National Innovation Foundation

Arunachal Pradesh Innovates

Honey Bee Network

ARUNACHAL PRADESH INNOVATES

National Innovation Foundation

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HONEY BEE NETWORK

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ARUNACHAL PRADESH INNOVATES

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.

ARUNACHAL PRADESH INNOVATES

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 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 ...ected 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 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?

[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.

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

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 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.

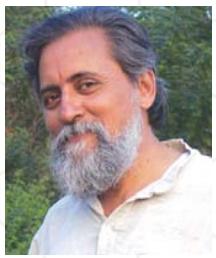
How can state government join hands with NIF?

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

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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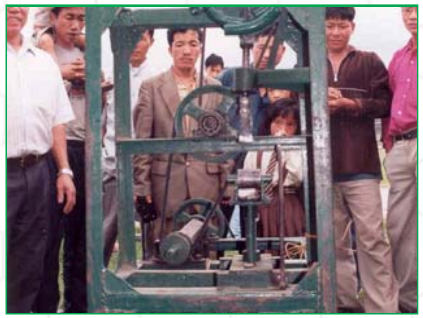

"Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful and richer in depth and content".

- 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

Bamboo splitting machine

Liagi Baht
Lower Subansiri

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.

02

Night playable shuttle cock

Koj Taki
Nirjuli

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.

03

Water shower smoke filter and generator

Joram Beda and Annu Darin
Papum pare

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.

04

Use of banana skin as baking soda

Hage Dibi
Zero

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).

05

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.

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

Bapi Tamuk
East Siang

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: httpimages.google.co.inimgresimgurl =httpbp3.blogger.com

07

Bamboo based ethnic foods

***Apatani* tribe**
Ziro

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.*

08

Use of *onyor* seeds as insecticides

Tate Tatin
Tagum Rime
Along

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 *Zanthuxylum* spp., which has proven to be effective in controlling these insects.

09

Use of *Ketsing* leaves as manure

Saaila Subba
Tawang

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.

10

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.