HARYANA INNOVATES

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HONEY BEE NETWORK

www.honeybee.org

Regional Collaborator
Kamaljeet

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PREFACE

National Innovation Foundation has been pursuing the mission of making India innovative and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. We have not been equally successful in scouting and documenting innovations and traditional knowledge practices in every state.

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

Despite various constraints, NIF has put together a small book celebrating creativity, innovations and traditional knowledge from Haryana. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover so many examples of the ability of local communities and individuals to solve problems on their own without outside help, how much more can be done if state and private sector agencies join hands with NIF actively. I invite the state government and its various organs to actively support our quest to uncover many more creative communities and individuals in rural and urban areas. NIF will then help in building value chain around them.

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

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

There are a large number of people who may not have been educated much, may in fact be economically poor also, but still have the ability to solve a few problems so well.

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

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

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

R. A. Mashelkar, F R S
Chairperson,Governing Council
National Innovation Foundation, Ahmedabad

Towards a Creative, Compassionate & Collaborative India

The Honey Bee network[1] , starting with a handful of volunteers twenty years ago, triggered a movement to scout, spawn and sustain unaided creative and innovative urges in the unorganized sector of our society.

The National Innovation Foundation (NIF) set up in 2000 by the Department of Science and Technology, while building upon the Honey Bee philosophy has taken this initiative forward.

Under the inspiring leadership of Dr. R. A. Mashelkar, Chairperson NIF and former Director General, CSIR, NIF has taken major initiatives to serve the knowledge-rich, economically poor people of the country. 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. It aims at promoting lateral learning among local communities to generate low cost affordable solutions of the persistent and emerging problems, and enhance the diffusion of innovations on a commercial as well as non-commercial basis.

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 75,000 ideas, innovations and traditional knowledge practices from over 500 districts of the country.

[1] The Honeybee collects pollen from the flowers but they are not impoverished, it cross pollinates 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, traditional knowledge producers and communicators so that they do not remain anonymous.

Through the collaborations with CSIR, ICMR, BSI and other R&D institutions, NIF helps in getting these technologies validated and value added. Pro bono arrangement with patent firms has helped NIF to 170 patent applications in India and USA (7 patent applications in US) and 1 PCT. Out of these, twenty nine patents have been granted in India and four patents in USA.

Micro Venture Innovation Fund at NIF has provided risk capital for 113 projects, which are at different stages of incubation and the total amount disbursed is close to Rs 1.3 crores.

Receiving nearly four hundred product inquiries from around fifty five countries for various technologies, NIF has succeeded in commercializing products across countries in six continents apart from being successful in materialising thirty cases of technology licensing with the help of partner agencies.

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

Those who see poor only as the consumer of cheap goods, miss the knowledge richness at the grassroots level. The Poor can be the providers. The Grassroots to Global (G2G) model that NIF is propagating is all set to change the way the world looks at the creativity and innovations at grassroots.

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

“Technology is the non-linear tool available to humanity, which can effect fundamental changes in the ground rules of economic competitiveness”.

