

National Innovation Foundation

Genesis of NIF

The Department of Science and Technology (DST), Government of India, set up the National Innovation Foundation (NIF) in February, 2000 under the chairpersonship of Dr R. A. Mashelkar, former Director General, CSIR and President, Global research Alliance, to fulfill the long felt need for recognizing, respecting and rewarding innovations and outstanding traditional knowledge at the grassroots. The Honey Bee network¹, starting with a handful of volunteers 18 years ago triggered a movement to scout, spawn and sustain unaided creative and innovative urges in unorganised sectors of our society.

The NIF provides an institutional platform for the knowledge-rich, economically poor people. It is committed to making 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 on a commercial as well as non-commercial basis.

Objectives

- To help India become an innovative and creative society and a global leader in sustainable technologies by scouting, spawning and sustaining grassroots innovations.
- To ensure evolution and diffusion of green grassroots innovations in a time bound and a mission oriented manner so as to meet the socio-economic and environmental needs of our society.
- To facilitate scaling up of grassroots innovations and traditional knowledge with or without value addition through commercial and/or non-commercial channels.
- To influence public policy and conduct, co-ordinate and support research, design and development efforts in the country on grassroots innovations so as to attain and maintain technological competitiveness of farmers, artisans, mechanics, etc., in the informal sector.
- To enable protection of the intellectual property rights of the knowledge holders wherever applicable and upholding their Prior Informed Consent (PIC) before transferring their technology to any third party.

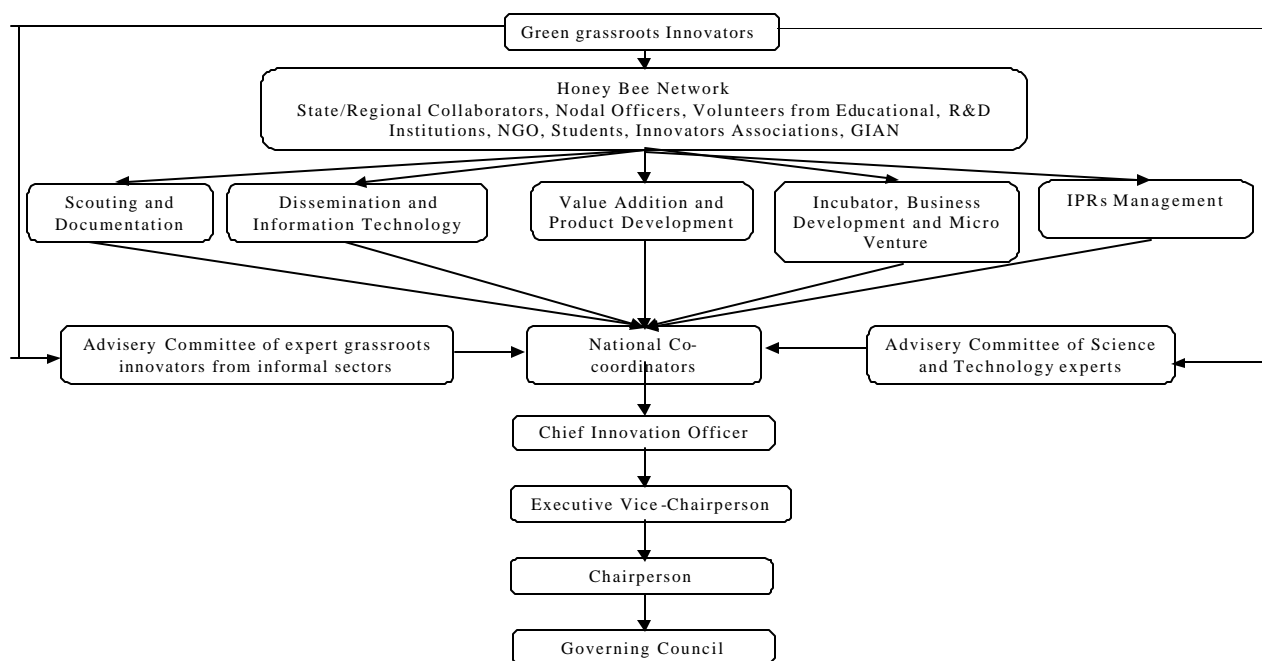
¹ The Honeybee collects pollen from the flowers and in the process links one flower to another enabling cross-pollination. Similarly, the Honey Bee Network strengthens people-to-people contacts, learning and networking by pooling the solutions developed by individuals across the world in different sectors. The network acknowledges the innovators, knowledge producers and communicators so that they do not remain anonymous. Further, the network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of HoneyBee 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.

