National Innovation Foundation

Orissa Innovates

Honey Bee Network

ORISSA INNOVATES

National Innovation Foundation

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HONEY BEE NETWORK

www.honeybee.org, www.sristi.org

Regional Collaborators
Dr. Balaram Sahu
Shrishti, Bhubneshwer

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ORISSA INNOVATES

PREFACE

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

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

Despite various constraints, NIF has put together a small book celebrating creativity, innovation and traditional knowledge from Orissa. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover at least a few examples of the ability of local communities and individuals to solve problems on their own without outside help, how much more can be done if state and private sector agencies join hands with NIF actively.

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

The book is divided in three parts. The mechanical innovations developed by innovators from Orissa are covered in part one. Selected examples of herbal traditional knowledge are given in part two. The innovations from other parts of the country suitable for the development of Orissa are given in part three.

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point. There are a large number of knowledge rich people who may not have been educated much, may in fact be

economically poor also, but still have the ability to solve a few problems so well.

The challenge really is to work out a synergy so that no creative voice remains unheard, and no solution remains localized and unrecognized. By adapting public policy in support of grassroots innovators and traditional knowledge holders, we can make economic development process more inclusive and sustainable.

This book on innovations has been compiled at the request of Dr. Vijay Kelkar, Chairman, Finance Commission and the Member, Governing Council of the National Innovation Foundation as a tribute to the creativity and innovation at grassroots. This presentation is part of a series of innovation compendium prepared for every State of India. We hope this will be followed up in the form of concrete policy and institutional initiatives in each State to empower creative people to improve the quality of life of common people and thus promote inclusive growth.

It is my belief that such examples will act as spur for other State government departments to look for creative efforts of their staff and users at ground level. I hope that NIF will have the opportunity to work closely with the State government in future and expand knowledge base, add value to selected technologies and help them diffuse through commercial and non-commercial social channels for improving the livelihood of the majority of the people.

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

Building a Bridge with Grassroots Innovators in Informal Sector

To make the Indian development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by common people at village or semi-urban level. Many of these experiments lead to development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often be to solve just his/her problem. There is no mechanism available for him to share the knowledge, innovation or practice with other people in different regions. Sometimes, ideas and innovations get diffused through word of mouth. But many times, these ideas remain localized. In the process, potential growth and social development gets constrained. To overcome this constraint, Honey Bee Network with a handful of volunteers triggered a movement, twenty years ago to scout, spawn and sustain the unaided innovations and outstanding traditional knowledge from the informal sector of our country.

Drawing upon this experience, National Innovation Foundation (NIF) was set up in 2000 with the help of Department of Science and Technology, Government of India to scale up the idea of learning from grassroots innovators.

Under the inspiring leadership of Dr. R. A. Mashelkar, Chairperson NIF and former Director General, Council of Scientific and Industrial Research (CSIR), NIF has taken major initiatives to serve the knowledge-rich, economically poor people of the country. It is committed to make India innovative by documenting, adding value, protecting the intellectual property rights of the contemporary unaided technological innovators, as well as of outstanding traditional knowledge holders. It aims at promoting lateral learning among local communities to generate low cost affordable solutions of the persistent and emerging problems, and enhance the diffusion of innovations on a commercial as well as non-commercial basis.

How does NIF work?

Primarily, NIF has five functions: (a) Scouting and documentation, (b) Value addition and research and

[1] The Honeybee collects pollen from the flowers but they are not impoverished, in the process links one flower to another enabling cross-pollination. Similarly, the Honey Bee Network strengthens people-to-people contacts, learning and networking by pooling the solutions developed by individuals across the world in different sectors. The network acknowledges the innovators, traditional knowledge producers and communicators so that they do not remain anonymous.

development, (c) Business development and Micro Venture, (d) Intellectual Property Rights protection and (e) Dissemination, database development and IT applications.

NIF has been entrusted with the responsibility of building a National Register of Grassroots Innovations and Traditional Knowledge. It is not enough to document or disseminate the innovations or outstanding traditional knowledge. Value addition is very important for harnessing the full potential of the idea. NIF has entered into MOU with CSIR and Indian Council of Medical Research (ICMR) besides other organizations. CSIR has allocated funds to support research on grassroots innovations in CSIR labs. Similarly, ICMR supports research on such herbal healing knowledge, which has not been documented in the classical texts and formal institutional literature. NIF also helps in generating a very large pool of open source / public domain technologies. A small number of innovations are also protected by patents and other IPRs.

For most innovators, attracting risk capital for converting innovations into enterprise is very difficult. They neither can offer much collateral nor are they able to develop a business plan or deal with formal R&D system.

A Micro Venture Innovation Fund (MVIF) has been set up with the help of SIDBI to provide risk capital for technologies at different stages of incubation. Under single signature, innovators are trusted and investments are made to help them commercialise their innovations. Most innovators do not make good entrepreneurs. For entrepreneurship, one has to make consistent batch by batch production of products. Innovators are often incorrigible improvisers. They seldom make two things alike. NIF has helped such innovators to license their technologies to third party entrepreneurs. Most of the licenses have been given to small entrepreneurs and in a few cases, to medium enterprises.

A very elaborate benefit sharing system has been developed, governed by the Prior Informed Consent (PIC) of the knowledge

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The Honey Bee Network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of Honey Bee newsletter. It also ensures that a fair share of benefits arising from commercial exploitation of local knowledge and innovations reaches the innovators and knowledge providers.

providers. Attempt is made to share benefits not only with the innovators but also with their communities and for nature conservation. In addition, a small part is kept for contingency support to needy innovators, for R&D stakeholders, promoting women's innovations and meeting overhead costs.

It is remarkable that grassroots innovations are generating global demand, as evident from inquiries from around fifty-five countries for various technologies, NIF has succeeded in commercializing products across countries in six continents apart from being successful in materialising thirty cases of technology licensing with the help of partner agencies.

What has it done?

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 1,00,000 ideas, innovations and traditional knowledge practices (not all unique, not all distinctive) from over 520 districts of the country.

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

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

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

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

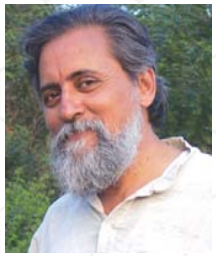
How can state government join hands with NIF?

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

source of innovative ideas and technologies and state government as partner in dissemination, value addition and even commercialization through incentives, promotion, subsidies, etc.

b. State government can join the national campaign for scouting innovations and traditional knowledge and motivate its grassroots functionaries to join hands with NIF in uncovering the talent at the community level.
c. Students in schools and colleges can be motivated to scout creative and innovative people in their neighbourhoods and send the entries to NIF (Post Box No.15051, Ambavadi, Ahmedabad 380 015, campaign@nifindia.org). Examples of innovations can also be included in the curriculum for the school and college education.
d. Demonstrations and trials can be organized at various regional research stations and KVKs (Krishi Vigyan Kendras) so as to create awareness about the creative potential of common people.
e. The research institutions can be mandated to add value to the knowledge of innovative people and help in protecting their knowledge rights.
f. On the state's website, link to NIF can be given and the innovations from the region can be displayed to put forward the creative face of the state before the people.
g. Some of the innovative people identified by NIF and/or state government could be awarded at district and state level besides giving them support for further work.
h. A nodal officer could be appointed to keep in dynamic touch with NIF to ensure that all the areas of possible cooperation are explored.

I hope that NIF would be able to develop a functional, fruitful and fulfilling relationship with the State of Orissa. Tremendously rich knowledge of biodiversity and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.



Anil K Gupta
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Professor, Indian Institute of Management, Ahmedabad
anilg@nifindia.org

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

- Dr APJ Abdul Kalam

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

- Dr RA Mashelkar

PART I

INNOVATIONS
from ORISSA

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

01

Lingaraj Pradhan
Sundargarh

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.

02

An umbrella that rains and cools!!

Supriya Chotrey
Khurda

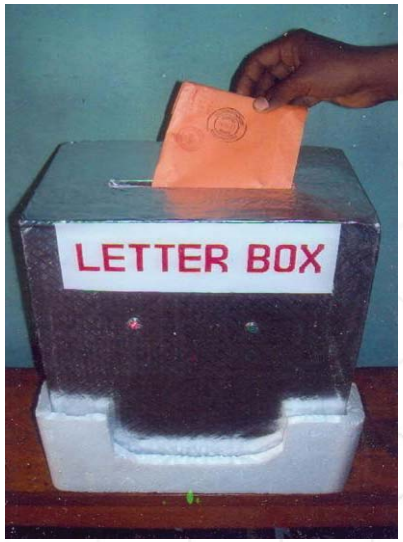
Supriya Chotrey was inspired to make an umbrella with a water spraying arrangement during an extreme heat wave that struck Orissa in 2003. She consulted her science teacher and successfully built a unique umbrella with a water sprayer, a thermometer and a siren attached to the handle of the umbrella. 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).

