



National Innovation Foundation

Arunachal Pradesh Innovates



Honey Bee Network

ARUNACHAL PRADESH INNOVATES



National Innovation Foundation

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PREFACE

National Innovation Foundation 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 507 district across India.

Thanks to the support of volunteers of 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, innovations and traditional knowledge from Arunachal Pradesh. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover so many examples of the ability of local communities and individuals to solve problems on their

own without outside help, how much more can be done if state and private sector agencies join hands with NIF actively.

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

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

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point.

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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 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 each 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.



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Building a Bridge with Grassroots Innovators in Informal Sector

To make the Indian development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by common people at village or semi-urban level. Many of these experiments lead to development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often be to solve his 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, NIF (National Innovation Foundation) was set up in 2000 with the help of Department of

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

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

in different sectors. The network acknowledges the innovators, traditional knowledge producers and communicators so that they do not remain anonymous.

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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.

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

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 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

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 from over 507 districts of the country.

NIF has filed 182 patents in India and seven in US and one PCT application. Out of these, 33 patents have been granted to grassroots innovations in India and four in US. NIF has funded 113 projects under MVIF to the extent of Rs.1.3 crores.

Hundreds of technologies have diffused through farmer to farmer social network.

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

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

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

How can state government join hands with NIF?

- a. NIF has no field extension unit nor does it want to have one. However, state government has several field functionaries in the field 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

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- 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 of the school children.
- d. Demonstrations and trials can be organized at various regional research stations, 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 a 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 Government of Arunachal Pradesh state. Tremendously rich knowledge of biodiversity, minerals and environment can be leveraged through the proposed association. We need to discover far more innovations and traditional knowledge from Arunachal Pradesh where our record so far is not very good.



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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 from ARUNACHAL PRADESH

This section contains grassroots innovations
originating from ignited minds of Arunachal Pradesh



Liagi Baht
Lower Subansiri

Bamboo splitting machine

The innovator is an energetic motor vehicle mechanic who came up with his innovation for splitting and dressing bamboo to meet a local need. With this machine one can split bamboo lengthwise and also into small pieces. This machine has an additional feature to maneuver and shave them into finer strips as well. This machine can be a useful substitute of *dao* and other such tools used by people for splitting and dressing bamboo. It is easy to operate, efficient and economical in nature as its output is almost three times in comparison to manual labour.



Night playable shuttle cock

The game of badminton can be played in sufficient light, natural or otherwise. However, it becomes impossible to play the game at night in absence of electric lights. The innovator came out with an idea of fitting a light inside the skirt of shuttle cock to improve visibility and to make it possible to play at night.

Koj Taki
Nirjuli



**Joram Beda and
Annu Darin**
Papum pare

Water shower smoke filter and generator

The innovators have designed a filter for removing suspended particle matter (SPM) especially from the smoke out of factory chimney. The innovative air filter removes up to 60 -70 % of all the unburned smoke particles and pollutant gases from the chimney smoke. The device comprises smoke chamber, water tank, induction coil and water pump. As the positively charged dust particles (fly ash) comes up, these collide with the pre-induced negatively charged water particles and help in getting the fly ash to settle down. It is based on the same principle as rain drops which effectively remove suspended dust particles from the air.

The innovators have also conceptualized the idea of trapping potential energy of sewage water using a generator.

Use of banana skin as baking soda

The banana (*Chinichampa*) skin can be used as substitute for baking soda. It is first dried completely for about two weeks. After this, it is to be burned in a vessel made from cast iron. The ash is then filtered with a cloth and extracted slowly for obtaining liquid baking soda. When dried on earthen *chulha*, it takes the form of pellets known as *Tapio* (solid baking powder).

Hage Dibi
Zero



Yanung Jamoh Lego
East Siang

Traditional herbal healer

Yanung Jamoh Lego (50) is an agricultural extension worker. For the past thirteen years, she has been actively engaged in studies of various herbal practices and is fully devoted towards the treatment of various human ailments. She lives with her husband, Gumin Lego, and four children. Her husband does not take much interest in her works though he helps in collection of herbs from the forest in times of need.

Her mother was a traditional healer and her father was a social worker, who worked for the preservation of the bio-resources of Adi community. Jamoh has passed on her herbal knowledge to around two dozen people. She contacts them and conducts meetings and informal teaching campaigns from time to time.

She is an expert in curing malaria, jaundice, gastritis, acidity (more than 2000 patients), appendicitis, piles (about 500 patients), asthma, cancer, rabies, kidney stones, asthma, bronchitis, pneumonia, cough, sinusitis and tonsillitis etc. Lego mentions that herbal treatment is tedious & hard but it reportedly gives permanent cure, provided the physician diagnoses the ailment correctly and gives the correct doses of medicine at the right time. She also says that the patient should be ready to comply with the healer's instructions with full faith. For her services, she was honoured with the SRISTI Samman 2007.

Siang nutri

'*Siang nutri*' is a herbal product developed from nineteen different plants, which include finger millet, fox tail millet, jobs tear, local paddy, sorghum and local maize, etc. Adi women use these ingredients in various socio-cultural occasions. Some of these herbs are also used in curing gynecological disorders in women. Women use these herbs in various forms like *sattu*, bread after steaming (called *eting*), traditional beverages, etc.

Around one week is required for making *Siang nutri*. A packet of *Siang nutri* of 300 gm is sold for Rs. 50. An adult person can take about two teaspoons with one glass of lukewarm water or cow's milk. For children one teaspoon in half a glass of water or cow's milk is sufficient. *Siang nutri* can be stored and used for up to six months at normal room temperature.