- To build linkages between excellence in formal scientific systems and informal knowledge systems and create a knowledge network to link various stakeholders through applications of information technologies and also otherwise.
- To promote wider social awareness and applications of innovations and traditional knowledge and encourage their incorporation in educational curriculum, developmental policies and programs.

Organizational Structure

NIF is governed by Governing Council consisting of several distinguished members and is chaired by Dr. R. A. Mashelkar, former Director General, CSIR. Prof. Anil K. Gupta, IIM, Ahmedabad, is the Executive Vice Chairperson of NIF. NIF has a Research Advisory Committee (RAC), with two sub committees, one including institutional scientists, designers and technologists, and the other including informal grassroots innovators and traditional knowledge holders. Dr Pushpangadan, former Director of the National Botanical Research Institute, Lucknow, chairs the research advisory committee.

Organizational Framework



Functional Areas: building the value chain around grassroots innovations

The NIF mobilizes a large network of stakeholders to provide all necessary help to innovators and traditional knowledge holders, right from adding value to their innovations, filing patents on their behalf to the possible business development or social diffusion. Five functions of NIF are described here. Conceptually, every scholar or manager working in NIF or its affiliated institutions is a multi tasking person and role distinctions are only meant for facilitating better coordination.

A. Scouting and Documentation

Scouting and Documentation of innovations is the first step towards the fulfillment of the mission of NIF. Scouting involves extensive fieldwork, travel in rural and urban areas, organization of *Shodh Yatras* in search of ‘odd balls’ – the experimenters – and local community and knowledge experts in the society. The purpose is:

- Scouting innovations and traditional knowledge practices with the help of grassroots level functionaries of education, agriculture, rural development, small scale industry, Panchayati Raj institutions, NGOs and other individual volunteers, *etc.*
- Screening, document and verify the claims about these innovations and traditional knowledge through various networks of scientific and other institutions as well as through the Honey Bee Network collaborators, study of existing databases and field visits.
- Experimenting with material and non-material incentive mechanisms for encouraging innovators and traditional knowledge holders to produce, share and valorise their knowledge.
- Providing assistance in forging decentralised networks of inventors/knowledge experts
- Obtaining PIC of the providers of knowledge, innovations and practices.
- Disseminating details about the innovations that the knowledge providers agree to share by putting them in the public domain through Honey Bee newsletter and other media in order to enrich the repertoire of the local communities and informal knowledge experts.
- Supporting *Shodh Yatras* and other formal and informal mechanisms for sharing knowledge in different parts of the country.

B. Value Addition and Research & Development

Most of the innovations and/or traditional knowledge practices need optimization in design and/or product formulation through blending with modern science and technology inputs. Market prospects for many innovations will be very low without proper value addition. The synergy is sought between formal and informal science and technology, institutions and knowledge system. The tasks involved include:

- Coordinating with public and private sector R & D institutions, academic institutions, private associations, industry clusters and innovation intermediaries.
- Mobilizing support for product development proposals through the DST’s TePP fund and other similar programs/ projects either at local or international level.
- Building up of product development teams on contractual basis to get the products and/or services developed through licensees/mentors ensuring appropriate benefit sharing arrangements.

- Establishing grassroots incubation centers like GIANS or GIAN cells to coordinate regional product development activities jointly with other National Coordinators and local advisory committees.
- Seeking advice of domain expert members for Research Advisory Committee (RAC) to scrutinize the innovations for their novelty value, cost effectiveness, social impact, *etc.* Further, the process of incubation is tracked through an Incubation Advisory Committee (this process needs considerable strengthening) so as to increase the probability of commercial success of the innovations or traditional knowledge.
- Formulating strategies, undertaking detailed product planning and prototype development while maintaining a WBS (work break-down structure).
- Analyzing the database/national Register and study the patterns in the nature of knowledge systems, networks and exchange mechanisms at grassroots to strengthen knowledge network of creative people.

