Automatic pump operator

National Second
Household & General Utility

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M Manihar Sharma (59), a mechanic and an innovator, has developed a system for automatic control of the water pumps for domestic and industrial use, in filling up overhead water tanks and ground reservoirs.

Second eldest among seven siblings, Manihar lost his mother when he was eight years old. He was brought up by his aunt. His father, a priest by profession, was a good scholar of Sanskrit. After Manihar passed class two, his father shifted him to a Sanskrit school, which did not go well with him. He left the school and completed his studies till class six privately and resumed regular schooling thereafter. After matriculation, he abandoned his studies due to financial problems and got married in 1972. He then started working as a labourer on muster roll for two years with the Engineering Department, Thoubal. The job was on daily wages basis.

Given the irregular nature of the job, he switched over and joined a shoe shop as a salesman but because of his health, had to leave it within a few months. He then decided to drive an auto rickshaw. Starting early in the day and working till late night, he did well as an auto driver and became the

Secretary of the Auto Association of Manipur in a few years. His irregular eating had an adverse effect on his already weak body system. Frustrated at being unable to give the desired attention to his family, specially children, he gradually started reducing his working hours and finally left driving in 1992.

Doing some jobs off and on, he started his restaurant in 1994. The restaurant ran well and he could earn a surplus and even buy some gold for his family. One day, during a regular medical check up, his Doctor friend asked him to join him and manage his clinic. Initially, he was a bit skeptical but later decided to go ahead as the job gave him plenty of time for his other innovative pursuits. This continued for twelve years after which their association ended due to some misunderstanding.

Since childhood, Manihar had never played with anything bought from the market rather he had always developed his own stuff like toys and small machineries. As a young man, he mastered all the nuances of repairing and maintenance of light vehicles and other engines. His constant inspiration has been his mechanic teacher, who used to repair or modify complicated and advanced machineries without any use of sophisticated tools and equipments. The mechanical tips and logical but informal steps, shared by his teacher have been the backbone of his innovative spirit.

After working as an auto rickshaw driver, running a small restaurant, serving as an assistant to his doctor friend, Manihar Sharma is now a full time innovator. His innate creativity has not been tampered by the constant struggle of making his ends meet on a day-to-day basis. The society and his own family members mockingly branded him as the man who would go to "*numit*" (sun) for his lack of pragmatism.

Developing the Automatic Pump Operator

While working with his doctor friend, the sight of the water overflowing from the overhead tanks in the nearby houses used to disturb him because his family members had to walk a long distance to fetch drinking water. He thought of a machine that could minimize the wastage of water and human power and started working on his first innovation, Automatic Pump Operator (APO) machine.

A crude prototype of Pump Operator, made in 1997, boosted his spirit but lack of money depressed him. Appreciation and recognition at the exhibitions could not bring in the financial support for his innovation. Fortunately, an officer from Manipur Science and Technology Council (MASTEC) helped him to get the Technopreneur Promotion Programme (TePP) support in 2005-06 for the prototype development of his machine.

The initial glitch was just over but more of it was to come in the future. The mechanical and electrical parts that he needed were not available in the local market. They could only be bought in bulk, either from Kolkata or Guwahati. The inability to buy expensive parts from the markets outside the state forced him to manufacture those plastic parts himself. Making molds for every part would have costed him several lakhs of rupees that he couldn't afford. So, this perfectionist and frugal innovator enrolled for a three months course on plastic molding techniques at Central Institute of Plastic Engineering and Technology (CIPET). He is the only trainee, among hundreds, who has actually made use of the technology.

The obsession to do the things perfectly made him to first practice the art of manual molding of plastic for years. His skill, hard work and sheer perseverance makes even CIPET send him works sometimes. The process is not a simple one. He still experiments and works on his molds, whenever he gets time. So far, for his Pump Operator he has developed more than 30 wooden molds. Each part or component (except the electrical components) is hand made by him**.**

While fixing the electronic circuit components, he had a lot of trouble in using the small hand-held drill to pierce through the circuit board. To overcome this challenge, he developed a micro-drill using old transistor-motor and other components. The micro-drill works very efficiently and is light and easy to use.

The APO is a mark of genius; not only all the components were hand made after years of learning, the equipments to assist him in his small work-shed were also modified or re-built to meet his requirements. After 15 years of struggle, he completed the APO machine with seven variants.

Automatic Pump Operator (APO)

The APO is a hassle-free household water management device that integrates the ground reservoir, water pump and the overhead tank.

Using a central control panel, the pump switches on automatically as soon as the overhead tank goes below the threshold level and switches off as soon it gets full. It also takes feedback from the source of water (reservoir-ground or overhead) to check if there is enough water. When there is little or no water, the APO does not switch on the pump. Thus it prevents damage to the motor.

In the most advanced version of the APO, Manihar has incorporated a system such that the feedback is available from multiple overhead tanks and the ground reservoir as well. The overhead tanks can be at different heights. If there is a surplus in a particular tank and deficit in another, irrespective of the fact whether ground reservoir has water or not, the APO can switch on the motor to pump water from the tank with surplus water to the one with deficit.