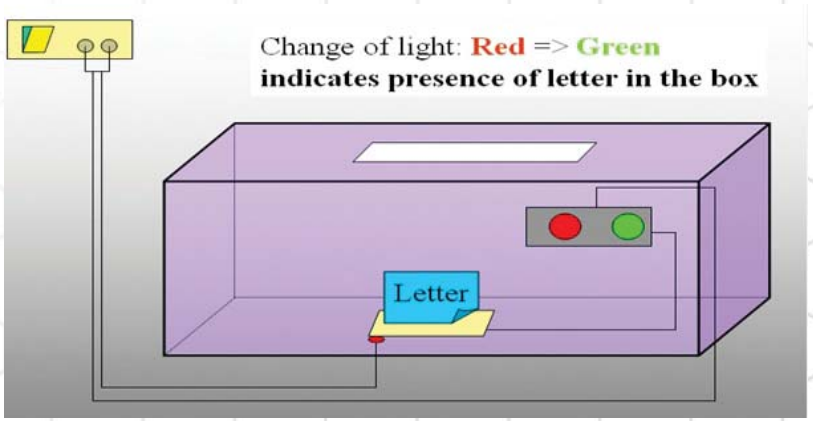
03

Utkalika Patnaik
Khurda

Intelligent letterbox

Utkalika Patnaik is an avid student and a classical singer. She has come up with an idea for a letterbox with an indicator light to indicate the presence of letter in the box. Her post box consists of an electronic circuit, a letter receiving plate, which senses the fallen letter and triggers the circuit, along with green and red status indication lights. The "red light" flashes when the letterbox is empty and the "green light" flashes when a letter falls inside and actuates the plate. It is particularly useful when one lives in a multi-storey building with lot of letterboxes on the ground floor. One can see from a distance whether the letters have arrived or not. 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, 17(1) & (2): 37-38, 2006).





04

Multipurpose crutch for the physically challenged

Rakesh Patra
Nayagarh

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.

Sarit Swapna Das
Nayagarh

Weighing machine using scooter tyres

Swapna observed that farmers without a cheap and reliable system to weigh their produce were at a disadvantage as they were often cheated by rigged scales. She built a simple weighing device from a used scooter tyre, which can weigh up to 25 kilograms. The apparatus consists of the inner tube of a scooter tyre filled with air, which is connected through the air-valve to a transparent plastic tube filled with red colored water and a calibrated vertical display. As the weights are placed on top of the tyre, the compression pushes air through the valve and displaces the colored water in the tube. She won an award in NIF's Fourth National Competition for Grassroots Innovation and Traditional Knowledge in 2007 in students' category.

06

Tackling ten problems at one go!

Gurcharan Singh Pradhan*
Sundargarh

Lack of workers to help him in his fields led Gurcharan to think about a multi-functioning machine that would help him save energy and work more efficiently. First he made a standard structure of his envisioned machine and used it for basic tasks like chaff cutting and paddy threshing. After he got comfortable using his machine, he started increasing its functionality by modifying it to perform other tasks too.

The machine carries out ten different farming chores *viz.* water pumping, chaff cutting, electricity generation, sharpening/grinding tools, sawing/wood cutting, coconut peeling, winnowing, paddy threshing, groundnut threshing and soft chaff/grass cutting. The machine, which is no bigger than a standard bicycle, has a frame consisting of a hand crank, chain and sprocket drive and a pair of belt and pulley. It can be operated by hand or foot (Also see Honey Bee, 17(3): 5 & 19, 2006).

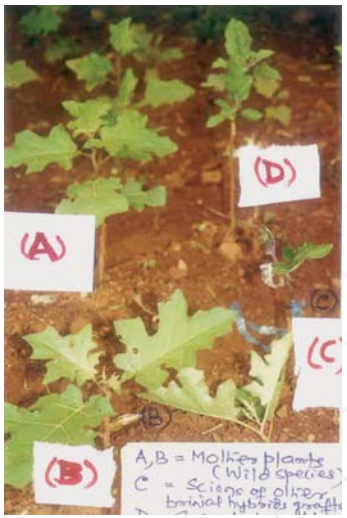
*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.

07

HS Sahoo*
Rayagada

Imparting disease resistance through grafting in brinjal

Sahoo advocates the use of Bhijri brinjal mother plant (one to six months old) and scions of improved or other varieties of brinjal to develop disease resistant varieties. By taking scion from the hybrid variety, grafting can be done successfully in 15 days. No fertilisers are required though some insecticide spray preferably herbal is desired. He won a Consolation award in NIF's First National Competition for Grassroots Innovation and Traditional Knowledge in 2001.



* Though awarded in NIF's First National Competition in 2001, the innovator is a professional as per the present rules of NIF, which were redefined 2003 onwards to specifically focus on innovations from the people of unorganised sector.

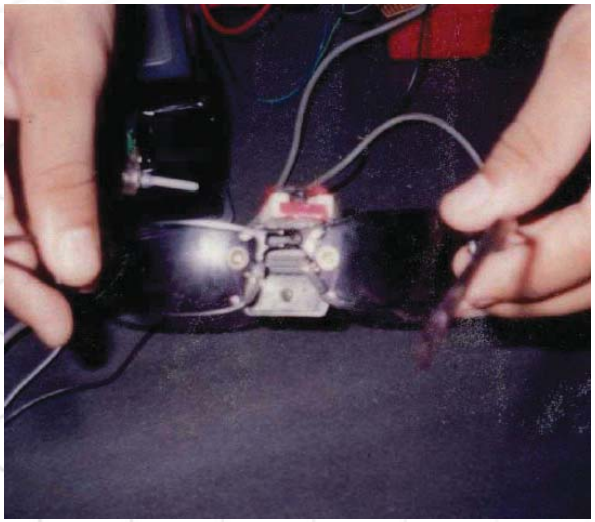
08

Glabenator- an advanced alternative and augmentative communication device

www.changemakers.net

Apurv Mishra
Bhubaneshwar

Glabenator is a small device that enables people having limb disability, paralysis or are dumb to express their feelings without much movement. The device, which is worn like a goggle, uses two muscles of the forehead to display several choices like food and water that a person needs in his day-to-day life on the display of the device. By raising the eyebrows, the person can scroll through different options available on the display. A particular option is selected by contracting the eyebrows. Thereafter the machine reproduces the selected and coded pre-recorded message.



Prafulla Kumar Puhana*
Jajpur

A serial innovator

Fifty three years old Prafulla Kumar Puhana, headmaster, teaching English and Maths , is also a serial innovator and has more than thirty innovations to his credit. Some of these are: pedal grinder, water operated fan, paper rolling machine, calculator with difference, multipurpose machine, and machine for reusing waste water, modified school computer etc.

Coming from an agricultural background, Puhana had great interest in science. He is a humble and dedicated teacher and guides students to prepare projects for their science exhibitions and inspires them to be original. He was honoured with SRISTI Samman at its annual function in 2008.

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10

Herbal fruit ripener

Budhadeba Sahu
Angul

Budhadeba Sahu is a 57 years old farmer and agricultural labour. He observed that the leaves of a particular plant* 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.

* Name not disclosed because of IP reasons

Source: http://www.thedailygreen.com/cm/thedailygreen/images/hm/banana-clean-FD-lg.jpg

11

Pratyush Ranjan Panda
Balasore

Bio-fuel from a local tuber

Pratyush Ranjan Panda is an innovative student studying in class tenth. Since his childhood, he used to observe the scarcity of kerosene in his village. His mother also faced problem procuring kerosene for cooking. Once he realised that a particular local tuber* could be fermented for a day and then distilled to produce ethanol. The vegetable was not much used by the people because of its unpalatable taste. He improvised this distillation process to extract ethanol from this source of starch and mixed it with kerosene in equal proportion to use it as a fuel in his home.

* Name not disclosed because of IP reasons

12

Floating crop beds in water

Pradeepta Pradhan
Angul

Pradeepta is an enterprising farmer growing paddy, pulses and vegetables in his fields. He has devised an interesting method to grow crops on a water surface. For this he makes a floating cropping bed of various husks over which manure and compost is spread. The seeds of various crops are then sown on this bed.

He has been using this practice to get good results. A variety of crops including paddy can be grown in this way. This is a good technique to utilize water logged areas and other lakes. Similar floating beds do exist in Bangladesh for transporting mainly nurseries of vegetable seedlings in rivers.

Automatic device to switch on/off pumps in deep open wells

Prasanta K Mohaptra*
Bhubaneswar

In drought prone areas of the state, farmers dig deep wells to get water for their crops. Water recuperation rate is very slow i.e. wells take a long time to regain original levels after pumping for few hours. Farmers have to visit the well often to gauze the water level so that they can start the pump to lift water. Sometimes the water level is so low that the farmer cannot gauge it clearly due to the darkness at the bottom of the well. If more water accumulates in the well, it puts back pressure on the water stream resulting in its stopping. While if water is less and the pump starts, only the muddy water gets lifted. Prasanta has made a simple electronic circuit that automatically switches on/off the pump when water reaches a desired height in the well. Using this device, farmers are relieved of their problems and there is no chance of back pressure on recharge flow in the wells.

