

## PART III

# INNOVATIONS for KERALA

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





**A. Muruganantham**  
Tamil Nadu

## Sanitary napkin making machine: An option for women entrepreneurship

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

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

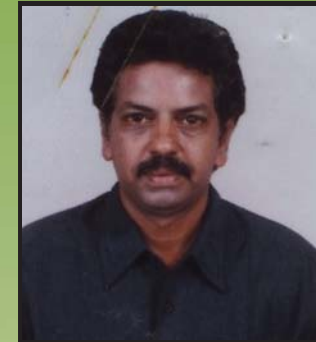
The innovator prefers to sell the napkin making machinery only to self-help groups of women. He has also designed a napkin vending machine such that one can put a coin and get a pad. With the support from the MVIF scheme of NIF, the innovator has been able to install over fifty units in seven states. NIF has filed a patent for the technology in the innovator's name.



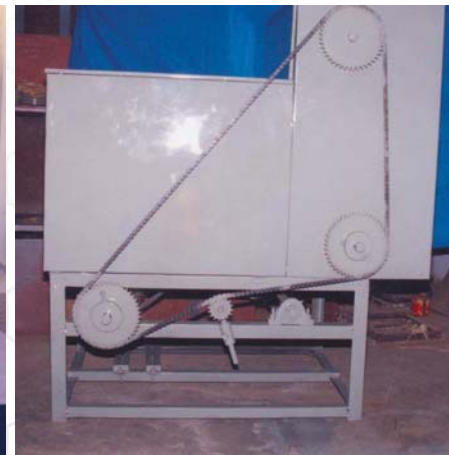
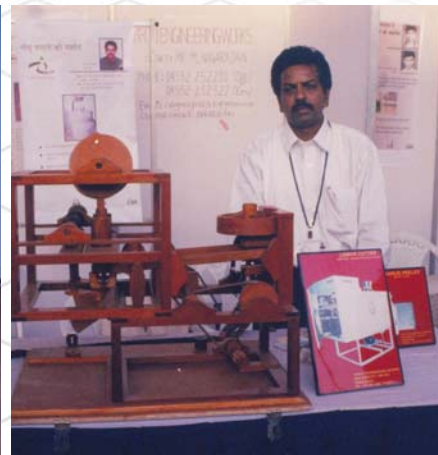
## Garlic peeling and lemon cutting machine

Faster peeling of garlic in an effective way is a major requirement in the pickle industry. This product is a food-grade, fully automated machinery designed for bulk quantity peeling of garlic. The machine ensures minimal damage and has wide application in making pickles and herbal medicines. The machine is energy efficient, saves labour, and has low capital and operating cost. It frees the industry from capacity constraints caused by shortage of labour in peak seasons.

The second product is also used in pickle industry, but for cutting lemons. It is a cost effective machine, having innovative design, with continuous feeding system. It performs precise and standard cutting of large quantity of lemons in uniform shape and size. It can be operated by one person and cuts lemon into eight equal pieces. The innovator has been able to run a good business with the financial support of MVIF and marketing effort of NIF. Nagarajan won a National Award in NIF's Third National Competition in 2005. NIF also filed patents of the machines on his behalf.



**M. Nagarajan**  
Tamil Nadu





**Sandeep Kumar**  
Bihar

## Bicycle that can be carried in a bag

A gritty and hard working graduate, Sandeep made this folding bicycle, which can be assembled and dismantled easily in a very little time. When dismantled and folded, the bicycle becomes portable such that it can be put in a bag and carried along!



## Hand operated water lifting device

An efficient way of pumping water to meet requirements in a cost effective way is always a challenge in rural India.

Developed from locally available materials, this hand operated water lifting device is simple in design, delivers high discharge and is low cost compared to conventional hand pump, bucket pump, and bicycle operated pumps.

Sakthimainthan won a Consolation Award in NIF's Fourth National Competition in 2007. NIF also filed a patent for the device in his name. The innovation has also been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.



**N Sakthimainthan**  
Tamil Nadu





**Dharamveer**  
Haryana

## **Aloe vera gel extractor**

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

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



## Mobile operated switch and multi-media poster

Imagine a village where the farmer has the luxury of being able to stay at home and switch his irrigation pump in the faraway field on or off as required during the day or at night. This is made possible by this innovation, which uses the power of mobile telephony to trigger electrical control switches.

The farmer can remotely know the status of the pump in his cell phone and turn the motor on or off by calling the particular configured number. It activates the switching by certain number of rings and hence incurs no call charges. Patent was filed by NIF in the innovator's name for this technology, which also won him a National Award in NIF's Fourth National Competition in 2007. Prem Singh has developed several other innovations, one of which is the viewer triggered multi-media poster. If any agency wants to communicate some graphic message with different language audios or videos, this multi-media poster can be very useful. NIF facilitated a Mumbai based company to purchase two hundred units of the talking poster worth around eight lakh rupees for diffusion in various states. These were made available in five local languages.



**Prem Singh Saini**  
Haryana





**Imli Toshi Namu**  
Nagaland

## Hydro generator using bamboo composite

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

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



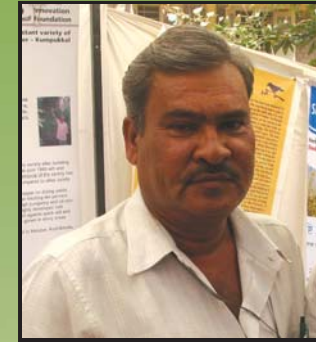


## Auto air kick pump

This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle having kick start or auto start mechanism so as to fix the problem on the spot and enable the rider to reach the nearby gas station or repair shop.

