATE RAVJIBHAI SAVALIYA GUJARAT

Ribbed Tawa/Pan And Others

Traditional iron tawas are much poor in thermal efficiency than many recent designs. With the increase in the LPG prices, reducing the energy consumption is quite a challenge while cooking. A product to overcome this challenge is the 'Ribbed Tawa', which is made of aluminium and has ribs on its bottom. This design allows the enhanced flow of heat from the bottom due to increased surface area, improving the baking capacity of the tawa thereby reducing energy use.

His innovation journey was full of twists and turns. He developed many more innovations such as a butter churning machine thirty years ago for which he got a President's Award. His innovations include wheat thresher, foot pump, electronic furnace type wood based crematorium, diamond polishing lathe, agate grinding mill among others.

He has been short listed for recognition in NIF's Fifth National Competition for Grassroots Innovations and Traditional Knowledge. Also see Honey Bee 19(4): 4-7, 2008.











U S PATIL MAHARASHTRA



Natural Fibre Based Match Stick

In order to promote the use of natural fibres and reduce the reliance on wood, the innovator has successfully developed a process of making splints for safety matches using some natural fibres.

In comparison with conventional matchsticks these matchsticks burn slowly but steadily, reducing the chances of the users' fingers being burnt. Further no harmful chemical is used except the mandatory phosphorus. Preparing these matchsticks is much easier and cheaper than preparing wooden matchsticks, which require huge machinery for cutting logs of wood to suitable size. He won a National Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005. NIF in coordination with GIAN- West sanctioned an amount of Rs. 12,500 from its Micro Venture Innovation Fund towards laboratory testing and technology transfer of the matchstick. NIF also facilitated filing of the patent on the same. These sticks help in saving wood and generate market for natural fibres.









WAZEER HAYATH KARNATAKA

Foldable talking stick for the blind

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







M MANIHAR SHARMA MANIPUR

54

Automatic Pump Operator, dehydrator, Agarbati Dhoop making machine

M. Manihar Sharma (62), a high school pass, has solved many local problems. After dropping out of high school he worked as a local mechanic in a workshop from where his fascination with mechanical world began. His journey is diverse; he was a founder general secretary of The All Manipur Auto Rickshaw Owner's and Driver's Association. He also ran a hotel, served as assistant to his doctor friend and is now a full time innovator.

He has come up with a Automatic Pump Operating system (APO) with seven variants, which allows hassle-free household water management. Using a central control panel, the pump switches on automatically as soon as the overhead reservoir goes below the threshold level and switches off as soon it gets full. The same principle follows for the ground reservoir as well.

The innovator has also made a simple dehydrator with very efficient mechanism. Hot air is blown into the chamber with the help of normal heating rods and air blower from below. Every layer of trays is attached with an air guide, which provides uniform distribution of the hot air. On top of the machine, an exhaust fan continuously drains out the moisture from inside.

Manihar has also developed an Agarbati Dhoop making machine. The device has two blade arrangements, one for making small bamboo splints and the other for making small sticks. For stick making it has multi-bladed arrangements for different stick sizes. Both the blades are fixed on two sides of a small wooden bloke. Apart from the above solutions, the innovator has also innovated a micro drill for small operations. He was given a National Award in NIF's Fifth National Biennial Competition Awards in 2009.











YAGNESH MEHTA GUJARAT

Air Curtains

Using ABS plastic, Yagnesh has come up with an innovative design of the air curtains. The fins are aerodynamically arranged facilitating proper air flow at the same time effectively repelling flying insects, dust and pollutants. Unlike the aluminium made rolling drums, these curtains are cheaper, require less maintenance, are easy to manufacture and produce negligible noise and vibration.

He won a Consolation Award in NIF's Third National Competition for Grassroots Innovation and Traditional Knowledge in 2005.







VINOD GAJJAR GUJARAT

Vatsal Tong

The conventional household utensil-holding devices used in kitchen have not undergone much improvement in recent times. Very often accident occurs due to the lack of gripping capacity of conventional tong. When posed with this problem, Vinodbhai came out with an innovative design of the tong, which is more user friendly, low cost and can be widely used for utensils of various sizes. It sold very well in various Traditional Food Festivals- Satvik held at IIMA campus.

He won an Appreciation Award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007.







SHAIKH NAZIM GUJARAT

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Solar cooker. stencil cutter and thread twisting device

Shaikh Nazim is a very creative person who keeps on churning ideas, some of which are mentioned below.

Solar Cooker: His solar cooker uses ordinary mirrors to reflect solar rays to cook the food. The difference between his and other solar cookers is that small square mirrors are placed at intersection points of an iron wire grid instead of a large single piece parabolic mirror (difficult to carry, install and maintain). The cooker costs Rs 2500 and saves the time of cooking.

Stencil cutting for embroidery design: Conventionally, stencil is prepared by punching small holes using needles manually. It is a very cumbersome and tedious task leading to pain in the palm. Nazim has developed a small innovative punching device to apply design on butter paper to facilitate the design on cloth. The device comprises a small a motor of DVD player, needle, crank and a connecting rod. Using this device, the time required to punch complex prints has been reduced considerably. It is similar in some sense to the device used for writing name on the metallic vessels.

Thread twisting device for embroidery design: "Marodi" is a traditional name which means twisting of threads. This is one of the most labourious and expensive work done on dresses. Conventionally it is being done manually by twisting the threads between palms. In order to simplify the operation, Nazim has developed a small electricity operated device. It comprises a motor of DVD player and a special hook made of wire, both assembled together in a PVC pipe. A variable adaptor helps in controlling the speed. The hook can be rotated in both clockwise and anti-clockwise direction using a switch. The innovator has been provided support under MVIF scheme of NIF.







RAJESH T R KERALA

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Septic tank baffle system

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).









KAILASH SRIVASTAVA MADHYA PRADESH

Automatic motor winding machine

Burning-out of the coil of electric fans is very common in rural as well as semi-urban areas due to erratic power supply and fluctuating voltage. These problems occur frequently in locally made fans which are widely used in rural areas. Coil making is an arduous and time taking process. If done manually it takes 8-12 hours per motor and needs a lot of concentration in counting the number of coils, which run into hundreds. Finger tips get bruised by continuous coiling.

The automatic motor coil winding machine of Kailash Srivastava addresses all these problems. It is cheaper than other available options, involves less maintenance cost and has more functions and can bind coils of many types in a short while, at the same time ensuring high quality output. As this device reduces drudgery and imprecision of manual coil winding operation which is slow, tedious and error prone, this could be a source of income for unemployed people who could start a small business equipped with this machine. There is a wide scope of diffusion of this device in the coil and motor winding industry, which is a cottage industry in rural and urban areas.

He has been supported under the Micro Venture Innovation Fund of NIF for test marketing of his innovation. He was also given a Consolation award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







M K NARANG MADHYA PRADESH

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Electronic gadgets

M K Narang owns an electronics shop. He has developed/improvised many solutions for day to day problems at a reasonable cost. One of the interesting among them is a mobile phone based security system where if someone tries to break open the door/shutter, the system dials the preset number, which alerts the owner. He has also developed an auto dipper unit for vehicles working on LDR sensors, a dark sensor based automatic lightening system, a timer based cooler pump protector, which switches on/off the cooler pump after preset durations, and an automatic water pump operator, which takes the feedback of overhead tank along with the reservoir.





MAKARAND KALE MAHARASHTRA

Bullet Proof Jacket from Herbal Ingredients

This innovation is a bulletproof jacket made up of 80 percent herbal ingredients consisting of proteins, silk and cotton and 20 percent chemical constituents. Cotton cloth pieces and chemical preparations are layered alternatively. The combination of the material distributes the impact strength of high-speed bullet. Webbing of cotton cloth has a significant impact in context of energy absorption. The fabrication follows mixing, dilution, grinding, blending, impregnation and drying to get the final product. Composition of various grains is used, from which the proteins are derived. The bulletproof jacket is light weight and has good resistance against bullets, apart from having stability against temperature fluctuations. It can be moulded in any shape and size. It has good shock absorption properties and also provides good resistance to chemicals and abrasive substances. This bulletproof material can be used to make jackets, body of bulletproof cars, shields of shoulders, helmet, and fireproof devices.

The innovator won a consolation prize in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007 for his efforts. NIF has also filed a patent on behalf of the innovator.







MADHAV SAWANT MAHARASHTRA



"Jalpari" - The Water Carrier

Villages in India have women who walk miles with heavy water pitchers on their head, which results in considerable discomfort and even injuries. This innovation is an alternative and consists of a shoulder slung unit fixed with water canisters balanced on either side.

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









MANIPUR

KSHETRIMAYUM NICHOLSON SINGH The shock-proof converter

An electric shock occurs when a person comes into contact with an electrical energy source. The present innovative device converts all electrical lines to shock-free power lines. This is a very useful device for every household/commercial establishment with electrical installation. The device can be installed just after the energy meter so that each and every connection in a household/commercial establishment gets connected to the device and becomes shock-free.

Nicholson is a prolific innovator and has many other innovations to his credit like the reuse of fused tube lights, longer lasting modified tube light choke, and movable solar energy panel. He was given a National Award in NIF's Fifth National Biennial Competition Awards in 2009.









Iron mesh for drying fish

N. Indrakumar Singh is a 70 years old carpenter who does agriculture work as well. He has no formal education but is a well informed person. He has developed quite a few machineries and specializes in making local loom machines.

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Smoking or drying of fish is an age old practice. One such method, which is very popular in the state of Manipur, is using of an iron mesh for smoking or burning off the fish scales. In early days, people used to make different kinds of bamboo mesh for such purposes. Now-a-days iron mesh, which is more durable, has become more popular.

The present innovation is a simple treadle loom machine to make iron mesh. It is quite similar to any other normal treadle loom, except that the new loom has four wheels and moves along as one weaves along. The machine is the only one of its kind for making iron mesh. It is low cost, and doesn't need an expert hand to operate. Each machine provides employment to about 3-4 people.

Besides the iron mesh making machine, the innovator has also developed a small device to make patterns on charcoal chula, Frill making machine of iron mesh, Wood curving technique, etc. The innovator has been given financial assistance for product development and dissemination for his machine. The innovator has been provided support under MVIF scheme of NIF.







SUKHBIR SINGH HANSPAL PUNJAB

Extruder thread making milling machine

Sukhbir Singh, educated up to 10th standard, has modified the milling machines. The modified machine can be used for making gear, facing surface (horizontal or vertical), drilling and for cutting threads. The thread cutting job can also be done on lathe but there is limitation in the number of threads, which is not there in the modified milling machine. Singh developed the machine in 1997 and has sold over 20 machines in Faridabad, Baroda and Indore.





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MOIRANGTHEM MANGLEMBI DEVI MANIPUR

66

Woolen scarf knitting device

This is a very simple but useful innovation to knit woolen scarves. The device consists of a wooden rectangular base with nails fitted around an inner smaller rectangle. The space between the nails depends on the design of the pattern desired. The desired frill design is made by tying threads to the nails. Thereafter, based on the design, woolen thread is knitted over the nails. The threading of the woolen threads forms a net without any knots.