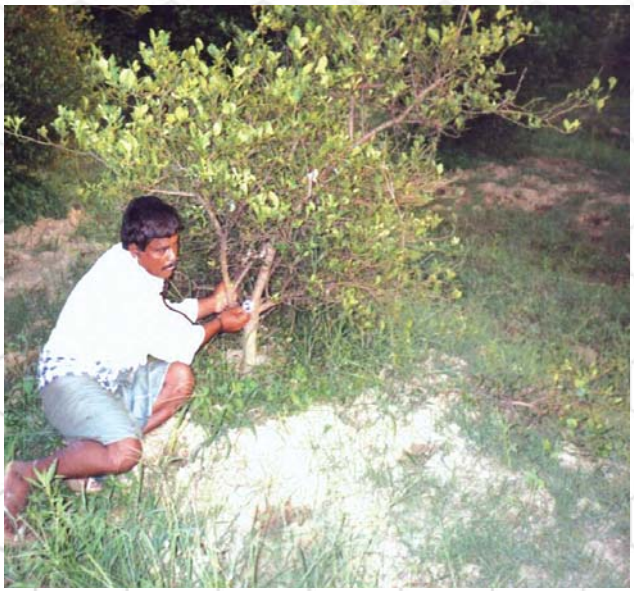
*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.

14

Stethoscope to detect pest in lemon

Chakradhar Pradhan
Baragarh

Root cutting pests harm the lemon plants resulting in reduction in the yield. These insects live below the surface about 3-4 cms 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.



Kabikarna Kirsani and team
Koraput

Lesson in enterprise: Building canal for perennial water supply

An interesting instance of community initiative to tide over water scarcity is evident in Mali Doliamba village. Kabikarna Kirsani, a local farmer, along with fellow villagers built a three km long canal to irrigate their rain-fed farms in the face of stiff adversities. The terrain was rocky, unruly and difficult. Using spade and other indigenous stone cutting materials, they adopted indigenous technique to find contour levels. The tunnels were so dug that level could be maintained. One and half year of hard work resulted in a perennial joy when water reached their village, though initially all engineers had ruled out this project as infeasible. Some harijans from another village had donated land for making a small reservoir from where the water was steered through the canal. The beneficiary villages agreed to compensate these families every year through some share of grains.

Today, a large part of Mali Doliamba is perennially irrigated. This has enabled the villagers of Mali Doliamba to undertake second crop in additional areas and has helped improve their livelihood. Their effort was praised by the local government also, which helped them at the later stage of their work (Also see Honey Bee, 17(1 & 2): 26, 2006).

Sure we should work hard, should he start so early

17th Shodh Yatra
09 May to 16 May 2006
Semiliguda to Sabara Srikhetra, Koraput District

Shodh Yatra is a walk through the villages in search of knowledge, creativity and innovations at grassroots.

It is an attempt on the part of SRISTI, a Honey Bee Network partner based at Ahmedabad and NIF along with other network partners to reach out to the remotest part of the country. It is guided by a firm belief that hardships and challenges of natural surroundings may be one of the prime motivators for triggering creativity and innovations.

Shodh Yatra aims at unearthing such traditional knowledge and grassroots innovations that have not only simplified the lives of men, women and farm labourers but have also significantly contributed towards the conservation of bio-diversity and other natural resources.

The yatris, during the 17th Shodh Yatra, over the period of eight days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country (Also see Honey Bee, 17(1 & 2): 21-27, 2006).

NATIONAL INNOVATION FOUNDATION, INDIA

The Seventh National Biennial Competition for Green Grassroots Unaided Technological Innovations and Traditional Knowledge

Co-sponsors

Honey Bee Network

CSIR

SRISTI

IIM-A

The competition

The NIF, set up by Department of Science and Technology, GOI, seeks entries of unaided technological innovations and traditional knowledge developed by an individual or group comprising farmers, artisans, fishermen and women, slum dwellers, workshop mechanics, students, local communities etc., in managing natural and/or other resources. The innovations can be in machines, gadgets, implements, or processes for farm operations, household utility, transportation, energy conservation or generation, reduction in drudgery, creative use of biodiversity, development of plant varieties, generation of herbal remedies for human or animal health or developing new or any other low cost sustainable green technology related to various aspects of survival in urban and rural areas. Creative ideas for innovative technologies which have not yet been reduced to practice are also welcome. Communities developing People's Biodiversity Register (PBR) or People's Knowledge Register (PKR) are encouraged to register/link their knowledge base with the National Register at the NIF.

The awards

The best three innovations and traditional knowledge practices will be awarded Rs 1,00,000, Rs 50,000 and Rs 25,000 each in different categories. In addition, individuals and/or organizations that make extraordinary contributions in scouting grassroots innovations and traditional knowledge may also get awards worth Rs 50,000, 25,000 and 15,000 respectively besides recognition to many others. There will be several consolation prizes of Rs 10,000 each in different categories depending upon the number of entries and incremental inventiveness and potential social and environmental impact. Three most outstanding innovative ideas may be given prizes of Rs 50,000, 25,000 and 15,000 in addition to consolation prizes of Rs 5,000 each. There are special prizes for innovations by or dealing with, physically challenged people. The innovations /ideas of professionally trained persons are not considered for award or financial support. There are special awards for journalists writing about grassroots innovations and/or traditional knowledge and creating greater awareness about NIF's missions. *The award money may be revised in due course.*

Students

Young inventors and innovators are invited to send their ideas or innovations for a special category of awards for them. These should be unsupervised, an outcome of their own creativity, without any support from their teachers or outsiders. There will be prizes worth Rs 15,000, 10,000 and Rs 7,500 for the best three entries and several consolation prizes of Rs 5,000 each in this category.

How to participate

Individuals or groups may send as many entries as they wish on plain paper providing a) genesis of the innovation and traditional knowledge b) its background and c) educational qualification and occupation, accompanied by photographs and/or videos if possible and any other information that may help in replicating the innovations/traditional knowledge. Herbal entries may be accompanied by dried plant samples to enable proper identification procedure. **The Seventh National Competition started on February 1, 2009 and entries will be accepted till December 31, 2010.** Every entry should include the **full postal address** to facilitate further communications.

Where to send entries?

National Coordinator (Scouting & Documentation), National Innovation Foundation, Bungalow No. 1 Satellite Complex, Premchand Nagar Road, Ahmedabad 380015 Gujarat
Toll Free No 1800 233 5555 Fax: (079) - 2673 1903
email: campaign@nifindia.org; www.nifindia.org

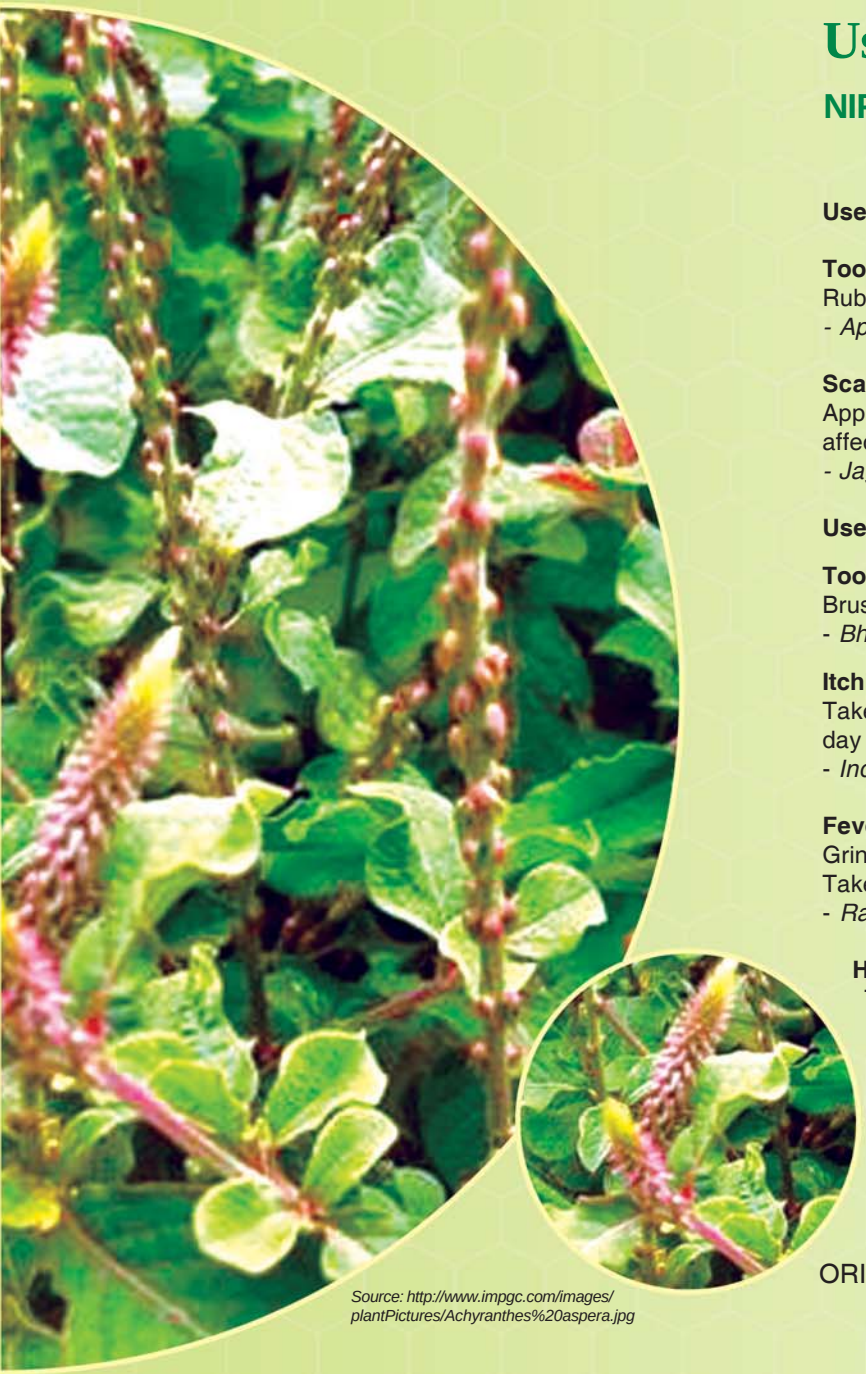
PART II

HERBAL PRACTICES & PRODUCTS

This section contains details of herbal preparations used traditionally for various ailments and products based on such traditional knowledge.

