TePP - A Joint Initiative of DSIR and DST/TIFAC

सत्यमेव जयते

Ministry of Science and Technology

Technopreneur Promotion Programme (TePP)

PRIDE OF INDIA™
Frontier Science & Technologies Mega Expo
INDIA'S MOST PRESTIGIOUS EVENT






Creative INDIA

The ***Technopreneur Promotion Programme (TePP)*** is a novel programme to extend *financial support* to individual innovators for converting their innovative ideas into working prototypes/models. Jointly operated by the Department of Scientific and Industrial Research (DSIR) and Technology Information, Forecasting and Assessment Council (TIFAC) of the Department of Science and Technology (DST), TePP endeavors to tap the vast innovative potential of the citizens of India.

- TePP is a mechanism to promote individual innovators to become technology based entrepreneurs (Technopreneurs). So far, TePP has supported over 100 projects and the list of such sponsored projects can be viewed at website: http://www.dsir.gov.in

- Any *Innovative Indian* – say, an Engineer, Scientist, Farmer, Artisan, Housewife or even a student, with an original idea/invention/know-how can apply for support under TePP. The maximum support under this scheme is Rs. 10.00 lakh (Rupees Ten Lakh only) per project. The project proposal should be for one's proving of a concept in the innovation chain.

- *Generic proposals on software development or only for patenting or for basic scientific research projects with no immediate commercial implications will not be accepted for consideration under TePP.*

Selected projects will be provided financial support to undertake developmental activities such as R&D, design engineering, fabrication, testing and trials, and subsequent patenting.

Interested? Contact:

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Technopreneur Promotion Programme (TePP)
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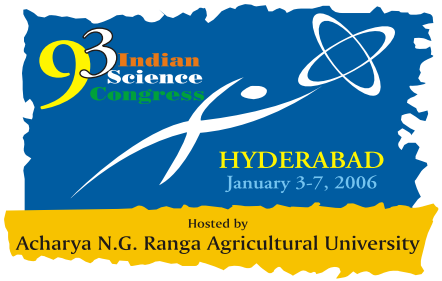

Printed by : Lovely Printers, Mobile : 9811086866

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New Delhi, 2006

Contents

Chemistry and Allied fields

Electrical Engineering / Electronics

Biomedical & Herbals

Others

India and the Knowledge Economy

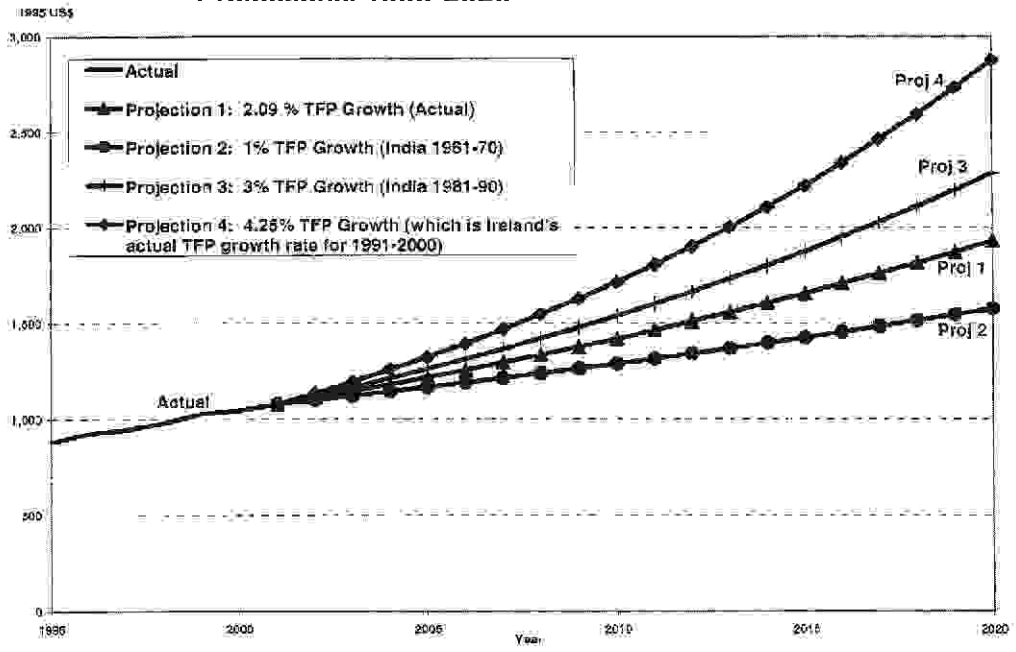
One of the world's largest economies, India has made tremendous strides in its economic and social development in the past two decades and is poised to realize even faster growth in the years to come. After growing at about 3.5 percent from the 1950s to the 1970s, India's economy expanded during the 1980s to reach an annual growth rate of about 5.5 percent at the end of that period. It increased its rate of growth to 6.7 percent between 1992-93 and 1996-97, as a result of the far-reaching reforms embarked on in 1991 and opening up of the economy to more global competition. It surged ahead to reach a growth rate of 8.2 percent in 2003-04. This is very much in line with growth projections cited in India's Tenth Five-Year Plan, which calls for increasing growth to an average of 8 percent between 2002-03 and 2006-07.

World Bank report *India and the Knowledge Economy* (2005) shows what India can achieve by the year 2020, based on different assumptions about it's ability to use knowledge, even without any increase in the investment rate.

Here, Total Factor Productivity (TFP) is taken to be a proxy for a nation's learning capability. The report summarizes that all things being equal, the projected GDP per

worker for India in scenario 4 in 2020 is about 50 percent greater than in scenario1. ***Knowledge can make a difference between poverty and wealth.***

Figure A : India: Real Gross Domestic Product Per Worker, Alternative Projections, 1995-2020



Source: World Bank: ***and the Knowledge Economy: Leveraging Strengths and Opportunities, 2005.***

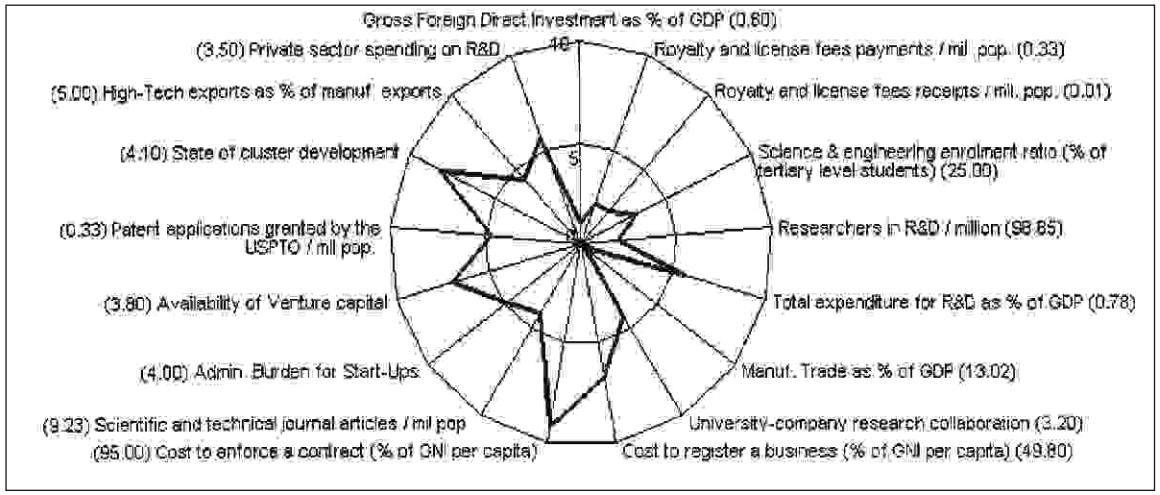
Great potential exists for increasing productivity by shifting labor from low productivity and subsistence activities in agriculture, informal industry, and informal service activities to more productive modern sectors, as well as to ***new knowledge-based activities***-and in so doing, to reduce poverty and touch every member of society. Innovation concerns not just the domestic development of frontier-based knowledge, it relates also to the application and use of new and existing knowledge in the local context. Large disparity exists between the most and least efficient producers in any sector, considerable economic gains can also be harnessed from moving the average domestic practice to the best domestic practice, not to mention best international practice.

UNDP developed detailed innovation scorecard for India and Figure B represents the scorecards for the other comparator countries. It highlights that India has been weak in tapping into the rapidly growing stock of global knowledge. Availability of venture capital is also rather limited but some signs of vibrancy are evident.

Keeping in mind these new developments, in 2003 India announced a new S&T policy. The policy recognizes that India has a sound innovation infrastructure including research laboratories, higher educational institutions, skilled human resources, and basic research strengths in agriculture, healthcare, chemicals and pharmaceuticals, nuclear energy, astronomy and astrophysics, space technology and applications, defense research, biotechnology, electronics, IT, and oceanography. The aim of the policy is to infuse the S&T system with new vitality so it can play a decisive and beneficial role in advancing the well-being of all sections of Indian

society. Several measures have been taken by government to strengthen the innovation system, one of it is TePP.

