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वैज्ञानिक तथा औद्योगिक अनुसंधान विभाग

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वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद
अनुसंधान भवन, २ रफी मार्ग, नई दिल्ली- ११० ००१

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
Anusandhan Bhawan, 2 Rafi Marg, New Delhi-110 001

PREFACE

I am extremely happy that NIF has continued to achieve extraordinary success in scouting grassroots innovations and traditional knowledge from different parts of the country. In the year under report, NIF uncovered more than 21,500 examples of innovations and traditional knowledge practices from over 360 districts of India. It is not the numbers which are important. It is the spirit of innovation that gets reinforced by such large scale evidence of creativity at the grassroots.

I realize that scrutinizing these innovations and traditional knowledge practices from the point of view of novelty, uniqueness, social impact, cost effectiveness, environmental compatibility, etc., pose a great challenge for NIF. Since more than sixty per cent of the traditional knowledge practices deal with biodiversity based knowledge, scanning formal scientific literature and publications on Indian systems of medicine will require a huge effort. Traditional Knowledge Digital Library (TKDL) being developed by the Government of India in due course may facilitate this task and help in prioritizing the knowledge to be taken up for validation and value addition. In the absence of such validation, we are constrained in honouring the herbal drug developers at grassroots. This may cause frustration in the short run to all those thousands of knowledge holders whose contribution we are not able to properly recognize at this stage. We have to strengthen the capacity of NIF to meet this challenge.

Dr A P J Abdul Kalam, Hon'ble President of India, not only conferred the awards on the grassroots innovators and traditional knowledge holders but also invited them to Rashtrapati Bhawan. This was an extraordinary gesture on the part of the President which has touched all the knowledge holders and others who work for them. This shows the respect and attention that our beloved President pays to the cause

of promoting indigenous creativity and innovation at grassroots.

The establishment of two more GIANs has added to the financial burden of NIF. With the increasing knowledge base and institutional responsibilities to add value and convert these innovations into enterprises, the resources of NIF have been shrinking. This is obviously not sustainable. We will have to find ways of augmenting NIF's resource base so that it does not feel inadequate in meeting the aspirations of thousands of knowledge holders.

The proportion of innovation and traditional knowledge from women continues to be very small in the total database. NIF is trying to develop different strategies to overcome this gap.

I had the opportunity to meet many of the innovators in different parts of the country, particularly in the north east. I have seen a new ray of hope on their faces for which GIANs, NIF and Honey Bee Network deserve full appreciation.

I wish my colleagues all success in meeting the challenges which keep growing bigger and bigger with every achievement that NIF makes possible. I invite leaders from various walks of life to get involved with the missions of NIF so that no unsung hero or heroine of our country remains unrecognized and unrewarded. NIF alone cannot achieve this mammoth task with a small team. I hope it will continue to receive unstinted support from various well wishers in the public, private and civil society sectors.

[R. A. Mashelkar]

I invite leaders from various walks of life to get involved with the missions of NIF so that no unsung hero or heroine of our country remains unrecognized and unrewarded.

PROFESSOR V. S. RAMAMURTHY
SECRETARY

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेकनोलाजी भवन, नया महरौली, नई दिल्ली - ११० ०१६

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
Department of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi-110 016

FOREWORD

National Innovation Foundation (NIF) has created yet another benchmark for scouting and documenting innovations and traditional knowledge practices during 2002-2003. Taking the total tally of grassroots innovations and traditional knowledge practices to over 36,000 by scouting more than 21,000 new examples in the third year is no mean achievement. Il am very happy that NIF continues to uncover the local creativity and innovative potential in different parts of the country. I am aware of the responsibility these numbers cast on us. Unless we add value to a large number of these innovations and traditional knowledge practices, we will not be able to generate wealth and share benefits with knowledge holders. This is a task in which Iwe invite public and private institutions of science and technology, business, design, etc., to participate and help build a value chain around these innovations.

It is a matter of great pride for us that the lessons based on NIF's work are being drawn upon by the international community. The real challenge, however, remains as to how we will respond to the rising aspirations of the knowledge holders who are sharing their knowledge and innovations with us. We have to keep their trust, protect their intellectual property rights and ensure that benefits reach the knowledge providers with or without value addition.

I am happy that the Micro Venture Innovation Fund is being set up with the help of SIDBI. The contribution of Honey Bee Network in uncovering tens of thousands of innovations and traditional knowledge practices constitutes the backbone of NIF's efforts. I appreciate such support of civil society organizations and networks in making India innovative.

I wish NIF and its team of collaborators and volunteers all the strength needed to meet the expectations of knowledge providers and innovators of India.

(V S Ramamurthy)

Prof Anil K Gupta
Executive Vice Chairperson
National Innovation Foundation
K L Chair Professor of Entrepreneurship
Indian Institute of Management, Ahmedabad

INTRODUCTION

The eight fold increase in the number of entries on green grassroots innovations as well as traditional knowledge practices scouted in the second year of NIF's existence has made an important statement about Indian grassroots genius. From 1,600 examples of contemporary innovations and traditional knowledge practices scouted in first year, 2000-01, NIF scouted more than 13,500 similar examples in the country during 2001-02. Entries for the third round have started coming.By early 2003, we had collected an additional 27,000 innovations and traditional knowledge practices.

The rise in expectations, as evident from this progress, if not matched by concrete improvement in the livelihood options of millions of people through knowledge and innovation based enterprises, would lead to massive and widespread frustration. How will we avoid that? Will the limited resources of NIF suffice for the purpose? I wish to share this with various stakeholders who are with us in our collective journey towards a creative, compassionate and conservation oriented India.

The documentation of people's knowledge would serve limited purpose if it did not contribute towards revitalizing the local knowledge systems and building bridges with the formal science and technology, design and entrepreneurial networks. NIF has strengthened its documentation system by revising the framework of Prior Informed Consent (PIC) during the year. While considerable discussion has taken place on the concept of PIC, there have been few attempts to institutionalize it at the national level. NIF has decided to seek PIC from each knowledge provider. However, our initial experience shows that considerable efforts have to be made for creating awareness about PIC. The consent of communities for providing traditional knowledge has never been sought systematically. New roles also cast new responsibilities. We expect Honey Bee Network collaborators and other well-wishers to share the burden of spreading awareness about PIC. This task will also require huge resources.

Another aspect of documentation is building multimedia multi language databases so that the three barriers to learning, i.e. literacy, language, and localism can be overcome.

The protection of intellectual property rights is extremely important. Policy makers have not yet responded to our appeals for developing an alternative intellectual property protection system specially tailored for small innovations and traditional knowledge.

SRISTI has contributed software and a model database of this kind for wider dissemination and further upgradation through NIF and Honey Bee Network. Several thousand CDs of this kind have been shared with policy makers, NGOs, researchers, entrepreneurs and others interested in adding value to local knowledge systems. It is important that we do not try to centralize the process of documentation and make conscious efforts to promote distributed, decentralized and self-governed knowledge nodes. The public domain knowledge can be disseminated through such nodes so that people to people learning in their own language and through multimedia resources is promoted. NIF continues to support *Shodhyatras* (eight to ten days' walk through villages every summer and winter in different parts of the country) during which we share databases and try to reinforce local experimental, innovative and conservation ethic.

The protection of intellectual property rights is extremely important. Policy makers have not yet responded to our appeals for developing an alternative intellectual property protection system specially tailored for small innovations and traditional knowledge. About ten years ago, the concept of International Network for Sustainable Technology Applications and Registrations (INSTAR) was proposed by Honey Bee Network to ensure protection of people's knowledge globally. We hope that national policy makers would recognize the urgency of taking steps in this regard so that even the slightest prospect of biopiracy can be avoided. The passing of the Biodiversity Act by the parliament provides an opportunity to take this issue forward. Meanwhile, NIF is continuing its modest efforts to protect the IPRs of grassroots innovators within India and abroad through conventional channels.

The budget speech of Finance Minister in 2002 included a welcome announcement about setting up a National Micro Venture Innovation Fund with the help of SIDBI. With thousands of innovations and traditional knowledge practices waiting to be valorized, incubated and converted into enterprises, we need considerable efforts and investments in adding value to these. A small scale effort was made by GIAN (Gujarat) set up in 1997 in collaboration with the Gujarat Government. It has succeeded, with a very small investment base and through many grants from Technopreneurial Promotion Programme (TePP) of the Department of Scientific and Industrial Research and Department of Science and Technology, in converting innovations into enterprises. Patents have been filed, technologies have been licensed both within India (on a district and state basis) and even internationally. New ventures have been created without following any bureaucratic processes with a team of just two – three people. It is natural that the concept of risk capital for grassroots innovators will take time to find greater acceptance. We will wait.

Creating new benchmarks of service towards knowledge rich, economically poor people is our motto. We look forward to hearing from you.

NIF has taken steps to set up two more GIANs at IIT, Guwahati, for north east India and at Jaipur for north India. The support from IIT, Guwahati, has been responsible for whatever achievements GIAN (North East) has made within the first eight months of its existence. GIAN (North) has been set up with the close cooperation and commitment of financial contribution from the Rajasthan Government. Many more such incubators need to be set up in different parts of the country. We expect volunteers from various fields to join the GIAN support teams.