Adi women possessed the knowledge of the use of some of the ingredients in *Siang nutri* in another form and name. To promote it as *Siang nutri* initially 40 women came forward in 2005 and formed SHGs under the leadership of Mrs. Yanung Lego. Since its foundation, the SHGs have made commendable progress and till now a total of 28 *Adi* women self-help groups (SHG) are working in the state.



Bapi Tamuk
East Siang

Seeds of *belang* (*Artocarpus heterophyllus* Lam.)

Over a period of time, the *Adi* tribe has developed risk management strategies to combat scarcity of food or the epidemic caused by rats in rice crop.

As a precautionary practice, ripe fruits of wild belang (jackfruit) are collected and seeds separated. The seeds are dried near the kitchen fire and stored in bamboo baskets. At the time of famine, the seeds are roasted in fire and eaten. This wild fruit is most significant in *Adi* culture and is given special respect in festivities. The seeds of wild *belang* are considered as preeminent and used to make various solid and semi-solid ethnic dishes.



Source: <http://images.google.co.in/imgresimgurl=httpbp3.blogger.com>

Bamboo based ethnic foods

Apatani women of different villages of Ziro district prepare varieties of fermented food products viz. *Hikhu*, *Hiring* and *Hithyi* from indigenous bamboo shoots. It may be common among the various tribes all over the state.

Hikhu: The bamboo shoots are collected by women from the forest and properly washed before peeling. They are then cut into small pieces and transferred into the bamboo basket after putting the *ekkam* or banana leaves inside the basket. The basket is covered tightly with the banana leaves and left for around 6-8 days for fermentation. These fermented bamboo shoots are called *Hikhu*.

Hiring: After making small slices, the bamboo shoot pieces are kept in a bamboo cylinder, which is made airtight with the *ekkam* leaves. The cylinder is left for about one week for fermentation and then the bamboo shoots are ready to be used. The taste of fermented bamboo shoot made by this method is better than the previous method.

Hithyi: The sliced bamboo shoots are dried in sun and stored in bamboo baskets. This product is called *Hithyi*.



***Apatani* tribe**
Ziro

Tate Tatin
Tagum Rime
Along

Use of *onyor* seeds as insecticides

Tate Tatin and Tagum Rime are farmers from Along district. They believe in eco-friendly management of insects in agricultural crop field. Gundhi bug, grasshopper and other piercing type of insects infest paddy crop considerably. To combat this menace, they made herbal formulation with seeds of *Zanthoxylum* spp., which has proven to be effective in controlling these insects.

Use of *Ketsing* leaves as manure

Saaila Subba is a farmer from Tawang district who has propounded the practice of use of *Ketsing* leaves as manure. The fresh and decomposed leaves of *Ketsing* (*Quercus pachyphylla* Kurz.) are used as manure for agricultural field crops. Since ancient times, this particular plant has been used as local manure by all the *Monpa* tribe of Tawang district. They believe that the use of this organic manure not only eliminates the harmful effects of chemicals but also improves the economic products.

Saaila Subba
Tawang

Monpa tribal community
Tawang

Use of *Minangmose* for mulching

For the Monpa community *minangmose* (*Gymnocladus assamicus* Kanj. Ex P.C. Kanj) is a religious, culturally and medicinally important tree species to meet multifarious needs. The pods are used to cure swelling and wounds. The bark and leaves are used for preparing incense sticks, washing clothes etc

The Monpa people also use green and dry leaves of *minangmose* in preparing manure. Its use as manure not only provides the nutrients to the soil but also is reported to reduce attacks of insects and pests in the field.

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 *Abelmoschus esculentus* (L.) Moench. (Bhindi)

NIF Database

Use from Arunachal Pradesh

Urinary tract infection

Grind the roots into a fine paste. Take the paste orally on an empty stomach

- *A. Tayeng and Tonya Sirum, East Siang, Arunachal Pradesh*

Uses from other states

Hair care

Grind fresh leaves into a fine paste and apply it on the scalp, leave it for an hour for drying and then wash with cold water

- *Dhaneswar Pradhan, Angul, Orissa*

Wound

Grind the seeds into a fine paste and apply it on wounds.

- *Naresh Giri, Hamirpur, Himachal Pradesh*

Eczema

Crush 500 g of fruits to obtain gel. Apply the gel topically on the affected part

- *Vejabhai Lakhmanbhai, Junagadh, Gujarat*

Cough

Boil small pieces of fruits and inhale the steam

- *Dhrusht Dhaman Kumar, East Champaran, Bihar*

Stomachache

Take root paste with water

- *Sehara Bano, Gopalganj, Bihar*

Uses in Classical Codified Literature

Decoction of immature fruits is used as diuretic¹; seeds are considered as antispasmodic¹; poultice of leaves are used externally as emollient²; seeds are useful in treatment of gonorrhoea, urinary discharges, strangury, diarrhoea, blood disorders³ etc; juice of the roots is used externally in Nepal to treat cuts, wounds and boils⁴. Twelve patents have been found on its applications in preparing cosmetics⁵ and other medicinal purposes.



Source: http://www.worldcrops.org/images/content/Cuba_500_400.JPG

Uses of *Alstonia scholaris* (L.) Br. (Singger, Thomdom)

NIF Database

Use from Arunachal Pradesh

Cuts and wounds

Grind the leaves into a paste and apply topically over the affected area

- Jongam Ngemu, Papum Pare, Arunachal Pradesh

Uses from other states

Headache

Extract juice from the bark (20g) and take orally

- Prishila Tuddu, Hazaribag, Jharkhand

Wound

Apply the paste of bark and leaves topically on infectious wound

- Robert L. Hamte, Aizawl, Mizoram

Whooping cough

Extract one teaspoonful sap of the plant and mix it with 100ml cow's milk. Take it once a day for three days.