Figure B: India's Scorecard on Innovation, Selected Variables, Most Recent Period



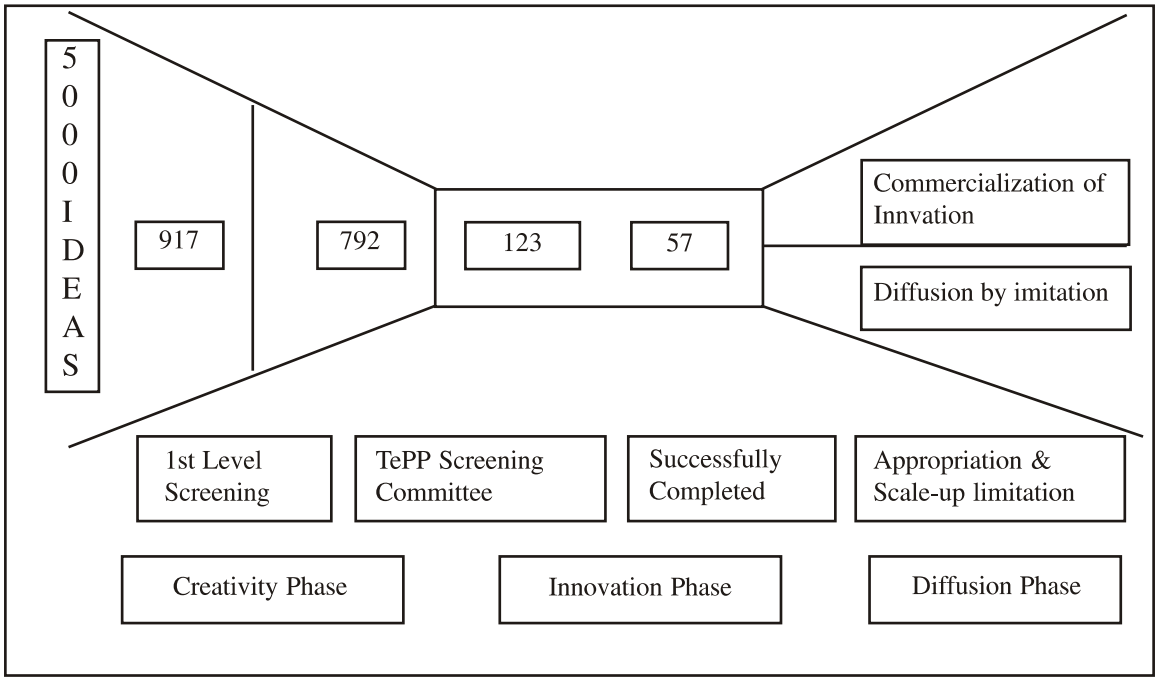
(Source : World Bank, "Knowledge Assessment Methodology," http://www.worldbank.org/kam).

Technopreneur Promotion Programme (TePP)

The phenomena of start-ups started in Silicon valley and their first round of funding comes from Angel Investors. Angels are the earliest of early-stage investors.

For many entrepreneurs, angels provide capital and frequently valuable guidance and strategic assistance-that they would likely not find anywhere else.

Figure C : TePP Innovation Funnel



Source: TePP, 2005.

The ideal angel is someone who is a generation ahead of the entrepreneur in creating value in the industry. They'll provide financial capital as well as intellectual

capital, which could be even more important than the money. Angels are sometimes said to invest *'emotional money*,' while venture capitalists are said to invest *'logical money'*. In countries like India, there are no angels- a critical gap in the innovation chain. To bridge this gap, TePP program was started. This provides "angel capital" to individual innovators at Ideation stage to work to prove their concepts as the first prototypes. Over 5000 ideas have been accessed and over 100 supported under this program. See TePP funnel in Figure C.

Innovation flows out of creativity and favorable conditions need to be created for creative energy to bloom. TePP with its extensive network of "friends of innovators", mentors, outreach partners and experts works to create a wide base of individual innovators to take India on the roadmap of Innovative India in the new knowledge economy.

1. Aaruni - Bullock Cart with a non-hydraulic tilting mechanism

The tradi-tional bullock cart has only two wheels. Consequently, part of the load is borne by the draft animals on their shoulder and neck. The harnessing system at present makes it difficult to negotiate sharp bends or turns in the road. Bullocks often develop galls on their neck. These galls affect not only the efficiency of the animals but also their stamina. To prevent the *ero-sion of strength* of draft animals and the waste of labor that stems from the limitations of the existing design. The innovator, an ***artisan*** from Junagadh (Gujarat), has developed an innovative ***Aaruni –*** the tilting cart**.**

Some of the features of this cart are:

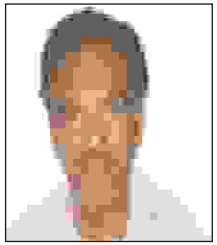
- load carrying capacity is 1.5 to 2.0 Mt. (which is 1.5 times of the conventional type)
- flexible dimensions and designs to suit local needs,
- full turning mechanism provides high maneuverability,
- available in three different models of two, three and four wheel,
- improved brake system and pneumatic wheel to make controlling easier,
- adjustable tilting and dumping mechanism, thereby saving labour costs.
- the Iron Body makes it more durable compared to traditional wooden cart,
- four-wheel base equalizes load & prevents the yoke gall formation on bullock's neck.
- can be attached as trailer with tractor or any other vehicle.
- the Unit cost has been approved by NABARD, enabling a buyer to get loan from any scheduled bank.

Price

The price of the cart ranges from Rs.13000/- to Rs.25000/- depending upon model and dimensions.

Status of Technology

The technology has been transferred to the prospective entrepreneurs for manufacturing the cart in the state of Maharashtra, Rajasthan & Gujarat.



Innovator
Shri **Amrutbhai Agrawat**
Village: Pikhor, Ta : Malia-Hatina
District: **Junagadh 362 245** (Gujarat)

Contact: G I A N (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

2. Air-energised Pressure Cooker

The Innovation lies in the use of waste heat generated in exhaust gases of an engine for cooking purposes.

The innovator has designed a pipe conveyor system with valves so that the pressure and heat can be adjusted and measured. At the end of the conveyor pipe, a stove / pressure cooker / autoclave can be attached and used for boiling turmeric rhizomes, paddy parboiling and so on. This stove costs Rs.5000 to Rs.10000 approx. depending upon the capacity of the vessel. The prototype has been tested successfully.

Patent: Patent No. 70 M 95 filed on 24.01.1995

Status of Technology
The innovator has successfully developed a prototype of the stove which can use the waste heat in the gases coming out of the engine used for pumping the water as well as low grade fuels like wood, coal etc. whenever electricity is not available and demonstrated successfully at three places in Erode district. The innovator has also received a National Foundation Award for this project.

Innovator
Shri **K R Duraisamy**
Krishnapuram,
Post- Elumathur, **Erode 638104**
Tamil Nadu

Contact : **SEVA** (Sustainable-agriculture & environment Voluntary Action, Madurai)

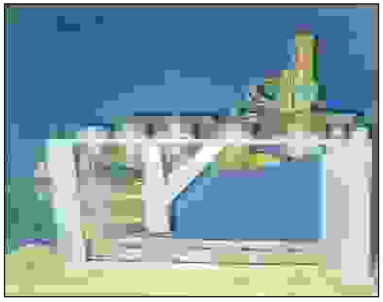
3. Bio-control agent (predatory mite), *Amblyscious sp.* against coconut eriophid mite

The Innovation lies in the **identification and isolation of a predatory mite** *Amblyscious Sp.* against **Eriophid mite** in coconuts, which causes severe damage to coconut growers in Tamil Nadu, Kerala and Karnataka. This predator is found to be very effective in combating the **eriophid mites**. Mass multiplication has been achieved successfully by the innovator at lab scale. Eriophid mites in coconut could be controlled successfully after releasing the predatory mites within three days. It was also found that the **sugarcane sheath mite** in sugarcane is a better source of multiplication of the predator mites as compared to those on artificial diet.

Innovator
Shri N Rajendran
Erode
Tamil Nadu

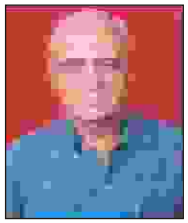
Contact : **SEVA** (Sustainable-agriculture & environment Voluntary Action, Madurai)

4. Bullock Operated Generator



The project envisages to provide utilization of the bullocks round the year by inventing a multipurpose bullock driven machine for the (a) Mechanical to electrical viz. bullock to production of electricity to operating T.V, radio, fan, kitchen appliances etc. (b) Mechanical to electrical to mechanical viz. bullock power to production of electricity to driving water pumps, compressors and machines for cottage industries (c) Mechanical to mechanical viz. bullock power to operating flour mill, pulse mill, cream separation, spice grinder etc.The machine would be light (about 125 kgs.) and so portable, advantage to farmers.

Status of Technology
Extensive research and study has been carried out by ICAR to assess the power of draft animals. Based on this it was decided that a bullock operated generator should be made for 1 H.P. output. Design, Development & Construction has been completed.