In each nail, there are two threads, one above the other. To make knitting continuous, the lower thread is picked, using a knitting hook, and put on top of the upper thread with a cross-over around each nail to ensure continuity of the knitted portion. The knitted part is pulled down from below, so that only one layer of knitted thread remains. Then the same process is followed until the desired length of the scarf is obtained.

This device makes knitting very easy for even the unskilled people and faster than traditional hand knitting. It can also make double layer pattern cloth or reversible design with no edge stitching.







BALWANT SINGH PUNJAB







Improvements to the automatic gear-cutting machine

Balwant Singh is a Ludhiana technician who lives and breathes engineering and machines only. He has made a couple of innovations with regard to gear cutting operations. He has made improvements in the methods based on his long experience to improve productivity. He has also modified the machine tools used for gear cutting in order to improve the precision level of the gears manufactured.

A milling machine is invariably employed for cutting large-size gears, when the face width is more than about 1-1/2 inches. The other alternative is to use a milling machine fitted with a hobbing attachment. While this ensures reasonably high output, the machine can also be used for normal milling operations when there is no gear-cutting work but the output is limited because no more than two or three gear blanks can be machined at a time. Singh pondered over the limitation of the design, which compelled frequent loading/unloading of component, which in turn caused loss of productivity. Through the process of trial and error, he replaced the universal-joint coupling with a bevel-gear mechanism. The new system consisted of three sets of bevel gears to transmit the spindle motion to the hobbing attachment. The bevel-gear system is inherently superior to the universal-joint coupling because the velocity of the output shaft remains uniform throughout. This avoids jerks that cause unacceptable vibrations.

For his contribution he won the Consolation Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002.




SUKHRANJAN MISTRI UTTARAKHAND



Pedal operated tile making machine

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

NIF has awarded Sukhranjan in its Third National Award Function in 2005.









NARAYAN DAS JETHWANI WEST BENGAL

Temperature Regulated Fan Speed Control System

Many times at night the temperature lowers and one has to physically get up and reduce the fan speed, which is quite irritating. The innovator has come up with an electronic system that will automatically adjust the rotational speed of the room fan according to the room temperature enabling a person to sleep peacefully and comfortably. The innovator has been provided support under MVIF scheme of NIF.

Ajooba Tube Light Frame

This system is a tube-light frame with out any choke and starter. The product is capable of using even 80 per cent fused tubes, which are considered as waste and thrown away. The power consumption is low and as there are no chokes or starters used, the overall cost is also quite less. Another interesting part of the system is that the luminosity of the tube can also be controlled.

Through its Micro Venture Innovation Fund, NIF has provided the innovator with working capital for commercialisation of his innovations.









ARINDAM CHATTOPADHYAY WEST BENGAL

Single Finger Pen

This innovation is a very simple one. A small refill-based pen is attached to a ring worn on a single finger. This innovation could be useful for physically challenged people who do not have a thumb. It could also be useful for the normal people for ticking a sheet or just writing. NIF has supported the innovator from its Micro Venture Innovation Fund for test marketing.





National Innovation Foundation - India

Taking grassroots innovations to the world



PART I innovations | ideas

E. STUDENTS

This section contains only a selected sample of mostly awarded grassroots idea/ innovations originating from different parts of the country



REMYA JOSE KERALA

Washing-cum-exercise machine

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.









DAVALSAB MAHAMADGOWS KARNATAKA

Auto stopper for LPG gas stove

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

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









ABHISHEK BHAGAT BIHAR

Automatic Food Making Machine

Who has not wished a machine which would cook one's chosen recipe every time exactly as one wished it to be? But then such a machine will not elude us any more, if Abhishek's innovative food machine comes in the market.

Kitchen King has 10 boxes containing different ingredients, with a display screen to select options to cook different items. The required quantity of each ingredient will be fed into the machine in the sequence one has pre planned to cook the desired dish.







SUSANT PATNAIK ORISSA

Breathing sensor apparatus to assist physically challenged

This system consists of a circuit, which uses the changes in breathing patterns to select several options such as food, water etc. It thus enables paralyzed/physically challenged people articulate their wish and be self-reliant in routine activities. The technology has a range of applications like operating a wheelchair, electronic appliances, prevention of accidents, detecting thefts, etc.

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Sushant has designed a proof-of-concept electronic circuit of a wheel chair, which can be navigated through your breathing.





MANU CHOPRA DELHI

Anti molestation device for women worn on wrist

'Better safe than sorry', that could be a good tag line for Manu's innovation of the Anti-Molestation Device. He says, "In Delhi it is a known fact that it is unsafe for women to travel by themselves at night. I don't allow my sister also to go out at times because of this. Being the national capital this should not be the situation."

Manu has come up with an idea to make an anti-molestation device. This is a watch like device capable of monitoring pulse rate and nerve impulse. Any significant increase in both the parameters (due to an emergency especially when someone is trying to trouble) will activate electricity in the upper portion of the device. When the person trying to molest will catch hold of the wrist, he would get a shock that would give sufficient time to the girl to run away.







SHALINI KUMARI BIHAR

Modified walker with adjustable legs

Shalini's grandfather uses a walker to assist him while he walks. But she noticed that he could only use the walker comfortably while walking on a level surface. Her grandfather enjoys walking on the terrace but he finds it difficult to walk up the stairs and he also finds it inconvenient to travel. Seeing her grandfathers' plight, Shalini came up with the idea of the modified walker with adjustable legs.





ARCHANA KONWAR ASSAM

Crutch with shock absorbers, bell and light

Archana's idea is to have a crutch with shock absorbers for the comfort of the user and also a bell to alert other commuters and a light to be used during the night.





The Cycl-O-Cleaner

RIYA KOTHARI, NIMRAN KANG, KAAMYA SHARMA & MEHR S. MEHTA NEW DELHI

The idea is to have a bicycle with two cylindrical brooms attached to the back wheel. The brooms rotate as one pedals and the brushes sweep away the dust making the drive way clean. The cycle may optionally include an extra dust bin attached to the front to collect large scraps and pieces of garbage.







SMARTHI, VINOTHA AND LAILA BANU TAMIL NADU

Use of Helmet as an ignition to start two wheelers

Troubled by the increase in every day reports of the number of deaths/serious injuries of the rider in cases involving motorcycle accidents, the students came up with this idea, which essentially means that a motorcycle cannot be started until the rider wears a helmet.







JYOTI RANJAN SAHU ORISSA

Device to Assist Low Vision People

Jyoti, a student of class nine, got the idea to make a device to assist people with low or poor vision by observing the students of a blind school which was close to his house. Some of them were suffering from glaucoma. He wanted to do something to help them. His device consists of a helmet mounted display device and a digital camera, which can zoom in pictures or videos onto the display device for the user to view.







VISHAN POPAT GUJARAT

Side Screen Wiper for cars, Single Push Pizza Cutter and other Ideas

A young student, Vishan, has many creative ideas to his credit. He has conceived an idea to have wipers for side windows in cars to enable passengers have a clear view of the sides in rainy conditions and otherwise too.

His other ideas include a single push pizza cutter, cleaning brush with cleaning liquid dispenser, a dust bin that gives an alarm when it is completely filled and others. He won the first prize in the class 8-12 section of the IGNITE 08-the National Competition for students' ideas and innovation organized by NIF.





MANIBHUSHAN PRASAD JHARKHAND

Innovative study table and idea of noiseless horn

Manibhushan is a young student. Facing problems studying in the night due to erratic electric supply, he has thought of developing a study table where the user can generate electricity at the same time along with the studies. He also wishes to incorporate a system wherein the light bulb will only glow till the time a book is on the table. NIF has supported him for the development of the prototype.

Manibhushan also suggests a noiseless horn where each vehicle is to have signal (may be IR) emitters and corresponding sensors. When horn is pressed by the driver, signals are transmitted (instead of sound), which are picked up by the car in front and a beep alert is there in its dashboard along with a light signal.





P KRISHNAKANT KERALA

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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.









OJASVI GOEL & SAHIEL BAKSHI DELHI

Rain water harvesting umbrella

Ojasvi has developed an umbrella, which can be used to harvest rainwater as well as protect oneself from the rains. The umbrella canopy has a circular opening leading to a tube, which opens into a bottle attached to the handle. Rain drops falling on the canopy drip into the opening and reach the bottle through the tube. Protection from rain and saving water at the same time, isnt it a nice idea! He won an award in IGNITE 08- the national competition of children's ideas and innovations.







MOHD. SAJID ANSARI JHARKHAND

Rice grain sorting / cleaning machine

When Sajid would come home from school he would see his mother very hassled while cleaning the rice. He wanted to make a device, which would help his mother. This is why he came up with the rice grain sorting/cleaning machine. This automatic electric machine separates broken rice grains and other physical impurities from unbroken rice grains.







NISHA CHAUBE UTTAR PRADESH

Travel Bags with Folding Seats

Considering the problem commuters have to face while waiting for buses/trains at stations, Nisha has suggested incorporating lightweight folding seats in travelling bags so that the commuter can use it to sit for some time when required.



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HARIMOHAN SAINI, MANOJ SAINI RAJASTHAN

Breaking Boundaries: Designing The First Five-wheeled Car

Young cousins Manoj and Harimohan Saini have designed and built a five-wheeled car in the hope of making a cheaper vehicle that most middle class Indians would be able to afford. They built the prototype using scrap materials such as scooter wheels, a moped engine, and a chassis built from available nickel pipes. The four front and rear wheels are free and only the fifth wheel in the center of the car is powered and used in steering. Manoj and Hari Mohan estimate that when they fine-tune the design their car will be able to reach speed as high as 80 km/hr and average fuel consumption of 30-35 km/l, more efficient than the 18-20 km/l rating of most available models.

They won an award in the Students' category in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF also engaged engineering students in BVB College of Engineering & Technology, Hubli, Karnataka to develop an improved prototype of the same.





AMANDEEP SINGH RAJASTHAN

Solar Laminator: Sun Gives Your Documents A New Life!!

Amandeep developed a laminating machine that runs on solar energy when he was still in school. He is an avid member of Bharat Scouts and Guides, and has received recognition for his innovation at several fora.

The solar powered laminator operates using the same principle as a solar cooker, replacing the electrical heating filament inside the laminator with a black box surrounded with mirrors. The solar energy collected in the box heats the metallic plates that affix the lamination sheets to the desired document. The machine can laminate an A4 size document in 15 minutes on a sunny day and can be powered by electricity in the absence of sunlight. He won an award in the Students' category in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF/ GIAN North also facilitated its testing at the Solar Energy Centre, Ministry of New & Renewable Energy, New Delhi.