- Mahendra Nath Dutta, Jorhat, Assam

Asthma

Take the decoction of bark orally

- Robert L. Hamte, Aizawl, Mizoram

Gastric complaint

Grind few leaves with black pepper and take orally before food

- Indra Kanta Ojha, Sibsagar, Assam

Stomachache

Take the juice extracted from bark (20g) orally

- Prishila Tuddu, Hazaribag, Jharkhand

Fever

Take powdered bark (50g) with water thrice a day

- Kutuva Birhorni, Koderma, Jharkhand

Uses in Classical Codified Literature

The bark is used against skin diseases and rheumatism⁶; root juice is taken with milk to cure leprosy⁶; fresh bark is put in water to draw out the latex in it, which is taken orally in case of tuberculosis⁷; dried powder is administered orally to cure diarrhoea⁸; bark extract is useful on intestinal worms⁹. 'Ayush-64 cap./tab.'¹⁰, prepared from this plant is effective both for prophylaxis and treatment of malaria. Fifteen patents were found on its medicinal applications as an antipyretic¹¹.



Source: http://www.mythofleurs.com/images/Fleurs_du_Vietnam/Alstonia_scholaris.jpg

Uses of *Carica papaya* L. (Omir)

NIF Database

Uses from Arunachal Pradesh

Cuts and wounds

Grind the leaves into a paste and apply topically over the affected area

- Jongam Ngemu, Papum Pare, Arunachal Pradesh

Jaundice

Take the decoction of the roots thrice a day along with some other herbs

- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Uses from other states

Toothache

Keep cotton dipped in the latex of the stem on the aching tooth

- Mangeram Jani, Hissar, Haryana

Intestinal worms

Take fresh latex mixed with honey orally

- Prabhat Kumar Pandey, East Champaran, Bihar

Ringworm

Apply the milky latex on the affected area

- Mukesh Kumar, East Champaran, Bihar

Jaundice

Eat the curry of tender fruit

- Sharda Devi Gangwal, Jaipur, Rajasthan

Kidney stone

Take the root juice orally

- Sandhya Suman, Sitamarhi, Bihar

Hydrocele

Make a paste of latex and tender fruit. Give one teaspoon thrice a day till the ailment 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 cardi tonic¹²; bark powder is applied externally on wounds¹³; decoction of the bark is given orally to get rid of intestinal worms¹⁴; beverage of the fruit is taken orally to cure diarrhoea¹⁵. Natural moisturizers and creams¹⁶ are prepared from *Carica* in combination with other plants. Thirty patents were found on its medicinal uses as an antiallergic¹⁷ and for prevention of cancer¹⁸.



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

Uses of *Centella asiatica* (L.) Urban (Kiling kiro)

NIF Database

Use from Arunachal Pradesh

Malaria

Take the decoction of the plant along with some other herbs thrice a day

- *Smit Yanueg Jamoh Lego, East Siang, Arunachal Pradesh*

Uses from other states

Toothache

Make a paste of *Kiling kiro* leaves, garlic cloves and banana roots. Apply topically and leave for one hour.

- *Anil Gogoi, Sibasagar, Assam*

Sinusitis

Grind leaves (10g) along with one black pepper and extract the juice. Put three drops into nostrils. Continue the treatment for three days

- *Batchu Murmur, Kokrajhar, Assam*

Dysentery

Grind leaves (10) of *Kiling kiro* and guava together to make a paste. Take this paste twice a day for ten days. In case of chronic dysentery, continue the treatment for 90 days

- *Guna Ram Khanikar, Golaghat, Assam*

Make a paste of leaves along with black pepper and take it orally

- *Dipali Borah, Sibasagar, Assam*

Memory enhancer

Take leaf juice orally

- *Savitri Devi, Kangra, Himachal Pradesh*

Skin diseases

Apply leaf paste topically over the affected part

- *Savitri Devi, Kangra, Himachal Pradesh*

Diarrhoea

Take two spoonful of whole plant juice with a pinch of salt orally twice a day for a week