CSIR, Indian Institutes of Technology (IITs), National Institute of Design (NID) and most importantly Indian Institute of Management, Ahmedabad (IIMA), have been far more supportive and forthcoming than agricultural research systems so far. However, a beginning has been made and a meeting was held with senior leaders of Indian Council of Agricultural Research in IARI, New Delhi, recently. We hope that eventually every scientific institution in the country will feel motivated to work with innovators and traditional knowledge holders in the informal sector. They might also see this opportunity as a key to making India a developed country within the next decade or two. We are confident that NIF will play a very vital role in India's evolution into a developed economy.

NIF wishes to put on record its deep appreciation for the guidance and constant encouragement received from Dr R A Mashelkar, Chairperson, National Innovation Foundation, Prof V S Ramamurthy, Secretary, Department of Science and Technology and other members of the Governing Council.

The NIF team and Honey Bee Network have demonstrated an extraordinary example of collective responsiveness towards the expectations of innovators and traditional knowledge holders. I am sure, their contribution will only increase in times to come. More and more volunteers are joining the network. We are grateful to Prof Bakul Dholakia, Director, IIMA, who has offered support in various activities of NIF unhesitatingly and whose help, we will continue to draw upon, in the future as well.

Creating new benchmarks of service towards the knowledge rich, economically poor people is our motto. We look forward to hearing from you. Your critical feedback, suggestions and ideas will help us evolve a better strategy aimed at making India innovative.

Anil K Gupta

Governing Council

1. **Dr R A Mashelkar** — **Chairperson**
   Secretary, DSIR and DG, CSIR, New Delhi
2. **Prof Anil K Gupta** — **Executive Vice Chairperson**
   Indian Institute of Management, Ahmedabad
3. **Dr V S Ramamurthy**
   Secretary, Dept. of Science & Technology, Government of India, New Delhi
4. **Dr Vijay L Kelkar**
   Adviser to the Minister of Finance and Company Affairs, Government of India, New Delhi
5. **Ms Elaben Bhatt**
   Founder, Self-Employed Women's Association, Ahmedabad
6. **Mr Anand G Mahindra**
   Managing Director, Mahindra & Mahindra Ltd, Mumbai
7. **Dr E A S Sarma**
   Principal, ASCI, Hyderabad
8. **Mr G Subba Rao**
   Chief Secretary, Government of Gujarat, Gandhinagar
9. **Prof Inderjit Khanna**
   State Election Commissioner, Rajasthan
10. **Prof Bakul Dholakia**
    Director, Indian Institute of Management, Ahmedabad

11. **Prof Kuldeep Mathur**
    Center for Political Studies, Jawaharlal Nehru University, New Delhi

12. **Ms Lalita D Gupte**
    Joint Managing Director, ICICI Ltd, Mumbai

13. **Dr Punjab Singh**
    Secretary, DARE & DG, ICAR, New Delhi

14. **Mr T P Vartak**
    President, Four Eyes Foundation, Pune

15. **Finance Secretary**
    Ministry of Finance, Government of India, New Delhi

16. **Financial Adviser**
    Department of Science & Technology, Government of India, New Delhi

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Honourable President Dr A P J Abdul Kalam with the innovators at Rashtrapati Bhavan

Celebrating Success: Learning from Failures

National Innovation Foundation (NIF) has had many successes during the last year, just as it has had a few failures in product development or commercialization. The scale need not be a constraint, but can be a spur for sustainable growth. From 13,500 grassroots innovations and traditional knowledge practices scouted in the second year (up from 1,600 in the first year), NIF mobilized more than 21,000 innovations and traditional knowledge practices during this year. It is obvious that larger the number of people whose lives we touch, greater is the moral burden and higher the societal expectations.This has to be contrasted with a 50 per cent decline in the interest rate and hence the income. This gives some idea about our predicament and the pressure under which we work. Serving more than 36,000 knowledge holders with these meager resources is obviously impossible. Are we getting trapped in a mirage of our own making? Should we stop documentation altogether and leave millions of knowledge holders and innovations yet undiscovered in the lurch? Or should we become sub-optimal in our performance and communicate only our handicaps to the innovators, and thereby generate cynicism instead of hope in their mind? There is nothing more dangerous to a society's growth and future development than the spread of a cynical attitude and we are determined to avoid it at any cost. But then we would need support from other stakeholders too.

More than 65 per cent of our entries so far, are based on the herbal knowledge system and we have not been able to award most of them because our Governing Council rightly felt that the claims of herbal healers needed to be validated. How do we get these validated? Unless all pharmacy, biotechnology, botanical and other laboratories in the country gear themselves to take up this task in a mission mode as a national priority, would we ever be able to build upon the tremendously rich knowledge at the grassroots level? If we have to hire public and private sector research labs on behalf of these innovators, we would need enormous financial resources. It is a different matter that in most of the labs, we do not have high throughput facilities to screen a large number of samples in the shortest possible period of time.

President Honours Innovators

Inspite of the many challenges faced by NIF, the year also had moments when we felt blessed. The most rewarding moment was when the Hon'ble President of India, Dr A P J Abdul Kalam not only gave away the awards in December 2002 to innovators and traditional knowledge holders from all over the country, but also invited them to the Rashtrapati Bhavan

The Honourable President Dr A P J Abdul Kalam at an informal interaction with the NIF team in March 2003. Also in the picture IIMA Director, Prof Bakul Dholakia (*second from right*)

the next day. It was a dream come true for most of the innovators and traditional knowledge holders. They had never thought that their creativity and innovative spirit would ever take them to the President's house for this rare honour. The President was particularly keen that different scientific labs in the country should adopt a few innovators and make sure that their technologies were valorized. And then, linkages with private entrepreneurs and industrial houses had to be established to ensure commercialization. Unless knowledge, innovations, and traditional practices are (a) valorized and nurtured which helps in improving the livelihood options of innovators and other disadvantaged sections of society and (b) the efficiency and consumer satisfaction is increased, how would the younger generation aspire to be innovators and knowledge experts?

The concern of the Hon'ble President for the creative people of the country was further in evidence when he took time out in March this year after the convocation function at IIMA, and met the members of the Honey Bee team, including the staffs of Grassroots Innovations Augmentation Network (GIAN), Society for Research Initiatives for Sustainable Technologies and Institutions (SRISTI) and NIF, and more importantly, many grassroots innovators. The President was visibly impressed when he met Dhanjibhai, a polio-affected person from Kutch, whose house was devastated in the recent earthquake, but whose spirit remained indomitable. He had designed a scooter which he could drive himself (once someone lifts him and puts him on the seat). Though this scooter may not have appealed to the scooter manufacturers of the country, it definitely appealed to the Hon'ble President and other dignitaries present.

Shodhyatras, journeys on foot through villages every summer and winter, continued. The efforts of the Honey Bee Network, SRISTI, NIF, and GIAN received recognition outside India when the Commonwealth Science Council (CSC) and the South African government invited three grassroots innovators to share their knowledge with their counterparts in the northern part of Africa, which is one of the poorest regions in the continent. The enthusiasm of the students, farmers and policy makers was unprecedented when they saw the posters and the multimedia exhibitions, based on the innovations awarded by NIF. The new possibility of south-to-south knowledge transfer and learning among people was evident, both to policy makers and common people. The Science and Technology Ministers from Commonwealth countries were greatly inspired by the experience and the exposure to grassroots creativity and innovations in India. Under the chairpersonship of Dr R A Mashelkar, Secretary, Department of Scientific and Industrial Research (DSIR) and Chairperson of NIF, the CSC committee resolved to

transform the Commonwealth Science Council into the Commonwealth Innovation Network. This was a major milestone in the journey of the Honey Bee Network and NIF to give voice and visibility to the Indian creative genius around the world and empower creative people, even in other developing countries. Dr M M Joshi, Hon'ble Union Minister of Human Resource Development, Science and Technology and Ocean Development, gave the keynote address and affirmed the Indian government's commitment to not only share its experience, but to also contribute towards strengthening linkages between informal and formal science in other commonwealth countries as well.

This report is organized in four sections. The first section, entitled *The Movement Spreads* deals with the growth of the movement through *Shodhyatras* and the international outreach of the Honey Bee Network's activities. The experience of the national scouting campaign is discussed in section two, *Dreams grow wings*. The progress in various projects based on people's knowledge is given in section three, *Championing Grassroots Innovations and Traditional Knowledge*. The goals we have set for ourselves are outlined in section four, *The Road Ahead*.

This report is not just about numbers, but about the lives of the green grassroots innovators and traditional knowledge holders that we are trying to touch and serve. It is about the tremendous improvement that can be brought about through a knowledge-based approach to development. It is also about our inadequacies in achieving that within the limited time and resources. But we are sure of one fact, that we should be judged by the number of innovations we unearth and augment in a manner that all the stakeholders in the value chain get the incentive to remain connected, contented and committed to the cause of creativity at the grassroots.

This report is not just about numbers, but about the lives of the green grassroots innovators and traditional knowledge holders that we are trying to touch and serve.

The Movement Spreads

***Shodhyatras:* Voyages of Discovery**

Two *Shodhyatras*, or voyages of discovery on foot, were organized during the year – one in June and the other in December.

Samadara to Bhadarva, Gujarat (June 2-8, 2002). The ninth *Shodhyatra* covered three districts of northern Gujarat: Kheda, Anand and Vadodara. It started on June 2, 2002, from Samadara village in Kheda district, culminating in Bhadarva village in Vadodara district, on June 8, 2002. Thirty innovators were scouted and honoured. The *Shodhyatris*, walked 96 km, covering 30 villages over a period of seven days.