Amandeep and his friend Ranjeet have also developed a manual multifunctional farm tool bar, which is capable of carrying out ploughing, weeding, leveling, sowing and spraying. The tools required for these different purposes can be fitted to the tool bar easily.





ANKUSH KUMAR JHARKHAND

Cob-web cleaner

How many times we frown at the irritating sight of the cob webs in the corners of our rooms, which refuse to go away completely with the traditional cleaners. A possible solution comes from a young boy, who has developed a battery operated cob web cleaner, which rotates the head to clean away the last strand of a cob web.

Beware Pick Pocket: an alarm/light to alert

A simple circuit that will make a siren to go off once some one tries to take away something from your pocket. And if you miss the alarm, a light will blink in your goggles. Another idea from the young mind!











SANKET V CHITAGOPAKAR AND PRASHANT V HARSHANGI KARNATAKA

Electronic stick for the visually challenged

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

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

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





V ATCHARA, K PREETHI TAMIL NADU

Low cost respirometer

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





RAKESH PATRA ORISSA

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Multipurpose crutch for the physically challenged

Rakesh, a student of class Xth, felt concerned about the plight of physically challenged people. He has made a wooden crutch, which is equipped with a foldable seat, a head light, an alarm, and even a place to put an umbrella. This multipurpose crutch provides convenience and comfort to handicapped people. This innovation reduces the drudgery involved in walking long distances using a crutch without making a halt. One can stop whenever one feels like taking a little rest. One does not have to sit on the ground from where getting up without external help is not easy. He won an award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007 in students' category.









SUPRIYA CHOTREY ORISSA

An umbrella that rains and cools!!

Supriya Chotrey was inspired to make an umbrella with a water spraying arrangement during an extreme heat wave that struck Orissa in 2003. She consulted her science teacher and successfully built a unique umbrella with a water sprayer, a thermometer and a siren attached to the handle of the umbrella. The umbrella has an upper layer of white cloth, and a lower layer of black cloth. In between these two lies a layer of sponge. A water spraying bottle is attached to the handle of the umbrella. When the ambient temperature rises above 35° C, the built-in thermometer signals the umbrella to sprinkle water from the attached spraying bottle. It saturates the sponge below the top. Once the umbrella gets wet, one gets cool air. She won an award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007 in students' category (Also see: Honey Bee, 16(3): 8-10, 2005).







SHWETA SHARMA PUNJAB

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Change of colour in medicine pack to indicate expiry

While cleaning out the medicine box at her house one day, Shweta saw that a lot of medicines had already expired. She got worried that she may have, at some point, taken an expired tablet and it may have caused some damage to her. She thought that being a literate person if she could make this mistake of not checking the expiry date, an illiterate person would face even more problems. This is how she came up with the idea of putting a layer of liquid that dissolves the covering membrane and spoils the tablet after the expiry date.





JASKIRAN GORAYA PUNJAB

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Making medicinal tablets inconsumable after expiry

Jaskiran got the idea for putting a layer of liquid that disintegrates the covering membrane and soils the tablet once it has expired while she was watching a TV serial. She saw an illiterate person give expired medicines to a patient and which worsened his condition. Jaskiran felt that she needed to find a technique to help an illiterate person find out if the medicine has expired or not and prevent him/her from consuming it.







Charging mobile from mobile

It happens many times that we have to make a call from our mobiles and we find that the battery has discharged. Sometime the charger may not be available and some other time, the electricity point for charging. But we would always find someone or the other with a mobile phone. Ravi, Sanjay and Manoj suggest a handy device using which a mobile can directly be charged from another mobile.









MD. USMAN HANIF PATEL MAHARASHTRA

Wind operated ceiling fan

In areas where electricity is not available or intermittently available, young Usman suggests installing small windmill on the roof, which would be attached to the ceiling fan in the room to operate it. He has also thought about a grading machine for oranges of different sizes.





T CHRIS ANANTH TAMIL NADU



Mini vacuum cleaner in shoe

Young Ananth's idea is to have a vacuum cleaner like small device in a shoe that could suck in dust when a person walks. The base of the shoe would also have a small dust bag in which this dust may be collected. He got this idea when he saw his mother vacuuming the house while he was playing. His shoes had a small whistle, which blew as air came out when pressure due to weight got exerted on the shoe. He asked his mother the process of vacuuming and thought if it had to do with only air coming in and going out, why can't his shoes be a vacuum cleaner.







Energy Generation Through Sewage Water

This is an interesting idea from a young student to use the flow of sewage water to run a turbine and generate electricity and light up the street lamps. The filtered water then can be used for drip irrigation or ground water recharging while the filtrate can be used for bio gas production.

He won an Award in Students' category NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007.







G SATISH KUMAR TAMIL NADU

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

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

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





BAPPI ROY WEST BENGAL

Idea of a Four-sided Television

In most of the meetings in rural areas, people prefer to sit in a circle so that they can look at each other and at the same time, enjoy a bonfire in the winter or a folk theatre performance. At present, all modes of visual communication require people to sit behind each other and face other persons' backs.

The suggestion from Bappi was of a four-sided television, which would make it possible for people to sit in a circle and watch programme, while having frontal view of each other.






"....implies a case where school children will ideate, college students will fabricate and the entrepreneurs and companies will commercialise or diffuse solutions socially as open source...."

NATIONAL INNOVATION FOUNDATION - INDIA's

IGNITE - School Students' National Competition of Ideas And Innovations

IGNITE is a national competition of ideas and innovations of school children organized by NIF. It accepts entries every year till July 31 and the awards are announced on October 15, the birthday of Hon'ble former President of India, Dr. A.P.J. Abdul Kalam, celebrated as Children's Creativity and Innovation Day. The awards will be given by Dr. Kalam at his convenience soon after.

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

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



IGNITE

National Innovation Foundation, Satellite Complex Prem Chand Nagar Road, Ahmedabad 380 015 ignite@nifindia.org www.nif.org.in

In partnership with







PART II plant varieties



SABU VARGHESE KERALA

"Wonder cardamom"- a new variety of cardamom

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.







K J BABY KERALA



White flowered cardamom variety

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.





K T VARGHESE KERALA

An improved disease resistant pepper variety -"Kumpukkal"

KT 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.







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







BALWAN SINGH HARYANA

Improved Varieties of Chilli and Onion

An improved variety of chilli named Alakhpura selection has been developed, the seed quality of which is claimed to be very good with 95 per cent germination. The fruit size is 6-9 inches, and it is said to be somewhat hot and pungent with thick skin texture. The powdered dried chilli imparts bright red colour. This variety grows well in sandy loam soil and the innovator has sold it to farmers throughout Haryana.

The onion variety developed by the innovator is commonly known in the innovator's village and neighbouring area as "Balwan Singh ka pyaj". It can be stored for around one year and the germination capacity of its seeds is claimed to be 98 per cent.







RAVISHANKAR KARNATAKA

Root wilt and drought tolerant pepper variety

Root wilt is a serious problem in pepper and leads to severe loss in production. By chance Ravishankar, found Hippali, a wild long pepper variety, which smelled like pepper fruit and the roots of which were resistant to the wilt. He experimented by grafting Hippali as scion, on the stock of local cultivars viz. Panniyur in the year 2001-02. The newly developed variety is reported to be tolerant to wilt disease and drought, and matures in comparatively lesser time (within 2 years) with 3040 spikes. The average dry pepper yield is 1.5 kg/year/vine.



07



SEBASTIAN JOSEPH KERALA

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).





ABRAHAM MATHEW KERALA

New nutmeg variety – "Kadukkamakkan Jathi"

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.





JOY PETER KERALA

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.





LATE JOY A S KERALA



New variety of white gourd resistant to Yellow Mosaic Virus

The innovator 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.





THAKARSHIBHAI SAVALIYA GUJARAT

Moralo- new groundnut variety

Now in his seventies, Thakarshi Savaliya has been farming since he discontinued his studies in class four. He runs a shop besides tending to his farm.

Thakershibhai is known throughout Junagadh as the father of the 'Moralo' groundnut, popular for its sweetness, productivity and resistance against the 'Tikka' disease. In 1988, while weeding and interploughing, Thakarshibhai and his son, Nitin noticed two plants that stood out from the rest. They were greener, their leaves were thicker, and they bore more flowers and pods. These plants were marked and stored by Thakarshibhai for seeds. He propagated the seeds separately each year, noticing that the crop matured in only 90 days, a month before the regular variety. He named his groundnut variety "Moralo" because the pods resembled a peacock in shape. He attended 2nd International Crop Science Congress, November 17-14, 1996, Vigyan Bhavan, New Delhi along with other farmer breeders from Gujarat. During the presentation attended by Dr. Norman E. Borlaug, Noble laureate, he surprised the groundnut breeders about a character (ridges on the pod), which conventional breeding on groundnut had almost completely ignored. He stressed that in his variety having strong pegs and no ridges, soil did not get attached and thus taking pods out at the time of harvest was easier. He used the entry pass for this conference for many years after for gaining access to places and people who otherwise did not appreciate his contributions.

He won the State Award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007. Also see Honey Bee, 7(3):15, 1996.





NARAYANA BHAT KARNATAKA

Dwarf, high yielding areca nut variety

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

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









PRAKASH SINGH RAGHUVANSHI UTTAR PRADESH

Kudrat 9- An improved variety of wheat

The innovator believes that every farmer should get good quality seeds to produce high yielding varieties of crops. He has developed a number of improved wheat, paddy, mustard and pigeon pea varieties, which are high yielding, with robust stem, having bold seeds with good taste and resistance to major pests & diseases.

"Kudrat 9", an improved wheat variety, developed by him using simple method of selection is quite popular among the farmers in different parts of Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Maharashtra, Rajasthan, Gujarat and some parts of Bihar, Haryana and Punjab. This variety bears large number of ear bearing tillers with lengthy spikes and has a hardy stem. The grain contains high protein and has better taste. The average yield of this variety is 55-60 quintals/hectares.

He won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF has filed applications under the PPV&FRA 2001 to register his pigeon pea (Kudrat 3) and wheat (Kudrat 9) variety. A few others are also in the pipeline. The innovator has been provided support under MVIF scheme of NIF.





V ANTONY SAMY TAMIL NADU

New acid lime variety

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

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







P N SURULIVEL TAMIL NADU

15

A new cardamom variety- PNS Vaigai

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





TOM C ANTONY KERALA

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.



A BALAKRISHNAN KERALA

Quick wilt resistant varieties of pepper

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 Survarana 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.







RAJ KUMAR RATHORE MADHYA PRADESH

Richa 2000- perennial pigeon pea variety

Progressive farmer Raj Kumar Rathore (40) owns 18 acres of land on which he grows wheat, soybean, mango, strawberry and litchi. One acre is reserved for breeding new pigeon pea varieties. His family has always supported his plant breeding efforts, even when the government discouraged him.