Uses of *Achyranthes aspera* L. (Apamari)

NIF Database



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

Uses from Orissa

Toothache
Rub fresh leaves on the teeth
- Apsari Sahoo, Dhenkanal, Orissa

Scabies
Apply root powder along with a pinch of salt on the affected part
- Jagdish Dash, Bargarh, Orissa

Uses from other states

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

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

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

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

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

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

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

Uses in Classical Codified Literature

Dried aerial parts are taken orally in the case of diabetes[1]; powder made from the dried plant is given orally to treat whooping cough[2]; decoction of the plant is used as laxative[3] and is also applied externally on boils and pimples[3].

Product 'Cystone'[4] is made from this plant, which inhibits calculogenesis by reducing stone-forming substances like oxalic acid, calcium hydroxyproline and prevents urinary tract infections. Thirty five patents have been found on the medicinal applications of *Achyranthes* mainly for curing laryngopharyngitis[5], and bronchial asthma[6].

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

NIF Database

Uses from Orissa

Cold
Take the leaf juice orally along with honey
- Sunita Mohanty, Dhenkanal, Orissa

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

Uses from other states

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

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

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

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

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

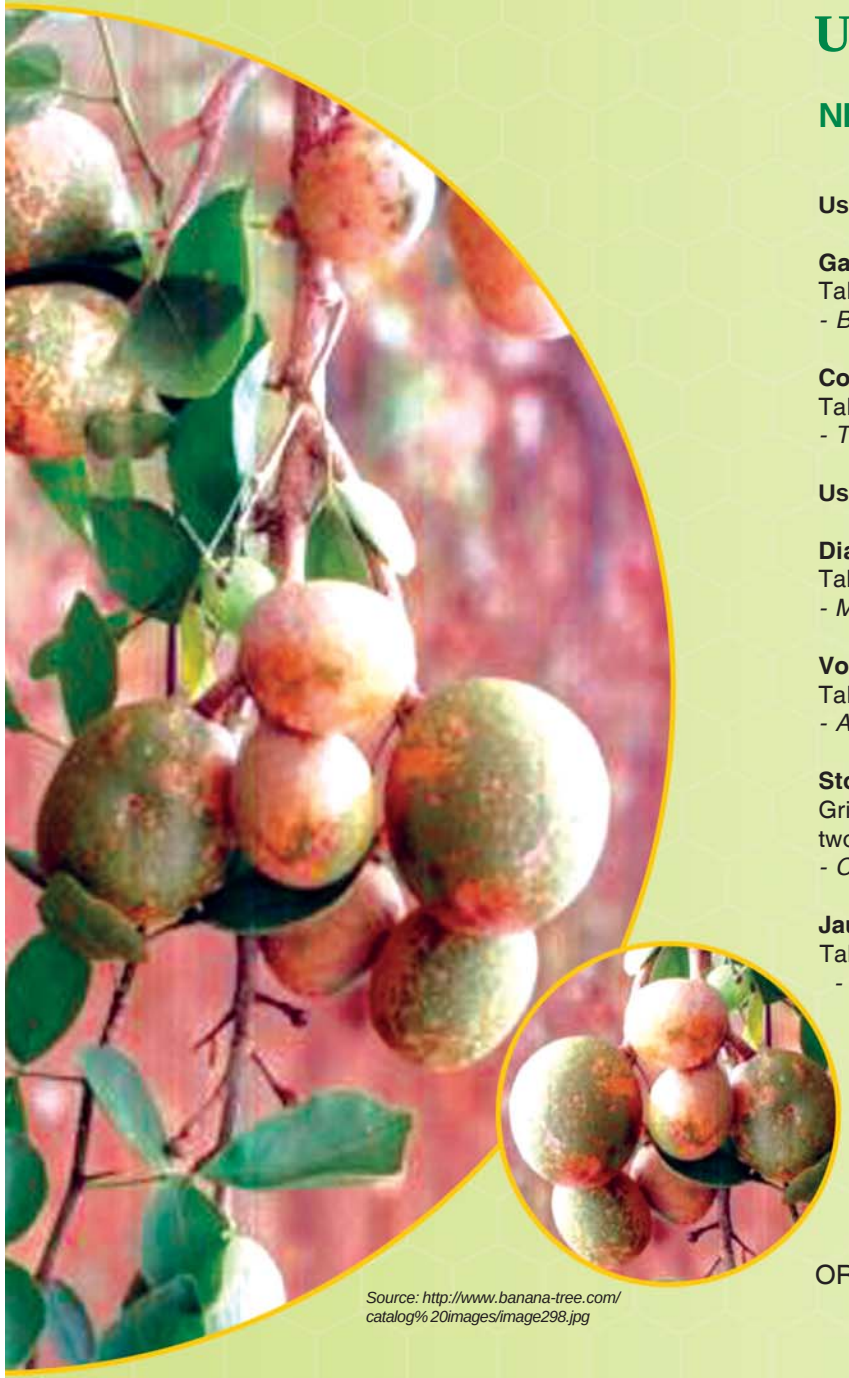
Constipation
Take the leaf decoction orally with honey
- Pradip Kumar, Bulandshahar, Uttar Pradesh

Uses in Classical Codified Literature

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

Source: NIF database

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



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

NIF Database

Uses from Orissa

Gastritis
Take the leaf paste orally with a pinch of camphor
- Bagarti Sahoo, Jagatsinghpur, Orissa

Constipation
Take the leaf paste orally along with black pepper
- Tulasi Sahoo, Dhenkanal, Orissa

Uses from other states

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

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

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

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

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

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

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

Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis[2]; 10g fruit pulp is given before sleep to overcome morning sickness[13]; and fruit rind is applied externally on hair to kill head lice[14].

Sweet fruit slices of 'Bael'[4], prepared from *Aegle* are used in diarrhoea, dysentery and gastro-intestinal disorders. It has digestive and carminative properties. Lukol's[4] tonic is made from this plant along with other plants. It improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system also help control leucorrhoea. 'Bilwa'[15], a product of *Aegle* is used as a medicine to cure a number of diseases. Fifty three patents have been found on the medicinal applications of *Aegle* mainly for curing diabetes[16], gastric ulcer[17] besides novel uses as herbal catalytic composition (US 6012417) for pollution control in automobiles.

Uses of *Annona squamosa* L. (Atha)

NIF Database

Use from Orissa

Dandruff
Apply the leaf paste on the scalp
- *Jitendriya Panigrahi, Balugaon, Orissa*

Uses from other states

Hair care
Apply the leaf paste on the hair
- *Sana Parvin, Mandu, Jharkhand*

Head lice
Apply the seed powder on the scalp
- *Madhav Rao Shankar Rao Patil, Jalgaon, Maharashtra*

Cough
Smoulder the powder of annona and date palm seeds to inhale the smoke for relief
- *Ramdas Ghanshyamdas Patel, Nasik, Maharashtra*