All the previous *Shodhyatras* had been held in less 'developed' areas. But the *yatra* in Kheda, which is among the most 'developed' and 'prosperous' districts of Gujarat, was sorely needed. This highly developed area has perhaps the highest input of fertilizer and incidence of pesticide spraying. Consequently, this *yatra* focused on promoting non-chemical/ organic farming, apart from learning from unsung heroes and heroines of our society.

We could sense the fatigue that was setting in the minds of the farmers who had been pursuing chemical intensive agriculture for so long. We also discovered that in this otherwise developed district, there were a large number of farmers who still relied on local animal husbandry knowledge and wisdom. If such a knowledge system had practical value in the heartland of a region synonymous with Operation Flood, its relative importance in the rest of the country can be well imagined.

One of the remarkable sights that we came across during the *yatra* was a courtyard which a girl (a school drop out) had transformed into a large canvas full of beautiful designs made with cow dung.

Thenur to Sevapur, Tamil Nadu (December 21-30, 2002). The tenth *Shodhyatra* took place in Tamil Nadu from December 22-30, 2002, covering 42 villages and a distance of 128 km. The *yatra* started from Gandhiyodhayam in Thenur village near Madurai. This place finds mention in Gandhian historiography for being the spot where Mahatma Gandhi, seeing the plight of poor agricultural workers, decided to adopt the simple dhoti as his dress.

About 16 NGOs worked together and organized the y*atra.* More than 50 farmers went from Gujarat (including three generations of a tribal farmer's family) to share their knowledge, innovations and practices and also learn from the local Tamil communities. Compared to the previous *Shodhyatras,* the participation of women was much higher. The language barrier was not an impediment to the spirit of learning. The *Shodhyatris* saw the impact coconut

harvester developed by Mr Karuppiah. We met Mr Karunanidhi, a bus driver, who had made an extraordinary contribution to the environment by distributing thousands of tree saplings wherever his work had taken him

Participation in Commonwealth Science Council - A Different Paradigm of Development

A small team of grassroots innovators and members from SRISTI, NIF, GIAN and Sustainable Agriculture and Environmental Voluntary Action (SEVA) visited South Africa in June to attend the Commonwealth Science Council (CSC). They presented the case for a different paradigm of development, implying that science and innovation reside as much in the farmer's field as in the laboratory. It was one of the first attempts by the Honey Bee Network to help south-south transfer of technology. Three farmer innovators shared their skills with their counterparts. These included, (a) Bhanjibhai Mathukia who had developed a three wheel and a four wheel tractor (patent filed in USA), a bullock operated sprayer and a check dam with a series of semi-circular structures (b) Amrutbhai who had developed a tilting bullock cart, a ground nut digger with a sandwich blade, modified pulley for wells and more than a dozen other innovations and (c) Mansukhbhai Jagani who had developed a motorcycle based ploughing machine (patent filed in USA).

The Ministerial meeting took place during June 10-11, 2002. The keynote address was delivered by the Hon'ble Union Minister for Human Resources Development, Science and Technology and Ocean Development, Dr M M Joshi, in which he made a special mention of the work being done by NIF, the Honey Bee Network and SRISTI.

Prof Anil K Gupta made a presentation on the philosophy and activities of the Honey Bee Network and associated organizations. Dr R A Mashelkar, Chairperson, NIF, presided over the Commonwealth Science Council (CSC) committee that met to work on resolutions guiding the future direction of CSC so that it could evolve into a Commonwealth Innovation Network. Earlier, Dr Ben Gubane, Minister of Science and Technology, Arts and Culture, South Africa, had written to Science and Technology Ministers of various member countries, suggesting that they learn from the Honey Bee Network, and try to establish similar National Innovation Foundations.

Various activities and products supported by NIF and Honey Bee Network such as cycle based sprayers, modified donkey tilting cart, herbal pesticides, veterinary medicines, and posters and panels based on innovations and traditional knowledge were showcased at an exhibition organized on the occasion. The delegates were also shown the multilingual, multimedia Honey Bee database of innovations, developed by SRISTI. Impressed

Dr Ben Gubane, Minister of Science and Technology, Arts and Culture, South Africa (*second from left*) discussing activities of NIF

by what they saw, the Ministerial gathering reconfirmed the importance of concentrating on grassroots innovations and traditional knowledge as a focal point for the Commonwealth Knowledge Network.

Adopting the Honey Bee model, it further stressed that the Commonwealth Knowledge Network should become a Commonwealth Innovation Network. It was also decided that every activity of CSC should be evaluated by its potential to make a definite and positive difference to the lives of the poor in the member countries.

Subsequently, the exhibition moved to Petersburg for the general public. The Hon'ble Premier of Limpopo Province, Mr Ngoako Ramatlhodi, inaugurated the exhibition and appreciated the ideas and technologies on display. Students and others interacted with the innovators with the help of translators. The process of poverty alleviation while rewarding creativity seemed set to find a wider audience.

Policy Dialogue for Micro Venture Innovation Fund

In order to foster business and enterprise linkages and strengthen the network, a meeting for setting up a National Incubation and Micro Venture Fund was held on October 18, 2002, at the Council of Scientific and Industrial Research (CSIR) Science Center, New Delhi. The meeting was chaired by Dr Vijay L Kelkar, Adviser to the Minister of Finance and Company Affairs, and Member of the NIF Board. Dr R A Mashelkar, Chairperson, NIF, and Prof Anil K Gupta, Executive Vice Chairperson, NIF, were also present on the occasion. The Secretaries of various departments of the Government of India, representatives of agencies of the United Nations and other stakeholders attended the meeting. This was a follow up to the announcement made by the Finance Minister in his budget speech of 2000 about setting up a national Micro Venture Innovation Fund at NIF with the support of SIDBI.

Dreams Grow Wings

Scouting and Documentation (S&D)

National Innovation Foundation carried out S&D activities through annual campaigns, incorporating multiple strategies.

During the second campaign, NIF received 13, 533 innovations and traditional knowledge practices. In the third round, more than 21,000 innovations and tradition knowledge practices have been received. These entries are still being scrutinized. NIF tried to scout innovations and traditional knowledge practices through advertisements in newspapers and online registration, as well as through Honey Bee Collaborators, nodal officers, NGOs, district collectors and so on.

It was found (through a sector wise analysis) that the maximum number of entries received pertained to traditional knowledge (on crop, animal and human health), followed by entries relating to agricultural practices and farm implements and then those related to non-agricultural technological innovations.

Honey Bee Collaborators' Meeting

A Honey Bee and NIF Collaborators' Meeting was held on September 18, 2002 at IIMA. One of the main points on the agenda was the launching of an effective campaign for scouting and improving the quality of entries.

Various Collaborators shared their experiences in adopting different methodologies for scouting innovations and traditional knowledge practices. It was stressed that the focus should be on quality, rather than on the number of entries. Similarly, the conversion of innovations and traditional knowledge practices into products and enterprises was also necessary.

There was a general consensus that Network contacts were more effective in the mobilization of entries than advertisements. NIF's experience at the national level corroborated this. Of the 13,533 innovations and traditional knowledge entries collected, barely 1,600 were mobilized through advertisements in the newspapers.

It was also felt that the originality of the innovation should be ascertained before detailed documentation. Those practices, which are well-known in a given region, could be kept as 'open source' technologies for wider use.

Research Advisory Committee (RAC) Meeting

A Research Advisory Committee (RAC) meeting of NIF, chaired by Dr Pushpangadan, Director, National Botanical Research Institute (NBRI), was held on September 19, 2002, at IIMA. The committee reviewed the prioritized entries for awards for the second annual competition.

Honourable President Dr A P J Abdul Kalam interacting with the award winning innovators at the exhibition organized during the award ceremony

Meeting of Informal Experts on Shortlisted Entries

A meeting of informal experts, including certain awardees from the first competition, was held on October 8, 2002, at IIMA. Members from several disciplines including Ayurveda, Mechanical Engineering, Taxonomy and others were present at the meeting. Experts evaluated 115 entries, keeping three factors in mind: uniqueness, potential social impact and cost effectiveness.

It was suggested that the committee members should receive the prioritized entries in advance, along with the prior screening criteria and that a uniform documentation structure should be developed.

It was also suggested that NIF should award certificates of invention/innovation to knowledge providers. This would assure innovators/traditional knowledge holders that their entries remained confidential and that the conditions specified by them in the consent form would be honoured.

Second Annual Award Function - Valorizing Innovation

The Second National Grassroots Technological Innovation and Traditional Knowledge Awards function was organized in New Delhi at the campus of the National Physical Laboratory during December 17-18, 2002. The Hon'ble President of India, Dr A P J Abdul Kalam, conferred national and state level awards on innovators, traditional knowledge holders, students and communities.

December 17, 2002. Dr R A Mashelkar, Chairperson, NIF, presented an overview of the achievements of NIF. This was followed by the keynote address which was given by Prof V S Ramamurthy, Secretary, Department of Science and Technology (DST). President Dr A P J Abdul Kalam expressed his confidence that through the process of setting up Grassroots Innovations Augmentation Networks (GIANs), NIF would help bring grassroots innovators into the mainstream. The President visited the exhibition where innovations were displayed. He interacted with the innovators. There was a press meeting chaired by Dr Mashelkar and an interactive session with the innovators and traditional knowledge experts.

December 18, 2002. In a warm gesture, the Hon'ble President invited the innovators and traditional knowledge holders for tea to the Rashtrapati Bhawan. This interaction with the President at his official residence was the highlight of the day's events. Most of the grassroots innovators had never imagined that their creativity would enable them to be hosted by the President of India.