Rathore has developed a high yielding perennial pigeon pea variety with a bushy growth habit. He first began his foray into commercial plant breeding in 1997 when he noticed an odd plant in his field of ICPL-87. The plant remained green for a longer duration and had bigger flowers and longer leaves. He propagated the plant in isolation but found that yields were low until he began topping the plant twice a year to encourage further branching. Rathore has struggled in the marketing of his variety but remains hopeful that a solution will be found.

Apart from the plant variety he has also made a motor-cycle driven agricultural implement and has developed a technique to preserve strawberries while in transportation. He was given a Consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. The innovator has been provided support under MVIF scheme of NIF.





BALASAHEB PATIL MAHARASHTRA



An Improved Dual Pod Variety of Chick pea-"Sushil Laxmi"

The most distinctive feature of the variety is that it bears two pods per axil as compared to single pod per axil, which is a common feature of most varieties that are available in the market. The plant variety is tall (50-60cm), spreading and has bushy type growth habit. The foliage is dark green and seeds are attractive, bold (25-30 gram/100 seeds) and brown in colour. The variety has been reported to be tolerant to wilting and insect pest attack in farmer's field, yielding on an average 14 - 16 quintals per acre under irrigated conditions and 12 - 13 quintal per acre in unirrigated conditions.





MANARAM CHOUDHARY RAJASTHAN

Rashidpura: An Improved Variety Of Onion

Manaram Choudhary is an innovative farmer from Ladkhani village in Sikar district of Rajasthan. Water shortages in the Sikar region inspired him to breed a variety that would require less irrigation. After much experimentation, he developed a highly productive, early maturing, and drought resistant variety of onion that has become famous across the northern states of Haryana, Delhi, and Rajasthan for its delicious taste. This white onion variety is called Rashidpura.

Yield of around 400 quintals per hectare can be obtained through this variety. Seed rates of this variety hovers around Rs. 1000 per kg while sometime rising as high as Rs 3000 per kg.

He received SRISTI Samman in 2000 and the State Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.





JAGDISH PARIKH RAJASTHAN

21

Ajitgarh Selection: New Cauliflower Variety

Jagdish Parikh is a sixty year old farmer who left his government job to start farming. He has developed a variety of cauliflower which weighs as much as fifteen kilogram. This particular variety of cauliflower can be sown in all the three seasons. He has been distributing seed of this variety free to his fellow farmers. His innovative skills have been praised and in the process he received numerous prizes and citations. He is also a poet and social mobiliser. He motivates the farmers to become more innovative and spreads the message of Honey Bee network through his creative compositions.

He won the State Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. He was also given SRISTI Samman earlier. For his detailed profile kindly see Honey Bee: 11(3)15-16, 2000.







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 smell and cooking quality in comparison with the parent ones. Most remarkable feature of the variety is the thinness of grain. It has been included as a standard reference for thinness by Protection of Plant Variety and Farmers' Right Authority (PPVFRA).

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





MAHAVIR SINGH ARYA RAJASTHAN

23

Improved Wheat and Mustard Varieties

Mahavir Singh Arya (55) overcame a childhood of poverty to become a successful farmer. He is an advocate of organic farming and produces very high yields from his small farm despite never having used any inorganic fertilizers. Arya first became interested in plant breeding when he observed farmers crossing crop varieties on a visit to Hissar. He then crossed T59 and Golden to make a new variety of mustard named Sundari. Since then, he has developed more than ten new mustard varieties. The maturity period of all these varieties ranges from 130-150 days and the yield from 18-24 quintals per hectare. All the varieties are disease resistant and high yielding. He has also developed many varieties of wheat with maturity periods varying from 135-60 days, and yields from 40-80 quintals per hectare.

He was appreciated in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. Further testing is in progress at institutional research centers.





JAI PRAKASH SINGH UTTAR PRADESH



New varieties of wheat, rice and pigeon pea

Jai Prakash Singh, an enterprising farmer has developed many improved varieties of wheat, rice and pigeon pea through recurrent selection of desirable plants and through crossing of the preferred parents. Virat (JP 6) is a new pigeon pea variety developed by him. It has coloured flowers, long leaves and bunchy type pods bearing at the top. The seed weight (19 – 20 gram/ 100 seeds), number of pods / plant (500 - 600), big size pods (3 – 5 inch), number of seeds/pod (5 – 6) and perennial yield (1st year 12 -14 quintal/ acre and 2nd year 14 – 15 quintal/ acre) is higher as compared to the local popular variety. This variety requires less quantity of seed (4 – 5 kg/acre) and maintenance as compared to other varieties grown in the region. He won a Consolation Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. The process is on to get the varieties developed by him registered under the PPV&FRA 2001. The innovator has been provided support for workshop development and also under MVIF scheme of NIF







ALAGARASAMY TAMIL NADU

25

Drought tolerant new Moringa variety

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

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





ALIBHAI ABHVANI GUJARAT

Resham Patto- New Chilly Variety

Alibhai Abhvani, popularly known as Alidada, developed a new variety of chilli called 'Resham Patto' (The Silk Leaf) with the help of Murubhai who made the initial selection from another chili variety. This variety is deep red in colour, has smooth thick skin that shines like silk and does not crack even after drying. This variety is ideally suitable for natural food colouring as it is non-pungent.

Alibhai won SRISTI Samman in 2002 for this variety and a Consolation Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. Though the contribution of Murubhai was discovered much later and remains to be recognised. Also see Honey Bee, 12(3):2, 2001.









JITABHAI PATEL GUJARAT

New Variety of Hyacinth Bean

Jitabhai Patel owns a sizeable farm in Vetla in the Vadali taluka of Sabarkantha district. In 1987, the area was hit by severe drought following the failure of the monsoons. All the grazing land had dried up and the stored fodder was exhausted. Fodder for cattle had to be bought from a distance of about 40 km from Vetla. Once, Jitabhai chanced upon a healthy valol creeper in a load of vetch that arrived as fodder. The creeper, val/valol, was a hyacinth bean known as Dolichos lablab. There were clusters of fully matured pods in some of the harvested creepers, while some of the vines had young pods of valol, which makes for a delicious vegetable and is a rage in most Patel households. Jitabhai was guite impressed by the size, appearance, flavour and taste of the papdis (young tender pods of valol). Being a connoisseur of the vegetable, he immediately collected as many ripe pods of the legume as he could from the fodder consignment. He sun-dried them and carefully preserved the seeds. Over a period of four years of meticulous observation and selection, Jitabhai arrived at a variety that flowered early, had a good resistance against diseases and provided a good yield of large pods. The family had vast quantities of valol shak (a dish of the vegetable) that year and liked the taste. The rest of the crop was sent to the market. For having developed a superior variety of the vetch cultivar, Jitabhai was selected for the Sardar Krishi award in 1998 by the Gujarat government and for SRISTI Samman in 2002. Also see Honey Bee, 13(3): 6-8, 2002.





INDRASAN SINGH UTTARAKHAND



"Indrasan" paddy variety

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

This idea for an improved paddy variety stemmed from the problems that Indrasan faced in cultivating high yielding variety seeds procured from the Pantnagar University. It was one of the first farmer-developed varieties, which diffused over thousands of hectares all over the Indo-Gangetic plains. It has a yield of about 8000 kg/ha, which is quite high in comparison to conventional paddy varieties. The productivity of the crop as well as the recovery rate of the grains were much higher than the other varieties. The starch obtained is of superior quality in comparison to the conventional alternatives. The major distinguishing character of this variety is its red coloured roots. It matures in 120 days and reaches a height of 80-100 cm with uniform spikelets. Another point in its favour is its high resistance to disease unlike other traditional varieties.

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



PART III AGRICULTURAL PRACTICES



AKHIL CHANDRA MANDAL ASSAM

Vertex cutting of areca nut

Akhil Chandra Mandal has studied up to higher secondary and his main occupation is agriculture. He came up with an innovative practice for cultivating areca nut. When shoots of areca nut tree are around two inches after planting, its upper portion is removed. Then vertex or head is cut off when the same plant is three years old, leaving aside 2-3 branches at the extreme lowest region.

The plants treated this way mature ahead by two years as compared with other plants. The longevity of the plant extends up to three more years than other plants. Yield per plant ranges from 7-8 bunches / cluster. He was given a consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007.

The innovator has also developed a water pump operated by the energy of discharge of higher capacity pump. One or more water pumps (excluding motors) are operated by hydro power generated through a turbine.




MANIAM SITARAMAN ANDHRA PRADESH

02

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

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

Sitaraman first learnt about the pesticidal property of the plant when he noticed dead rice hispa larvae along the water channel in paddy fields where the leaves of the plant were floating. Since then he started putting cut branches of this plant in his rice fields and observed that the damage caused by rice hispa pest had considerably reduced. (Honey Bee: 11(2) 7, 2000).





A. I. NADAKATTIN ANDHRA PRADESH

Tamarind cultivation under dryland conditions and Water harvesting techniques

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

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





HARBHAJAN SINGH HARYANA

Cotton Cultivation for Water Conservation

In many regions, where irrigation adds to the cost as well as increases the incidence of the pests, farmers have evolved novel practices to achieve efficiency with lesser resources. One such example is to sow cotton on the ridges and provide irrigation in each channel separated by a distance of six feet.

Water is applied in the alternate channel in subsequent irrigation. This reduces water requirement and controls the weeds and also the pests. This practice is found to control wilt and other diseases, while the yield remains equal to those seen in normal irrigation and sowing pattern.





B. S. DINESH KARNATAKA

Mukkadaka decoction to control hoppers in paddy

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





BASAV RAJ SANTESHIVARA KARNATAKA

Control of brown plant hopper in paddy

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



SHANKARA PATALI KARNATAKA

Use of buttermilk as coagulant for rubber latex

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

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

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





GEORGE MATHEW KERALA

Kandakayam system - a new innovation in vanilla cultivation

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.



K PANICKAN KERALA

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.



K C KURIAKOSE KERALA

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 per cent whereas in Brown Budding it is only 60-80 per cent. 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.





FRANCIS PA KERALA

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.





LINGARAJ PRADHAN ORISSA

Potato cultivation in hay sacks

Lingaraj Pradhan, 62, has developed an innovative method of potato cultivation. He cultivates potatoes in sacks made of hay ropes. This method of cultivation is mostly a boon for landless farmers, as it needs very small area of land and reuses water. The other advantage is the better utilization of manure due to the absence of weeds. Each sack gives a yield of 10 to 15 kilograms enabling even a landless farmer to cultivate potatoes on a commercial basis. Lingaraj has not sought publicity for his practice or taken any help from government agencies. But those who have heard of it and visited his garden are full of appreciation. In fact, the practice is currently being used in four nearby villages. He won a Consolation award in NIF's Third National Competition for Grassroots Innovation and Traditional Knowledge in 2005.





RAM ABHILASH PATEL RAJASTHAN

Innovative technique of using clay pellets for sowing paddy

The crop production of paddy depends on the way the seeds or seedlings are sown. Ram Abhilash Patel has developed an innovative way of sowing paddy using clay pellets. In this method, pond soil i.e. clay soil is taken and mixed thoroughly with paddy seeds. Small pellets are prepared from the mixture with each containing 3-4 seeds. These pellets can be sown manually or with the help of a seed drill but manual practice is followed, as seed drills are not available for the size of pellets.