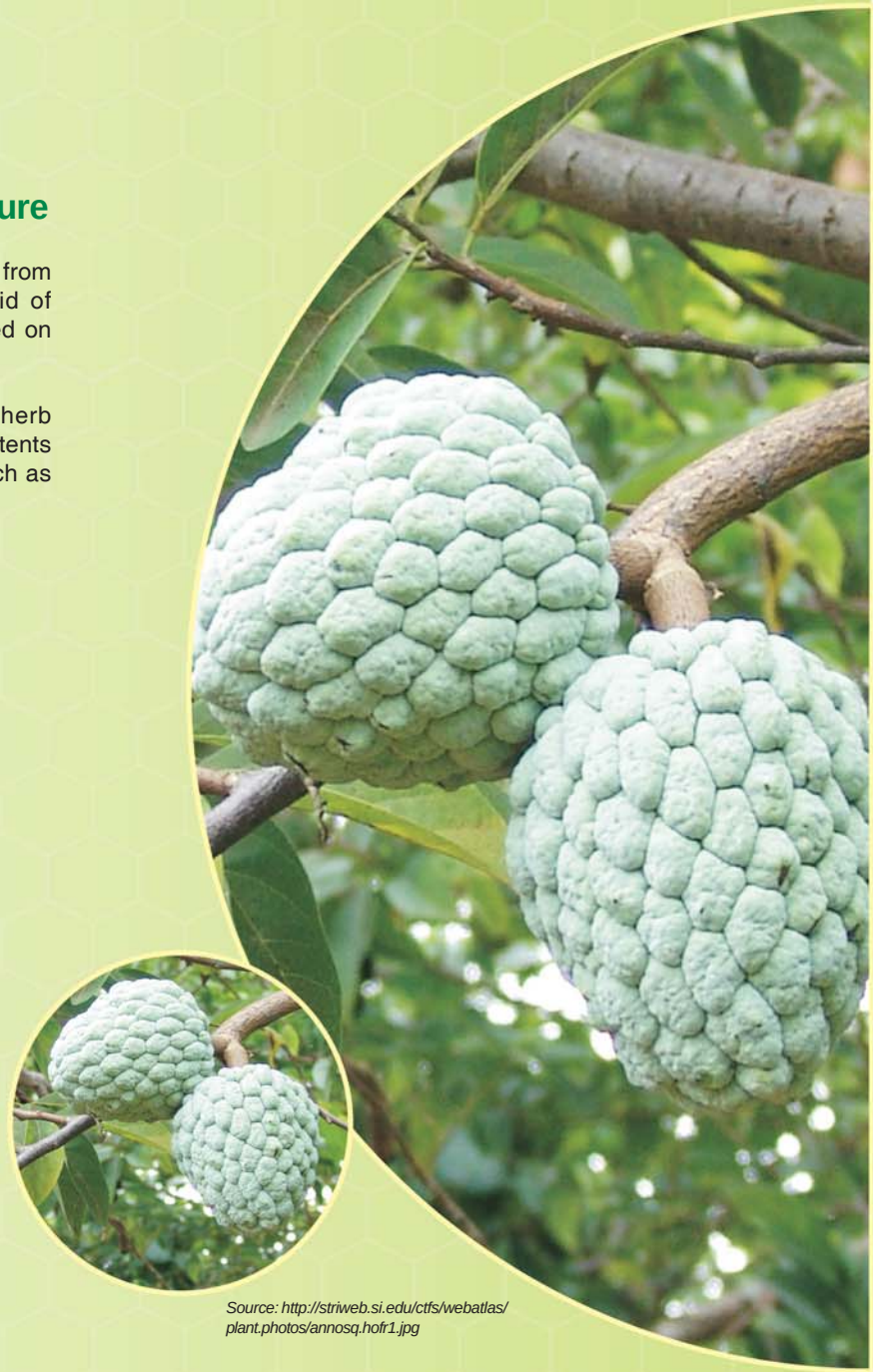
Diabetes
Take four tea spoonfuls of the fruit powder orally every morning on an empty stomach
- *Shantanu Gupta, Kota, Rajasthan*

Abscess/boils
Apply the fruit paste over the affected part
- *Naganath Durga Chogule, Sholapur, Maharashtra*

Uses in Classical & Codified Literature

Ripe fruit is considered as an anthelmintic[18]; extract from leaves and fruit is administered orally to get rid of rheumatic pain[19] and the paste of leaves is applied on the head to kill head lice[2].

Product 'LICEX Headlice Expeller'[20] is a multi-herb formulation that removes headlice and nits. Nine patents have been found on its various medicinal uses such as an antiretroviral[21] and for scalp care[22].



Source: http://striweb.si.edu/ctfs/webatlas/plant.photos/annosq.hofr1.jpg

Uses of *Balanites aegyptiaca* (L.) Delile (Hingu)

Source: http://www.css.cornell.edu/ecf3/Web/new/AF/pics/alanitesFruit.jpg

NIF Database

Use from Orissa

Neurological disorder
Take the fruit powder (5g) orally on an empty stomach till the ailment cures
- *Sanatan Bisoi, Nabarangapur, Orissa*

Uses from other states

Respiratory disorder
Prepare tablets from the mixture of the fruit powder and jaggery. Take one tablet orally every morning on an empty stomach for 40 days
- *Ramabandhu Mahajan, Jalgaon, Maharashtra*

Diarrhoea
Take the seed decoction orally
- *Chandra Devi, Nagor, Rajasthan*

Swelling
Apply the leaf paste over the affected part
- *P.D. Walikar, Bagalakot, Karnataka*

Poisonous bites
Apply the root paste topically
- *Ramabandhu Mahajan, Jalgaon, Maharashtra*

Uses in Classical & Codified Literature

Bark powder mixed with salt is given to treat cough[23]; fruit is used as an anthelmintic[24]; and extract of root bark is given orally to cure asthma[25]. Product 'Diosgenin'[26] is made from this plant along with other plants and acts as an antinflammatory agent. Three patents have been found on its medicinal applications mainly for treating HIV/AIDS, leukemia[27] and jaundice[28].

Uses of *Carica papaya* L. (Papita)

NIF Database

Uses from Orissa

Lactogogue
Eat the ripe fruit
- Kalia Behera, Bargarh, Orissa

Piles
Take the leaf juice orally
- Mama Sahu, Dhenkanal, Orissa

Uses from other states

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

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

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

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

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

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

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

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

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

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

Veterinary practice

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

Uses in Classical Codified Literature

Decoction of the flower is used as cardiotonic[29]; bark powder is applied externally on wounds[30]; decoction of the bark is given orally to get rid of intestinal worms[31]; beverage of the fruit is taken orally to cure diarrhoea[32]. Natural moisturizers and creams[33] are prepared from *Carica* in combination with other plants. Thirty patents were found on its medicinal uses as an antiallergic[34] and for prevention of cancer[35].

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

Uses of *Kalanchoe pinnata* (Lam.) Pers. (Hemakedar)

Source: NIF database

NIF Database

Use from Orissa

Diarrhoea
Grind the leaves and black pepper (7 each). Take the paste orally along with water
- Gadadhar Mohapatra, Puri, Orissa

Uses from other states

Injury
Put warmed leaves on the affected body part
- Onom T. Doming, East Siang, Arunachal Pradesh

Eye pain
Put two drops of the leaf juice in the eyes
- Susanta Kumar Manjhi, Birbhum, West Bengal

Stomach disorder
Take two spoonfuls of the leaf juice orally
- Susanta Kumar Manjhi, Birbhum, West Bengal

Diarrhoea
Take the leaf juice orally along with some sugar
- Bikesh Kumar, Sitamarhi, Bihar

Cuts & wounds
Apply the leaf paste topically
- Arun Ghosh, Bankura, West Bengal

Pain
Apply the leaf paste topically
- Priyanka Pramanik, Purulia, West Bengal

Jaundice
Take the leaf juice along with black pepper orally
- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Kidney stone
Grind the leaves of the plant with a piece of turmeric and extract the juice. Add some jaggery and take the preparation for ten days.
- Dimbeswar Gogoi, Sibasagar, Assam

Take the leaf juice orally once a day for 25-30 days.
- Guna Ram Khanikar, Golaghat, Assam

Take the leaf juice for 10-15 days
- Sukkhi Devi, Udham Singh Nagar, Uttarakhand

Uses in Classical Codified Literature

Plant paste is applied on forehead to alleviate headache[36]; leaf paste is applied externally to cure cuts and wounds[37]; fresh sap of plant is used for eye diseases[38]. Product 'Regenerating Day Cream'[39], a multiherbal medicine enhances skin's tone and elasticity, helps to smooth wrinkles and fine lines. Five patents were found on the medicinal applications of *Kalanchoe* mainly as an antiobesity[40] medication.

Uses of *Leucas aspera* Spr. (Goisi)

NIF Database

Use from Orissa

Stomachache
Take the leaf decoction orally
- Kuni Naik, Dhenkanal, Orissa

Uses from other states

Migraine
Put two drops of the juice extracted from freshly plucked leaves in the nose
- Ramji Chink Badaik, Gumla, Jharkhand

Eczema
Mix plant ash and coconut oil to make a paste. Apply the paste on the infected body part
- Gokul Singh, East Champaran, Bihar

Jaundice
Extract the juice of leaves and mix in it a little quantity of goat's urine. Take this mixture twice a day for 4 days
- Shalini Shrivastava, Balia, Uttar Pradesh