Several group discussions were organized to reflect upon the concerns of grassroots innovators, traditional knowledge holders, representatives of NGOs, academicians and scouts in strengthening the Honey Bee Network. The participants suggested that NIF should adopt novel methods for the diffusion of innovations and outstanding traditional technologies.

Audio and visual media have been very effective in disseminating ideas in villages across the country. It was suggested that media and poster campaigns in village post offices, bus stops and fairs should be the foci of the dissemination strategy. It was felt that the Internet could play an important role in popularizing innovations internationally. Furthermore, public telephone booths could be equipped with computers and Internet connections. CDs with information about NIF and its activities should be distributed among students. Issues like incentives for innovators, licensing technology for commercial and non-

Highlights of the Group Discussions

- The concept of Prior Informed Consent (PIC) should be explained to the innovators as they may not understand its complexity.
- Regarding the Intellectual Property Rights (IPR) protection system, it was felt that NIF's present procedures were satisfactory, but the need for a special system to protect the interests of small innovators and traditional knowledge holders remained.
- The need for automatic protection of various entries in the NIF Register was emphasized.
- School and college students, local NGOs, National Service Scheme students, *Panchayat Samitis*, cooperative banks and *Aanganwadi* workers should be involved in scouting.
- Business houses should be called upon to finance innovations.
- Public and private research and development organizations and laboratories should be involved in verifying the efficacy of innovations.
- Guidelines for valorizing innovations were suggested. It was felt that products with social and economic value should be selected for value addition.
- Careful framing and advertising of the criteria of selection could help bring in private funding.
- More efforts are needed for marketing the products. NIF should be more aggressive in this field.

If risk capital had played such an important role in industrial transformation in the new economy, why should the transformation of the informal economy in the unorganized sector (where transaction costs are even higher) be imagined without similar risk/venture capital and incubation support?

commercial diffusion of innovations and entrepreneurship development among innovators were also discussed. The innovators hoped that they would get support from NIF once their innovations were complete. The NIF team also felt that the innovators should be informed about the various support systems available to them and the economic prospects of their efforts.

National Workshop on Women's Creativity

A national workshop on documentation, verification and value addition in grassroots innovations and traditional knowledge with specific focus on women's creativity was organized in Ahmedabad during January 21-25, 2003.

Community leaders of various federations and self help groups from Chattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu attended the workshops. The participants were exposed to various aspects of identifiying, documenting and pooling best practices in their region and developing products and enterprises through a micro venture and innovation fund. The workshop was based on the idea that the saving and credit functions performed by women's groups were a very important means of empowering them. But, they could emerge from their impoverished circumstances only when the production function underlying the technology used by them was modified.

This would require technological change. At their current level of access to institutions, markets and other support structures, identifying the best practices as a means of developing new innovative products is a potent means of achieving this. NIF could help trigger a major transition from the global bias in favor of micro finance to micro venture finance. If risk capital had played such an important role in industrial transformation in the new economy, why should the transformation of the informal economy in the unorganized sector (where transaction costs are even higher) be imagined without similar risk/venture capital and incubation support?

It was in this context that the Hon'ble Finance Minister had announced the setting up of a National Micro Innovation Venture Fund through a partnership between Small Industries Development Bank of India (SIDBI) and NIF in the parliament last year.

Value Addition and R&D

Based on the recommendations of the National Coordinators on the feasibility of various innovations, projects of different innovators were provided support. These included those offered direct support by NIF

During the year, NIF succeeded in getting pro-bono support from the country's top IP attorneys to protect the innovations of the grassroots innovators.

and others supported through GIANs or network collaborators.

NIF supported GIAN (West) in organizing 'GRIDS 2003' in collaboration with NID. The aim of the workshop was to encourage the activities of Grassroots Innovations Design Studio (GRIDS), established at the NID campus. This was done with the objective of linking the creativity of individual grassroots innovators with the expertise of a premier design institute to convert innovation prototypes into viable products.

Business Development (BD)

BD activities in the year 2002-2003 were mainly performed by GIANs (primarily in GIAN West) as there was no staff specifically available for BD at NIF. The details of activities are reported under GIAN West.

Intellectual Property Rights

During the year, NIF succeeded in getting *pro-bono* support from the country's top IP attorneys to protect the innovations of the grassroots innovators. Till March 31, 2003, 16 applications had been filed by NIF and its associates (*list enclosed*). In another 25 cases, the process of the filing of patents has been initiated. Prior art search (PAS) on various technological innovations was carried out with the assistance of Intellectual Property Rights Fellows and other research associates to evaluate the various entries for NIF awards.

A two day workshop on "Intellectual Property Protection for Grassroots Innovations" in association with the Intellectual Property Management Division (IPMD) of CSIR, was organized during November 16-17, 2002, for the NIF and GIAN teams.

With the objective of creating awareness and respect for grassroots creativity, the IPR team has been coordinating with some of the best law schools of the country. Their students visit NIF and undergo their internship here for a period of about six weeks. This has been a mutually beneficial partnership which enriches the students with skills in areas like drafting, patent specifications, learning nuances of prior art searches, drafting of claims etc., while NIF gets PAS done for various entries. Students from NALSAR University of Law have successfully undergone training in IPR at NIF. Students from IIT Kanpur have also undergone similar training at the IPR Division.

A proposal to establish a Law Clinic at the West Bengal National University of Juridical Sciences, Kolkata, was mooted. The university has responded positively.

Status report of the projects supported during 2002-2003

Sr. No	Title of Innovation	Supported Through	Amount Sanctioned (Rs.)	Amount Released (Rs.)	Month of Fund Release
1.	Development of Bamboo Bicycle (Kanak Das, Bhargav Pathak, Chandi Kalita)	GIAN (NorthEast)	46,780	46,780	April, 2002
2.	Groundnut Harvester (Marudrao Sharode)	Prof K Munshi, IIT, Bombay	18,500	18,500	September, 2002
3.	Driving device for bicycle Phase 1 (Kanak Das)	GIAN (NorthEast)	22,500	22,500	April, 2002
4.	Coconut Dehusker (R Jayseelan)	SEVA*,Madurai B K Chakraborty IIT, Bombay	25,000 36,000	25,000 36,000	April, 2002 September, 2002
5.	Bamboo Bicycle (Dodhi Pathak)	Prof Saha, IIT, Delhi	24,500	24,500	March 2002
6.	Towards the visit to innovators and defining problems of innovators	Prof Saha, IIT, Delhi	15,000	15,000	February, 2002
7.	Cardamom Drying Chamber (P J Abraham)	PDS**, Idukki	36,650	36,650	January, 2002
8.	Low cost Hand Pump (Ouseppachan Anchukandathil and Reji Joseph)	PDS, Idukki	25,000	25,000	January, 2002

Sr. No	Title of Innovation	Supported Through	Amount Sanctioned (Rs.)	Amount Released (Rs.)	Month of Fund Release
9.	Development of an Environment Friendly Oil Engine (M Akasi)	SEVA, Madurai	26,000	26,000	February, 2002
10.	Relay Switch (Ponnusamy)	SEVA, Madurai	35,000	35,000	February, 2002
11.	Development and design improvements to the Motorcycle driven Agricultural Implement (Mansukhbhai Jagani)	GIAN (West)	1,50,000	1,50,000	February, 2002
12.	Herbal Medicine for bone fracture and backache (Pushpalata Saikia)	GIAN (NorthEast)	7,000	7,000	February, 2002
13.	Check Dam + Auto Compression Sprayer + Bicycle Sprayer (Student project) (Bhanjibhai, Arvindbhai,Mansukhbhai)	GIAN (West)	56,500	28,000 28,500	1st installment (December, 2002) 2nd installment (March, 2003)
14.	Pedal Bore and other innovations (C V Pathak)	Direct	28,000	28,000	December, 2002
15.	Design Optimization of a Bamboo Fan used as a Forced-Air Paddy Cleaner (Nipul Bezborah)	GIAN (NorthEast)	60,000	60,000	November, 2002

Sr. No	Title of Innovation	Supported Through	Amount Sanctioned (Rs.)	Amount Released (Rs.)	Month of Fund Release
16.	Product Development, Improvement & Technological Dissemination of the innovative Power Saving Technical Pump (Ram Naresh Yadav)	GIAN (North)	50,000	50,000	November, 2002
17.	Development of Motor Protection Device (Bharat Kamble)	Direct	1,05,000	30,000	January, 2003
18.	LP Gas Kit for Moped (Ram Kumar)	GIAN (North)	24,000	24,000	November, 2002
19.	Multi-cylinder Reciprocating Water Pump (Shakun Das)	Direct	34,500	34,500	July, 2002
20.	To Develop Prototype, Testing and Improvement of Power Tiller mounted Iron Wheels (P Thirumaran)	SEVA, Madurai	16,000	16,000	November, 2002
21.	Testing and certification of 10 HP Tractor(Bhanjibhai Mathukia)	GIAN (West)	1,50,000	1,50,000	December, 2002
22.	Product Development, Testing and Improvement of Innovative Multi-crop Thresher (Madanlal Kumawat)	GIAN (North)	55,000	55,000	December, 2002