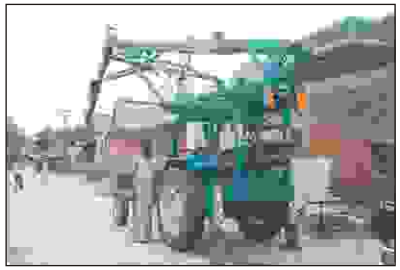


Innovator
Shri **R S Singh**
No. 9/31 D-3, Brij Enclave Extension
P.O. Bajardiha, **Varanasi** **221109**

5. Coconut harvester - multi-purpose

The innovation lies in converting a tractor into a harvester which is used for the harvesting of the coconuts efficiently.

The innovator has designed coconut harvesting machine by using his old tractor on which a hydraulic jack is mounted. It has several advantages over the manual method viz.
by tractor-mounted harvester, 600-650 trees could be harvested by two persons whereas by using manual method, only 160 trees could be harvested.
Expenses amount to Rs.460 for 8 acres/day by mechanical harvester whereas expenses would amount to Rs.640 for 2 acres/day for manual harvesting.



Status of Technology

The innovator, Kuruppaiah has very successfully developed the prototype of the harvester and has demonstrated at many places, which can be used for harvesting coconut as well as for lifting purposes. He has received four orders from farmers for, purchasing the same.

Innovator

Shri **P Karuppaiah**

Suvvarayar Street
Gomathi Lathe Works, Watrap
District : **Virudhu Nagar**

Contact : **SEVA** (Sustainable-Agriculture & Environment Voluntary Action, Madurai)

6. De-husking coconut -a mechanical device

Coconut dehusker helps dehusking the coconut in two strokes without much manual force.

Shri Jayseelan has successfully developed and demonstrated an improved device for dehusking machine driven by a 2 H.P. motor with eight (8) working stations.

The dehusking machine consists of a 9 feet shaft that is run by motor and four 3 feet transverse shafts and equal torque is transmitted from a long shaft to each transverse shaft. The complete assembled machine consists of eight stations with equal torque to each station and consists of knife dehusking device followed by a safety guard. The eight working station prototype of dehusking machine has been developed.

Status of Technology

The Innovator has successfully demonstrated dehusking of the coconut with 8 stations successfully. The productivity of dehusking of coconut has increased upto 1000 coconuts per hour.

Innovator

Shri R Jayaseelan
J.J Illam, 134-B, Kullalar Street
RAMASAMIPURAM, Post Koomapatti
District : Virudh Nagar **626133**

Contact : **SEVA** (Sustainable-Agriculture & Environment Voluntary Action, Madurai)

7. Energy Efficient Oil Expeller Machine

The oil expelling machine innovated reduces the energy consumption by coupling the motor with the crushers directly. The existing oil expeller depends on sheave and pulley technology for driving the crushers. The innovator has also made a prototype and demonstrated that the device helps save 55% of electricity for crushing, compared to a similar amount of extraction done by a conventional machine.

Benefit

The oil expeller has facility to crush all kinds of oil seeds including the cotton seeds and mustard seeds, which are acknowledged as the most difficult type of seeds to crush. The energy efficiency of this machine is at least three times that of any other comparable existing oil expeller. Moreover, it occupies about one-third of the space which any other oil expeller does.

Patent

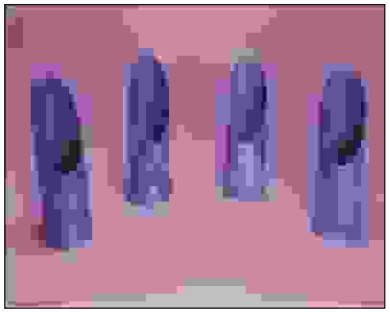
Patent application has been filed in India and USA.

Innovator

Shri **Kalpesh Chadulal Gajjar**
M/s Swastik Entek Pvt Ltd
Opposite Ganjbazar
VISNAGAR 384 315
Gujarat

Contact: **GIAN** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

8. Kittanal - a cost and time effective device for bag filling



One of the major activity in nurseries is bag filling. It is usually done by hand and involves much expenditure. Kittanal is a small nursery bag filling device that has been designed to cut down time and labour and thus the cost of polythene bag filling operations. It is a cylindrical apparatus with one its ends cut at a slant. The design of the kittanal is unique that ensures cutting down labour costs and also helps to reduce drudgery. It would enable labour to fill up more number of bags per day and will help them earn better wages.

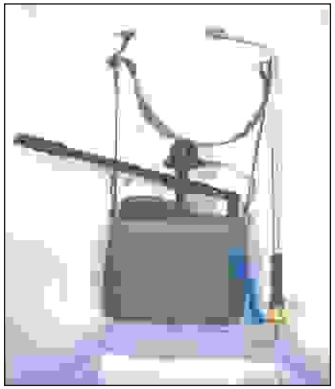
Status of Technology

Kittanal is a product, which is easily made at any place and also very cheap, so commercialization was successful in areas near to innovator's place. The project was mainly a dissemination activity. It has fulfilled the objective. 3000 pieces of Kittanal were prepared and sent to various agencies and nurseries, forestry organizations, SEWA etc. for its dissemination among potential users. Extremely good response has been received for kittanals.

Innovator
Shri **Khimji Bhai Kanadia**
Village: Gadha, Via : Vaktapur, Taluka: Himmatnagar
District. **: SABARKANTHA 383 010**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

9. Kushal – a small 5 litre capacity sprayer



Sprayers play a vital role in agricultural operations. Most of the sprayers that are available in the market of a 16-litre capacity, with a metal body are priced at more than Rs. 1,000/- per unit. These are not suited for farmers with small land holdings, as the sprayer capacity is not fully utilized.

The large sprayers spray large droplets, which may harm the young plant due to pressure exerted on them. Secondly, the spray also leads to large-scale wastage, as big drops are not absorbed by foliage. The present small sprayer provides a mist spray that may reduce the wastage of the pesticide. The spray is very gentle and does not affect the plant.

Status of Technology

A new design for a tank with better finish for enhanced market appeal was made with the help of National Institute of Design (NID). Subsequent to this, working model for Kushal Sparyer (5 ltr. Capacity) was made by incorporating the improved design features and other attributes, like a high strength PVC air stock , stop cock, compatible standard brass nozzle etc. have been added. The stand and general frame were made more attractive in appearance. These activities made the product much more efficient and aesthetically good looking as compared to the crude model.

The technology has already been commercialized by the innovator in the state of Gujarat and the innovator manufactures the sprayer at Himmatnagar of District Sabarkantha (Gujarat).

Patent

Patent has been filed in India.

Innovator

Shri **Khimji Bhai Kanadia**
Village: Gadha, Via : Vaktapur
Taluka: Himmatnagar
District **: Sabarkantha 383 010**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

10. Mini Tractor 10 H.P.

In spite the increasing cost of cultivation and reduction in size of land holding, the market is flooded with costly high power large size tractors suitable for use in large holding only. To get rid of the problems, Shri Mathukia has developed small three and four wheel tractor. It is ideal for small farmers due to its cost effectiveness, easy maneuverability and simplicity in design. These tractors are capable of performing all the agricultural operations.

This tractor has various advantages like innovative transmission unit, interchangeability from three wheel to four wheel & vice versa, design simplicity and improved performance with reduced cost, low fuel consumption and low maintenance cost, adjustable wheel base to meet the requirement of inter-culturing operation in different crops. Besides, it has flexibility to build a high power tractor.

Status of Technology

The crude prototype developed by the innovator has been technologically upgraded in order to meet the standard norms of road safety (Central Motor Vehicle Rules set up by ARAI, Pune) and the working model tested as per the norms by CFMT &TI (Central Farm Machinery Training and Testing Institute, Budni, M.P.) for its certification. This is a pre-requisite to launch the tractor commercially in market. Finally, a well-designed 10 H.P. tractor having a variable speed engine was developed.

The technology has been licensed to M/s Pramal Farmatics (P) Ltd., Anand on October 16, 2004 valuing worth over Rs. 100 lakhs.

Patent

The application has been filed for design registration on 21st day of February, 2002 vide application number 187836/Class 12-09. Patent application has been filed in India [496/CAL/2002, 22nd August, 2002] under the name *Convertible Three Wheel Tractor* and in USA [60/388,356, 13.06.2002] under the name *Tractor having a convertible front end and variable track width and related methods.*

Innovator
Shri **Bhanji Bhai Mathukia**
Village: Kalawad, Visavdar
District: **JUNAGADH**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

11. Plough - Motorcycle Driven Plough

Motorcycle driven plough is a new farming machine, smaller than the tillers and tractors but stronger than the bullocks and other farming animals and is useful for performing various kinds of agricultural operations. The product is essentially a mechanical system that can easily be attached to the rear of a motorcycle by replacing the rear wheel. The mechanical system has provision for various kinds of tools and implements (like, small harrow, seed drill and sprayer kits) to be fitted to the motorcycle for various farming operations like ploughing, sowing seeds and cultivation. The device can cultivate one acre of land in half an hour and the fuel consumed for the operation is 2 litre diesel only.