- Dr A P J Abdul Kalam

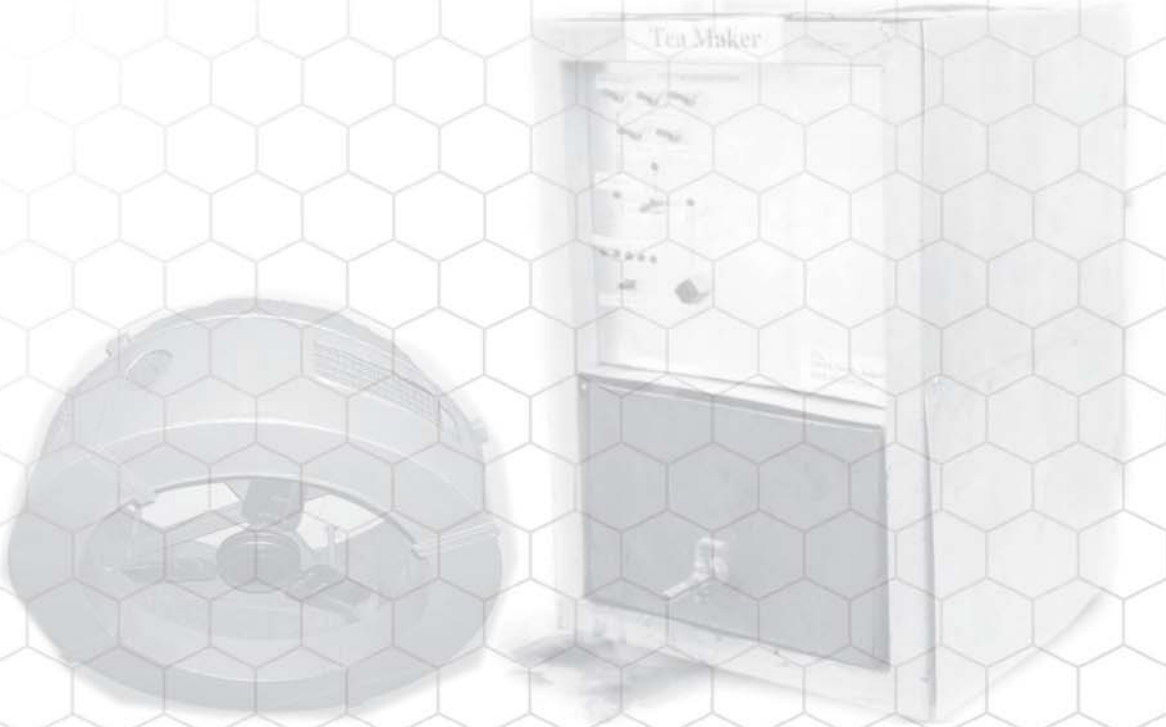
“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.

- Dr R A Mashelkar

PART I

INNOVATIONS
from HARYANA

This section contains path breaking innovations originating from ignited minds of Haryana



01

Prem Singh Saini
Ambala, Haryana

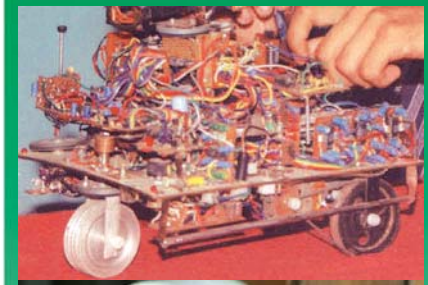
Telephone Operated Remote Switch

The innovator observed the difficulty of farmers in their homes at night, who need to go to faraway fields, as per availability of power supply, to switch the motor on or off for pumping water.

The innovation uses the power of a mobile phone on existing networks to enable the farmer to know of electricity status and remotely switch the pump on or off as required, while sitting in his home itself. This “mobile phone operated switch” is an instrument box with an attached mobile phone and modified circuit which can toggle a device between switch-off and switch-on conditions, besides letting the user know the status of the remote device.

Only authorized users having the specific mobile number can operate the system. Sitting at home, traveling thousands of miles away, the farmer can know if electricity is “on’ or ‘off’ at pump house. He can turn the pump on or off at will without spending any call charges. He would know of the status of electricity supply, and pump status and control functions just by the number of rings.

Electronic Robot, Guest Welcome System & Talking Poster



The innovator has developed an electronic robot that can be used in hazardous areas for command and control. This unit can be controlled by a TV remote and can 'see' and maneuver around obstacles, take photographs as required, detect fire, smoke and monitor humidity levels. The functional versatility and degrees of freedom is achieved by its 10 wheels, powered by 5 motors using custom electronics embedded with more than 40 ICs, 200 transistors, 900 resistors, dedicated sensors and intelligent control systems.