Sr. No	Title of Innovation	Supported Through	Amount Sanctioned (Rs.)	Amount Released (Rs.)	Month of Fund Release
23.	Wind Mill (N V Satyanarayana)	Direct	5000 3000	5000 3000	September, 2002 December, 2003
24.	Bore well Air Recycler Compressor (R S P Ayyadurai)	SEVA, Madurai	15,000	15,000	February, 2003
25.	Development of Portable Steam jacket cum Water heater Multi utility stove" (S J Joe)	PDS, Idukki	28,000	8,000	January, 2003
		Total	10,97,930	10,02,930	

* SEVA : Sustainable Agriculture and Environ-mental Voluntary Action

**PDS : Peermade Development Society

List of Patents Filed - 2002-03

Sr No	Innovation	Law firms providing *pro bono* support	Particulars	Status
1	Coconut Harvester (P Karuppiah)	Anand & Anand, New Delhi	Patent - NIF	Filed-03-02-2003
2	Multi Cylinder Reciprocating Water Pump (Sakun Das)	Anand & Anand, New Delhi	Patent- NIF	Filed-17-01-2003
3	Portable Power Generating Device (N V Satyanarayanan)	Anand & Anand, New Delhi	Patent - NIF	Filed–18-12-2002
4	Path finding Android (Robot) (Prem Singh Saini)	Anand & Anand, New Delhi	Patent – NIF Provisional	Filed-15-01-2003
5	Dish Washing Apparatus (Anil Makanawar)	Anand & Anand, New Delhi	Patent – NIF Provisional	Filed-05-02-2003
6	Single Wheel Weed Remover (Gopal Malhari Bhise)	Anand & Anand, New Delhi	Patent – NIF Provisional	Filed-11-12-2002
7	Double Acting Pump (Manubhai Jadeja)	Anand & Anand, New Delhi	Patent – NIF Provisional	Filed –08-01-2003
8	Adaptive Agricultural Machine (Mansukhbhai Jagani)	NRDC, New Delhi	Patent	Filed-22-07-2002

Sr No	Innovation	Law firms providing *pro bono* support	Particulars	Status
9	Entech Oil Expeller (Kalpesh Gajjar)	Testa Hurwitz, Boston, USA	Patent GIAN (West)	Filed-10-22-2002
10	Convertible Three Wheel Tractor (Bhanjibhai Mathukia)	Testa Hurwitz, Boston, USA	Patent GIAN (West)	Filed-13-06-2002
11	Convertible Three Wheel Tractor, (Bhanjibhai Mathukia)	D P Ahuja & Co, Calcutta	Patent GIAN (West)	Filed-22-08-2002
12	Auto Air Kick Pump, (Arvindbhai Patel)	D P Ahuja & Co, Calcutta	Patent GIAN (West)	Filed-06-05-2002
13	Bicycle Sprayer, (Mansukhbhai Jagani)	D P Ahuja & Co, Calcutta	Patent GIAN (West)	Filed-10-12-2002
14	Beauty care Umbrella (Dulal Chaudhury)	Direct	Patent GIAN (NE)	Filed-06-08-2002
15	Soft Mega Cloth and it's Manufacturing (Dulal Chaudhury)	Direct	Patent GIAN (NE)	Filed-06-08-2002
16	Tooth Extraction machine (Dr Rahul Bihari)	Surana and Surana, Channai	Patent GIAN (North)	Filed16-01-2003

Examples of innovations and traditional knowledge were publicized through the mass media.

Information Technology & Dissemination

Exhibitions and agricultural fairs are vibrant platforms where people assemble in large numbers, either for academic, commercial or cultural purposes. NIF and the Honey Bee Network members have participated in several such fairs. Many innovators were requested to help in the setting up stalls, which had prototypes or real models of the innovations and a multi media kiosk for accessing the Honey Bee database. The Honey Bee newsletter, CDs on NIF and network activities, campaign posters, leaflets and other publications were distributed at these exhibitions.

Our experience has shown that many farmers, artisans, community leaders and professionals visit the stalls and get information about the innovations developed by other farmers. While accessing this knowledge base, they also share their own innovations and traditional knowledge.

Examples of innovations and traditional knowledge were also publicized through the mass media. Meetings were held with officials of Prasar Bharati and Doordarshan Ahmedabad to pursue the possibility of a 10-minute slot for innovators and traditional knowledge holders, on a fortnightly basis. (Three programs have been telecast as scheduled). But there is no progress so far, for the slot on "India Innovates" on the National Doordarshan channel, despite pursuing this matter for the last three years.

A series of profiles of innovators were also published in various magazines and newspapers. BBC showed a film *Patently Obvious* based on Honey Bee Network's experience. BBC World Radio aired a program featuring our work. Profiles of innovators were also presented on Radio Mirchi (FM Radio), Ahmedabad.

Participation in Exhibitions

- Confluence – Marketing fair, IIMA, November 2-5, 2002
- Agri fare 2002 – Confederation of Indian Industry (CII), Ahmedabad, November 21–24, 2002
- Kisan Exhibition - Pune, December 11-15, 2002
- The 90th Indian Science Congress 2003 Bangalore University, January 2–7, 2003. The NIF stall was given the Pride of India award for best presentation
- Assam Sahitya Sabha - North Lakhimpur, February 7-11, 2003
- National Science Day celebration - Ahmedabad, February 28 – March 3, 2003

A meeting was organized on October 19, 2002, at India International Center, Delhi, to showcase NIF's activities to academicians and professionals. The objective was to expand the network. A presentation on NIF's activities was made and the members visited the exhibition organized on the occasion. Three innovators

were invited to the meeting so as to provide a first hand exposure to the participants about the powers of innovations at grassroots.

Through Grassroots Innovations Design Studio (GRIDS), both GIAN (West) and NID participated in Asia's largest auto expo held at New Delhi in 2002. They displayed Vanraj – a small tractor, and Shakti – a motorcycle driven plough modified by students at GRIDS. Participation in the exhibitions provided exposure to GIANs on how to disseminate the message of knowledge based approach to development. It also enabled product exposure in the market.

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Exhibitions organized

- A workshop on 'Renewable Energy Applications' was organized by IIT, Guwahati, October 21-26, 2002. Grassroots innovators participated
- Second Awards Ceremony (NIF) - Pusa Campus, New Delhi, December 17-18, 2002
- The Consortium of Women Entrepreneurs in India (CWEI) Exhibition at Guwahati, January 10-13, 2003

The National Agricultural Machineries Exhibition (NAME) was organized by the Karnataka State Department of Agriculture and the Institution of Agricultural Technologies, Bangalore, during May 2-5, 2002. The event was co-sponsored by NIF, with the objective of popularizing innovations in farm mechanization. About 19 innovators from Tamil Nadu, Karnataka, Gujarat, Chattisgarh, Madhya Pradesh and Kerala participated in the exhibition. The visitors were impressed with the innovations on display. People Rewarding Initiatives in Technology, Values and Institutions (PRITVI) and Sustainable Agriculture and Environmental Voluntary Action (SEVA), the Honey Bee Collaborators in Karnataka and Tamil Nadu respectively, the Collaborator in Gujarat and the nodal officer from Madhya Pradesh assisted NIF in the exhibition.

Websites of NIF and its collaborators have also been updated to keep our visitors informed about the latest developments at NIF. These include:

www.nifindia.org; www.sristi.org; www.honeybee.org; www.gian.org; www.indiainnovates.com.

However, we realize that the quality and frequency of updates leave considerable scope for improvement. We are trying to improve our performance on this account.

Important visitors

Dr Vijay Kelkar, Adviser to the Finance Minister and member of NIF's Governing Council, visited the organization in January 2003. During the visit, detailed discussions were held in the presence of Ms Elaben Bhatt

(Founder, Self Employed Women's Association, ahmedabad), also member of the Board of Directors of NIF, about the future direction of the organization.

Many visitors like Prof Vijaya Chandru of Indian Institute of Science (IISC), Bangalore, Prof S K Saha of IIT, Delhi, and Ms Joyce Mogale from South Africa, took interest in the activities of NIF and GIAN and sought to explore possible avenues of cooperation.

Interactions were held with the Indian Institute of Science, Bangalore, to explore the possibility of linking People's Biodiversity Registers with the National Register of the National Innovation Foundation.

India with its billion people population, 30 per cent of whom are in the youthful age group, it is a veritable ocean of talent much of which may be latent. Imagine the situation when the entire sea of talent is allowed to manifest itself in path breaking innovations! Our country can surely be a torchbearer of progress for the entire world.

Dr A P J Abdul Kalam
Honourable President of India

Championing Grassroots Innovations and Traditional Knowledge

GIAN strides ahead

Even as GIAN (West) continued its onward march, GIAN (North) was established in Jaipur as an independent society in November 2002 and formally launched on January 18, 2003. It is governed by an independent board, chaired by Prof Inderjit Khanna, member of NIF Governing Council and former Chief Secretary, Rajasthan. The board has distinguished members from the private sector, the NGO sector, academia, grassroots innovators and representatives of NIF.

GIAN (North East) is only a year old and has made significant progress in this short period. Detailed activities of GIAN-NE are reported later. Efforts are also being made to establish GIANs in eastern and southern India. To formalize linkages with institutes of formal science, an MoU was drafted for cooperation with IIT, Kanpur.

A: GIAN (North)

GIAN (North) has facilitated product development, business development/venture promotion, technology promotion and IPR protection of grassroots innovations.

a) Product Development

(i) Incubating ideas into products

Four innovations viz., LPG kit for moped, improved forage cutter, hydraulic system for a marble cutting machine and a horizontal windmill had been taken up for conversion into products. In three cases, the first prototype is ready. The hydraulic system has to be tested further. GIAN (North) has initiated a dialogue with the marble industry to involve the sector in providing facility/ support for development and trial of the hydraulic system in a working gang saw machine.