He was appreciated in the NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.







SUNDARAM VARMA RAJASTHAN

Dry Land Forestry Technique

Sundaram has developed a technique for plantation where it is claimed that a litre of water per plant once in its life time is sufficient for it to grow. The technique involves ploughing the field up to a foot deep before the rains. The field is planked and pressed so as to break the capillaries soon after the rains are over. Water which has already charged the soil can not easily be lost by evaporation now. The plants that are to be grown are sowed in a pit six inches further deep and then covered with soil and watered (one litre) in October-November. Idea is that unlike the plants sown in monsoon season; these will need to send roots deeper because there is no moisture in the upper layers of the soil. Once the plant catches the sub-soil moisture, it can survive till the rains next year. After which the tree sapling does not need any additional irrigation.

Using this technique, he has planted over 50,000 local forest trees/plants in and around Danta region in Sikar district. He is a very innovative farmer and has also developed many improved varieties of Bengal gram, Cluster bean and Moth Bean. He had shown this technique near GIAN office in Children Science Park campus in Jaipur. The technology though proven still remains to be replicated at large scale. For his detailed profile and work please see Honey Bee, 8(1):3-4, 1997







V K JAYAVEERAN TAMIL NADU



Plant protection practices

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

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

b) Pests and diseases of Paddy

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

c) Green Algae

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

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





P B MUKUNTHAN TAMIL NADU

Groundnut sowing practice

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

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



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SHODH YATRA a journey

Shodhyatra is a journey on foot in the search of knowledge, creativity and innovations at the grassroots.

In an attempt on the part of SRISTI, a Oney Bee NEtwork, partner based in 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 are many times important 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 laborers but have also significantly contributed towards the conservation of bio-diversity.

The first ever Shodh Yatra was organized in Gujarat in 1998 and since then the state has been the host to eleven such Shodh Yatras till now. The yatris, during the Shodh Yatra, over a period of seven-eight days, travel a distance of 120-150 kilometers honoring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Earlier these walks covered a distance of 250 km in ten days. Many bio-diversity and recipe contests are also organized in different villages. The Shodh Yatra mobilizes the participation of people from all walks of life including scientists, students, innovators, farmers and traditional knowledge holders.

SHODHYATRAS IN GUJARAT



1	1st Shodhyatra	7	7th Shodhyatra
	May 15-23, 1998		June 16-23, 2001
	Gir to Gadhada, Saurashtra		Dabhuda to Sarsala, Kutch
2	2nd Shodhyatra	8	9th Shodhyatra
	December 31, 1998- January 6, 1999		June 2-8, 2002
	Amirgadh to Tundiya, North Gujarat		Samdara to Bhadarva, Kheda
3	3rd Shodhyatra	9	13th Shodhyatra
	May 15-23, 1999		May 1-8, 2004
	Gola Gamdi to Nighant, South Gujarat		Nana Ambala to Bala Chhadi, Jamnagar
4	4th Shodhyatra	10	Mini Shodhyatra (Salt Region)
	December 26, 1999- January 2, 2000		May 11-14, 2009
	Nilpar to Nanikhakhar, Kutch		Vachharaj bet to Kharagoda,
5	5th Shodhyatra		Surendranagar
	June 2-8, 2000	11	23rd Shodhyatra
	Kasana to Koba North, Gujarat		May 28 - June 2, 2009
5	6th Shodhyatra		Faingiya to Puniavat, Dahod & MP
	December 23, 2000- January 1, 2001		
	Mohandari to Dhulda, Dangs &		



6TH SHODH YATRA December 23, 2000- January 1, 2001 Mohandari (Dang), Gujarat to Dhulda (Nasik), Maharashtra



8TH SHODH YATRA December 24, 2001–January 1, 2002 Bhikampura to Nilkanth, Alwar, Rajasthan

प्रयागधर्मा किसानोकी शोधयात्रा

भीकमपुरा से नीलकंड(गढ) (जि. अलवर, राजस्थान दिनांक: २४-१२-२००१ से १-१-२०० ः सारिट र् आई.ए

ी-बी

11TH SHODH YATRA 26th May to 4th June 2003 Udham Singh Nagar, Uttarakhand to Pilibhit, Uttar Pradesh



12TH SHODH YATRA 25 December to 31 December 2003 Malnad region, Karnataka



14TH SHRAM AND SHODH YATRA 19 January to 24 January 2005 Nagapattinam, Tamil Nadu



15TH SHODHYATRA May 15-22, 2005 Majheen to Dadh Chamunda, Kangra, Himachal Pradesh



16TH SHODH YATRA 27 December 2005 to 2 January 2006 Kumuly to Kattappana, Idukki, Kerala



17TH SHODH YATRA 09 May to 16 May 2006 Semiliguda to Sabara Srikhetra, Koraput District, Orissa



18TH SHODH YATRA 25th December 2006 to 3rd January 2007 Gangagarh (Bulandshahar) to Daula (Baghpat), Uttar Pradesh



19TH SHODH YATRA 20th June to 27th June 2007 Quazigund to Khanabal, Anantnag, J&K



20TH SHODH YATRA December 26, 2007- January 2, 2008 Patamda, East Singhbhum & Purulia to Bankura, West Bengal



21ST SHODH YATRA 2nd June to 9th June 2008 Araku Valley, Vishakhapatnam, Andhra Pradesh



24TH SHODH YATRA 29th December 2009 to 3rd January 2010 Dhemaji, Assam



TRADITIONAL FOOD FESTIVAL- SATVIK

Supported by NIF and the Honey Bee Network, the traditional food festival is organized by SRISTI to focus on the organically produced traditional food by farmers. The object of the fair is to promote conservation of agro-biodiversity by stimulating demand of unique preparations as well as grains of local varieties of different crops including minor millets and even uncultivated plants. In this event, stalls are set up by various organizations, farmers' collectives and individual farmers to display and sell less popular and/ or organic foods. Recipe contests are also organized during the festival. The Traditional Food Festival is also used as a platform to reach out to as many people as possible to sensitize them about the implications of organic food and the attributes of local varieties. The First Food Festival held in February 2004 had forty stalls and was attended by 20,000 people. By the Tenth Food Festival in 2012 the number of stalls had gone up to eighty with more than 50,000 people attending the festival over a period of three days. The total sales also grew manifold, which shows the awareness and the impact the event has been able to generate.

NIF puts up an exhibition of grassroots technologies during the event and also organizes idea competitions to stimulate and unfold the hidden creativity and innovative spirit of the children and the adults alike. In the Tenth Food Festival, apart from a few new innovations, many herbal products based on the knowledge of the people, were also on display, and these included biscuits, health drinks and nutritional supplements besides agricultural growth promoters, herbal pesticides, galactogogues, herbal creams for skin and cracks on soles.



PART IV herbal healing traditions



USES OF ABRUS PRECATORIUS L. (GURIVANDA)

Uses from NIF Database

Leucorrhoea

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

Baldness

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

Mouth ulcer

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

Stomachache

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

Knee pain

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

Uses in Classical Codified Literature

Dried leaves and root powder is given orally in case of eye complaint¹; decoction of young leaves is given orally for cough²; leaf powder is given orally in case of urine problems³; seed extract is used in sciatica³. It is one of the ingredients of 'Tranquil'⁴ for relieving stress and anxiety. Ten patents have been found on the applications of Abrus as natural sweetener⁵, oral contraceptive⁶, etc.
USES OF ADHATODA VASICA (L.) NEES (ARDUSI, VASA)

Uses from NIF Database

Asthma

Take the leaf decoction orally - Moyataji Karamshi Thakor, Patan, Gujarat

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

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

Cough

Take the leaf juice orally - Revabhai Sivabhai Raval, Sabarkantha, Gujarat

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

Fever

Take the leaf juice orally - Revabhai Sivabhai Raval, Sabarkantha, Gujarat

Stomachache

Take the leaf decoction orally - Ramjibhai Nanabhai Brahmania, Panch Mahal, Gujarat

Tuberculosis

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



Malaria

Take the leaf decoction orally with jaggery

- Mahesh Kumar Khangar Purohit, Sirohi, Rajasthan

Constipation

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

Sprain

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

Uses in Classical Codified Literature

Decoction of the plant is taken orally to cure asthma⁷; leaves (500g) are decocted in water (5L) until a dark brown mass is obtained and two spoonful are taken with honey thrice a day for 2-4 days to cure fever⁸; rheumatic patients should warm the leaves and apply on the body⁹. Product 'Menstri Care'¹⁰ prepared from the plant is an effective medicine for women's health problems. 'Diakof'¹¹, an herbal medicine uses Adhatoda along with other plants for treating cough. Ten patents have been found on its medicinal applications mainly for cough¹² and asthma¹³.

USES OF AEGLE MARMELOS (L.) CORR. (BEL)

Uses from NIF Database

Eye diseases

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

Fever

Take the leaf juice along with honey - Poonam Raghav, Bulandshahar, Uttar Pradesh

Cough

Take the fruit juice orally - Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Nasal bleeding

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

Diarrhoea

Take the fruit juice orally - Priti Kumari, Bulandshahar, Uttar Pradesh

Skin disease

Apply the leaf juice topically - Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Intestinal worms

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

Diabetes

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



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

Vomiting

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

Stomachache

Grind the fresh roots along with one black pepper. Take two spoonfuls of the paste twice a day for two days

- Chhoti Devi, Udham Singh Nagar, Uttarakhand

Uses in Classical Codified Literature

Burnt fruit pulp is applied on rheumatic arthritis¹⁴; 10g fruit pulp is given before sleep to overcome morning sickness¹⁵; fruit rind is applied externally on the head to kill headlice¹⁶. 'Bael'¹¹, prepared from Aegle is used in diarrhoea, dysentery and Gl disorders. It has digestive and carminative properties. 'Lukol's¹¹ tonic is made from this plant along with other plants, which improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system control leucorrhea. 'Bilwa'¹⁷, 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 like for treating diabetes¹⁸, gastric ulcer¹⁹etc.

USES OF ALSTONIA SCHOLARIS (L.) BR. (SAPTPARNI)



Image Source : http://www.mytho-fleurs.com/images/Fleurs_du_Vietnam/Alstonia_ scholaris.jpg

Uses from NIF Database

Chest Pain

Take one spoonful bark powder along with water

- Kora Minnana, Vishakhapatnam, Andhra Pradesh

Headache

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

Stomachache

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

Gastric problems

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

Fever

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

Uses in Classical Codified Literature

The bark is used to cure skin diseases and rheumatism²⁰; the root juice is taken with milk to cure leprosy²⁰; fresh bark is put in water to draw out the latex, which is taken orally in case of tuberculosis²¹; dried powder is administered orally to cure diarrhoea²²; and bark extract is useful in case of intestinal worms²³. 'Ayush-64 cap./tab.'²⁴, prepared from the plant, is effective as an antimalarial compound both for treatment and prophylaxis. Fifteen patents have been found on its medicinal uses as an antipyretic²⁵.