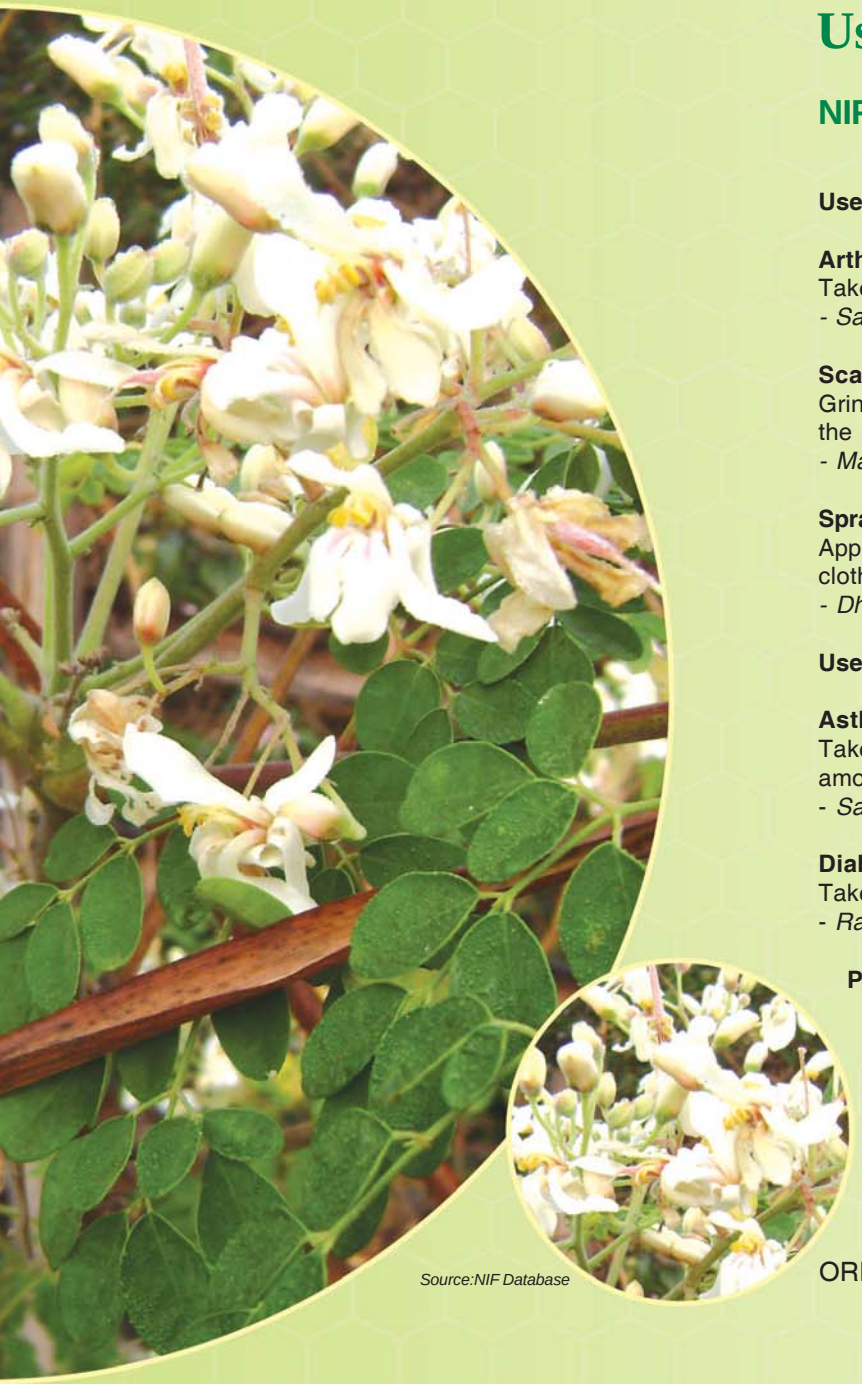
Stomachache
Take curry made from the plant
- Usha Rani, Darbhanga, Bihar

Sinus
Put few drops of leaf juice in the nose.
- Onom T. Doming, East Siang, Arunachal Pradesh

Uses in Classical Codified Literature

Dried plant powder is applied in case of scabies[41]; the plant is used as an anthelmintic[42]; a handful of flowers (5g) roasted in ghee is given once a day to cure cough[43]. 'Herbal Steam Bath'[44] is used to clean dirt and bad odour in the body, stop burning sensation in eyes, prevent watery eyes, headache, nausea, migraine etc. 'Herbex Cough Syrup'[45] is very effective for all kinds of cough and cold, asthma, bronchitis, wheezing cold and upper respiratory tract infections.

Source: NIF Database



Source:NIF Database

Uses of *Moringa oleifera* Lam. (Sajana)

NIF Database

Uses from Orissa

Arthritis
Take the stem decoction orally
- *Sanatan Mahanta, Keonjhar, Orissa*

Scabies
Grind the bark (100g) in cow's urine (100ml). Apply the paste topically
- *Maheshwar Swain, Jagatsinghpur, Orissa*

Sprain
Apply the leaf paste topically and cover with a wet cloth
- *Dhanmantari, Sundargarh, Orissa*

Uses from other states

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

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

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*

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

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*

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

Uses in Classical Codified Literature

Juice of bark is given orally along with a pinch of asafetida and salt[46]; dried fruit is eaten to combat diabetes[47]; powder of the plant is administered orally to cure asthma[48].

Product 'Sugan Nutrimix'[49] 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'[4] is a herbal oil, which provides relief from neuromuscular pain. Twelve patents have been found on its medicinal uses such as for anticancer[50] and antidiabetic[51] properties.

Uses of *Phyllanthus emblica* L. (Amlaki)

NIF Database

Use from Orissa

Pimples
Apply the leaf paste topically
- *Ratnaprabha Barik, Kendrapada, Orissa*

Uses from other states

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

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

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

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

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

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

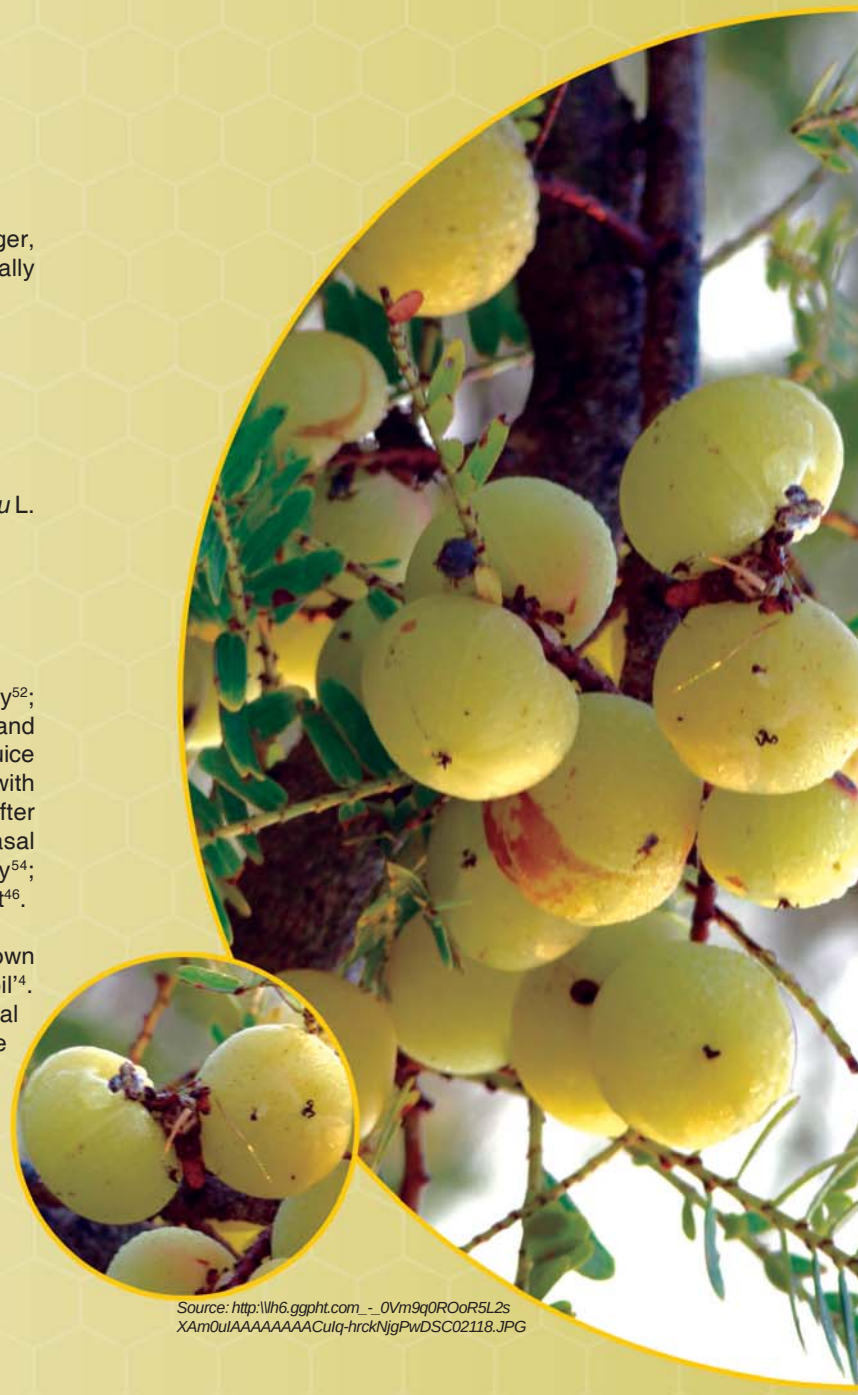
Wounds
Apply the pounded leaves topically
- *Sevaram Bhaskar, Dhamtari, Chhattisgarh*

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

Uses in Classical Codified Literature

Bark and fruits are used in diarrhoea and dysentery[52]; fresh juice of the fruit, mixed with pure cow's butter and honey, is administered to cure obstinate hiccough[52]; juice relieves pain in urine trouble[52]; pulp (2-3g) is eaten with warm milk to get rid of headache[53]; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding[2]; fruits are taken orally to reduce acidity[54]; decoction of the fruit is taken to increase blood count[46].

Phyllanthus is one of the main ingredients of well known medicines 'Triphala, Chavanprash and Amla hair oil'[4]. Seventy six patents have been found on its medicinal uses such as for diabetes[55], liver disorders and immune deficiencies[56].



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

Uses of *Plumbago zeylanica* L. (Dalachit)

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

NIF Database

Use from Orissa

Scabies
Apply the paste of leaves and bark, after adding a spoonful of turmeric, over the infected part
- *Pratap Chandra Pradhan, Laxmipur, Orissa*

Uses from other states

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

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

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

Uses in Classical & Codified Literature

The paste of the whole plant is applied externally on any kind of skin diseases[57]; extract of leaves and root is administered orally to alleviate arthritic pain[58]; and the plant acts as a good digestive[59]. Product 'Muscle & Joint Rub'[4] is highly effective for backaches, muscular sprains and joint pains. 'Citrakadi gutika'[60] is used to cure diarrhoea associated with abdominal pain and chronic colitis. Four patents have been found on its medicinal uses mainly for skin diseases[61] and gastrointestinal disorders[62].