- *Sapam Deben, Bishnupur, Manipur*

Jaundice

Take whole plant's juice orally

- *Vifiya Oraon, Lohardaga, Jharkhand*

Herbal tea for immunity

Add some leaves while preparing tea. It helps to enhance immunity

- *Jasmit Singh, Hamirpur, Himachal Pradesh*

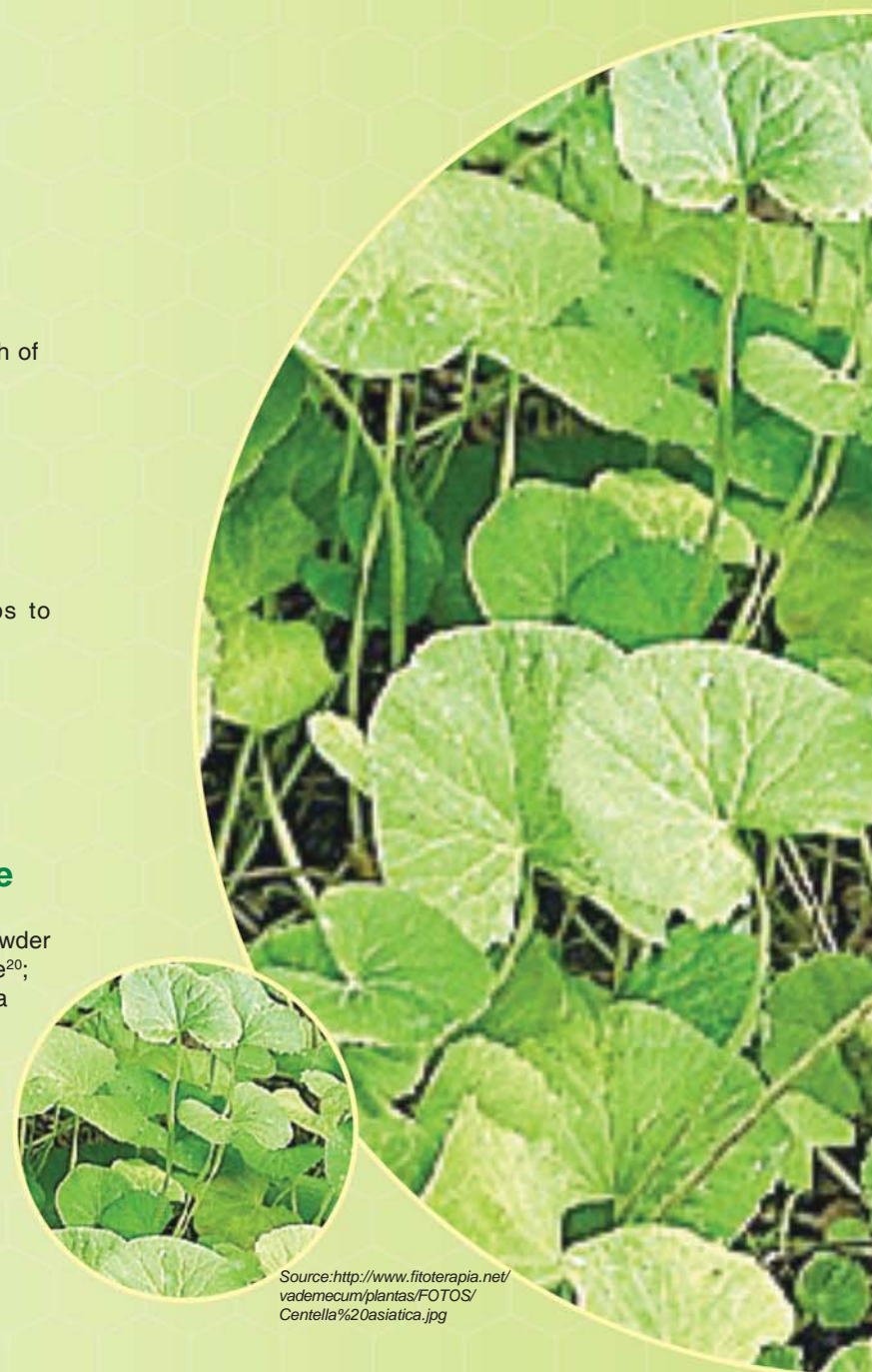
Insomnia

Include whole plant's paste in daily diet

- *Khioram Barman, Borpeta, Assam*

Uses in Classical Codified Literature

Fresh juice of aerial part is used as brain tonic¹⁹; powder of aerial parts helps to control high blood pressure²⁰; whole plant is diuretic²; plant paste is applied as a poultice in case of bone fracture². 'Herbal Tea'²¹ is mainly indicated as a health drink. 'Mentat'²² improves mental functions, mental quotient, memory span, and concentration ability and stress threshold. More than three hundred patents were found on its medicinal applications as an anti-depressant²³.



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

Uses of *Ficus benghalensis* L. (Shirof)

NIF Database

Use from Arunachal Pradesh

Wound

Apply bark power topically on wounds

- Ongkom Payang, Upper Siang, Arunachal Pradesh

Uses from other states

Whooping cough

Take a spoonful of bark paste orally

- Priyanka Kumari, West Champaran, Bihar

Fever

Take decoction of bark orally along with a little salt

- Sohanlal Chhipa, Jhalor, Rajasthan

Stomachache

Tie warmed leaves on the stomach to get relief from pain

- Gajanand Maharaj, Jaipur, Rajasthan

Backache

Massage the latex mixed with mustard oil on the aching part

- Chen Singh Charan, Nagor, Rajasthan

Wound

Mix leaf ash and coconut oil to make a paste. Apply the paste topically

- Priyanka Pramanik, Purulia, West Bengal

Sprain

Smear lukewarm paste of the bark on the site of the sprain

- Arun Ghosh, Bankura, West Bengal

Heel crack

Apply the latex topically

- Priyanka Pramanik, Purulia, West Bengal

Uses in Classical Codified Literature

Aerial roots' paste is mixed with salt after filtering and taken once a day²⁴ for diabetics; decoction of plant is applied externally on wounds and ulcers²⁵; latex is given orally to cure bronchitis²⁶. 'Anti-Dandruff shampoo'²², a product prepared from this plant in combination with other plants, is used to keep hair healthy and dandruff free. Product 'KLD Lotion'²⁷, a multiherbal ayurvedic preparation using *Ficus*, is effective in many skin ailments such as acne marks, pimples, burns, sunburns, nappy rash etc. 'Litina'²⁸, a herbal toothpaste made from this plant along with other plants, is good for the gums and the teeth. Four patents were found on medicinal applications of *Ficus* for antitumor²⁹ medication, wound healing³⁰ etc.

Uses of *Kalanchoe pinnata* (Lam.) Pers. (Nebi nelam)

NIF Database

Use from Arunachal Pradesh

Injury

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

Uses from other states

Eye pain

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

Stomach disorder

Take two spoonful of the leaf juice orally
- Susanta Kumar Manjhi, Birbhum, West Bengal

Diarrhoea

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

Cuts & wounds

Apply leaf paste topically
- Arun Ghosh, Bankura, West Bengal

Pain

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

Jaundice

Take the juice of leaves and black pepper orally
- Arunkumar Pandey, Fatehpur, Uttar Pradesh

Fever

Take the juice of leaves and black pepper orally
- Arunkumar 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, Sivasagar, Assam

Take leaf juice orally once a day for 25-30 days.