Benefits The device is useful for :

- Shallow low cost tilling option for arid and semi-arid areas
- Variable crop inter-culturing option at high speed
- Lesser cost, high speed sowing options at low cost, small capacity trailer carriages.

Patent

The product is protected in India and a design patent was filed on 21st Feb, 2002 under the name of "SHAKTI Bullet Shanti. Applications were also filed for the grant of Indian Patent and in USA with the help of NRDC under the name *Adaptive Agriculture machine.*

Innovator
Shri **Mansukhbhai Ambabhai Jagani**
Village : Mota Devaliya, Taluka : Babra
District : **AMRELI**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

12. Quick & Consistent Coconut Breaker

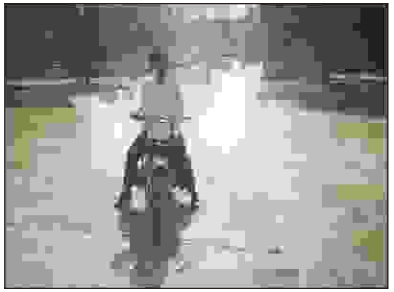
A simple, quick and consistent coconut breaker, which breaks coconut easily and neatly in two pieces is the work of the innovator.

The device overcomes some of the problems of the conventional method. It consists of a wooden box, which has a semi-spherical cavity in it in which the coconut has to be placed. Inside this cavity resides a hard thick metal piece which has a blade embedded in the middle and whose level could be changed with the help of screws. Since the breaking of coconut takes place in the box itself, water gets collected in the box. It can be taken out by providing a small outlet pipe.

Status of Technology
The technology is yet to be commercialized.

Innovator
Shri **M S V Naidu**
273, 27th Cross
11th Main, Banashankari 2nd Stage
BANGALORE 560070
Karnataka

13. Sprayer - Motor cycle (Bullet) driven Sprayer



The sprayer is mounted on the motorcycle. The sprayer is powered by the energy generated through the engine and is connected to the motorcycle with the help of a belt drive. Once the pressure starts building up in the container, the insecticide is pushed up through the connectors towards the nozzle. As the motorcycle is driven between rows of plantation, the pump sprays pesticides on the crop.

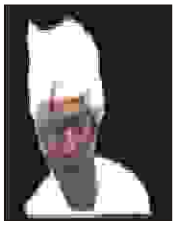
Benefits

The sprayer is energy-efficient, costs less and easier to handle. Further, it is an extremely flexible product with adjustable height and width of spraying boom. Since motorcycle requires less space to move, it can be used in a more versatile manner as compared to power sprayers that are mounted on tractors.

The motorcycle-mounted sprayer is less bulky than conventional power sprayers, so it is very easy to handle and also, it is much simpler to assemble and dissemble.

Status of Technology

Innovator has developed a working model with the help of Industrial Design Centre (IDC) of IIT Bombay with technical modifications in the existing model. However, some practical drawbacks were identified in power transmission system of the product. Therefore, power transmission system was redesigned with the help from Nirma Institute of Technology and a new working model has been developed incorporating the new technical concept.



Innovator
Shri **Ganesh Bhai Dodia**
Village: Ghogha Samdi
Taluka: Gadha – Swamina
District: **BHAVNAGAR**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

14. Udder care kit for prevention of *mastitis*

An innovative, simple kit (Udder kit) for arresting the ***mastitis*** disease at the prognostic level itself. The kit contains **drench powder** (Mastone) and **Sanitone.** The drench is given internally through mouth. It contains ***hypothiocyanate*** (DSCN), ***Cyano sulphurous*** ion (O2SCN) and ***cyano sulphuric acid ions*** (3 SCN) which react specifically with free ***sulph hydryl*** group in the bacterial protein oxidising them to the ***sulphonyl derivatives***. The drench powder thus inactivates vital bacterial. enzymes and devastates the entire bacterial load.

The ***Sanitone*** is an external applicant over the udder. It is a combination of bacteriostat and bactericide not causing undue side effects like udder tissue chaff or skin cleavage. It combats against bacterial invaders effectively. The active ingredients are a combination of ***Iodophor*** and $KMnO_4$ at a specific proportion.

The kit will help arrest the ***mastitis infection*** and prevent onset of clinical symptoms. The users are animal owners, milk societies, animal husbandry departments and farmers holding animals.

Status of Technology developed
Prognostics and Prevention kit for oncoming Mastitis. Commercialized.

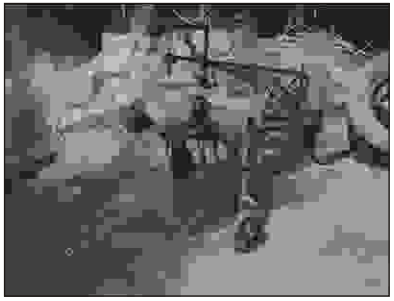
Innovator
Dr **R Venkatakrishnan**
B-44, Anna Nagar-East,
Chennai 600102
Tamil Nadu

15. Wheel Plough and multi seed drill

Multi-seed drill m/c replaces the user of manpower required & increaser efficiency of sowing

The innovator has successfully designed bullock and tractor drawn multi seed drill and tested in the fields. The seed drill (bullock/tractor drawn) has several advantages over manual method. The sowing cost of manual method is Rs.350/acre whereas sowing cost of bullock driven seed drill is Rs.75/acre and tractor driven in Rs.250/acre. Using this seed drill all seeds can be sown. The method reduces seed rate 10% in case of big seeds and 50% in case of small seeds.

Patent
The patent has been filed in India.

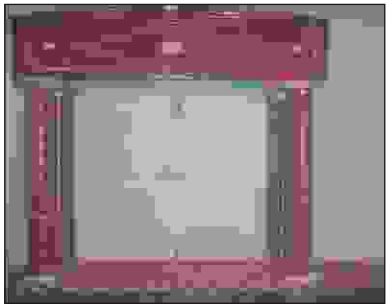


Status of Technology
The innovator has received few orders for both tractor & bullock drawn multi seed drill and he has supplied to three farmers in Madurai District. Dry land Farmers in South India are getting benefited.

Innovator
Shri **G Gnanamani**
M/s Shanmuga Sundari Industries,
10, Sambandam Street
Nelvayal Nagar, Perambur
Chennai 600011
Tamil Nadu

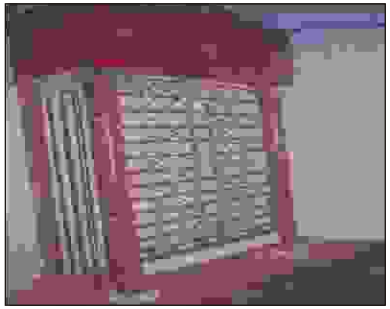
Contact : **SEVA** (Sustainable-agriculture & environment Voluntary Action, Madurai)

16. Akhlaquoon — Autoclosure Door for Safety



A mechanical auto closure device for door to trap thieves has been developed by the innovator.

The innovator is located in a resettlement area of Jahangirpuri slum. Due to the limitation of space for taking up the work, he was advised to tie-up with the ITI, Jahangirpuri. On the request of TIFAC, Director Technical Education, Delhi Government permitted the innovator to use the space at ITI Jahangirpuri where he has successfully carried out the work.



Patent : Patent Application made.

Status of Technology

The innovator has successfully developed the prototype-improved version of his auto door closure.

Innovator
Shri Akhlaq Ahmad Khan
D-1417, Jahangir Puri
DELHI 110033
Telephone: 011-27633979

17. Bus Heating System- using waste from engine exhaust

The system works on the concept of heat transfer by phase change of a working fluid. This method of heat recovery utilizes the isothermal nature of heat transfer achieved by phase change method. It results in extremely high heat transfer rates. This is the underlying principle used in the operation of heat pipes.

The system involves two heat exchangers arranged in a closed loop - one for heat extracting (boiler/ vaporizer) and the other is heat rejecter (operating on principle of condensation of vapors) with a blower blowing the indoor cabin air to be heated over the vertical tubes. These two would be connected by a large diameter pipe transporting the heat from the boiler under the chassis of the bus up to the indoor condenser; and a smaller diameter pipe bringing the condensate back to the boiler by action of gravity.

The system is useful in very cold conditions. This is a better choice than use of electric battery since the number of cells required in very cold conditions would be very large, that too for two to three hours only. The bus alternator would not be able to charge such a large battery bank.

Four test runs were carried out before the final test. The final test run was carried out in the presence of representative from Petroleum Conservation Research Association. The unit was seen to be extracting an average of 7kW heat from the engine exhaust at the expense of 325 watt of electrical energy consumption .

Status of Technology

The system was installed in a bus of the Himachal Pradesh Road Transport Corporation (HPRTC) for demonstrating and conducting trials. Technology demonstrated. Second stage demonstration with user friendly prototype (based on feed back) is required before commercialization.