(ii) Product Development support

Seven innovations are being provided product development support – power saving pump (UP), improved multi-crop thresher (Rajasthan), herbal medicine for kidney stone (Rajasthan), electronic robot (Haryana), electronic stick for the blind (students from Uttaranchal), heat efficient cooking vessel (Delhi) and steam operated stove (UP).

(iii) Students' involvement in validation/ technical documentation

Eight students from IIT, Kanpur, and IIT, Kharagpur, were involved in the technical studies of some of the innovations.

b) **Business development/ Venture Promotion**

Market feasibility and business planning projects have been undertaken by 13 students of B-Schools (IIM-L, NMIM, XIM-B, IIT-K, AIM and MNIT). Eight reports have already been

Innovator Ram Naresh Yadav with his power saving pump

submitted and five are expected by the end of June this year.

(i) An entrepreneur has extended support in developing the final commercial model of power saving pump developed by Ram Naresh Yadav of Kanpur (Uttar Pradesh). The formal agreement would be signed once the final prototype is ready.

(ii) Karanpal Vishvakarma of Saharanpur (Uttar Pradesh), a mechanic by profession (awarded during the first competition), was supported by GIAN (North) as he developed the first prototype of his forage cutter. Encouraged by his efforts and confidence, one of his well wishers, Sardar Surjit Singh, invested in the innovation and also started a new hardware shop. He gives the income generated from repair and service of the forage cutter to the innovator.

iii) Radhey Shyam Tailor had developed a Trench Digging Machine. To meet his working capital requirement, GIAN (North) mediated with the State Bank of India to extend cash-credit facility to the innovator's unit.

(iv) Madan Lal Kumawat, who developed a multicrop thresher, was supported in his endeavours aimed at adding new features which would increase the demand of his device.

(v) GIAN (North) provided start up support to Ram Abhilash (he had developed a LPG driven pump) to set up his own micro venture at Rohtak, Haryana.

(c) Technology Promotion

(i) Check Dam : The innovative and low cost Check Dam designed by Bhanjibhai Mathukia of Gujarat has been taken up for replication with the assistance of GIAN (West) in Rajasthan. A check dam with a series of semi-circular structures has been constructed in a village near Jaipur by the local community with the help of Morarka Foundation. Seva Mandir, operating in the Udaipur region, has offered to replicate the same in their area next year.

(ii) Pulley with stopper : Developed by Amrutbhai Agrawat, this pulley has a lever arrangement that ensures one way movement of the rope and bucket. The Dept of Science & Technology, Rajasthan, is considering installation of this innovative pulley in five villages in Rajasthan.

(iii) Farm Implement: The Agriculture Department, Govt. of Punjab, has offered to help in the diffusion of technologies relevant to farming practices in Punjab - particularly multicrop thresher (developed by Madanlal Kumawat of Rajasthan). If

found suitable, it could sponsor its field trials in Punjab.

(iv) **Dry land Forestry:** Concerned government departments were persuaded to visit plantations of Mr Sunda Ram at Sikar who uses an innovative minimal water plantation technique. They have agreed to replicate it in other places in Rajasthan. A documentary is being prepared on this technique.

(d) Assistance for IPR Protection of grassroots innovations

One patent application has been filed in India. Basic documentation for two more innovations are complete and are in the process of being filed.

GIAN (North) facilitated participation of five grassroots innovators from Rajasthan in patent awareness programmes organized by the Patent information Cell, Department of Science and Technology, Government of Rajasthan. Another programme is being planned exclusively for rural/ grassroots technologies.

A new vision of India as a major player in the global setting has been articulated.
The wave of change sweeping the country and the world has thrown up myriad opportunities and challenges...In order to meet these challenges, just as we had launched a national freedom movement to unshackle ourselves from the foreign powers, we need to launch a national innovation movement.

Dr R A Mashelkar

GIAN (North East) has built many partnerships with centres of excellence in the region.

B: GIAN (North East)

Linkages with Formal Scientific Institutions

GIAN (North East) has built many partnerships with centres of excellence in the region. This includes North Eastern Regional Institute of Science and Technology (NERIST), Guwahati University, Nagaland University and Tezpur University. This is in addition to IIT, Guwahati, which has hosted GIAN (North East).

In an attempt to link formal and informal knowledge, a workshop on "Translating Ideas into Products and Patents" was organized on February 17, 2003 at NERIST, Itanagar. Six grassroots innovators from the region were honoured in a research institute. This was a unique experience for the grassroots innovators.

(a) Scouting for Innovations/Traditional Knowledge

Given the fact that the existing Honey Bee Network is not very strong in this region, efforts are being made to increase the reach of the network so that more innovations and traditional knowledge practices can be mobilized. Despite all the constraints, many interesting innovation and traditional knowledge practices have been scouted.

(b) Patents

GIAN (North East) has filed patent applications for two innovations in India. It is in the process of filing of six other patents. Prior art search and a literature review with expert comments have been done for all the important technological innovations from GIAN (North East).

(c) The Network

Students from different parts of the north eastern region have been mobilized as volunteers for scouting. GIAN (North East) has organized a number of community meetings in Assam at Bongaigaon, Darang, Jorhat, Kamrup, Morigaon, Nagaon, Nalbari, and Tezpur district; in Meghalaya at Ri-Bhoi and Shillong district; in Arunachal Pradesh at Sagalee, Ziro and Itanagar etc.

GIAN (North East) has entered into an alliance with several NGOs and voluntary organizations. Jigyas Educational Trust, a leading NGO in Assam, has offered to help in scouting in Assam. SAARTHI and Morigaon Samata Mahila Sangha have been working with GIAN (North East) in Assam. In Meghalaya, Ri-Bhoi Area Welfare Association has shown keen interest.

In Arunachal Pradesh, Tani Happa Native People Society, Sagalee, and Ayo Danyi Literary and Charitable Society have been contributing to the scouting activities of GIAN (North East).

Bicycle propelled by rider and terrain induced Forces

(d) Grassroots Innovations Exhibition

GIAN–NE organized Technice 2000, an exhibition of grassroots innovations at IIT, Guwahati, during August 30 - September 1, 2002. The three-day exhibition, which attracted nearly 3000 visitors was inaugurated by Dr Mashelkar. About 32 grassroots innovators and traditional knowledge holders of the north eastern region participated in the event.

About 32 innovators and 15 scouts were honoured. Many marketing agencies showed keen interest in the "UV Protection Umbrella", developed by Mr Dulal Choudhury. GIAN (North East) is trying to mediate a technology transfer agreement on behalf of the innovator.

A bamboo bicycle model made by a prisoner, Mr Manik Saikia of Jorhat jail, was also included in the exhibition. The development of this product was the result of an initiative taken by GIAN (North East) to identify innovative skilled people in prisons and provide them the opportunity to engage in productive activities. The jail authorities cooperated. In recognition of his outstanding skill, the Assam Govt has reduced Mr Saikia's period of imprisonment by two years.

GIAN (North East) participated in the "Workshop on Renewable Energy Applications", organized by IIT, Guwahati. Grassroots innovators from the north east region as well as other regions participated in the workshop.

(e) Projects supported:

GIAN (North East) has extended product development support to 23 innovators and traditional knowledge holders. These include:

Bamboo Bicycle: The innovation is a cycle constructed completely of bamboo, except for the tyre, tube and chain. Mr Dodhi Pathak, the innovator, received financial support for setting up an enterprise for product development. Students from IIT Delhi, NERIST, the State Forest Research Institute (SFRI) and the Bamboo and Cane Technology Center are working to develop a commercially viable model of the product. Two models have already been made.

Bicycle propelled by Rider and Terrain Induced Forces : This mechanism uses the force generated on a bumpy road for transmission purposes. The innovator, Mr Kanak Das, has received support from IIT, Guwahati. The institute is conducting further analysis of the innovation. GIAN (North East) has initiated a market survey and four different models have been developed.

Development of Pre Medicated Bandages for Bone Fracture and Backache: This traditional method of curing bone fracture and

Nripen Kalita's zero head water turbine

backache, using herbal medicine, has been taken up for development as a viable product. The innovator, Mrs Puspalata Saikia, has received an offer of support from the Biotechnology Department, Guwahati University for product development. As in the other cases, NIF has supported this innovation through GIAN. The Assam Science, Technology and Environment Council (ASTEC) also assisted Mrs Saikia.

Floating Water Wheels for Harnessing River Energy: The innovation, a floating water wheel, harnesses energy from the river current. The innovator, Mr Mahendranath Dutta, has been offered support to tide over the model's current repair related expenses.

High Efficiency Ceiling fan: This mechanism, a ceiling fan with separation features, provides a greater volume of air. The innovator, Mr Nipul Bezbora, appears all set to introduce a new concept in the design of ceiling fans. GIAN (North East) has taken up the product for value addition, with the help of IIT, Guwahati, and Tezpur University.

Beauty Care Umbrella: This umbrella, unlike the ones currently available, provides protection from UV radiation (inhibits up to 85 per cent of UV radiation). The innovator, Mr Dulal Choudhury, has commercialized the product as a Beauty Care Umbrella. A patent has already been filed for the innovation on behalf of the innovator. GIAN (North East) is also trying to facilitate the technology transfer agreement.