C. Business Development & Micro Venture

The Business Development cell at NIF aims at:

- Identifying application domains, conduct market benchmark studies, modify the product and ascertain techno- commercial feasibility of innovations.
- Coordinating with various entrepreneur/industry associations, management institutions and incubators to mobilize mentoring and management support for grassroots innovators and TK holders.
- Coordinating with private and public sector industrial and financial institutions and associations to link innovations with investment and enterprise wherever possible.
- Encouraging various industry associations and other developmental bodies to set up mechanisms for licensing innovations for business development. The benefits may be shared in an equitable manner with the innovators and TK holders. In addition, a share may be contributed towards conservation of nature, innovators association, and for community development.
- Providing financial assistance to innovators, TK holders and other players in the supply chain for all activities related to technical and business incubation.
- Helping promote various innovations and outstanding TK through market and non-market channels.

D. Intellectual Property Rights Management

The only resource, as mentioned earlier, in which poor people are rich is their knowledge. Protection of the intellectual property rights and generating incentives for them becomes necessary to ensure knowledge-based approach to work. The activities necessary to achieve this goal are:

- Pursuing prior art search so that innovators can maintain their competitive edge and uniqueness of each practice can be properly assessed.
- Coordinating with various intellectual property institutions and attorneys to mobilize *pro bono* or paid help for grassroots innovators to file patents, trademark and other means of IP protection besides filing applications on their behalf directly.
- Providing assistance to innovators to enter into licensing arrangements with entrepreneurs for transferring technologies.
- Creating an innovation fund for supporting innovators through contributions from innovators and others.
- Screening patents and other prior art on the traditional knowledge included in the National Register and oppose wherever possible improperly issued patents.
- Pursuing with the government authorities, the possibility of NIF providing the certificate of inventions/unique Traditional Knowledge accompanied by medium term protection so as to reduce transaction costs of the IP offices and the innovators.
- Coordinating with WIPO and other international patent offices to secure IP protection for grassroots innovators globally, wherever applicable.

E. Dissemination and Database Management through Information and Communication Technology (ICT) applications

To help in developing three databases at NIF based on the prior art search viz., National Register of Grassroots Innovations and Outstanding Traditional Knowledge, People's Knowledge Database (PKD includes public domain but valid knowledge) and Database of Professional Knowledge (DPK deals with entries received from professionally trained innovators or traditional knowledge holders). Other activities are:

- Developing and maintaining the multilingual National Register of Innovations (contemporary innovations and traditional knowledge), PKD and DPK management, electronic networking, web based management of value chain for grassroots innovations, coordination with various regional language portals and managing National Grassroots Innovation and TK Management Information System. National Register also helps in protecting the IPRs of knowledge holders.
- Coordinating with multi language, multimedia kiosks at various public places, educational institutions and local bodies and help establish decentralized Indian language databases of innovations and traditional knowledge.

- Coordinating dissemination and publication activities of NIF in various languages. Helping in diffusion of innovations and traditional knowledge on sectoral and regional basis to trigger experimental and innovative ethic.
- Managing the archive of all communications and maintain effective touch with latest trends in technologies which can be harnessed in support of grassroots innovators, develop an effective management information systems, design and develop softwares in open source for use by GIANS and other collaborators, maintain websites of NIF and all other collaborators, *etc.*

Grassroots Innovations Augmentation Networks - GIANS

The first Grassroots Innovations Augmentation Network (GIAN) was established in Gujarat in March 1997 with the help of Gujarat Government, SRISTI and IIMA with the primary objective to link innovations, investment and enterprise. This idea was mooted at the International Conference on Creativity and Innovations at Grassroots (ICCIG), January 11-14, 1997, held at IIM Ahmedabad, where the need for a micro-venture promotion and finance support system to cater to the need of grassroots green innovators was recognized.

Following this model, GIAN-NE cell has been set up at IIT, Guwahati and another independent GIAN-N is set up at Jaipur in collaboration with Rajasthan Government in 2002 and 2003 respectively. As establishment of full-fledged GIAN takes its own course of time, GIAN cells have been formed at different places with the active involvement of regional collaborators and technical institutions to incubate innovations for product development and eventual setting up of enterprises. Two such cells have been formed in Karnataka and Tamil Nadu.