USES OF ANDROGRAPHIS PANICULATA (BURM.F.) WALL. EX NEES (KALMEGH)



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

Uses from NIF Database

Acidity

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

Fever

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

Gastric complaint

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

Wound

Boil the whole plant powder in coconut oil and filter the oil. Apply the oil after cleaning of wound.

- Amirdaraj Kaani, Tirunelveli, Tamil Nadu

Skin disease

Take one spoonful of the whole plant powder daily - Kousalya, Pudducherry

Uses in Classical Codified Literature

Decoction of the whole plant is given orally for fever²⁶; hot aqueous extract is useful as anthelmintic²⁷; infusion of the plant is externally applied to cure skin infections²⁸ and orally given as febrifuge in malaria²⁹. Livup capsules³⁰ and Detox³¹ tablets are effective liver vitalizers and help in addressing liver complaints. Fourteen patents have been found on its medicinal applications like for treating osteoporosis³² and for hepatoprotective³³ property.

USES OF AZADIRACHTA INDICA A. JUSS (NEEM)



Image Source : http://shwethabhaskar.com/Projects/Abortion/neem.jpg

Uses from NIF Database

Skin disease

Apply the leaf paste topically - Adesh Kumar Vansal, Delhi

Earache

Mix the seed oil with honey and put a few drops in the ear - Ramesh Kumar, East Champaran, Bihar

Stone

Take the leaf ash orally along with water - Uttam Singh, Sirohi, Rajasthan

Joint pain

Apply the seed oil and massage on the aching joint

- Jagjeet Bahadur, Sitapur, Uttar Pradesh

Constipation

Pound the leaves of neem, Aloe vera and fenugreek seeds. Soak them in buttermilk and boil. Add cow ghee till it becomes thick like wax. Take a spoonful orally - Amirdaraj Kaani, Tirunelveli, Tamil Nadu

Uses in Classical Codified Literature

Dried bark is given orally to treat malaria³⁴; whole plant is used to cure various skin disorders³⁵; dried fruit is given orally to get relief from piles¹. 'Neem tooth paste'³⁶, a high quality product, is used to prevent tooth decay and inflammation of the gums. Tablet 'Pilex'¹¹ is used to treat chronic constipation associated with haemorrhoids. More than a hundred patents have been found on its medicinal use such as for dental care³⁷ and in treating haemorrhoids³⁸.

USES OF BOERHAAVIA DIFFUSA L. (ATIKA MAMITI)



Image Source : http://www.zimbabweflora.co.zw/speciesdata/image-display. php?species_id=122630&image_id=3

Uses from NIF Database

Conjunctivitis

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

Cough

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

Nausea

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

Kidney stone

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

Jaundice

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

Uses in Classical Codified Literature

The leaf juice is given with milk to get relief from cataract³⁹; decoction of the plant is given orally to purify blood⁴⁰; the plant extract is used as diuretic⁴¹; and decoction of the leaves is applied externally in case of skin infections⁴². 'Liver-kidney care'⁴³made from this plant works synergistically on the liver and kidney to heal and prevent infections in both the systems. Fourteen patents have been found on various medicinal applications of Boerhaavia for different ailments mainly for liver disorders⁴⁴, hypertension⁴⁵ etc.

USES OF BOMBAX CEIBA L. (SEMAL)



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

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

Urinary disorder

Take orally the decoction (10ml) of the bark of semal and flowers of palash (Butea monosperma (Lamk.) Taub.) mixed in 2:1 ratio

- Lakshmanbhai Ramaji Parmar, Banaskantha, Gujarat



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

Gynaecological disorder

Take the root juice orally - Maganbhai Khimjibhai Patel, Sabarkantha, Gujarat

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

Uses in Classical Codified Literature

Decoction of the bark is given orally to combat fever⁴⁶; diabetics should take decoction of the heartwood⁴⁷; bark juice is given to reduce stomachache⁴⁸. Product 'Acne-n-Pimple Cream'⁴⁹ is prepared from Bombax along with other plants to treat pimples and skin eruptions. 'Evecare'¹¹, 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 like for skincare⁵⁰, AIDS⁵¹ etc.

USES OF BUTEA MONOSPERMA (LAMK.) TAUB. (PALASH)



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

Uses from NIF Database

Pyorrhoea

Brush with twig for relief - Bhim Singh, Sivni, Madhya Pradesh

Toothache

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

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

Joint pain

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

Whooping cough

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

Acidity

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

Cuts & wounds

Apply the bark juice topically - Dinesh Bediya, Ranchi, Jharkhand

Uses in Classical Codified Literature

Bark is used as poultice for pimples⁵²; bark juice is given orally to cure intestinal worms⁵³. 'Lukol'¹¹ has a stimulatory action on the endometrium and improves uterine circulation. 'Hair Loss Cream'⁴ improves tensile strength of hair and increases hair density. Ten patents have been found on its medicinal uses for bone disorders⁵⁴, skin care⁵⁵ etc.

USES OF CALOTROPIS PROCERA (AIT.) R. BR. (AAK, MADAR)



Image Source : http://faculty.ksu.edu.sa/assaeed/ar/PublishingImages/Range_Plants/ Calotropis_procera_3.JPG

Uses from NIF Database

Asthma

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

Ear ache

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

Stomachache

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

- Chawda Chanduben Jawanji, Gandhinagar, Gujarat

Arthritis

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

- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Skin disease

Apply the bark paste on the infected part - Muralilal, Jaipur, Rajasthan

Uses in Classical Codified Literature

Plant extract is used as bronchodilator⁵⁶; flower buds of Calotropis, along with black pepper seeds and salt, are crushed to make pills the size of small peas. Two pills are taken twice daily for 3 days to cure malaria⁵⁷; and warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain⁵⁸. 'Muscle & Joint Rub'¹¹ is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'⁵⁹, 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 activity⁶⁰, and bronchial asthma⁶¹.

USES OF CARICA PAPAYA L. (PAPITA)



Image Source : http://www.biolib.cz/IMG/GAL/BIG/53816.jpg

Uses from NIF Database

Toothache

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

Jaundice

Take the curry made from the unripe fruit orally - Doli Sharma and Kirti Sharma, Bulandshahar, Uttar Pradesh

Stomach disorder

Eat the ripe fruit for relief - Dimple Sharma, Bulandshahar, Uttar Pradesh

Constipation

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

Intestinal worms

Take the dry seed powder orally - Shabnam Kumari, Bulandshahar, Uttar Pradesh

Take fresh latex mixed with honey orally

- Prabhat Kumar Pandey, East Champaran, Bihar

Stone

Take the root powder orally along with water on an empty stomach - Shripal Singh, Bulandshahar, Uttar Pradesh

Lactogogue

Eat the ripe fruit - Kalia Behera, Bargarh, Orissa

Cuts &wounds

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

Ringworm

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

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

Uses in Classical Codified Literature

Decoction of the flower is used as cardiotonic⁶²; bark powder is applied externally on wounds⁶³; decoction of the bark is given orally to get rid of intestinal worms⁶⁴; beverage of the fruit is taken orally to cure diarrhoea⁶⁵. Natural moisturizers and creams66 are prepared from Carica in combination with other plants. Thirty patents were found on its medicinal uses as an antiallergic⁶⁷ and for prevention of cancer⁶⁸.

USES OF CASSIA FISTULA L. (AMALTAS)



Image Source : http://ratnuu.files.wordpress.com/2008/07/kanikonna1.jpg

Uses from NIF Database

Eye disease

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

Cough

Take one spoonful of leaf powder orally - Prem Singh, Bulandshahar, Uttar Pradesh

Chew the fruit skin in the morning

- Santoshben Gamar, Banaskantha, Gujarat

Muscular pain

Burn the leaves into ash and mix it with mustard oil. Apply the paste on the aching part - Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Burn

Apply the leaf paste topically - Chandbhan Singh, Bulandshahar, Uttar Pradesh

Ringworm

Apply the root paste on the affected area - Kumar Chandel, Hamirpur, Himachal Pradesh

Stomachache

Take the fruit decoction along with jaggery orally

- Bhagwati Lal Kumawat, Chittorgarh, Rajasthan

Uses in Classical Codified Literature

Powder of the dried bark is applied in case of leucoderma³⁹; fruit juice is useful in jaundice⁶⁹; fruits are used as diuretic⁶⁹; and root powder is applied in skin diseases⁶⁹. Pilex¹¹ (Vein care) helps support metabolic processes involved in maintaining the vascular system's integrity for optimum health and appearance; Purim¹¹ (Hemo care) is used for blood purification. Six patents have been found on the medicinal applications of Cassia fistula as an antiviral⁷⁰.

USES OF CELASTRUS PANICULATUS WILLD. (MALKANGANI)



Uses from NIF Database

Tuberculosis

3 drops of oil are mixed in yolk of egg and administered - Prishila Tudoo, Hazaribag, Jharkhand

Graying of hair

Oil is applied on the scalp - Sharvan Singh, Kangra, Himachal Pradesh

Gas/acidity

2-3 gm of powdered seeds is taken orally with water - Devaram, Sirohi, Rajasthan

Intestinal worms

Shade dried fruit is ground into a fine powder and sieved. 2-3 tablespoon of the powder is taken orally in the morning and evening for 4-5 days

- Nimavat Gitaben J, Junagadh, Gujarat

Skin disease

Oil is applied on the infected place - Devaram, Sirohi, Rajasthan

Uses in Classical Codified Literature

Fruit juice is used as cardiotonic²⁴; seeds are used as appetizer⁶⁹; fruit paste mixed with warm mustard oil is applied externally⁷¹. 'Geriforte'¹¹, an anti stress medicine facilitates respiratory functions, and assists cardiovascular functioning by improving circulation and reducing raised lipid levels. 'Anxocare'¹¹, a memory enhancer promotes better receptivity and learning abilities. Three patents have been found on its medicinal applications like treating deficit hyperactivity disorder⁷².

USES OF CENTELLA ASIATICA (L.) URBAN (BRAHMI)



Image Source : http://131.230.176.4/users/pelserpb/7_31_11/31Jul11/centellaasiatica.jpg

Uses from NIF Database

Insomnia

Plant paste is taken along with food regularly - *Khiroram Barman, Borpeta, Assam*

Anorexia

Juice from leaves (25g) is extracted and administered orally - Gamaliyal Hembrom, Hazaribag, Jharkhand

Toothache

Equal proportion of brahmi leaves, onion and banana roots are ground to make a fine paste and applied on the aching part - Anil Gogoi, Sibsagar, Assam

Jaundice

Plant (10g) is ground, mixed with water, filtered and the extract is taken - *Vifiya Oraon, Lohardaga, Jharkhand*

Dysentery

Paste of leaves along with black pepper is given orally - Dipali Borah, Sibsagar, Assam

Skin disease

Plant is taken as a vegetable regularly - Bablu Bediya, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Fresh juice of aerial part is used as brain tonic^{73;} the powder of aerial parts helps to control high blood pressure⁷⁴; whole plant is diuretic⁶⁹; plant paste is applied as a poultice in case of bone fracture⁶⁹. 'Herbal Tea'⁷⁵ is mainly indicated as a health drink. 'Mentat'¹¹ improves mental functions, the mental quotient, memory span, and concentration ability and stress threshold. More than three hundred patents have been found on its medicinal applications as an antidepressant⁷⁶.