Uses of *Shorea robusta* Gaertn. f. (Sal)

NIF Database

Use from Orissa

Lumbago
Soak parboiled rice (100g) in water overnight. Make a paste, spread it on a sal leaf and burn the leaf. Take a spoonful of ash along with water on an empty stomach
- Mukta Naik, Keonjhar, Orissa

Uses from other states

Skin disease
Apply the bark powder over the affected part
- Sneha Suman, Hazaribag, Jharkhand

Burn
Apply the dried bark powder topically
- Sneha Suman, Hazaribag, Jharkhand

Wound
Grind gum (50g) and cook in cow's ghee (250g). Apply the mixture topically
- Satyanarayan Sain, Sikar, Rajasthan

Uses in Classical & Codified Literature

Bark juice is given orally to combat diarrhoea[63]; gum is externally applied to get relief from cuts and wounds[64]; and the plant acts as an antipyretic agent[30]. Product 'Foot Care Cream'[4] is useful for elimination of cracks in the skin of the heels. 'Drops for Gum'[65], made from *Sal* along with other herbs, acts as an oral antiseptic and astringent. Fourteen patents have been found on its various uses mainly for the treatment of asthma and hypertension[66].

Source: http://flora.huh.harvard.edu/FloraData/110/TaxonImage/Dipterocarpaceae/Shorea%20robusta.jpg

Uses of *Solanum xanthocarpum* Schrad. & Wendl. (Bheji Baigana)

Source:SRISTI Database

NIF Database

Use from Orissa

Dysentery
Burn the fruit wrapped in a castor leaf. Collect the roasted seeds and take orally with a pinch of cow ghee
- Sabita Panda, Dhenkanal, Orissa

Uses from other states

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

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

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

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

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

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

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

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

Uses in Classical & Codified Literature

Extract of dried flowers is administered orally to cure fever[3]; extract of fruit and seed is taken orally to combat cold[67]; the plant acts as a gastric stimulant[3]. Product 'Diakof'[4] and 'Koflet'[4] made from *Solanum* is beneficial for both dry and productive cough. Five patents have been found on its various medicinal uses such as bronchial asthma[68] and cancer[69] etc.

Uses of *Vitex negundo* L. (Begunia)

NIF Database

Use from Orissa

Oral care
Chew the fresh leaves
- Raktanjaya Nayak, Balasore, Orissa

Uses from other states

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

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

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

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

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

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

Veterinary practice

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

Uses in Classical Codified Literature

Smoke of the leaves is inhaled to get rid of cough[2]; in case of diarrhoea flowers are used[40]; extract of the plant is taken as a diuretic[2]. 'Muscle & joint rub'[4] is a highly effective medicine for backache, muscular sprain and joint pain. 'Dental Cream'[4] is specially formulated toothpaste that tightens and reduces swelling of gums, stops gum bleeding, prevents toothache, decay and controls bad breath. 'Atharva Nirgundi Siddha Tail'[71] is useful in arthritis, joint pain, relieves oedema. Thirty-five patents have been found on its medicinal applications like for rheumatic arthritis[72].

Source: SRISTI Database

Uses of *Ziziphus mauritiana* Lamk. (Barakoli)

Source: SRISTI database

NIF Database

Uses from Orissa

Acne
Apply the leaf paste topically
- *Ajay Kumar Jena, Balasore, Orissa*

Indigestion
Take the root juice orally
- *Madhusudan Menda, Keonjhar, Orissa*

Uses from other states

Indigestion
Mix the fruit pulp of *Ziziphus* with one year old vinegar and add some black salt to it. Take the formulation for fifteen days on an empty stomach
- *Jivan Nath Bichchunath, Udham Singh Nagar, Uttarakhand*

Hair care
Boil the fresh leaves (100-150g) in one litre of water. Wash the hair with cooled decoction.
- *Baba Anantanand, Hissar, Haryana*

Acne
Apply the leaf paste topically
-*Ajay Kumar Jena, Balasore, Orissa*

Indigestion
Take one spoonful of the root paste orally
- *Madhusuda Munda, Keonjhar, Orissa*

Rheumatism
Apply the leaf and root paste (along with the roots of *Cassia auriculata* L.) on the aching part
- *Jivanbhai Bhanjibhai Jagarana, Bhabnagar, Gujarat*

Veterinary practice

Lactagouge
Feed the cattle with dry leaf powder mixed in fodder
- *Baba Anantanand, Hissar, Haryana*

Uses in Classical Codified Literature

Pounded leaves are applied on boils[73]; powdered leaves are taken to reduce blood sugar[2]; decoction of the plant is administered orally as a diuretic[74]; and powder of dried fruit is given orally with water to cure diarrhoea[75].

'Dhanwantharam oil'[76] is prepared from *Ziziphus* along with other plants used for rejuvenating body and skin care. More than ten patents have been found on its medicinal applications mainly for treating cancer and tumorous growth[77].

Promotion of knowledge based enterprises and lateral markets

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

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

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

Herbal Formulations for Healthy Crops~

SRISTI SHASTRA

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

It flourishes the growth of the plant by increasing flowering as well as fruiting. Besides overall vegetative growth, it is not harmful to nature and human beings. It also controls sucking pests like white fly, heliothis, aphid etc.

SRISTI KRUSHAK

Popatbhai Rupabhai Jambucha, Gujarat

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

SRISTI SURAKSHA

Community Knowledge, Gujarat

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

SRISTI PRAYAS

Community Knowledge, Gujarat

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

SRISTI SHAKTI

Community Knowledge, Gujarat

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

Herbal Formulations for Livestocks and Poultry~

Coccicure

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

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

Poultmax

Community knowledge, Valsad, Dang, Gujarat

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

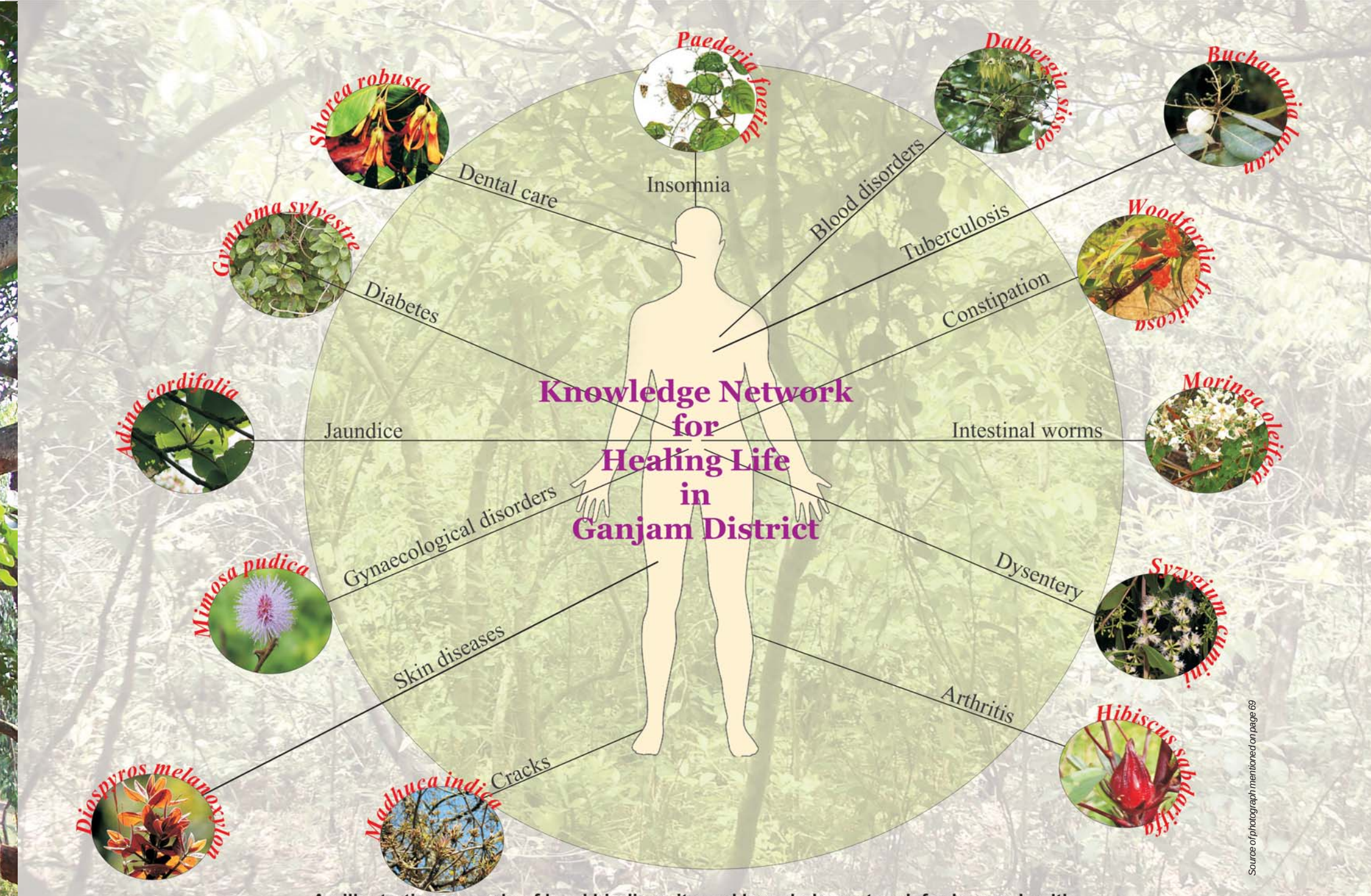
Mastiherb

Ukhardiyabhai S. Raot, Dang, Gujarat

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

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


Extending its arms,
exploring the time,
when will creativity at
grassroots
reach its prime