- Guna Ram Khanikar, Golaghat, Assam

Uses in Classical Codified Literature

Plant paste is applied on forehead to alleviate headache³¹; leaf paste is applied externally to cure cuts and wounds³²; fresh sap of plant is used for eye diseases³³. Product 'Regenerating Day Cream'³⁴ 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 antiobesity³⁵ medication.



Source: NIF database

Uses of *Leucas aspera* Spr. (Eki pettu)

NIF Database

Use from Arunachal Pradesh

Sinus

Put few drops of leaf juice in the nose.

- *Onom T. Doming, East Siang, Arunachal Pradesh*

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*

Uses in Classical Codified Literature

Dried plant powder is applied in case of scabies³⁶; the plant is used as an anthelmintic³⁷; a handful flower (5g) roasted in ghee is given once a day to cure cough³⁸. 'Herbal Steam Bath'³⁹ 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'²¹ is very effective for all kinds of cough and cold, asthma, bronchitis, wheezing cold and upper respiratory tract infections.



Source: AWCCDS, Bihar

Uses of *Nyctanthes arbor-tristis* L. (Hewali)

NIF Database

Use from Arunachal Pradesh

Malaria

Take the leaf paste on an empty stomach
- Tonya Sirum, East Siang, Arunachal Pradesh

Uses from other states

Hair fall

Apply seed paste on the scalp
- Rani B. Bhagat, Pune, Maharashtra

Cough

Take the warm juice of tender leaves with a little salt at night for three to four days
- Mahendra Nath Dutta, Jorhat, Assam

Fever

Take the decoction of the leaves orally
- R.K. Bheirosana Singh, Bishnupur, Manipur

Take the juice of leaves (6-7) and a ginger thrice a day
- Rani B. Bhagat, Pune, Maharashtra

Wound

Apply leaf paste topically for relief
- Ranjeet Kumar, Sheohar, Bihar

Pain

Apply fresh leaf paste on the fractured part to alleviate pain
- Ramsharan Dhruv, Dhamtari, Chhattisgarh

Intestinal worms

Take flower juice with a pinch of salt orally for two days
- Manoj Kalita, Kamrup, Assam

Diabetes

Take decoction of the leaves orally for 40 days
- Shama Pravin, Gopalganj, Bihar

Uses in Classical Codified Literature

Dried fruits are taken orally to get relief from cough⁴⁰; decoction of dried flower is given with jaggery as an anti-fertility agent in females⁴¹; leaf juice is applied externally on ringworm and other skin diseases⁴¹. 'Lupin'⁴² is a medicine used for pain and inflammation associated with musculoskeletal and joint disorders. Six patents were found on its medicinal uses for treating Leishmaniasis⁴³ and also for its natural property as a dye⁴⁴.



Uses of *Phyllanthus emblica* L. (Amla)

NIF Database

Use from Arunachal Pradesh

Acidity

Grind the fruit with other herbs and take to treat acidity
- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Uses from other states

Eye irritation

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

Cough/cold

Mix the fruit powder and *Glycyrrhiza glabra* L. (10g). Take five gram of the mixture orally with water
- Ved Prakash, Faridabad, Haryana

Jaundice

Grind equal amounts of amla fruit, ginger, black pepper and turmeric into a fine powder. Take one tea-spoonful of this powder with honey
- Nagarmal Bagaria, Nagor, Rajasthan

Wounds

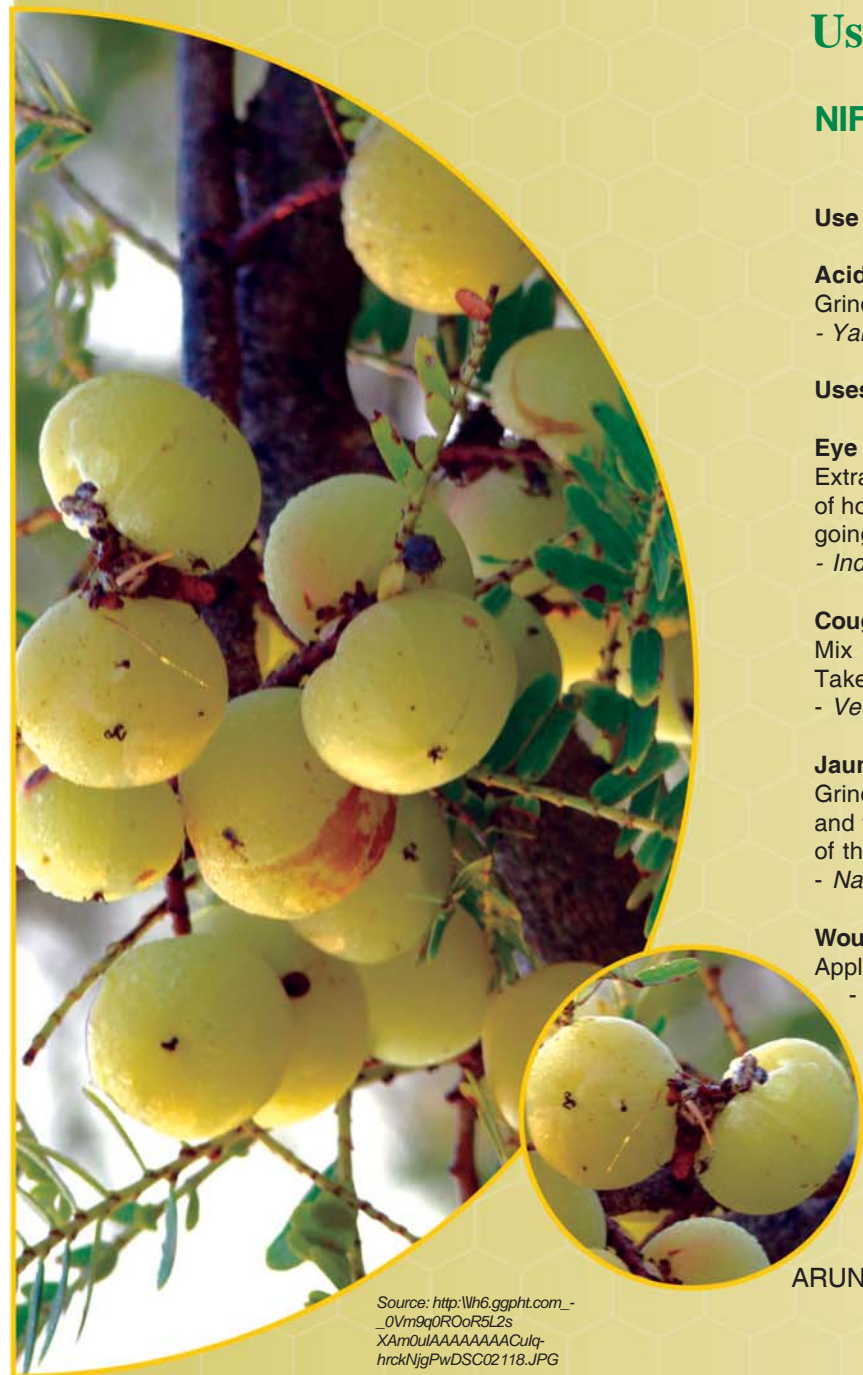
Apply leaf paste topically on wounds
- Sevaram Bhaskar, Dhamtari, Chhattisgarh