Innovator

Shri **Deepak Kaushik**

A-627/A, Palam Vihar
GURGAON 122017
Haryana

18. Design Cutting Machine

The development of design cutting machine is both user friendly and eco-friendly. It has applications in easy cutting of paper, leather, Rexene, cloth, canvas and cardboard, with a cutting area of 30cm. x 150cm. and in 15 seconds time. The machine works with an attachment of 1 hp motor as compared to a conventional machine that runs with a 5 to 15 hp motor and delivers lower productivity.

Patents filed/ granted

Patent application filed in 2003 in India under the title *Multipurpose – design cutting/sizing/embossing machine*

Status of Technology

The technology has been developed and commercialized by the Entrepreneur himself.

Innovator
Mirza Mohhamad Arif
C-141, Red Quarters, Minto Road Complex
New Delhi 110002
Telephone: 011- 23230055 Email: msohil@helinfosys.com

19. Disk-brakes for Human powered Vehicles

Non-motorized vehicles such as bicycles and cycle rickshaws constitute the lifeline of the short haul transport in developing country. Brakes are still the weakest area in these vehicles. The present product is a low cost oil hydraulic disk brake for use in non-motorized vehicles specially for the cycle rickshaw and the bicycle.

Benefit
This hydraulic disc brake will be useful for vehicles such as wheelchair, vending carts of various types, animal carts, tractor-trailers with better braking

Status of Technology
The prototype of disc brakes for non-motorized vehicles have been fabricated and tested for its actual use and its effectiveness in the field. The technology has been commercialized on a limited scale by the entrepreneur.

Innovator
Shri **C P Bhatnagar**
A-98, Ashok Vihar, Phase-II
Delhi 110052

20. Double Acting Water Lifting Pump

The pump works on the principle of reciprocation of the piston and the cylinder. The basic principle of the operation is creation of vacuum resulting in suction and compressing water resulting in discharge. One cycle consists of two strokes. Both the strokes are effective and hence the device is known as *double acting reciprocating pump*. The pumping unit consists of Piston, Cylinder (Bi-housing body), valves, oil seal, sleeve, compression ring, piston rod, and suction /discharge pipes.

Benefits
This can act as an alternative of hand pump and submersible pump in order to draw the underground water with lesser recurring costs that small farmers can afford.

Status of Technology
The prototype for the double acting reciprocating pump with balancing mechanism was developed and has been tested at L.D. College of Engineering, Ahmedabad. An improved prototype was also tested at Nirma Institute of Technology.

Patent
Patent has been filed in India in 2003.

Innovator
Shri **Budhubha Vaduji Jadeja**
Village : Bhujpur, Taluka : Mundra
District : **Kutch**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

21. Elliptical Machining Bed

Elliptical Machining Bed (EMB) is a device, which can be fixed on the table top of any ordinary vertical miller or drill machine, for machining the elliptical shape directly on jobs. Modem computerized machine like the CNC Miller is available in the market for machining of ellipse shapes, but due to its high cost, is beyond the reach of thousands of small scale industries.

The innovation involved two pistons moving along the cross slide, while revolving on the bed in a circular motion. The size of the ellipse depends on the distance between the two pistons.

Patent
A patent for the proposed innovation has been filed in the year 1996.

Innovator
Shri **Prem Narayan Dharwan**
30, Raison Road, Opp.Capital
Ashok Nagar, **Bhopal 162 023**

22. Innovative Cotton Stripper

The V 797 or Kalyan variety of cotton, which is grown in vast areas of Gujarat, has to be processed to separate cotton lint (fiber with seeds) from unopened and semi-opened shells of the cotton balls before ginning operation. The only separation method available was manual separation, which was tedious and it was leaving some impurities in the cotton. The productivity was also low and it use to result in lower price in the market for such cotton compared to other cotton varieties. To overcome these problems, the innovator had developed a Cotton Stripper machine, which removes lint from the cotton shell in faster and efficient manner mechanically without breaking the seeds. It is an electricity operated machine having automatic suction facility. It is a mobile unit mounted on four pneumatic tyres.

Features

- Extremely efficient & effective machine to separate the seed cotton from the shells.
- Saves cost involved in manual labour and reduces drudgery of women & children.
- Processes 400 kg. / hr of Kala (Cotton with shell) compared to 20 kg. per day by manual labour
- Improves the quality of cotton
- Staple Cutting has been completely eliminated
- Available with automatic suction feed as auxiliary attachment

It may be useful in pre-cleaning in hybrid cotton (before ginning operation) to remove the impurities.

Patent

* Patent filed in India after product development (18 MUM 2001, January 8, 2001)
* US patent was awarded on April 8, 2003. Patent no. is: US 6, 543, 091B2.

Status of Technology

The machine has been tested in the field and has received tremendous market response. The innovator has been able to design three different models of machine for different level of capacity and requirement to cater to the needs of different segment of customers like Ginning Mills, Large Farmers, and Cooperatives. The innovator has started manufacturing the cotton stripper machine with the help of M/s Chetak Agro Industries, Viramgam, Ahmedabad. The machine is available in three different models. The costs varies from Rs. 2,00,000/- to Rs. 5,00,000/-.

Innovator
Shri **Mansukhbhai Patel**
Village: Nana Ubhada
District: **AHMEDABAD**
Gujarat

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

23. Robot for Fire Fighting

The proposal is for development of Robot for fire fighting, bomb disposal & Life rescue. The robot will be able to detect location of fire, direct water jet, automatically stop & search for new fire location. The Robot is capable to see through smoke, and is operated by a remote control system at a safe distance. This may help in saving the life of fire fighters as well as public.

Status of Technology

Designed & Fabricated the prototype of fire fighters robot which was demonstrated & displayed in Indian Science Congress, 2002 at Lucknow. The prototype of fire fighting Robot has been made and tested for the actual field conditions.

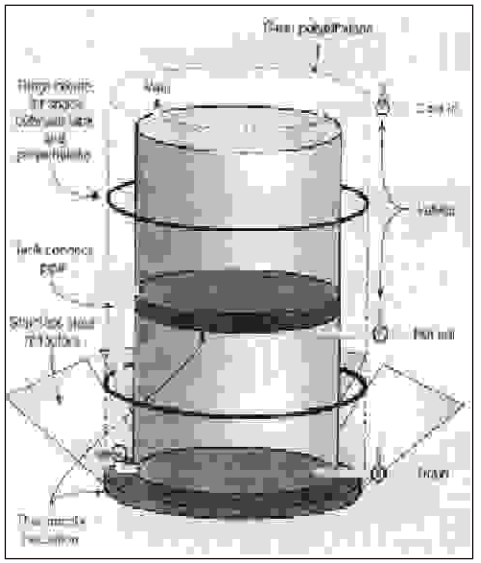
Innovator

Shri **Pranvendra Kumar Rao**
Dy Director
UP Fire Services HQS, 4th Floor
Indira Bhawan, Ashok Marg
Lucknow 226001

24. Solar Water Heater

It is an innovative device which is vertical and cylindrical with omni-directional reflector. It is mobile and it does not require pressurized water from overhead tank. Solar Water heaters are based on a common natural phenomenon: Cold water in a container exposed to the sun undergoes a rise in temperature. A solar water heater is usually a flat-plate collector and an insulated storage tank. The collector is commonly a blackened metal plate with metal tubing attached, and is usually provided with a glass cover and a layer of insulation under the plate. The collector tubing is connected with pipe to a tank that stores hot water for later use.

The innovative feature of the product is that a lotus flower shaped reflector made of stainless steel has been used. It doesn't need to be moved to follow the motion of the sun. With the use of this circular reflector, when one side is shaded, the other side will be still working. A separate insulated cover made of circular bamboo basket has also been used to help hold the heat overnight. To make the system airtight, insulation of glass wool (6 mm. thick) with a transparent polythene cover has also been used



Status of Technology

The product has been fabricated and tested. The technology is yet to be commercialized.

Innovator
Dr A Jagadeesh
Head
Research & Development
R.M.K.Engineering College
KAVARAIPETTAI 601 206
Tamil Nadu

25. Solid Biomass Furnace

Biomass fired Furnace is designed and developed for large scale heating applications like in hotels / community kitchens / sweet makers (Halwayees) etc. The furnace has the following features:

- It has an electric blower with regulator for providing primary and secondary hot air for complete and faster combustion.
- To get hot air, the burner has a heat exchanger in hot flue gas path.
- Provided with fire brick and glass wool insulation for less emission of heat from the furnace body.

- Has an Ash pot to hold ash generated for more than 6 hours
- Temperature gauge in the flue gas chimney and provision of removable cast iron grate.

Since volatiles are significant constituents of biomass fuels, a timer has been added to regulate primary and secondary air suitably so as to ensure proper combustion of volatiles.

Status of Technology

The Burner developed by Shri Nibhoria provides for special requirements of primary and secondary air distribution for optimum combustion, optimum utilization of heat generated in different cooking chambers and also adequate insulation. Biomass briquette is used as fuel. Other features of the improved Biomass furnace are:

- Inclusion of a time to regulate the primary and secondary air flows
- Improvement in the design to make furnace, as per the feedback of the users
- New design for the chapatti making tawa
- Making the system electric shock proof by putting MCB and earth leak protection
- To make the chulha workable with biomass fuel pellets.