Achievements/ Highlights

1. Documenting the knowledge, innovations and practices of grassroots innovators and traditional knowledge holders and rewarding the outstanding one's among these

NIF (www.nifindia.org) has organized five national campaigns till date. The fifth campaign to scout innovations and outstanding traditional knowledge ended on 31st January, 2006. More than 65,000 innovations and traditional knowledge practices have been scouted from over 450 districts of the country, during these five campaigns. NIF has also been able to mobilize a large number of practices pertaining to women's knowledge domain. It is important to mention that 80% of these entries have been received through Honey Bee Network volunteers. Many of these practices are not unique and several may be found in more than one place. What the database shows is the vibrant pervasiveness of the knowledge system at the grassroots level.

In the first national campaign of NIF, which started in March 2000, around 1600 innovations and traditional knowledge (TK) examples were identified. The next year the number increased to around 13,500 collected from around 300 districts of the country. In the third round, NIF received more than 21, 000 innovations and traditional knowledge examples. In the fourth round, NIF slowed down the scouting because of the need for sorting out, screening and adding value to already scouted tens of thousand innovations and traditional knowledge apart from lack of resources. The fourth round concluded on December 31, 2004 with around 14, 000 innovations and TK. Out of these, over one

hundred short listed entries were presented before the RAC panel of experts for recommending innovations for award (26th and 28th May, 2006 Agricultural RAC and 10th and 11th June, 2006, Mechanical RAC). The research advisory committee comprised very distinguished experts from formal and informal sectors. For instance, the committee to screen agricultural practices and varieties was chaired by Dr.Nagarajan, Chairperson, Protection of Plant Variety and Farmers Rights Authority and included three Vice Chancellors and several other directors and senior scientists. The Sixth National Campaign would continue from February 1st 2007 till December 31st, 2008.

Harnessing creativity of children

NIF joined hands with Central Board of Secondary Education (CBSE) to unearth the creativity of children by organizing a National Competition for innovations and ideas for students. A circular was issued by CBSE to all its affiliated schools to participate in this National Campaign. NIF received numerous entries from all parts of the country and presently the short-listing of the same is in progress. Last year NIF collaborated with SRISTI in bringing out a special issue of Honey Bee celebrating creativity of children. Hon'ble President of India Dr. A.P.J. Abdul Kalam wrote an inspiring editorial. Buoyant by the success of the special children's issue, this year, NIF brought out a special multimedia CD featuring children's creativity. NIF received a large number of queries from all over India for the CD. NIF has proposed to make special arrangements to document creative ideas of children during their interactions with Hon'ble President in different parts of the country.

2. Collaboration with formal scientific institutions

1. MoU with CSIR

NIF signed a Memorandum of Understanding on 29th June 2004 with the Council of Scientific and Industrial Research (CSIR), New Delhi for scientific validation of innovations/ practices. A Joint Implementation Committee (JIC) comprising directors of leading CSIR labs, CSIR Headquarter and nominees of NIF has been constituted under the chairpersonship of Prof. R. Kumar, emeritus scientist, Indian Institute of Science, Bangalore. Several technologies have already been taken up for validation at CSIR labs. Four sub groups have been set up to process the technologies submitted by NIF dealing with energy, mechanical, food processing and nutraceuticals and herbal drugs. Each sub group includes the directors of various CSIR labs and thus the best of the formal science interacts with the best of the informal science.

2. MoU with NBRI

An MoU has been signed between National Botanical Research Institute and NIF to screen herbal innovations/traditional knowledge.

3. MoU with Indian Council of Medical Research (ICMR)

Out of all the practices received, more than 70 per cent deal with herbal drugs for human or animal applications. The governing council of NIF has decided that herbal claims will not be awarded till the same have been validated. However, given the limited human and financial resources, it was not possible for NIF to do justice to many such claims. Accordingly, an MoU between NIF and ICMR was signed on 23rd June 2006. Under this MOU, only such claims would be validated which meet one of the three conditions viz., (1) New plants *not mentioned* in classical codified traditional knowledge systems (2) Plants mentioned in the classical traditional knowledge systems but claimed for *new use* and (3) Combination of known plants to increase the bio-efficacy. In this case at least one constituent in the formulation will have to satisfy the criteria mentioned in (1) or (2).