The innovator has developed two other intelligent applications that respond to human presence and delivers the desired function on demand. The first innovation is a guest welcome system installed at entry points in any building which can detect motion and give out the welcome address thereby surprising and delighting the guest. It also greets the guest while going out. It is programmed to be uni or bi directional, has audio volume control and as a standalone unit, it can be powered by battery or conventional electricity.

Extending the envelope of automated communication, the second innovation is a "talking poster", which suits the learning style of some users who are unable to read the content of a poster. The content is delivered via audio as a pre-recorded message when the person come in and stands in the line of sight of the poster. NIF helped the innovator in procuring orders from a Mumbai based company, which has deployed the posters among its MFI and Cooperative Bank clients for sharing information about loans schemes among potential clientele. The posters in various language versions have been installed in states like Andhra Pradesh, Maharashtra, Orissa etc.

02

Gopal Kumar Saluja
Ambala, Haryana

Ceiling Cooler

While costly airconditioners and aircoolers have been around for years, this innovator has developed a unique 'ceiling cooler" by upgrading the ubiquitous ceiling fan.

The ceiling cooler comprises the ceiling fan, a submersible water-pump with motor, a cylindrical water container having arrangement for continuous water drip, as used in desert coolers. Four spokes made from valves of old engine are welded to cross bars for adjusting and making the unit leveled.

03

Cotton Cultivation for Water Conservation

Harbhajan Singh
Fathehabad, Haryana

In many regions, where irrigation adds to the cost as well as increases the incidence of the pests, farmers have evolved novel practices to achieve efficiency with lesser resources. One such example is to sow cotton on the ridges and provide irrigation in each channel separated by a distance of six feet.

Water is applied in the alternate channel in subsequent irrigation. This reduces water requirement and controls the weeds and also the pests. This practice is found to control wilt and other diseases, while the yield remains equal to those seen in normal irrigation and sowing pattern.

04

Ram Kumar
Hissar, Haryana

Indigenous Gas Kit for Moped

As an accomplished mechanic of two wheelers, this innovator got inspired by a Maruti van fitted with a LPG gas kit, and decided to build his own gas powered moped.

He has developed a gas powered moped unit using a small LPG cylinder at the rear and a custom gas kit with a specialized valve that prevents back flow of gas or damage due to sparks in the carburetor. The low running cost and manageable weight of the small cylinder at back are some of the highlights of this innovation.

Mobile Operated Vehicle Security System

Vehicle security is an important concern as the phenomena of car theft has become a widespread problem. The innovator has used the power of mobile telephony to provide an effective vehicle security system to monitor and prevent car thefts.

If the vehicle is stolen, car owner can call back the pre-programmed mobile number in the vehicle to cut off the engine ignition system, thereby disabling it. Only the car owner can switch on the ignition by making another call to the same number. Since this system uses a mobile phone fitted inside the car, in case of theft, the car location can always be tracked using the national net of the cellular service providers.

05

Shri Rambilas Sharma
Rohtak, Haryana

Gas Based Trolley and a Water Pump

Starting out as a vendor delivering LPG cylinders, this innovator first developed a LPG gas based motorcycle. Then he moved on to develop a water pump powered by TVS moped engine running on LPG.

Apart from achieving a high energy efficiency of Re 1.00 per hour of operation, the innovator addressed several technical issues by custom designing a gas inlet, building a new carburetor to facilitate combustion of gas in the engine, using a bicycle freewheel and chain for cranking the engine.

06

Safe Chaff Cutter

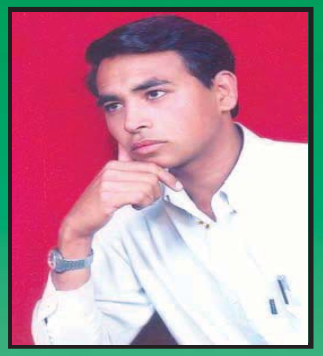
Ram Prasad Beniwal
Hissar, Haryana

Rural India is witness to many accidents due to use of unsafe equipments and some times careless work practices. When a chaff cutter is running, users sometimes use their hands to pull out the chaff stuck in the machine. The absence of safety features or design provisions to handle such functional needs causes heavy injuries.