Innovative Zero Head Water Turbine: Innovator Nripen Kalita's zero head water turbine, with an innovative blade arrangement, harnesses river water energy efficiently and economically. The product is being developed further.

Countable Calculator: This innovation converts a hand calculator into a mechanical counter for factories at low cost. Two young brothers, Mr Champak Bora and Mr Trilokya Bora, have developed the product. GIAN (North East) has incubated this product with the help of the Department of Electronics, IIT, Guwahati and a Technical Assistant of Tezpur University.

Additive for Petrol: This product is an additive for petrol engines. Developed by Mr R K Debgupta from Guwahati, the compound has several advantages, when used as an additive in petrol engines. The Department of Mechanical Engineering, IIT, Guwahati is working on this project. The product has been tested and the results have been satisfactory.

Low Cost Power Tiller: A 5 hp engine drives this power tiller. The wheels, made of wood, are provided with teeth to negotiate wet load operations. This innovation, the brainchild of Mr Kanak Das, will greatly benefit the poor and small farmers. GIAN (North East) will

provide managerial support in developing the prototype. ASTEC, based on a request by GIAN (North East) has sanctioned Rs 25,000 for developing the prototype.

Technique to Control Rice Bug Attack on Paddy Fields: This traditional knowledge praxuses Tham crab to trap tomato fruit borers, potato tuber moths and other bugs. Mr K D Kharkognor, Assistant Agronomist of the office of the District Agriculture Officer, Ri-Bhoi District has fused traditional knowledge with modern pheromone trap devices. Mr Kharkognor has also substituted the Tham crab with the intestines of chicken and goat and other meat with a foul smell and found it considerably successful. GIAN (North East) is redesigning the baffle traps used in this technique using locally available biodegradable material.

Innovative Coupling Device for Vehicles: The innovator R K Dasgupta's coupling device for manually run vehicles helps vehicles carrying heavy loads or travelling over steep surfaces. He has obtained a patent for the innovation. A business plan has also been prepared. A loan application (on behalf of the innovator) seeking financial support for manufacturing and marketing the product has been submitted to Small Industries Development Bank of India (SIDBI).

L-drop Auto Protector for Doors: The innovation, an L-drop auto protector, prevents unauthorised locking of doors. Mr Govinda Gogoi of Guwahati developed the innovation. GIAN (North East) is working on the development of a more efficient, commercially viable product. Literature review and prior art search have been done. A patent will be filed (on behalf of the innovator) very soon.

Low Cost Coconut Husker: The low cost coconut husker, developed by Mr Shailendra Pandey and Mr Dinanath Pandey of Assam, has been taken up for further value addition.

Herbal Treatment of *Alopecia Areata:* *Alopecia Areata* is a common disease that results in the loss of hair on the scalp and elsewhere. It usually starts with the formation of one or more small, round, smooth patches. This is a disease for which satisfactory cures are not available. However, Mr Kaviraj Kailash Chandra Mishra and his son Mr Yogesh Mishra have developed a herbal medicine to cure this disease. GIAN (North East) is helping the innovators develop a commercially viable product with the help of the Dept of Bio-technology, IIT, Guwahati.

Manual Wood Cutting Machine: This innovation by Mr Karuna Kant Nath of Assam requires less effort, is relatively inexpensive and very useful for small scale wood workshops. A market survey has been undertaken. This product has the potential for usage in hilly, remote areas and has already received 10 orders.

Innovator R K Debgupta with his power disk

Substitute for Pan Masala/Gutkha made of Guava: This product attempts to substitute guava for pan masala/gutkha. The innovator Ms Ankita Dutta is a student.

Innovative Use of Jute Sticks and other Waste Materials: This innovation uses biomass materials to make handicrafts. Ms Juti Bhattacharya of Guwahati has developed innovative products using simple technology. An NGO has also been contacted to train women (in making handicrafts in this manner) from the disadvantaged sections in Barpeta district of Assam.

Herbal Mosquito Repellent: A herbal mosquito repellent has been developed by a school student, Ms Leena Talukdar, of Morigaon, Assam. The Dept of Biotechnology, IIT, Guwahati, will study the properties of the ingredients and develop a more efficient, commercially viable product.

Herbal Pesticide to Control Termites: This innovation developed by a school student, Ms Upasana Talukdar, from Assam has been taken up for validation.

First Innovation Based Small Scale Industry started at Guwahati by GIAN-NE

The innovator, Mr R K Debgupta, who developed a power disc for bicycles and automobiles, has started an industry for the manufacture and sale of these products for bicycles. The opening ceremony of the unit was held on March 10, 2003. The machine parts are manufactured at different places and assembled at India Lever Company, established by the innovator. The unit is likely to receive support from SIDBI at a nominal rate of interest.

C) GIAN (West): Present Activities

(a) Accomplishments

GIAN (Gujarat), now GIAN West) was the set up in 1997 and has completed six years. The existing scope of GIAN (Gujarat) has been expanded to two more states, namely Maharashtra and Goa. NIF has given a grant of Rs 30 lakh for the purpose. The highlights of the achievements of GIAN West in 2002-03 are listed below:

- Obtained a US patent for the cotton stripper machine, developed by Mansukhbhai Patel of Viramgam district, Gujarat, in April 2003. This is perhaps the first patent granted to an Indian farmer cum artisan in U S A.
- Three innovators, supported by GIAN, attended the Commonwealth Science Council (CSC) Ministerial gathering in South Africa and exchanged technical know-how with students and faculty members of a technology institute in Venda, a northern province of South Africa..

- Incubation support was extended to 14 innovations. These include the check dam, auto sprayer, bicycle sprayer, hand-driven sprayer, head load reducing device, milking machine, buttonhole machine, double-acting pump, 5.5 hp tractor, oil expeller, 10 hp tractor, Bullet Santi and small diesel engine.

- Incubation finance was arranged for nine innovations. These include the hand driven sprayer, modified scooter for the physically challenged, bicycle hoe, innovative bicycle, buttonhole machine, check dam, auto sprayer, 10 hp tractor and double acting pump.

GIAN (West) provided incubation support to 14 innovations

(b) *Other Initiatives*

- An Innovators Fund (pooling contributions from innovators and using it to help other innovators) was conceptualized. The formation of an Association of Grassroots Innovators of Gujarat is being considered. Financial support of Rs 25,000 has been mobilized from the innovator and entrepreneur of the Cotton Stripper Machine for the Innovators Fund.
- Continued support is being provided to the 10 hp tractor, oil expeller, Bullet Santi, solar cooker, innovative wind mill application, auto air kick pump, auto weigh sprayer, water cooler, and ericulture (nonviolent silk rearing technique).

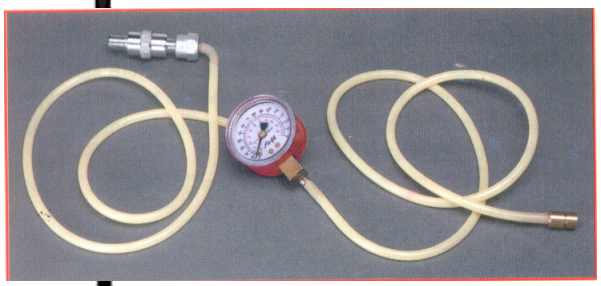
(c) Replicated the Design of Check Dam

GIAN (West) initiated a process of cross-regional application of innovations for their dissemination, market development and commercialization. Some examples of this are : Milking Machine from South India to Gujarat, Check Dams from Gujarat to Rajasthan.

GIAN sought the assistance of fifteen summer interns from top business schools and technical institutes for technical support and business development of various innovations.

(d) *IPR Initiatives and Accomplishments*

- A total of ten patents were filed in India. These include patents for the Aaruni bullock cart, natural water cooler, cotton stripper, oil expeller machine, 10 hp tractor, Bullet Santi, fibre optic conduit coupler, Aaron fly wheel, auto air kick pump and bicycle sprayer.
- Six patents were filed in the USA for the cotton stripper, Bullet Santi, fibre optic conduit coupler, oil expeller machine, Vanraj 10 hp tractor and auto air kick pump. The patent was granted for the cotton stripper machine by the United States Patent Trademark Office (USPTO) on April 8, 2003.



Auto Air Kick Pump - Arvindbhai Patel

Motorcyle Driven Santi - Mansukhbhai Jagani

- Design registration applications for two innovations - Vanraj tractor and Bullet Santi - have been filed.
- Trademarks for GIAN, SRISTI, NIF, the Honey Bee Network and SHASHWAT brand name have been filed.
- Ten applications for patents are being processed at the national level and at the United States Patent Trademark Office (USPTO).

(e) Business Development Activity

NIF provided Rs1.5 lakh for testing and prototype development of the 10 hp Tractor, Rs 56, 500 to replicate the check dam and develop autosprayer, Rs 65, 000 for prototype development and pilot scale manufacture of the hand sprayer and Rs 30, 000 for further design development of the double action pump.

Auto Air Kick Pump

GIAN (West) facilitated the technology transfer in this project. Exclusive manufacturing and marketing rights have been given to M/s Mould Well Enterprises at Dahanu in Maharashtra. A state wise dealer–distributor network is being developed for marketing the product. The distributorship rights for six states of north east India have been finalized with an entrepreneur from Guwahati. About 1,000 units have been sold.

Motorcycle Driven Santi - multipurpose tool bar

The innovator was provided assistance in developing a small gearbox to improve the efficiency of the product and include additional features. More than 50 enquiries and orders for three units have been received. Discussions are underway with an entrepreneur from Maharashtra for marketing rights for the state. NIF is helping in expanding the manufacturing facility.