With the TePP support, the Solid Biomass Furnace is installed at the Jawahar Navodaya Vidyalaya, Chandigarh and Najafgarh, New Delhi. Subsequently the innovator could install several such systems in school canteens, and the school authorities have expressed significant amount of savings as compared to the LPG Burners. Such a efficient furnace would also encourage use of biomass briquettes, which in turn will help curbing the use of fossil fuels like LPG. The Innovation also gives an option for utilization of locally available biomass/ agro-wastes in an environment friendly manner. The Technology developed is presently commercialised.

Innovator
Mr. **Ramesh K Nibhoria**
3521, Sector 38-D
Chandigarh 160036

26. Steam Operated Stove

The innovator has developed a stove which is operated on steam and kerosene oil with a 40% savings on fuel. The invention is based on the operation of steam boiler to enhance heat energy. When steam and air are passed through red hot carbon separately, water gas and producer gas are formed and produce high temperature due to a high calorific value. The steam operated stove would save 40% of kerosene and also produces more heat.

Status of Technology
The prototype has been fabricated and tested at Indian Institute of Petroleum, Dehradun. The thermal efficiency of improved cooking stove is found 12% higher than that of conventional one. An overall energy of 50% over the operating range has been observed.

Innovator
Shri **Rajiv Agarwal**
Behind Jain Temple
Rampur (U.P) **244 901**

Contact: Indian Institute of Petroleum (Dehradun)

27. Stored Heat Cooker

The present cooker aims at overcoming the drawbacks of a conventional cooker. The following are the innovative features of the present cooker:

- *Accumulator* has been redesigned.
- To achieve peak efficiency, the path, in which heat flows, has been modified.
- Method of use has been improved to derive optimum performance.

Benefit

The product has following advantages:

- Fuel saving.
- The cooked food remains hot for few hours without any consumption of energy.
- It serves as a sterilizing equipment especially in villages where electricity and LPG are not easily available.

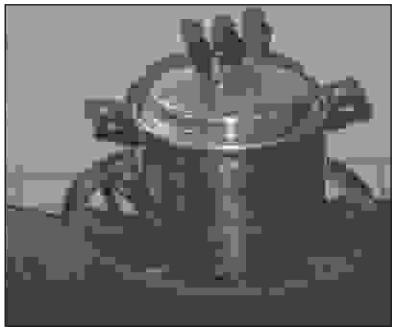
Patent

- Applied for patent in India (1997)
- Applied for patent in USA, Application No. *09/219105*
- Applied for patent from WIPO through PCT No. *PCT/99/00365*

Innovator

Shri **Vijay Vasant Deshpande**
Flat No.705, Building No. 11, Shanti Park Housing Society,
9th Block, Jayanagar
Bangalore 560 009

28. ZADD clamping for the pressure cookers

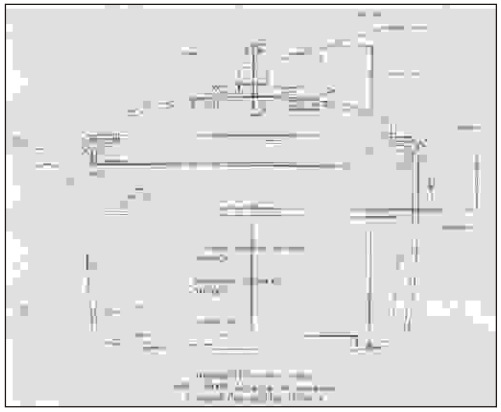


There are two types of locking mechanisms for the pressure cookers in the world viz.

- the bayonet clamping used on Prestige, Butterfly and other brands, and
- the oval clamping used in Hawkins and other brands.

Some of the features

The innovator has developed a new clamping system, which has been named as ***'Z' clamping system***. This results in better space utilisation (upto 70% as in bayonet clamping cookers) and positive locking (as in oval clamping cookers). It will be much easier to use and economical to manufacture as it can be produced with pressure die-casting process. **Prototype of the product has been successfully developed and tested.**



Innovator
Shri **Manjunath Varambally**
c/o K.G.N.Sharma
No.26/6, Secretariat Housing Colony
Marenchalli Extension
Vijayanagar
BANGALORE 560 040

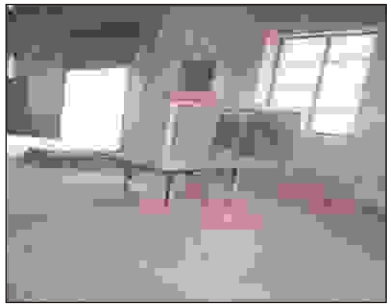
29. Alkalin Lignin products and Cooler Pads from Dry Pine Needles (DPN)

The large parts of Himalayan region are covered under Pine Forest right from Jammu & Kashmir, Himanchal Pradesh, Garhwal and Kumaon Hills of Uttaranchal, Nepal, Bhutan, Sikkim up to Arunachal Pradesh. Pine(Chir) is the main source of oleoresin from which Rosin and Turpentine Oil are produced. It also gives very good quality timber for furniture, pulp and paper, wood wool etc. Apart from these products, it also gives pine needles in dry form during summer which has not been explored for commercial use so far.

The entrepreneur has developed and standardized the process to extract the alkali lignin from the dry pine needles.

Patent Filed/Granted

The patent has been filed with the help of NRDC.



Status of Technology

The alkali lignins are being sold to the lead acid battery manufacturers in the market. The entrepreneur has also developed and optimized the performance for making the cooler pads as per the standard cooler sizes from the residual dry pine needles after extracting alkali lignin from them. The innovator has now signed an MoU with NRDC which is helping it to file a patent and license its technology to the perspective entrepreneurs. The cooler pads developed by the innovator were also sent to the popular cooler manufacturer company "Symphony" to get the feed back .

Innovator
Shri **S R Verma**
Mohan, P.O. Ramnagar
District : **Nainital** 244715
Uttaranchal

30. Demonstration plant recovering Zinc metal from locally produced industrial wastes

This is a technology developed for the recovery of pure zinc metal from zinc bearing industrial wastes and residues that are produced domestically. This includes materials with a moderate chloride content. As a result, materials such as Indian 'galvanizers Ash' and other chloride containing wastes can for the first time be treated for the recovery of pure electrolytic zinc, much of which has to be imported. A very high degree of zinc extraction is possible without the use of any special pressure generating and maintaining equipment, regardless of the form of the zinc present, due to a unique dissolution technique.

Status of Technology
Necessary equipment required under the project has been installed for the purpose of pilot plant production of Zinc metal.

Innovator
Shri Vishal Raj Gupta, SAI Niwas
M-25, Housing Board Colony
NAHAN 173001
Himachal Pradesh
Phone : 01702-222621

31. Heterocyclic fine chemicals in plug flow reactor

The Innovator aimed at to carry out cyclo-condensation reactions fixed bed of catalysts to manufacturer fine chemicals like derivatives of pyridines. The proposal is based on Zeolite based catalytic processes, which is novel. The pyridine derivatives are used to manufacture anti-ulcer, anti-TB and antihistamine drugs.

Status of Technology
Based on the studies on lab scale reactor facility, the 3,5 dimethyne Pyridine has been synthesized using simple & cheap raw materials. 70-75% yield with 99.5 % purity is achieved. By this facility, various other products can also be synthesized for application in drug and chemical industry.

The product has been scaled up to pilot plant level.

Innovator
Mohammad Tahir Taj-ali Sayad
1001-A Khan Bhag, **Sangli 416416**
Maharashtra
Telephone : 0233-326067 **Telefax** : 0233-321189

32. Laboratory dialysis, distilling and purification of proteins – fabrication of a prototype

Dialysis is a method of separating chemical substances by the means of diffusion through a semi permeable membrane. Dialysis of proteins in the laboratory involves the problems of loading and recovery. In the present invention, a sample loading and the recovery has been made simple and easier in addition to other benefits not offered by existing devices.

The novel features of the instrument are as follows:

- The sample loading is very easy – no syringe, needle is required
- Novel gravity based sample recovery – sample remains untouched by hand
- Both micro and macro dialysis in same device
- High efficiency - sample losses during processing virtually zero
- Membranes of different cut-offs can be easily used
- Leakage possibility eliminated altogether
- Labeling easy
- Running multiple samples is easy — no threads entangle no buoys
- Changes *in* sample volume can be monitored very *easily* and accurately

The process of dialysis plays a critical role in protein purification, which is the foundation of many applied technologies e.g. Diagnostics, fertility assessment, pregnancy *diagnostics,* antisera production for RlA/ELISA, enzyme base technologies e.g. biosensors, etc.

Under this project the innovator has developed a prototype of the dialysis device successfully as per the patented (USA) technology. The device has several advantages over other devices for protein dialysis. These advantages include:

- Sample loading & unloading is simple & easy. No syringes pipette etc. are required.
- Online volume monitoring possible.
- Processed sample remains untouched by hand.
- Highly efficient as loss of sample during the processing is minimal

Same device can be used for dialysis, concentration and storage of the sample., thus eliminating any losses involved in transfer to a second device for concentration or storage.