The innovator has upgraded the existing Motor Driven Chaff Cutter with addition of gear combination to control the pressure rollers and cutting action at the time of entanglement of fodder to avoid any accident.

A safety attachment is developed for the chaff cutter by using an old gear box of thresher and propeller shafts used in cars and trucks. This attachment helps in controlling the forward and backward movement of rollers. This helps in smooth and regulated operation in machine when there is chaff entanglement in between the rollers (a clutch based locking system is developed by another innovator, Kamruddin Saifi in western Uttar Pradesh. It helps in detaching the motor from the chaff cutter through a clutch and applying instantaneous breaks through a foot pedal).

07



Ashok Kumar Dhiman

Firozpur, Panchkula,
Haryana

Tea Making Machine

The innovator has developed a versatile, automated, low cost tea making machine that facilitates the Indian method of making fresh tea. Unlike conventional machines, which use premixed powder or tea-bags, this machine produces tea, with an option of mixing milk, sugar and tea leaves in user determined proportions.

By circulating hot water in the system, the entire unit can be cleaned effectively. Using a low wattage heater, the machine can also be run by an inverter during power black-outs. It produces 4 cups of tea in 5 minutes.

In 1943 a prolific innovator, late Shri P L Mistry, had also innovated a machine for preparing tea in the Indian way.

08

Aloe Vera Gel Extractor

Dharamveer

Firozpur, Panchkula,
Haryana

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

With this device, the innovator uses the specially designed pressure cooking chamber to extract the essence from Aloe Vera. Being a compact portable unit, it can be quickly and easily transported and used anywhere, to process herbs and deliver on demand. The present machine has a capacity to process 100 kg of Aloe Vera per hour.

09

Attar Singh alias Pappu Ahalawat

Jhajhar, Haryana

Solar Powered E-bike

The innovator had difficulty in transporting fodder from far away fields to his home for the cattle. Inspired by an electric bicycle that he saw on the road, he decided to build his own version of an e-bike powered by the sun to cut down on energy costs.

Using roof mounted solar panels to charge the batteries; the innovator developed his e-bike fitted with a three phase motor at the rear. The solar bike comprises a bike frame (Todi frame), set of batteries, 3-phase motor and power controller (48 V DC – 3 Phase AC) to drive the rear wheel.

10

Improved Hadamba Thresher

Jagmal Singh
Bhiwani, Haryana

The innovator, years ago, witnessed heavy commercial losses incurred by farmers due to ineffective threshing and breakage of seeds using existing Hadamba threshers. As a solution to this, he decided to redesign it for effectively threshing castor seeds.

Improvements in this specialized thresher include reallocation of conveyer belt in the feeding chute arrangement for better grain feeding access, controlling the exit hatch for seeds to one third of the original area, reducing speed of cutter rotor to eliminate seed breakage, and maintaining speed of the agitator to achieve proper and consistent filtration of seeds.

The innovation was scouted by Dr Attar Singh of Krishi Vigyan Kendra, Haryana Agricultural University, Bhiwani.

11

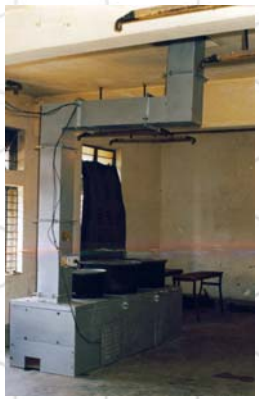
Ramesh K Nobhoria*
Chandigarh

Sanjha Chula

The innovator wanted to develop an effective, smokeless, and energy efficient stove that can handle solid biomass, adapt itself to versatile cooking needs and also achieve complete combustion.