USES OF CROCUS SATIVUS L. (KESAR)



Image Source : http://1.bp.blogspot.com/_LbfiZKDrfdg/TM4JfXQbFJI/AAAAAAAAJ8/ ZZM5zVolo9Q/s1600/Crocus+sativus+3rt654.JPG

Uses from NIF Database

Cough/cold

Take a pinch of kesar along with a glass of milk - Mohammad Abbas Zargar, Anantnag, J&K

Urinary disorder

Take the decoction of kesar and tea orally - Wajjat Ullah Shah, Anantnag, J&K

Wrinkle on face

Take kesar along with milk - Sita Kumari, Gopalganj, Bihar

General health

Take 200mg of kesar and 1g each of ginger, cloves and cardamom. Grind them together to form a paste. Take a spoonful of the paste along with milk

- Prakash Soni, Karol Bagh, Delhi

Eye irritation

Crush and apply kesar in the eyes along with honey

- Mohd. Jafruddin Nirala, East Champaran, Bihar

Uses in Classical Codified Literature

Decoction of flower is given orally to cure asthma⁷⁷; dried stamen acts as digestant; it is believed to be acting as contraceptive⁷⁹. 'Kunkumadyam Thailam'⁸⁰ is a classical ayurvedic product, which is useful on pimples, black heads etc. 'Male Rejuv'⁸¹ has been effectively used to restore male vitality and energy. Seven patents have been found on its medicinal applications such as to stimulate hair growth⁸² and cure headache⁸³.

USES OF DATURA METEL L. (DHATURA)



Uses from NIF Database

Dandruff

Put three-four leaves in boiling coconut oil. Filter the medicated oil and apply lukewarm oil on the scalp.

- Bezwada Venkateswarlu, Prakasham, Andhra Pradesh

Alopecia

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

Headache

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

Asthma

Take a seed soaked in water orally initially. Gradually increase a seed every week for five weeks

- Rani Farhat, Hazaribag, Jharkhand

Stomachache

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

Backache

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

Arthritis

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

Uses in Classical Codified Literature

One fruit is filled with 10g Piper longum L. and burnt. About 5g of this ash is given with honey, morning and evening, for 5 days to cure malaria⁸⁴; the thumb is kept inserted within the fruit to treat finger felon⁸⁵; and the root paste is applied externally on poisonous bites86. 'Muscles & joint rub'¹¹, is a highly effective medicine for backaches, muscular sprains and joint pains made from the plant. 'Unicough syrup'²⁴ is used to cure bronchitis, cough/cold and asthma.

USES OF HOLARRHENA ANTIDYSENTERICA WALL. (KUTAJ)



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

Uses from NIF Database

Liver disorder

Decoction of the bark is administered orally - Priyanka Pramanik, Purulia, West Bengal

Diarrhoea/dysentery

Juice extracted from bark is administered orally - Ambika Singh Sardar, Purulia, West Bengal

Paste is prepared from the bark. 10g of the paste is given along with a spoonful of honey - Kundan Kumar, East Champaran, Bihar

Intestinal worms

Juice from the pounded leaves is taken orally to kill worms - Ambika Singh Sardar, Purulia, West Bengal

Fever

Leaves (5g) along with those of Picrorhiza kurroa Royale ex. Benth. (5g) are boiled in 100ml of water till the decoction remains 10ml. This is then taken orally till the ailment cures

- Hariom Kumar, East Champaran, Bihar Bodyache

Bark is ground in water; some quantity is taken orally and the rest is applied on the body - Devaram, Sirohi, Rajasthan

Malaria

Equal amount of leaves of kurchi and Cyperus rotundus L. are ground into a fine powder. One spoonful is taken orally to combat the disease - Chandan Kumar, East Champaran, Bihar

Uses in Classical Codified Literature

Dried bark powder is given orally to cure stomachache⁸⁷; seeds are ground into a powder, a dose of 5-10g of the powder is given with water as an antidote and a paste of the seeds is also applied locally to relieve pain and swelling on poisonous bites⁸⁸. 'Diarex vet'¹¹ is used for diarrhoea in cattle. 'Kutajarista and Kutajavaleha'⁸⁹ are the most popular preparations used in diarrhoea, dysentery, colitis and bleeding problems. Thirteen patents have been found on its medicinal applications mainly for gastrointestinal disorders⁹⁰.

USES OF KALANCHOE PINNATA (LAM.) PERS. (PATHARCHATTA)



Uses from NIF Database

Eye pain

Two drops of the juice extracted from the leaves are put in the eyes - Susanta Kumar Manjhi, Birbhum, West Bengal

Stomach disorder

Two spoonful of the juice extracted from the leaves are given orally - Susanta Kumar Manjhi, Birbhum, West Bengal

Jaundice

Juice of leaves along with black pepper powder is given till the ailment cures - Arunkumar Pandey, Fatehpur, Uttar Pradesh

Cuts & wounds

Topical application of leaf paste helps in stopping bleeding - Arun Ghosh, Bankura, West Bengal

Pain

Leaf paste is applied on the aching part - Priyanka Pramanik, Purulia, West Bengal

Fever

Juice of leaves along with black pepper powder is given orally - Arunkumar Pandey, Fatehpur, Uttar Pradesh

Diarrhoea

Leaves (5-6) are ground along with some sugar candy and sap obtained is administered orally - *Bikesh Kumar, Sitamarhi, Bihar*

Uses in Classical Codified Literature

Plant paste is applied on forehead to alleviate headache⁹¹; leaf paste is applied externally to cure cuts and wounds⁹²; fresh sap of plant is used for eye diseases⁹³. Product'Regenerating Day Cream'⁹⁴ a multiherbal medicine enhances skin's tone and elasticity, helping to smooth wrinkles and fine lines. Five patents were found on the medicinal applications of Kalanchoe mainly as an antiobesity⁹⁵ medication.

USES OF MORINGA OLEIFERA LAM. (SAHJAN)



Uses from NIF Database

Asthma

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

Diabetes

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

Joint pain

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

Sprain

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

Poisonous bite

Pound seeds with equal amounts of ginger, black pepper and lindi pepper and add cold water. Take the mixture orally

- Ganesh Madhukar Shanbhag, Sholapur, Maharashtra

Ulcer

Make pills from the leaf paste. Take one pill for three days early in the morning after light breakfast

- Sukumar Nath, North Tripura, Tripura

Backache

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

Dog bite

Mix the bark powder with powdered roots of kukurdanti (Achyranthes aspera L.) and roots of dhatura (Datura sp.). Prepare the tablets of this mixture and take one tablet in a day for three days

- Srigam Raghu, Vishakhapatnam, Andhra Pradesh

Uses in Classical Codified Literature

Juice of bark is given orally along with a pinch of safetida and salt⁹⁶; dried fruit is eaten to combat diabetes⁹⁷; powder of the plant is administered orally to cure asthma⁹⁸. Product 'Sugan Nutrimix'⁹⁹ is a ready mix preparation where Moringa is mixed with pulses, spices and other natural ingredients to make it rich in nutrients, minerals, protein etc., and to enhance its taste. This powder can be consumed in it is natural form or can be mixed with staple food. 'Pain Massage Oil'¹¹ is a herbal oil, which provides relief from neuromuscular pain. Twelve patents have been found on its medicinal uses such as for anticancer¹⁰⁰ and antidiabetic¹⁰¹ properties.

USES OF NYCTANTHES ARBOR-TRISTIS L. (HARSINGAR)



Image Source : http://www.wellgrowhorti.com/Pictures/Landscape%20Plants/Shrubs/ Web%20Pictures1/N/Nyctanthes%20Arbor-%20Tristis.jpg

Uses from NIF Database

Cough/cold

Two spoonful of the juice of leaves is administered orally along with honey or ginger juice - Susanta Kumar Manjhi, Birbhum, West Bengal

Paste is prepared using three leaves and black pepper and is taken orally with water - Ashok Kumar Yadav, East Champaran, Bihar

Fever

Juice of leaves is administered orally to cure fever

- Susanta Kumar Manjhi, Birbhum, West Bengal

Leaves (6-7), along with ginger, are crushed to extract juice, which is given to drink thrice a day *- Rani B. Bhagat, Pune, Maharashtra*

Two leaves of shiuli, neem, three black pepper and four leaves of tulsi are ground in half litre of water and boiled till half a cup of residue remains. This is cooled and given orally - Arjun Singh, Bharatpur, Rajasthan

Hair fall

Seeds are crushed in water and the paste is applied on hair scalp - Rani B. Bhagat, Pune, Maharashtra Intestinal worms

Oral intake of leaf juice kills the worms

- Rani B. Bhagat, Pune, Maharashtra

Uses in Classical Codified Literature

Dried fruits are taken orally to get relief from cough¹⁰²; decoction of dried flower is given with jaggery as an antifertility agent in females¹⁰³; leafjuice is applied externally on ringworm and other skin diseases¹⁰³. 'Lupin'¹⁰⁴ is a medicine used for pain and inflammation associated with musculoskeletal and joint disorders. Six patents were found on its medicinal uses for treating Leishmaniasis¹⁰⁵ and also for its natural property as a dye¹⁰⁶.

USES OF OCIMUM SANCTUM L. (TULSI)



Image Source : http://hpb.narod.ru/adyar/ocimum_sanctum-leaves.jpg

Uses from NIF Database

Cough, cold and fever

Take the decoction of leaves along with black salt - Prem Prakash Kumawat, Nagor, Rajasthan

Mouth ulcer

Mix the juice of tulsi leaves and lemon and apply on the ulcers - Rahul Bharti, Hazaribag, Jharkhand

Diabetes

Make powder from equal amount of leaves of tulsi, bel and jamun. Take a spoonful orally along with cold water

- Birendra Singh Chowan, Jaipur, Rajasthan

Itching

Apply the leaf paste topically - Kundan Kumar Singh, Gopalganj, Bihar

Health tonic

Take equal amount of leaf juice of tulsi and neem along with little black pepper powder and black salt

- Adesh Kumar Vansal, Delhi

Uses in Classical Codified Literature

Whole plant is used to cure bronchitis¹⁰⁷; dried whole plant is used as tonic⁸¹; and the plant is used to combat diabetes¹⁰⁸. 'Diakof'¹¹, a sugar-free cough linctus, with tulsi as an ingredient, is beneficial for both productive and dry cough. 'Tulsi churna'¹⁰⁹, a natural ayurvedic product, provides antioxidants and is used to improve digestion and general health. More than fifty patents were found on its medicinal applications such as for treating cataract¹¹⁰ and cancer¹¹¹.