Diarrhoea

Take mixture of juice of amla and lemon (in equal proportion) orally
- Bina Chaudhry, Kamrup, Assam

Uses in Classical Codified Literature

Bark and fruits are used in diarrhoea and dysentery⁴⁵; fresh juice of the fruit, mixed with pure cow's butter and honey, is administered to cure obstinate hiccough⁴⁵; juice relieves pain in urine trouble⁴⁵; pulp (2-3g) is eaten with warm milk to get rid of headache⁴⁶; powder of seeds after mixing with ghee is applied on the head to stop nasal bleeding⁴⁷; fruits are taken orally to reduce acidity⁴⁸; decoction of the fruit is taken to increase blood count⁴⁹. *Phyllanthus* is one of the main ingredients of well known medicines 'Triphala, Chavanprash and Amla hair oil'²². Seventy-six patents were found on its medicinal uses for diabetes⁵⁰, liver disorders and immune deficiencies⁵¹.



Source: http://Wh6.ggpht.com/_0Vm9q0ROoR5L2s/XAm0uIAAAAAACulq-hrckNjgPwDSC02118.JPG

Uses of *Solanum nigrum* L. (Okomamang)

NIF Database

Use from Arunachal Pradesh

Malaria

Take the decoction of the plant along with some other herbs thrice a day

- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Uses from other states

Nasal bleeding

Boil dry fruit (25g) in mustard oil (100g) and filter. Apply the filtrate on the forehead

- Sahim Ansari, Lohardaga, Jharkhand

Mouth ulcer

Chew the leaves

- Shripal Singh, Bulandshahar, Uttar Pradesh

Cough

Take the root juice orally

- Priyanka Kumari, Gopalganj, Bihar

Fry the leaves of okomamang (200g) in mustard oil (20ml) and take it orally with a little salt

- Sukhai Mali, Faridabad, Haryana

Jaundice

Take the root juice orally

- Suman Kumari, Gopalganj, Bihar

Stomachache

Take the fried leaves of *Solanum*, neem and *Vitex negundo* L. orally twice a day

- Moirangthem Mani Devi, Imphal West, Manipur

Uses in Classical Codified Literature

Powdered fruit is given orally to reduce fever³¹; juice extracted from the whole plant is applied externally on the burnt part⁵²; poultice of the plant is placed on the aching joint⁵³; fruits are ground and taken orally to cure diarrhoea⁵⁴.

'Herbolax'²² made from *Solanum* along with other plants is used as gentle laxative in case of constipation and for electrolyte balance. Ninety patents were found on its medicinal uses mainly on hepatitis^{55,56}.