4. MoU with Botanical Survey of India (BSI)

During the validation process, NIF realized that proper identification and authentication of plant sample is extremely important. To ensure highest technical standards, NIF's has signed an MOU with BSI, in July 2006.

5. Association with Kerala State IT Mission (KSITM)

The main objective is creation of Village Knowledge Registers (VKR) through the local bodies, digitization of traditional knowledge, documenting grassroots innovations, dissemination and conducting promotional programs through the use of ICT infrastructure available in the state, which includes the Akshaya centres, local bodies and regional educational institutions.

6. People's Biodiversity Register (PBR) and National Register at NIF

MoU was signed on June 14, 2004 between NIF and traditional knowledge holders of Mala community, Gujarat, mediated by IISc professionals. However, no formal understanding has yet been reached between National Biodiversity Authority and NIF.

7. Linkages with other distinguished institutes

NIF has established linkages with several premier research and technical institutions at the national level for promotion and dissemination of the potential technologies. NIF has been working closely with various institutions like IITs, NID, IARI, IVRI, SAUs, and CIIE at IIMA, etc.

3. Communications with the Media

Activities of NIF got a big thrust with the interest shown by premier National and International Television Channels. Discovery Channel- India profiled a few innovators for its television program 'Beyond Tomorrow', it held press conferences in Ahmedabad, Kolkata, Bangalore and Delhi. To highlight the role of the grassroots innovators, NDTV India started a regular series 'India Innovates' in English and 'Aavishkar India' in Hindi on its Channel NDTV Profit profiling innovators across the country. These programs generated a lot of interest amongst the people and hundreds of enquiries have been received till date. BBC London had a program on grassroots innovations, where NIF shared its views. Since mid 2006, Eenadu newspaper, a

premier daily published from Hyderabad has been carrying an article every week on grassroots innovations, which has generated tremendous response. Outlook India, a leading national weekly published an article on the innovators in its November 2006 edition. BBC London covered the December Shodyatra in Northern India and subsequently profiled some of the innovators for its program in January 2007 at IIM, Ahmedabad.

4. Value Addition, Research and Development (VARD)

Grants have been given to support innovation sand traditional knowledge in testing, validation, prototype development etc. Over Rs.10 lacs have been spent during last year on prototype development, testing and performance evaluation of mechanical, agricultural and animal health related innovations. Fellowships have been provided to innovators from its own resources as well as through external contributions. It is worth mentioning that a young entrepreneur, a former IITian also offered fellowship support to innovators.

5. Intellectual Property Rights protection

Till date, NIF has filed 105 patent applications in India and US (7 patent applications in US) and 1 PCT. Out of these seven patents have been granted in India and three patents in USA. Besides the above patent applications, four Design & Trademark Applications have also been filed by NIF on behalf of the innovators.

6. Dissemination

NIF has taken up several steps to create wider awareness about innovations at grassroots. Some of the steps include use of IT such as:

- a. Development of a multi language, multimedia Honey Bee data base
- b. NIF has co-sponsored a portal on innovation, viz., www.indiainnovates.com, being currently developed, which has generated very a encouraging response worldwide. It may eventually become a one-point stop for information on the innovative face of India.
- c. An experimental village kiosk was set up by the Honey Bee network in a village in north Gujarat to learn about the complexity involved in IT applications in villages to promote use and exchange of information about innovations.
- d. The software for the National Register has been developed and various collaborators have also been provided the database entry modules in local languages with the help of the Honey Bee network and SRISTI. This may be further improved and developed in open source soft wares.
- e. A web-based three-language innovation/traditional knowledge entry module has been put on the web site.
- f. Two state government websites, viz., Punjab and Maharashtra, have linked to the NIF site to diffuse our work widely. However, efforts will be made to pursue such linkages with all the state governments and other institutions.

7. Business Development

Large number of requests have been received from around the world for various products, either for technology transferring providing exclusive/non-exclusive marketing/manufacturing rights or for simple purchase of innovative products. Some experienced industrialists and professionals

have also extended support in terms of mentoring a few projects to take them forward in the value chain.

The demand has been overwhelming for products like exercising jhula (swing), non-stick clay tawa, milking machine, coconut tree climber, Motek treadle press, garlic peeling machine, reuse of fused tube light, etc. The challenge is to get more and more products developed in modular manner so that same product can meet needs of different client segments with minor modifications.