USES OF PHYLLANTHUS EMBLICA L. (AMLA)



Image Source : http://opendata.keystone-foundation.org/wp-content/ uploads/2010/03/Phyllanthus-emblica.jpg

Uses from NIF Database

Eye irritation

Extract juice from ripen fruit and add equal amount of honey. Put one drop of the mixture in the eyes before going to bed at night - Indira Chandel, Bilaspur, Himachal Pradesh

Diabetes

Take equal amounts of Ko belang, Terminalia chebula Retz., Terminalia bellirica Roxb. and groind into a fine powder. Take two spoonful powder orally

- Pritam Chand, Kangra, Himachal Pradesh

Jaundice

Take equal amounts of Ko belang fruit, ginger, black pepper and turmeric are ground into fine powder. Take one tea-spoonful of this powder alongwith honey

- Nagarmal Bagaria, Nagor, Rajasthan

Diarrhoea

Take juice of Ko belang, with an equal quantity of lemon juice orally - Bina Chaudhry, Kamrup, Assam

Stomachache

Boil the fruit, tea leaves and garlic; take decoction orally

- Bartyl Suchiang, Jaintia Hills, Meghalaya

Gynaecological disorder

Take equal amounts of Ko belang, tapioca, cumin and grind into a fine powder. Take one spoon of the powder orally

- Gunaram Kanikar, Golaghat, Assam

Uses in Classical Codified Literature

Bark and fruits are used in diarrhoea and dysentery²⁰; fresh juice of the fruit, mixed with pure cow's butter and honey, is administered to cure obstinate hiccough²⁰; juice relieves pain in urine trouble²⁰; pulp (2-3g) is eaten with warm milk to get rid of headache¹¹²; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding¹⁴; fruits are taken orally to reduce acidity¹¹³; decoction of the fruit is taken to increase blood count⁹⁹. Phyllanthus is one of the main ingredients of well known medicines 'Triphala, Chavanprash and Amla hair oil'¹¹. Seventy six patents have been found on its medicinal uses such as for diabetes¹¹⁴, liver disorders and immune deficiencies¹¹⁵.

USES OF PLUMBAGO ZEYLANICA L. (CHITRAK)



Uses from NIF Database

Eyesight

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

Stomach disorder

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

Arthritis

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

Wound

Apply the root paste topically - Boyiana Sanyasi, Vishakhapatnam, Andhra

Pradesh

Uses in Classical Codified Literature

The paste of the whole plant is applied externally on any kind of skin diseases¹¹⁶; extract of leaves and root is administered orally to alleviate arthritic pain¹¹⁷; and the plant acts as a good digestive¹¹⁸. Product 'Muscle & Joint Rub'¹¹ is highly effective for backaches, muscular sprains and joint pains. 'Citrakadi gutika'¹¹⁹ is used to cure diarrhoea associated with abdominal pain and chronic colitis. Four patents have been found on its medicinal uses mainly for skin diseases¹²⁰ and gastrointestinal disorders¹²¹.

USES OF PONGAMIA PINNATA (L.) PIERRE (KARANJ)



Image Source : http://ichip.ymes.tpc.edu.tw/~cgk001/images/DSCF1817.JPG

Uses from NIF Database

Hair care

Mix seed oil with pounded seeds of Nyctanthes arbor-tristis L. and apply on the head - Rani B. Bhagat, Pune, Maharashtra

Asthma

Take orally two spoonful of the decoction of the leaves of karanj, Adhatoda vasica Nees. and roots of Achyranthes aspera L., Solanum xanthocarpum Schrad. & Wendl.

- Tolabai Gameti, Udaipur, Rajasthan

Wound

Mix the seed oil (100ml) with burnt leaves of Phyllanthus fraternus Webst. (250g) and apply on the wound

- Davalal Gameti, Udaipur, Rajasthan

Toothache

Brush the teeth with its stem - Rahul Kumar Gupta, Hazaribag, Jharkhand

Fever

Grind the seeds (10g) and black pepper (2nos), make pellets of gram size and take orally - Devendra Kumar, Hazaribag, Jharkhand

Eczema

Apply the seed extract topically - Sitaben Gayakwad, Dang, Gujarat

Uses in Classical Codified Literature

Dried flower powder is taken orally to reduce blood sugar¹²; juice extracted from green fruits is mixed with mustard oil and applied in case of rheumatic pain¹²³; and fresh bark extract is administered orally to cure bleeding piles⁵³. 'Erina Plus gel'¹¹ acts as a stimulant and helps in increasing the blood supply to skin. It prevents hair loss and skin disorders. 'Face Treatment Cream'¹²⁴ acts as a revitalizer, moisturizer and anti-wrinkle skin cream, and also works on dark circles and puffiness around the eyes. Ten patents have been found on its medicinal applications mainly for hair care¹²⁵, skin diseases¹²⁶.

USES OF TINOSPORA CORDIFOLIA (WILLD.) MIER EX HK.F. & TH. (GILOY)



Migraine

Stem of the plant (250g) is boiled in water along with green gram (250g) and sesame oil (250ml) till half of the decoction remains and then applied on the forehead

- Stedimon Arackal Paul, Port Blair, Andaman & Nicobar Island

Asthma

Juice is extracted from the leaves and two spoonful are administered orally with honey for 40-42 days

- Ramabandhu Mahajan, Jalgaon, Maharashtra

Fever

Juice extracted from stem (10g) is mixed with little water. Warmed juice is taken orally twice a day for 8-10 days

- Susanta Kumar Manjhi, Birbhum, West Bengal

Jaundice

Stem (8 inch long) is soaked in a cup of water and left overnight. The next morning the same water is given orally

- Susanta Kumar Manjhi, Birbhum, West Bengal

Diabetes

Juice extracted from stem is administered orally in the morning on an empty stomach - Subhjyoti Chatterjee, Burdwan, West Bengal



Fresh leaves (1-2) are taken on an empty stomach - D. K. Phukan, Guwahati, Assam

Intestinal worms

Oral intake of leaves juice kills worms - Susanta Kumar Manjhi, Birbhum, West Bengal

Piles

Whole plant (50g) is boiled, dried and ground into a fine paste. Tablets are then prepared and one tablet is administered orally to the patient thrice a day for 3-5 days

- Pukhram Angouba Singh, Bishnupur, Manipur

Uses in Classical Codified Literature

Powdered roots are taken to cure mouth ulcer¹²⁷; powdered plant is administered orally with honey to get relief from stomach disorder¹²⁸; the stem is bitter and is used as anthelmintic⁶⁹; decoction of the plant is given orally to cure diarrhoea¹²⁹. Tinospora is a well known medicinal plant and used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon^{11'} etc. In today's world of modern medicine, it is also called as magical herb due to its property of curing a lot of diseases^{130, 131}. More than hundred patents have been found on its medicinal applications as an antiallergic¹³² and for cancer¹³³ etc.

USES OF VITEX NEGUNDO L. (NIRGUNDI)



Uses from NIF Database

Oozing from ear

Few drops (3-4) of warmed juice of leaves is put in the ear - Susanta Kumar Manjhi, Birbhum, West Bengal

Ear pain

Leaves are boiled in mustard oil, oil is then filtered and used as an ear drop - Bhagat Ram, Kangra, Himachal Pradesh

Obesity

A spoonful of the juice extracted from the leaves is taken orally everyday - Arun Ghosh, Bankura, West Bengal

Diabetes

Equal amounts of leaves of vitex, neem and Catharanthus roseus (L.) Don. are ground and tablets (5g) prepared from the powder. Two tablets are administered orally in the morning on an empty stomach

- Susanta Kumar Manjhi, Birbhum, West Bengal

Rheumatism

Lukewarm leaves are put on aching joints

- Naganath Durga Chogule, Sholapur, Maharashtra

Muscular pain

Leaves are smeared with mustard oil, lukewarmed and applied on the affected part - Savita Kumari, Gopalganj, Bihar

Skin disease

Small pieces of plant, mixed with cow's urine, are applied on the affected skin

Uses in Classical Codified Literature

Leaf smoke is inhaled to get rid of cough¹⁴; in case of diarrhoea flowers are used⁶⁹; extract of the plant is taken as a diuretic¹⁴. 'Muscle & joint rub'¹¹, is a highly effective medicine for backache, muscular sprain and joint pain. 'Dental Cream'¹¹ is a formulated toothpaste that tightens and reduces swelling of gums, stops gum bleeding, prevents toothache, decay and controls bad breath. 'Atharva Nirgundi Siddha Tail'¹³⁴ is useful in arthritis, joint pain, relieves oedema. Thirty-five patents were found on its medicinal applications mainly for rheumatic arthritis¹³⁵. Biologically synthesized green silver nano-particles from leaf extract of Vitex negundo L. induce growth-inhibitory effect on human colon cancer cell line HCT15¹³⁶. More than hundred patents were found on its medicinal applications as a rheumatoid arthritis¹³⁷ and for skin care¹³⁸ etc.

HERBAL FORMULATIONS FOR HEALTHY CROPS

Sristi Shastra

Arkhiben Vankar, Ranabhai Kamaliya, Banidan Gadhvi, Gemal Rana, Rajnikant Patel, Ahmadbhai Kadivala, Gujarat.

It flourishes the growth of the plant by increasing flowering as well as fruiting besides overall vegetative growth, without being harmful to nature as well as human beings. It also helps in controlling sucking pests like white fly, heliothis, aphid etc.

Sristi Krushak

Popatbhai Rupabhai Jambucha, Gujarat

It is an excellent remedy for leaf curl disease, which not only controls the disease but simultaneously increases the vigor of the plants by increasing its overall growth.

Sristi Prayas

Community Knowledge, Gujarat

It is a highly effective formulation to act as a herbal growth promoter, which also stops shedding of flowers as well as increases the overall growth of the plant. This formulation strengthens the plants internally and enables them to withstand extreme weather conditions.

Sristi Shakti

Community Knowledge, Gujarat

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

Sristi Suraksha

Community Knowledge, Gujarat

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



HERBAL FORMULATIONS FOR LIVESTOCK AND POULTRY

Coccicure

Sudakarbhai K. Gauli & Jeevalbhai M. Gauli, Dang, Gujarat

It is a unique herbal medication for prevention and curing of Coccidiosis (Eimeria sp infections) in Poultry. The primary function of the medication is to reduce the oocytes maturation and affects the life cycle of various Eimeria species.

Poultmax

Community knowledge, Valsad, Dang, Gujarat

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

Mastiherb

Ukhardiyabhai S. Raot, Dang, Gujarat

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

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



END NOTES & REFERENCES

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