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

NIF Database

Use from Arunachal Pradesh

Typhoid

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

Uses from other states

Asthma

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

Diabetes

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

Rheumatism

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

Piles

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

Veterinary practice

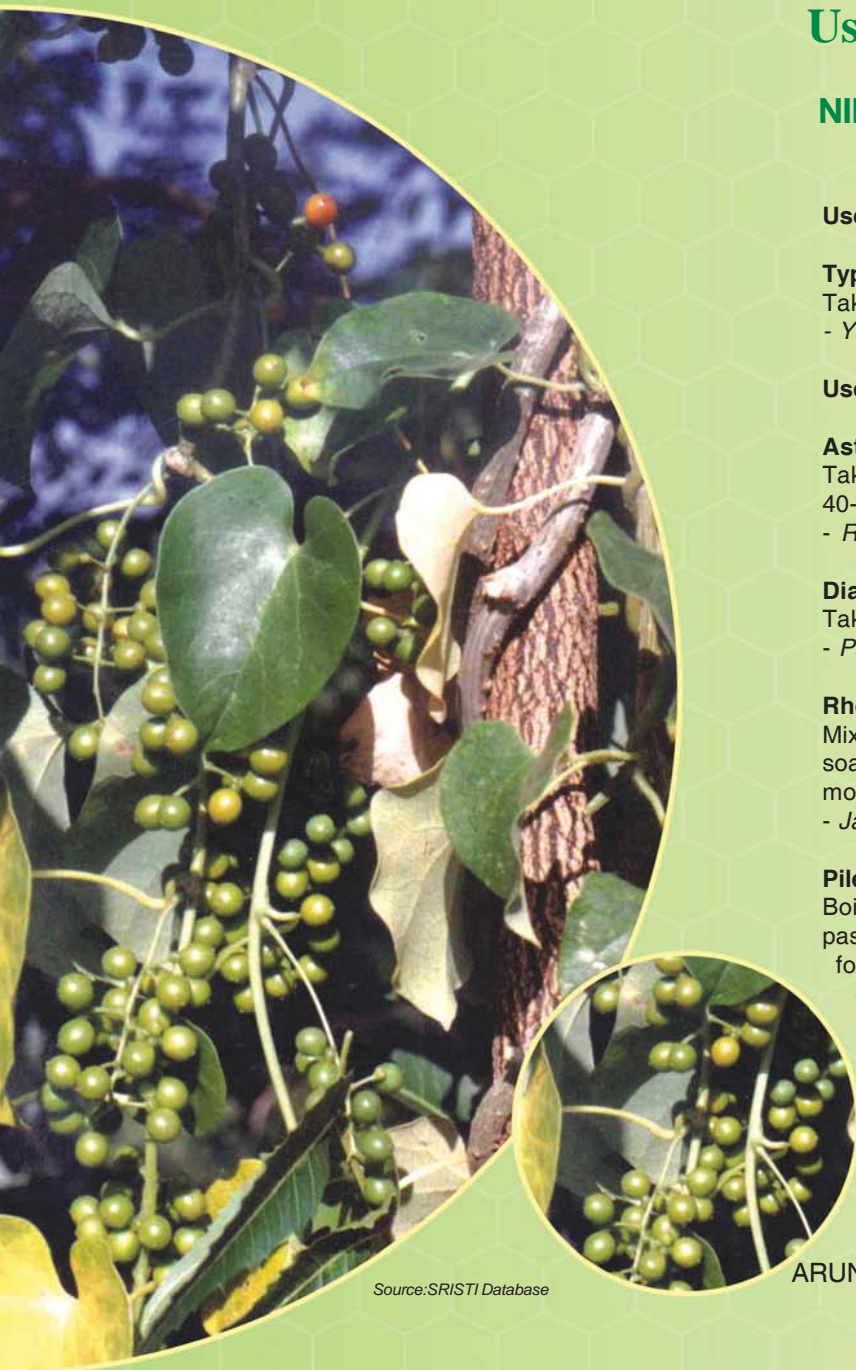
Anestrous

Grind the plant, along with the bark of *Cassia fistula* L. and leaves of *Artocarpus heterophyllus* Lam., and take orally
- Honnegowda, Bengaluru rural, Karnataka

Uses in Classical Codified Literature

Powdered roots are taken to cure mouth ulcer⁵⁷; powdered plant is administered orally with honey to get relief from stomach disorder⁵⁸; the stem is bitter and is used as anthelmintic²; decoction of the plant is given orally to cure diarrhoea⁵⁹.

Tinospora is a well known medicinal plant and used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon²²¹' etc. More than hundred patents were found on its medicinal applications as an antiallergic⁶⁰ and for cancer⁶¹ etc.



Source:SRISTI Database

Uses of *Vitex negundo* L. (Uttak)

NIF Database

Use from Arunachal Pradesh

Paralysis

Apply leaf powder along with other herbs topically
- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Uses from other states

Ear pain

Boil the leaves in mustard oil and filter. Use the filtrate as an ear drop
- Bhagat Ram, Kangra, Himachal Pradesh

Stomachache

Take the mixture of powders (in equal proportion) of the leaves of *Vitex*, *Cocculus hirsutus* (L.) Diels. and *Bombax ceiba* L.
- Yusuf Khan, East Champaran, Bihar

Muscular pain

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

Lumbago

Massage the leaf juice over the affected part
- Shreenand B. Dandekar & Meera Dandekar, Ratnagiri, Maharashtra

Rheumatism

Place lukewarm leaves on aching joints
- Naganath Durga Chogule, Sholapur, Maharashtra

Uses in Classical Codified Literature

Leaf smoke is inhaled to get rid of cough⁴⁷; in case of diarrhoea flowers are used²; extract of the plant is taken as a diuretic⁴⁷. 'Muscle & joint rub'²², is a highly effective medicine for backache, muscular sprain and joint pain. 'Dental Cream'²² 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'⁶² is useful in arthritis, joint pain, relieves oedema. Thirty-five patents were found on its medicinal applications mainly for rheumatic arthritis⁶³.



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. Gaudi & Jeevalbhai M. Gaudi, Dang, Gujarat

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

Poultmax

Community knowledge, Valsad, Dang, Gujarat

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

Mastiherb

Ukhardiyabhai S. Raot, Dang, Gujarat

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



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



PART III

INNOVATIONS for ARUNACHAL PRADESH

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





Karuna Kant Nath
Assam

Manual wood cutting

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.

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 bobin *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 during NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



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.

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.



02



Milonjyoti Das
Assam



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.



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.