Sturdily built in mild steel, with primary and secondary hot air flow for complete combustion, it has three sequential burning assemblies of different temperatures. It has minimal heat loss due to glass wool insulation and fire brick lining. With a heat exchanger, it has a 400W electric blower to feed hot air to the firing chamber for fast and complete combustion.

The unit has a chimney, to take away the flue gases, with an attached temperature gauge which helps indicate the need to fire more fuel in the firing box. This unit has a built in feature for placing chapatti/tandoor tawa inside the first chamber. With a separate ash pot in the fire box, the unit also works with different fuels such as biomass fuel briquettes, wool, coal etc.



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

12

Potato Peeling Machine

O P Garg
Kurukshetra, Haryana

In his native place, the gurudwaras had to peel large quantities of potatoes for the weekly "langar" (community lunch) for which the innovator decided to develop a motorized tool for reducing drudgery and increasing speed and precision.

Using locally available standard components, this ingenious device uses a standard drum into which the washed and soaked potatoes are loaded from the top. The rotation of the base of drum makes the potatoes come in contact with walls coated with textured sandpaper. The arrangement facilitates removal of the peels effectively. The peeled potatoes exit from the chute located at the side of the drum, which are then washed to remove any impurities.

13

Mahaveer Singh
Bhiwani, Haryana

Kit for Hydraulic Lift System

The innovator noticed a common problem in the hydraulic pump system of most tractor based lifting systems. In existing hydraulic system for tractors, the pump runs continuously when the engine is running, even when it is not needed. This leads to loss of power and reduction in component and product life.

Without any modification to existing tractors, the innovator built a “on demand” kit, which is mounted using four screws between the hydraulic pump and driving gear. With this device, the user can disengage the hydraulic lift system when not needed and also engage it quickly and easily when required.

14

Herbal Growth Promoter

Ishwar Singh Kundu
Kaithal, Haryana

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

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

The innovator has been supported under the Micro Venture Innovation Fund of NIF for commercialising "*Kamaal*". The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied to the garden in Rashtrapati Bhavan.

A Cost Effective Laboratory-Scale Fermenter*

Yasmin Mirza
Prof. K. R. Aneja
Dr. A.K. Punia

Kurukshetra, Haryana

The idea of developing a cost-effective laboratory scale fermenter came to their mind during the study of production of alkaline protease by a *Bacillus* species isolated from soil.

A laboratory scale fermenter is basically a vessel, which provides a controlled environment for the growth of microorganisms for obtaining a metabolic product of interest. Fermentation is mainly carried out in conical flasks, which are incubated in a shaker incubator. Unlike the laboratory scale fermenter, in this mini fermenter, glass bottles are used and any number of bottles can be used with a single motor. Also the need of shaker incubator is omitted in this set up since the air supply serves the purpose of aeration and agitation. Sparger (glass tube for air supply) is used which has a single big opening facing the bottom, the arrangement of which is considered to be the best as it doesn't get blocked by the growth of microorganisms. The drop in air pressure is also minimum. The mini-fermenter mimics large scale fermenters as it provides constant air supply.

Mini-fermenter set up requires only Rs. 500-600 and is reusable. It can be operated in batch and fed in batch mode. It can run for many days (10-15) without the risk of oxygen limitation or accumulation of waste gases. School and college laboratories can set up the mini-fermenter to study the principles of microbial fermentation.

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16

Improved Varieties of Chilli and Onion

Balwan Singh
Bhiwani, Haryana

An improved variety of chilli named Alakhpura selection has been developed, the seed quality of which is claimed to be very good with 95% germination. The fruit size is 6-9 inches, and it is said to be somewhat hot and pungent with thick skin texture. The powdered dried chilli imparts bright red colour. This variety grows well in sandy loam soil and the innovator has sold it to farmers throughout Haryana.

The onion variety developed by the innovator is commonly known in the innovator's village and neighbouring area as *"Balwan Singh ka pyaj".* It can be stored for around one year and the germination capacity of its seeds is claimed to be 98 per cent.