Patent : US patent granted on 9th April, 2002

Status of Technology developed
Prototype developed. Innovator further requested additional funds for comparing the performance with other systems as per PRC suggestion. TSC suggested that it can be taken as a separate project.

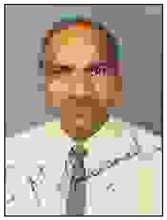
Innovator
Dr Parikshit Bansal, 5568
Sector 38-West
Chandigarh 160014

Telephone : **Off :** 0172-2214683-87 Extn.2123, **Res :** 0172-2692461
E-mail: pbansal@niper.ac.in **Mobile :** 9316034908

33. Natural, Vegetable Dyes and Shades

The innovator has developed different shades from 4 dyes. The dye sources are Goa powder, Akhrot peel, Acacia Catechu and Dolu.

Status of Technology
Developed different shades on wool (about 600), selected eco-friendly moderants.
The results are useful for undertaking further work towards commercial applications of the shades/dyes developed.



Innovator
Dr Faqeer Mohammad
868, Hamdard Nagar (B)
Behind IInd Petrol Pump
Anoop Shahar Road
ALIGARH 202 002

34. TARGET by Sol-Gel Technique

The innovator has developed *Targets* of Ultra High Purity Metal Oxides, Carbides and Nitrides by Sol-Gel technique. The Targets of pure SiO_2 & TiO_2 specifically for application in Electron Beam Evaporation for end use as optical anti-reflection coating on glass has been made. This was achieved by controlling purity and parameters of sol-gel, additives during the process, uniform particle size or powder, forming of tablet under correct pressure, thermal cycling during sintering and partial oxygen pressure.

Benefit
Sol-Gel derived *Targets* are mandatory for any targets to be used for pulse laser deposition, sputtering and electron beam evaporation technique. This has wider application for Optical Coatings on lenses used by the Defense Services on binoculars, memo devices for computer chips and for magneto resistive devices (LCMO).

Status of Technology
The innovator has made small size Targets of 10 mm diameter, 3mm thick, of pure TiO_2, SiO_2, SiC, LCMO; by Sol-Gel Techniques. The innovator had also developed Very High Purity Materials of Pure Oxides and also of Ferro-electric / Ferromagnetic nature, such as SiO_2, TiO_2, SiC, TiC, $BaTiO_3$, ZnO, LCMO etc. These Targets are used to produce High Purity, Optical Quality coatings of Metal Oxides (TiO_2, SiO_2) and that of Magneto Resistive Devices (LCMO) used in futuristic application of very high density computer memory chips. Samples were tested at M/s Milman Thin Film Systems Pvt. Ltd., Pune. The company found the Targets very suitable for industrial applications. The innovation has a tremendous export potential.

Innovator
Shri **Avinash R Moghe** Managing Director
M/s Ohm Solitronics Pvt. Ltd.
62/A, Mayur Colony, Kothrud
PUNE 411 029.

Telephone: 020-439468 1543968 15439469 14538836
Fax : 020-5433654 **E-mail:** moghe@vsnl.com

35. Vanillin from dry pine needle alkali lignin

The Innovator has successfully extracted vanillin (high value added item) from dry pine needle alkali lignin.

Small lab scale process plant to extract vanillin from the dry pine needle alkali lignin has been set up for the first time. The yield of the process is 14 % as envisaged. There is however still scope for improvement. Purity of the vanillin produced by the innovator is yet to be checked by CPPRI, Saharanpur. It may be noted the most of the vanillin is imported in the country at much a costlier price.

Status of Technology
Efforts are on to commercialise it.

Innovator
Shri S R Verma, Mohan
P.O. Ramnagar,
District : **Nainital 244715**

36. Direct Current Transformer

Direct Current Transformer (DCT) is totally a new concept and works on the principle of electromagnetic induction. It is better than the two existing methods, namely (a) Transformer and Rectifier Combination and (b) Motor-Generator set etc. DCT is an electromechanical device used to convert **3** - phase A.C to D.C. **3** - phase A.C. is fed to primary limb of DCT and +ve half cycles are tapped on one secondary limb and -ve half cycles are tapped on another secondary limb. In this way, one can get two D.C. sources from single **3 –** phase A.C. source.

Expected Benefit

DCT will be very useful in High Voltage Direct Current (HVDC) transmission, which is becoming common through out the world for efficient power transmission. DCT will also be useful in industry wherever DC source is required, e.g., automobile industry, chemical industry etc.

Patent

The patent of DCT has been filed by the innovator. NRDC helped obtaining the patent.

Innovator

Shri **Lalit Mohan**, Lecturer, Electrical Engineering
Giani Zail Singh College of Engineering and Technology
Dabwali Road
Bhatinda 151 001

37. Electronic Tagging of Book like Objects

Fabric TRrack is a technology that makes handling of day-to-day physical objects efficient (accessible). This is accomplished through electronic tagging of the objects. ***FabricTRack*** makes it possible to manage/organize the physical objects using computers. One innovative aspect of FabricTRack is that it uses fabric, Zari (The shiny/conductive border material in Sarees) and hi-tech electronics to accomplish the electronic tagging. The technology / knowledge base is developed with artisans, craft enterprises in mind. Craft indeed is a mix of aesthetics, utility and value addition. The flexibility and aesthetics of the fabric / zari along with the functionality of the hi-tech chip makes ***FabricTRack*** building blocks a versatile value addition tool in the hands of artisans and craftsmen.

The ***Fabric TRrack*** proves the viability of the innovation through a location tracking system for book like objects. A fully functional prototype of physical (paper) file tracking system - ***FileMon***, targeted towards work groups that use files is available.

Product
FileMon is a physical file (paper based) tracking system targeted towards work groups that depend on files to carry out their activities. Work groups using ***FileMon*** stand to gain increased productivity, avoidance of unnecessary stress and tension due to not being able to locate/access a file on demand, and better business decision making.

Process
The production of the above products is done using craft material and artisans. A non-craft/mechanized production process is also available.

Benefits

- The direct benefit of using the products is work group **productivity gain**.
- The indirect benefits of widespread adoption of the innovation are:
- Better livelihood for craftsmen/artisans through higher value addition to their wares.
- Technology infusion into wider section of the society and the resultant economic multiplier effect.
- Two way conversation between traditional craft and technology: opening up new innovation opportunities.

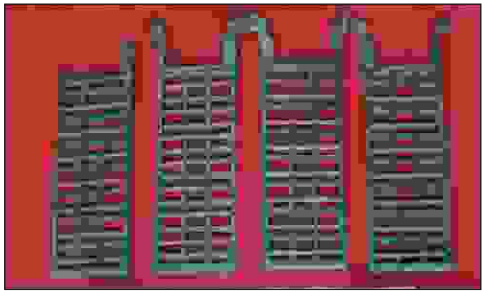
Status of Technology
Production knowledge transferable to literate, non-technical, well-off craftsperson successful.
Knowledge transfer to semi-literate, non-technical, artisan being attempted.

Innovator

Shri **Balaji Sowmyanarayanan**
41 Kuppuswamy Layout(New 19)
46th Street Extension
Nanganallur, **Chennai 600 061**

Telephone : 044-2233 5885 (Home), 044 – 2432 9962 (Office)
E-mail: labsji@yahoo.com

38. Non-metallic conducting grid for lead acid storage battery



The innovation relates to the replacement of the existing conventional solid metal electrodes/ plates/ grids with a non-metallic conducting composite. Copper plated and lead plated non-metallic ABS Plastic grids resulted in 47% saving. The objective of this project is to develop plastic grids capable of conducting the current through the core. Such battery will be light weight as well as equally efficient and par with the solid metal grid and increased value of AH/Kg. It has been found that ABS Plastic attains conductivity with the addition of carbon black and/or graphite, but at the expense of increased hardness. It is possible to mould this new material of plastic in grid form, which will be a new concept in the lead-acid battery technology.

Some of the Features

- Saving in metal
- Batteries are light weight
- Larger charge retention
- Has more shelf life
- Batteries have negligible self discharge
- Ideal for solar, UPS, railway signalling, emergency light, computer back up and other light weight applications.

Status of Technology

The proportion and blending process of ABS plastics and carbon black has been standardized. Grids were made from the material and a prototype battery has been manufactured. The battery weighs significantly less than comparable conventional lead acid storage batteries.

Innovator

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Karnataka

39. Auto-distractor

Auto-distractor is a medical equipment used in Orthopedics. It fits on external fixators like Russian ring fixator - **Ilizarov** or German **Orthofix.** It is useful in correcting

- Birth defects like short or deformed legs or hands.
- Also useful in curing polio disabilities.
- Also in accidental defects like bone loss, infected non-union or shortenings of limbs.

In Ilizarov technique, rings are mounted externally on affected hand of leg through stainless steel wires and pins. Now to lengthen that limb one has to separate those rings at a very slow rate of 1 mm per day till you get desired length compensation. Conventionally these rings are attached to each other through studs. Nuts on those studs are rotated every six hours by 90°. This produces linear displacement of nuts eventally separating rings.