Ghonakanta Gogoi
Assam





A. Muruganantham
Tamil Nadu

Sanitary napkin making machine: An option for women entrepreneurship

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

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

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



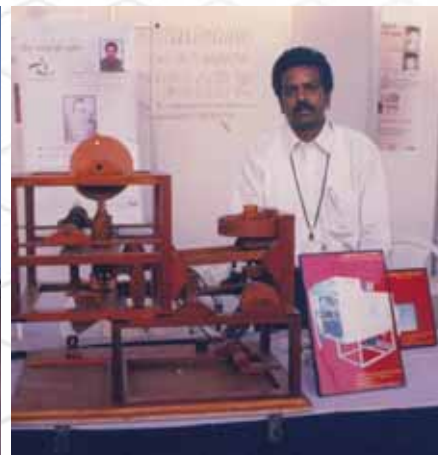
Garlic peeling and lemon cutting machine

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 MVIF and marketing effort of NIF.



M. Nagarajan
Tamil Nadu





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. The product 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.



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.



N Sakthimainthan
Tamil Nadu





Dharamveer
Haryana

Aloe vera gel extractor

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

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



Mobile operated switch and multi-media poster

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.



Prem Singh Saini
Haryana





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!



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 drum rotate it 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.



K. Balakrishna
Karnataka





**Sheikh Jahangir Sheikh
Usman**
Maharashtra

Two-wheeler based spray painting device

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



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.

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.



Mohammad Saidullah
Bihar





Imli Toshi Namu
Nagaland

Hydro generator using bamboo composite

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

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



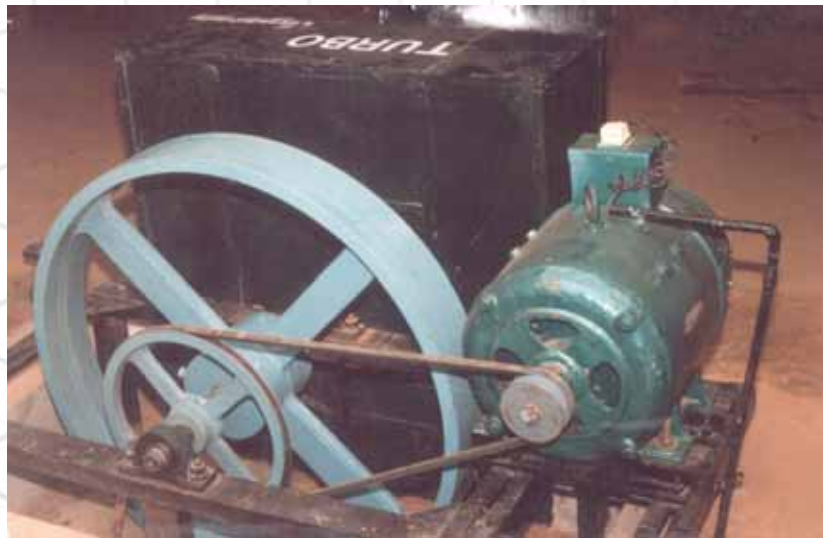
Modified hydro electricity turbine

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

Hydro electric turbine is specifically designed for the hills. 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 Karnataka.



G. K. Ratnakar
Karnataka





Dilip Bhagabati
Assam

Monkey trap

Sometimes monkeys destroy the crops, kitchen garden and even the grocery of kitchen. To get rid of this, the innovator has developed a trap. The naughty monkey can be trapped and released in the dense forest.



Biomass gasification system

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

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

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



Rai Singh Dahiya
Rajasthan





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

NIF had facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs.



Handpump with a change

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.

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



Ramashankar Sharma
Bihar





Ishwar Singh Kundu
Haryana

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.

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 Biennial Competition for Grassroots Innovations and Traditional Knowledge Practices 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.



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.



Madhav Mahajan
Maharashtra





Dadaji Ramaji Khobragade
Maharashtra

HMT: An improved paddy variety

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

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



Mysore Mallige: A unique paddy variety

Shri Lingamadaiah, a graduate in law, is known for his variety '*Mysore Malligae*' in Karnataka, Tamil Nadu and parts of Andhra Pradesh. *Mysore Malligae* developed through systematic recurrent selection by the innovator. It is an early bearing variety with a yield of about 36 quintals per acre (9000kg/ha). The innovator was facing pest and disease problem in paddy for many years and also getting low milling recovery. He started multiplying the new paddy variety by selection procedure to get pest and disease free variety with higher milling recovery. It yields more even without any extra input and is of short duration, resistant to lodging and milling recovery is about 80 percent. If grown organically, hardly any pest and disease attack is observed. He is growing this variety since 1994. It has covered 25-30% of paddy growing area in the region.

He won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2002 and was also honored with Beeja Mitra award from GREEN Foundation.



M. Lingamadaiah
Karnataka

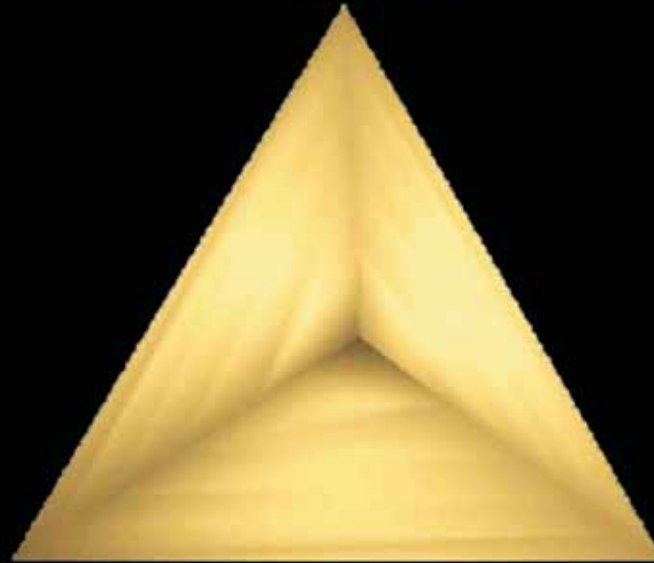


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