Business Relationship: G2G

Technology partnership offers for manufacturing and/or marketing during the last years were received from countries like China, Taiwan, Nigeria, Uganda, Australia, United states, Holland, United Kingdom, Iran etc. It is also worthwhile to mention that a leading agricultural product distribution chain has come forward to stock some of the grassroots products in their centers spread across the country. Similarly, Subiksha chain having 500 stores in five states have also offered to partner with Honey Bee Network members for retailing fruits and vegetables and other products. Former CEO of a large company and an outstanding marketing wizard has been engaged as a senior adviser to help mentor our team and develop wider network for rapid commercialisation.

NIF is also tying up with leading NGOs in the war-ravaged country of Liberia in Africa so that low cost technologies from the grassroots in India can be used to rebuild the country. It is expected that in the next few months a large number of grassroots innovative products will find market in African countries and other parts as a part of the journey that has been termed as G2G (grassroots to global)

Product enquiry

Till date NIF has received more than 350 product enquiries from around 42 countries for mainly 15 products. Though the work to be done is huge in terms of the frequency and scale of traffic. It is worthwhile to note that NIF has succeeded in commercialising products to various countries in five continents, for instance, 1) Pomegranate deseeding machine: Turkey and United States of America, 2) Coconut climber: Australia and United States of America, 3) Resin grading machine: Peru, 4) Arecanut husking machine: Singapore, and 5) Garlic peeling machine: Pakistan.

Students Club for Augmenting Innovations (SCAI) Chapters

Apart from the existing chapters in various Colleges and Universities spread across India, new chapters have been set up to work in collaboration with NIF for scaling up various innovations for testing, validation, enterprise planning etc. The institutes are spread across the length and breadth of the country like the IIMs, IISc Bangalore, Kerala Agricultural University, college of fisheries, Kochi, BITS-Pilani, XLRI, Jamshedpur etc.

Students from these various SCAI chapters have shown tremendous interest in taking up various projects. The annual Business Competition, “DISHA”, was organized with the help of Indian Institute of Management, Kolkata.

Micro Venture Innovation Fund (MVIF)

NIF's efforts for setting up a high risk fund dedicated to support grassroots innovation and traditional knowledge bore fruit when MVIF was set up with the help of SIDBI in October 2003 and operationalised in January 2004.

Since its inception, a total of 72 projects have been supported under MVIF, which are at different stages of incubation. The total amount disbursed till date amounts to around Rs. 35,00,000/ (Thirty five lakh rupees) Several incubates have already started repaying back the MVIF assistance provided to them.

Technology licensing

Since inception NIF through the GIANS and its other collaborating partners have undertaken 24 cases of technology licensing which may be briefly summarized as follows: GIAN-NE with 9 (nine) cases of technology licensing, SEVA with 1 (one) case of technology licensing, GIAN-N with 1 (one) case of technology licensing and GIAN-W with 13 (thirteen) cases of technology licensing

Looking ahead

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 greater sustainable alternatives by using local resources frugally. When a Professor in Boston buys four tree climbers to do research on biodiversity at the top of trees, Indian grassroots innovators begin to contribute in advancing science. The alternative technology with the professor was not only costly but also highly cumbersome with practically very low flexibility. Similarly, several countries find that manual milking machine can improve the viability and quality of milk by avoiding touch of hand and improving efficiency. Slowly, the herbal pesticides are also making major inroads in the input market. Collaboration with some of the top labs and generation of scientific evidence is giving a new respectability with traditional knowledge. A research study received two weeks back from Gujarat Agricultural University demonstrated unambiguously that many herbal pesticides were as effective as *endosulfan* against variety of insects over two seasons. Just three per cent spray of goat milk had significant effect on controlling while flies. The traditional knowledge is generating respect out of its efficiency. There is no need for scholars to be considerate. They should evaluate it in their own professional interest to generate more viable and sustainable solutions.

Similarly, in the food processing sector, the first herbal fruit ripener might be contributed by the traditional knowledge holder members of the Honey Bee Network. This is just the tip of the iceberg. Those who see poor only as the consumer of cheap goods, miss the knowledge richness at grassroots level. The G2G model is all set to change the way the world looks at the creativity and innovations at grassroots.