Auto-distractor is a motorized mechanism controlled by a micro controller. The distraction work is fully automatic as per given program.

It has following advantages over manual:-

- Since it completes one millimeter in 54 micro steps, it is totally painless.
- It is dead accurate and human error free.
- The regeneration quality of bone is excellent.
- The regeneration time is minimum reducing post-operative period.

Auto-distractor can also be used on uni-planer German fixator Orthofix. One can also program different rates of distraction for all three different ports, it can be used for deformity correction. Auto distractors available abroad are very costly. So it can save Foreign currency as well as it will be affordable to patients.

Status of Technology
The prototype has been made indigenously and clinical trials are in progress. The results are very encouraging.

Innovator
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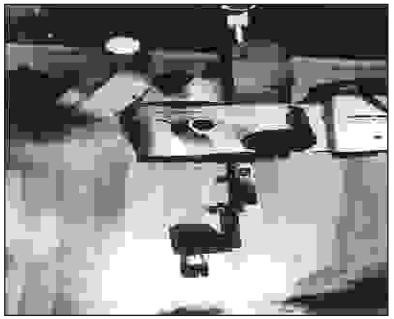
Behind new Shetkari bank H. O.
Vishrambag **SANGLI-416415**
Maharashtra

40. Diagonal Inverter for Operation Microscope



While operating on the posterior segment of the eye there is a limitation of the operating microscope in focusing beyond the anterior one third of the eye cavity because of the convex optics of the eye. Thus an additional lens system is required to visualize the posterior two thirds of the eye cavity and the retina. By interposing of a high convex lens (65D) the retina and vitreous can be visualized. This gives a diagonally inverted image of the retina thereby rendering this lens useless for operation purpose. Through this invention the inverted image is reinverted to give an erect image with the help of a poro-prism system.

In the imported system, a set of two prisms, properly aligned are inserted between the eye piece and objective column of the microscope. The prototype developed by him uses a single poro-prism. Also the single poroprism is swung into position at the focal point of microscope very conveniently whereas in the imported system alignment of two prisms is an elaborate exercise.

This indigenous item costs Rs. 25,000 as compared to the imported item which costs about Rs. 2.50 lakh.

Status of Technology

The prototype of the invention consists of a 65D biconvex aspheric lens mounted on a cylindrical tube with screw threads for fine focusing up and down movement. This lens is attached to the main prism assembly which consists of 5 right angled prisms joined together in such a manner that it reinverts the inverted image of the retina as seen through the 65D lens. The product was engineered and 2 prototypes were developed using tools and fixtures in an engineering workshop.

The technology has been commercialized by the innovator himself.

Innovator
Dr **S C Gupta**
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NEW DELHI 110 007
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41. Herbal Pesticide

The Innovation lies in development of herbal pesticides that is cheaper & effective to control pests.

Formulations of herbal pesticides to control pests of vegetable crops and paddy were successfully developed. Over 500-1000 liters of pesticides have already been sold to more than 300 farmers in 50 villages in nearby districts. The innovator, Shri Nagarajan has successfully developed pesticides in both liquid as well as powder form. The pesticide has a shelf life of 6 months.

Status of Technology
The Technology is yet to be commercialized.

Innovator
Shri **K Nagarajan**
Koralampatti, Konoor Post
Kannivadi Via
District: **Dindigul**
Tamil Nadu

Contact : **SEVA** (Sustainable Agriculture & Environment Voluntary Action, Madurai)

42. Herbal Products for Diabetes and Heart Disease

Animal toxicity studies were undertaken in the project. Results would be useful in seeking permission from DCGI for undertaking clinical trials.

Patent

The patent has been filed in the name of *A process for the preparation of an anti-diabetic preparation from Fenugreek seeds*. Patent application no. 980/DEL/97. Also, patent has been filed in the name of *A process for the preparation of an anti-diabetic preparation*. Patent application no. 982/DEL/97

Status of technology

Animal toxicity studies completed. The work done would enable to apply to Drugs Controller General of India for seeking permission to take up clinical trials as per their norms.

Innovator

Prof. **P. S. Murthy**
B-164, Sector-14
NOIDA 201 301

43. Memory Enhancer from Panchgavya

The process has been developed for micro encapsulated pellet formulation with adequate stability containing ingredients of *Ashtamangal Ghrit*, which acts as memory enhancer. This product will be safe and stable and will help people in enhancing the memory capacity.

Status of Technology

The coated micro spheres containing Ghee and other constituents of *Ashtamangal Ghrit* were successfully prepared and analyzed for accelerated stability studies, which has revealed that Ghee retained its chemical composition in this formulation for at least five years without any decomposition sign. The formulation is pleasant and acceptable by consumers. The technology is not yet commercialized.

Innovator

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Contact: Go-Vigyan Anusandhan Kendra (Nagpur)

44. Portable X-ray Body Imaging Device

X- Ray Imaging is essential to diagnose Pulmonary Tuberculosis & Heart Diseases. These X-Ray images are obtained by Converting Fluoroscopic Images into digitized format. Such digitized images can be transported by Electronic media to a Mother Centre for interpretation. The system is extendable worldwide.

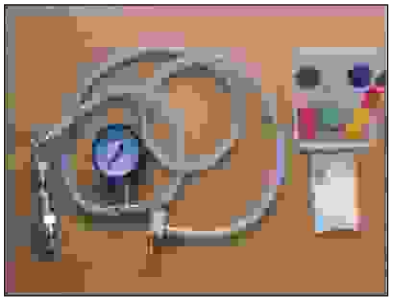
Status of Technology

Assembly for grabbing X- Ray images was fabricated. A number of trials were undertaken. The images were transferred to a hard disc and were suitably modified by using Photoshop software. Thereafter such modified images were successfully transferred over a distance through a CCD Camera. The innovator is trying to improve the device by using a COMD camera.

Innovator

Dr **Prakash Bhave**
X-Ray Clinic, Nikhil Pride, Tilak Road
2042 Sadashiv Peth,
Pune 411030

45. Auto Air Kick Pump



A handy device to inflate tyre of scooter or motorcycle having kick start mechanisms. The innovative air pump comprises of a special adapter, a pressure gauge, rubber tubing and a nipple. The adapter is fitted on to the compressor (by removing the spark plug). The nipple on the other end is then inserted into the tyre. The air pressure generated inside the cylinder of the motorcycle / scooter, while kick starting, is utilized and transferred in to the deflated tyre with the help of auto kick pump. The pressure can be measured from the pressure gauge attached to the device. The device is very useful and handy, when the tyre gets punctured and there is no repair shop nearby.

Some of the features of the device are:

- Threads of the adapter is made of aluminum
- Has non return valve in adapter in place of conventional valve
- Brass nozzle in place of plastic
- Nylon dust used as a leak proof agent
- Five different sizes and shapes of kit etc.

The final product has been tested at LD College of Engineering, Ahmedabad for two stroke engines as well as four stroke engines.

Patent

Patent has been filed both in India in the year 2002 and in USA on 19th June, 2003 under the name *Auto air kick pump for inflated tyres*.

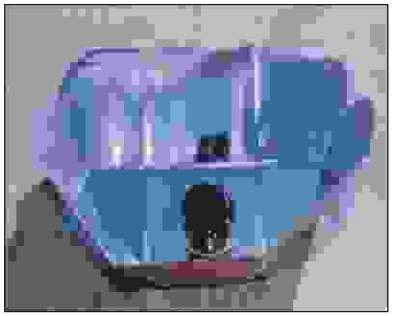
Status of Technology

The technology has been transferred to M/s Mould Well Enterprise, near Janak Enterprises, Dahanu Road (Maharashtra) 401602.

Innovator
Shri **Arvindbhai Ranchhodbhai Patel**
92-93, Pragati Park-2, Near Dhruv High School Maninagar (East),
AHMEDABAD 380 008

Contact: **G I A N** (Gujarat Grassroots Innovations Augmentation Network, Ahmedabad)

46. Low Cost Solar Cooker



The conventional solar cooker consists of glass reflectors, which are very vulnerable and involve high recurring cost along with high initial cost. In the present device, a reflective silver paper is used as a reflector to replace glass. The solar cooker prepared on this concept is very cheap and highly efficient. Since the material used is made of corrugated paper sheets, it is light in weight. The sheets are attached in such a way that it can be easily folded to minimize space requirement. The cost of the solar cooker is considerably cheaper (in the range of Rs. 75/- to 100/-).

Benefit

The solar cooker will be highly useful for floating communities like Banjaras, who carry the cooking material with them wherever they go to earn their livelihood. Besides, the product will be useful in warm regions of the country like Gujarat, Rajasthan etc., for common mass, where the sources of conventional fuel are not easily available.

Status of Technology

The product was fabricated and distributed among potential users with the help of NGOs for wider dissemination. The solar cookers were distributed to create awareness on its uses and benefits. Pamphlets and other literature were also distributed along with the solar cooker so that users can understand not only the concept but also other prominent advantages of the cooker.

Innovator
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Innovator / Innovation Index

Note : The Number correspond to Profile Numbers.

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