The Low Cost Solar Cooker

This innovation, a Solar Cooker developed by Mr Niranjan Khatri, has been taken up by GIAN as a special social project. Technopreneur Promotion Programme (TePP) has sanctioned financial assistance of Rs. 1.30 lakh to disseminate the technology.

About 100 solar cookers were manufactured and supplied to women in rural areas in Gujarat through NGOs like Self Employed Women's Association (SEWA) and Maldhari Rural Action Group (MARAG). This project was taken up at the request of the Department of Science and Technology as a special case.

Small 10 hp Tractor

GIAN West developed the final prototype and submitted it to Central Farm Machinery and

Small 10 hp Tractor - Bhanjibhai Mathukia

Natural Water Cooler - Arvindbhai Patel

Testing Institute (CFMT&TI) for testing and certification. It has initiated the procedure for commercialization. The first round of discussions has been completed with two entrepreneurs.

Oil Expeller Machine

About 15 enquiries have been received for the machine. But these could not be processed due to the innovator's limitations. The innovator has also developed cold press technology with the financial support of a Mumbai based firm. The innovation has received favourable response from several multinational corporations.

Natural Water Cooler

GIAN (West) mobilized market development support from Gujarat Energy Development Agency (GEDA) through a subsidy. GEDA has sponsored a 75 per cent subsidy for 15 units (about Rs 1.5 lakh). Ten units have been supplied in the market

Milking Machine

Market development support has been provided for this project. The machine was displayed in exhibitions in Gujarat and Maharashtra. About 500 enquiries have been received so far. Discussions are underway with interested entrepreneurs from Gujarat for commercialization.

Bicycle Sprayer

Students of the Xavier Institute of Management, Bhubaneswar (XIMB), helped in preaparing a business plan for the product. The prospect of commercialization is being explored through clearing houses and the idea of issuing advertisements in newspapers is being considered.

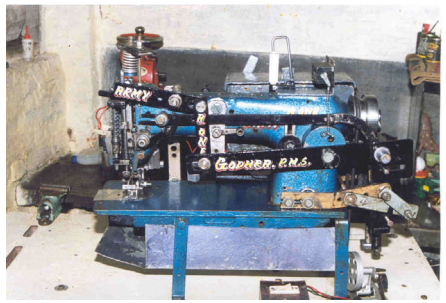
Herbal Formulations

GIAN is in the process of commercialization of 34 herbal formulations developed by SRISTI Sadbhav Sanshodhan Laboratory. Discussions are on with entrepreneurs from different regions for manufacturing and marketing the products. A pilot scale production unit is being established by an entrepreneur to meet the initial demand. Involving self help groups in producing and marketing the products in north India is being considered. Discussions are also underway with the Moraraka Foundation of Rajasthan for commercialization of these products.

Check Dam

The design of this innovation has been replicated in Rajasthan with five such check dams constructed in Gujarat and Rajasthan. The Gujarat Government was approached to replicate the design through government schemes. Proposals for financial support for

Check Dam - Bhanjibhai Mathukia



Buttonhole Machine - Anil Rashmikant Kamdar

replication have been submitted to various public and private funding agencies.

Hand Driven Sprayer

Product standardization has been nearly completed by GIAN. The pilot scale facility is being established at the innovator's place to meet local demand.

Buttonhole Machine

GIAN has completed a market feasibility study for the product with students from XIMB.

(f) Workshops and Exhibitions

GIAN (West) participated in various state and national level workshops and exhibitions to showcase grassroots innovations.Their stall at the Indian Science Congress, held in Bangalore, was adjudged the best stall in the exhibition.

I want to emphasize that to meet the twin objective of growth with equity, knowledge cannot be the prerogative of a few; everyone in the society must have access to knowledge and become a knowledge worker. Nations which do not create knowledge societies will vanish into the oblivion.

Dr R A Mashelkar

The Road Ahead

Miles to go before we sleep...

Consistent with its *raison d' etre*, NIF is relentlessly championing the cause of grassroots innovators. The voyage has uncovered many fascinating and effective innovations from grassroots innovators and steered the process of conversion of these innovations into profitable ventures.

A wide range of innovations and traditional knowledge practices from various parts of the country has been unearthed by NIF. We have been able to identify farmers, artisans and mechanics who on their own, and at times through shared community knowledge and technologies, tried to improve methods of managing natural and other resources and solving local problems creatively. Thousands of innovators and knowledge holders were identified in the last three years and we are sure that these innovators constitute a very small portion of the total. We are not content with merely identifying innovative farmers/ artisans, but have taken the process several steps forward by involving scientists, volunteers, mentors and others in joint experimentation to further improve innovations and traditional knowledge practices.

We have also found that when innovators were given opportunities to interact with one another, it gave them new ideas. This shows how processes of innovation can be stimulated, with one new idea spawning the next. And this also reveals how scientists, field functionaries, local authorities and development planners can provide support and create conditions that encourage farmers, artisans, healers and workshop mechanics to accelerate the innovation chain.

Over the last three years, NIF has acquired greater familiarity with all the facets of grassroots innovations management. In its quest as a crusader for the rights of grassroots innovators, it has won wide support from different sections of society.

Enthused by its past achievements, NIF continues to make the much-needed difference in the lives of grassroots innovators and the country at large. It stands firm in its pursuit of scouting, scaling up, and spawning grassroots innovations with renewed vigor.

Friends and Supporters

The support of partners, contributors, volunteers, and scouts who have shared NIF's vision and joined us in our efforts has enabled NIF to pursue its goals. The Governing Council and staff of NIF are grateful to them. Each of them provides the energy to make India innovative. We thank all those who wrote, spoke, served, volunteered or contributed in any other way.

We would like to remember friends who put in special efforts:

We seek to broaden the participation of the public and private sector to meet the mammoth task of scouting, spawning, and scaling up grassroots innovations.

The Indian Institute of Management, Ahmedabad; the Indian Institute of Technology, Delhi; the Indian Institute of Technology, Guwahati; the Indian Institute of Technology, Kanpur, the Indian Institute of Technology, Mumbai, the Indian Institute of Rural Management, Anand; the North Eastern Regional Institute of Science & Technology, Itanagar.

Above all, we thank DST, DSIR, Ministry of Finance, GoI, and several other public institutions without whose support, we would not have reached this far.

The Challenges

NIF has faced many challenges while on its mission of commercializing grassroots innovations. Some of these were :

- No proven formula for transforming innovations into enterprises.
  We had to set out to do the unprecedented ourselves and develop our own model, learning from Honey Bee Network, SRISTI and GIAN.
- Establishing the critical link between potential customers and innovators.
- Ensuring the requisite level of compatibility of objectives between academic institutions and the innovators.
- Effecting partnerships with industry and research institutions, which required deliberations over shared commitment and interdependency.
- Establishing the final link in the innovation chain – the distribution of benefits to the local, state and national economy.
- Access to a host of resources – funds, personnel and infrastructure for knowledge holders.

As we take stock of our past experience and reflect on how we would deliver on our future commitment to unearth a greater number of grassroots innovations, we feel that we have learnt several lessons. These are about nurturing innovations and identifying the best practices for scaling them up and ensuring their widest possible dissemination.

We seek to broaden the participation of the public and private sector to meet the mammoth task of scouting, spawning, and scaling up grassroots innovations.

Acknowledgement

The support from NIF staff and particularly Dr Sanjeev Saxena (Chief Innovation Officer), Ms Riya Sinha, National Coordinator (Scouting and Documentation) and Mr Jibanananda Khuntia (National Coordinator, Value addition and Research and Development), Dr Vijaya Vittala (Coordinator, GIAN North East), Mr Debasish Roychaudhuri (Chief Innovation Manager, GIAN North) and Mr Mahesh Patel and his team at GIAN (West), is greatly

appreciated. They have received excellent cooperation from volunteers of Honey Bee Network, particularly, Mr Vivekanandan (SEVA), Dr T N Prakash (PRITVI), Mr T J James (PEDES), Mr Kamal Jeet Miglani (SRISTI Gyan Kendra), Mr Sunda Ram (Rajasthan), Dr Balaram Sahu, Mr Ranjan Mahapatra (Orissa), Mr Arun Chandan (Himachal Pradesh), Mr Muthu Velayutham (CCD, Tamil Nadu), SRISTI team and many others from different parts of the country.

The faculty, students and staff at IIMA have extended enormous help in various activities of NIF held on the campus.

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You can also find more information about us at
www.nifindia.org

Join us

If you share our vision of "India - an innovative, creative society and a global leader in sustainable technologies", we welcome your support.

You can join us by:

- Identifying potential grassroots innovators, outstanding traditional knowledge holders and entrepreneurs.
- Making venture investments for setting up grassroots innovations based enterprises.
- Helping in the commercial and non-commercial diffusion of innovations.
- Helping link formal and non-formal science, policy makers and activists who have faith in the potential of green grassroots innovations for technological development, poverty alleviation and conservation of the environment.

Our work of recognizing and supporting the creative potential of grassroots innovators is made possible by your individual and corporate support. We welcome contributions for specific projects or for a more general purpose.

Your commitment to NIF will play a critical role in our efforts to serve countless grassroots innovators, combining the seven E's, that is, ethics, equity, excellence, education, efficiency, environment and empathy.

For more information about our work and how you can help, please write, call or email us. We welcome your enquiries, feedback and involvement.