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

Arvindbhai won a National Award in NIF's Second National Competition in 2002. NIF, apart from filing a patent in his name, facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs.



**Arvindbhai Patel**  
Gujarat





**Bhanjibhai Mathukiya**  
Gujarat

## Vanraj- 10 HP Tractor

This innovation, developed over fifteen years, is a compact yet powerful 10 HP “convertible” tractor. The front axle is designed facilitating its deployment as a “three wheeler” at low speed for farming operations and a “four wheeler” at higher speeds for transporting goods to the market. The tractor is built with an adjustable wheel base for various inter-culturing operations, thereby enabling the farmer to repair the unit with minimal effort or skills.

For the tractor, Bhanjibhai won a National Award in NIF’s Second National Competition in 2002. As a result of NIF’s facilitation, he also obtained patents for his tractor in India and USA.



## Biomass gasification system

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

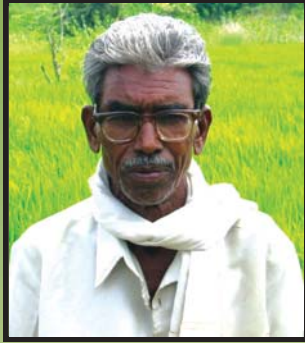
People using the biomass gas (producer gas) as a fuel generally complains of choking in the engine after running for a certain period of time. The innovator has changed the conventional design of gasifiers especially the filters and cooling unit to get clean gas, ensuring smooth operation of engine at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

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



**Rai Singh Dahiya**  
Rajasthan





**Dadaji Ramaji Khobragade**  
Maharashtra

## HMT: An improved paddy variety

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

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



## Herbal growth promoter

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

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

The innovator won a Consolation Award in NIF’s Fourth National Competition in 2007. He has also been supported under the MVIF of NIF for commercialising “*Kamaal*”. The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied for use in the gardens in the Rashtrapati Bhavan with encouraging results.



**Ishwar Singh Kundu**  
Haryana





**Sanjay Karmakar**  
Jharkhand

## Fishing rod with light and sound alarm

Many times while waiting for the fish to be trapped, the mind gets diverted and one misses the fish. This fishing rod has a siren and a light to intimate that the bait has been bitten by the fish.



## Maruti Jhoola- the health care chair

Modern life with its fast pace and sedentary lifestyle has created the need for solutions incorporating relaxation and invigoration. Maruti Jhoola is a unique health chair with multiple capabilities, functions and settings for various postures and seating dynamics.

It is ergonomically designed and serves the purpose of seating as well as exercising, with a capacity to accommodate a person weighing 120 kgs. It can double up as a hammock or a jhoola. The health chair has established itself as useful for people suffering from arthritis and joint ailments. To facilitate market, an entrepreneur has been engaged. Lot of cost was spent on packaging and transportation of the chair. It is now being redesigned and the cost may come down.



**Sakrabhai Prajapati**  
Gujarat





**Late S. Harishchandra  
Shetty**  
Karnataka

## Latex less jackfruit- Somapady variety

Using grafting technique, Harishchandra developed a latex less jackfruit variety for which he won a National Award in NIF's Second National Competition in 2002. The fruits obtained, in this particular variety, are totally gum less with a very good taste and colour. Their texture and aroma is also quite unique. He has distributed more than one lakh gum less jackfruit seedlings all over the state and also to other states like Tamil Nadu, Kerala and Andhra Pradesh (also see Honey Bee, 14(1):3-7, 2003).





## Mysore Mallige: A unique paddy variety

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

He was given a National Award in NIF's Second National Competition in 2002 and was also honored with Beeja Mitra award from GREEN Foundation (also see Honey Bee, 13(4): 5-9, 2002).



**M. Lingamadaiah\***  
Karnataka



\* Though awarded earlier, the innovator is a professional as per the present rules of NIF, which were redefined to specifically focus on innovations from the people of unorganised sector.



**K. Balakrishna**  
Karnataka

## Power generation through sewage/slow moving water

There is a search going around the world for solutions that harness alternate energy sources to generate electricity. The innovator has developed a system that generates energy from slow moving sewage or any other source of flowing water.

In this arrangement, electricity is generated when the slow moving sewage/water is passed through a cylindrical drum. The helical blades inside the cylindrical drum provide desired efficiency to the system in generating power. The capacity of the existing pilot unit is 30 kVA. This technology can have a tremendous impact on the generation of power from low velocity, high volume discharge of effluents from industries and civil sewage processing plants. NIF has been actively following up with national and international entities for partnership in taking this innovation forward and has also filed a patent for the technology in the innovator's name. Public agencies such as municipal authorities can particularly help in testing its utility.



## Arecanut husking machine

Husking of areca nut is not an easy task. One person hour is required for husking approximately 1000 nuts. To improve the productivity, Bhandari has developed two different machines to process areca nuts. These machines are designed to peel areca nut of any size and are more efficient when compared to others available in the market. In the first manual husking machine, a wheel had to be rotated by hand, which made it slower than the second automatic machine.

For this innovation, he won a National Award in NIF's First National Competition in 2001 (also see Honey Bee, 12(2):11-16, 2001 and 14(4) & 15 (1):11-15, 2003).

For better peeling of dry areca nuts, he modified the machine using the relative motion between the high-speed rotating cushioned discs. He has also developed many other technologies, such as hand pumps, pepper thresher, alternators, *papad* maker, single wheeled push carts, hydro-pumps, etc. NIF has filed a patent for this machine on his behalf.



**Narasimha Bhandari**  
Karnataka



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