An illustrative example of local biodiversity and knowledge network for human health
(All the species are found in Ganjam district)

Source of photograph mentioned on page 69


Glimpses of 17th Shodhyatra

PART III

INNOVATIONS
for ORISSA

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

01

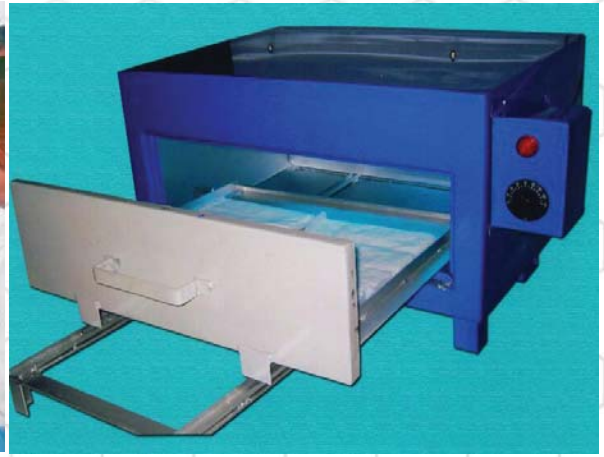
A Muruganandam
Tamil Nadu

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 to Rs. 1.50 per pad approximately.

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



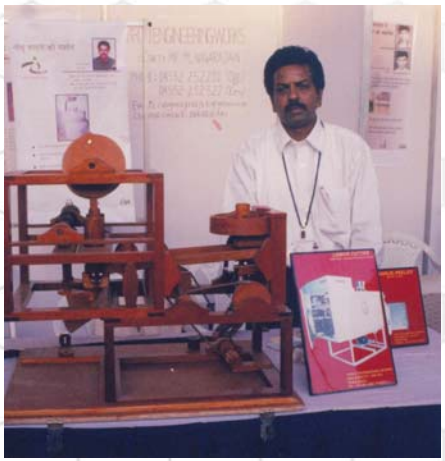
02

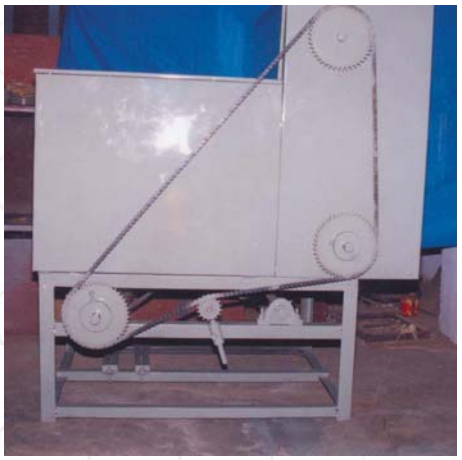
Garlic peeling and lemon cutting machine

M Nagarajan
Tamil Nadu

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

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





03

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 reduces drudgery in the process.

The machine has simple controls and can be easily operated by women as well. The creation of suction and low vacuum makes it suitable for other applications also. NIF has been giving marketing support to the innovator. As a result, this machine has also been sold to customers in Phillipines, Uganda and Ethiopia apart from India.

04

Maruti jhoola- the health care chair

Sakrabhai Prajapati
Gujarat

Modern life with its fast pace and sedentary lifestyle has created the need for solutions incorporating relaxation and invigoration. Maruti Jhoola is a unique health chair with multiple capabilities, functions and settings for various postures and seating dynamics.

It is ergonomically designed and serves the purpose of seating as well as exercising, with a capacity to accommodate a person weighing 120 kgs. It can double up as a hammock or a jhoola. The health chair has established itself as useful for people suffering from arthritis and joint ailments. To facilitate marketing an entrepreneur has been engaged. Earlier, lot of cost was spent on packaging and transportation of the chair. It is now being redesigned and the cost may come down.

05

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.

The Innovation has been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.

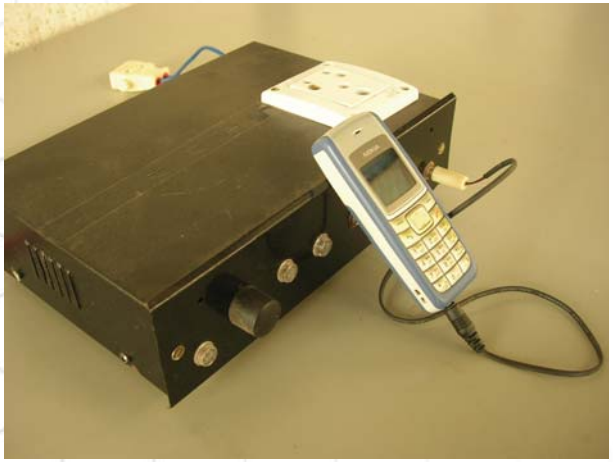
06

Mobile operated switch and multi-media poster

Prem Singh Saini
Haryana

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

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



07

Arvindbhai Patel
Gujarat

Auto air kick pump

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

This device uses the engine as the compressor for pumping air into the tube. A pinch of polymer granules is also inserted in the tube to seal the leakage in the tube.

Arvindbhai won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF, apart from filing a patent in his name, facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs. The technology is available for licensing to enterpreneurs in different states.

08

Power generation through sewage

K Balakrishna
Karnataka

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 drum rotate it and and generate 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. NIF 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.

09

Madanlal Kumawat
Rajasthan

Improved multicrop thresher

Farmers across India require a reliable machine that achieves threshing with minimal grain breakage, clean output for a variety of crops. The innovator has developed a versatile thresher that can meet these needs.

The modified thresher 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.

The innovator has been provided working capital for his enterprise from the Micro Venture Innovation Fund of NIF. More than a hundred farmers have bought his thresher.

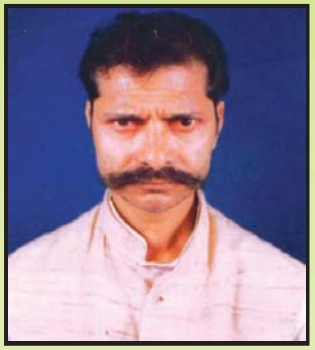
10

Trench digging machine

Radhey Shyam Tailor
Nathulal Jangid
Yusuf Khan
Rajasthan

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

The trench digging unit developed by the innovators can be fitted to any tractor. The modified unit has a hydraulic lever to adjust digging depth and to maneuver the running unit, a planetary gear system and motion converter unit to achieve speed reduction and deliver power from the tractor. The compact machine can dig narrow and deep channels evenly, on hard and soft soil conditions. In one hour, it can dig 65 meters long, 5 feet deep and 14 inches wide pit, 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.



Prakash S Raghuvanshi
Uttar Pradesh

Kudrat 9- An improved variety of wheat

The innovator believes that every farmer should get good quality seeds to deliver high yielding varieties of crops. He has developed a number of improved wheat, paddy, mustard and pigeon pea varieties, which are high yielding, 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, Chattisgarh, 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.

12

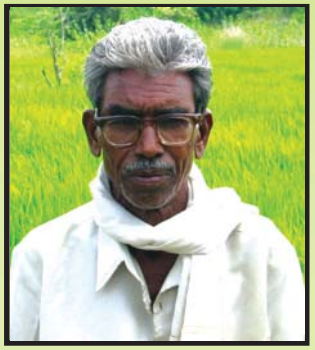
Bullet Santi-motocycle based multipurpose plough

Mansukhbhai Jagani
Gujarat

Like other drought prone regions, Amreli region, from where the innovator belongs, has severe labor shortage, few farm animals or mechanized implements to conduct farming operations. To address this need, the innovator designed a unique unit: the 'Bullet Santi".

Using the chassis, drive and power of an Enfield Bullet motorcycle, the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. This helps in plouging, weeding and sowing seeds. Being a unique local solution, the machine has proved to be cost effective and fuel efficient. Bullet Santi can plough an acre of land in half an hour consuming only two litres of fuel. Innovator 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'.

13



Dadaji Ramaji Khobragade
Maharashtra

HMT: An improved paddy variety

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

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

14

Herbal growth promoter

Ishwar Singh Kundu
Haryana

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

The main ingredients of the product are "*aak*" (*Calotropis gigantea*), "*reetha*" (*Sapindus trifoliatus*), "*dhatura*" (*Datura metel*), "*neem*" (*Azadirachta indica*), Tobacco (*Nicotiana tabacum*), and "*bhang*" (*Cannabis sativa*), etc.

The innovator won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. He has also 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 for use in the gardens in the Rashtrapati Bhavan with encouraging results.

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