The APO covers the entire spectrum of a thorough water pumping system – from a running pipe, pond, river, tank, etc. It can lift water in higher tank from lower one and *vice versa* depending upon the need. Depending upon the complexity of the system and the features required, the cost of APO varies between Rs. 2000-3500.

Most of the automatic pump controllers[1], use feedback from overhead tank only, while the present innovation has also used feedback from reservoir to ensure no damage to motor due to empty running. The controller systems using the feedback of reservoirs are completely electronic and are costlier[2]. Interestingly, he has not filed any patents as he lacks the knowledge of patenting.

Other Innovative Pursuits

Around 1960, when still a bachelor, Manihar Sharma thought about a passenger pedal rickshaw with a capacity of six to seven people. But, he did not dwell hard over it. After developing an APO, he started to revive the idea but due to the lack of technical instruments and financial problems, he could not complete it. His other innovative works include a dryer and a *dhoop*-making machine.

Innovative Dryer: This machine is a simple dehydrator with an efficient mechanism. Hot air is blown into the drying chamber from below with the help of normal heating rods and air blower. Every layer of the drying tray is attached with an air guide that provides uniform distribution of hot air. On the upper corner of the machine, an exhaust fan continuously takes out the moisture. Preliminary trials indicate much faster and more uniform drying process for fruits and vegetables. The added advantage is that the machine is run by a single-phase power; which means any domestic line can be used. It also consumes less energy. A similar capacity standard dryer runs on 15000 watts, whereas the present machine consumes only about 6000-8000 watts.

***Dhoop* (Incense Sticks) Making Machine:** His wife used to make the incense sticks manually to generate income for the family. Her pains made him innovate a *dhoop* stick making device. This manual device has two blade arrangements, one for making small bamboo splints and the other for making small sticks. For stick making it has a multi-bladed arrangement for different stick sizes. Both the blades are fixed on two sides of a small

wooden block. The main advantage of this efficient machine is that, it is the only machine that can make sticks from both green and dry bamboo. In fact, dry bamboo is the preferred type. The quality of *dhoop* is superior to any of the available ones – both manual and machine. The Bamboo wastage is also very minimal.

An Individual Innovator Based Incubator

Even in his worst times, he has been helping other innovators or those who need his help, without any qualms. He has helped his doctor friends by repairing their hospital equipments. He has also helped desperate individuals by making plastic spare parts, which are not available in market (photocopy machine gears, or wheels for gym equipments). In his home-cum-makeshift workshop, if not engrossed in innovations, he is busy in the repairing work of local machineries brought in by his neighbors, friends and relatives or fabrication of small plastic equipments. He often spots the fault just by a close look at the machines. This, he considers as a god gift and so he does not charge the people who come to him to get their gas stoves, radios, TV, lighter, torches, table clocks, umbrellas, etc., repaired, unless there is a component to be replaced.

As a part of Honey Bee Network, he hosted a workshop for the innovators in March 2009. Initially he was reluctant to do it, but he was convinced to use the *mandap* (an open religious space in every Brahmin's house) for the meeting. He was a proud and happy host to all the innovators and the invitees. He also has been providing support to many innovators from Manipur – he has completely transformed the *Muga/edi* reeling machine of another innovator named Maimu by replacing almost all the wooden movable parts with plastics without charging any extra money for his work.

In a place where kinship and personal relationships count more than anything else, his absence in social functions never calls for a reprimand. Once he even missed his best friend's brother's funeral because he was engrossed in his work and completely forgot about it. The next day his friend turned up at his work place and spent hours talking about his new machineries; there was not an iota of remorse and ill feeling between them.

There is a certain degree of innovativeness to his house's entrance also. His house is surrounded by a two feet drain. Instead of building a small permanent bridge over it, he has made a draw bridge like arrangement, which he lowers only when a visitor is there. The bridge leads to his workshop from where one can then enter his house. He has three daughters and a son. One of his daughters is differently abled. Mrs. M Geeta Devi, his wife, is the breadwinner, earning around Rs 3000 per month by preparing *dhoopbatti*, *agarbatti*, doing embroidery work and tailoring. His innovations are just an erratic source of income. Her initial complaints have now changed to appreciation and support. His neighbors initially branded him as mad. When different government officials started visiting him and he received the government grants they realized his caliber.

Hope Survives

Manihar Sharma had always longed for a small workshop in which he can make innovative products. A few months back, NABARD provided him a grant for developing a manufacturing unit and to meet the demand of his products. Some of his innovations have huge application potential – the only hurdle is to make a breakthrough in commercial terms. A lavish and comfortable life, through his innovations, is not on his wish list; he just

needs a support system for his family. Often the difficulties bring him on the brink of giving up, but his spirit endures.

Complacency and drudgery have not touched him. He does not let his mind and hands rest until he has developed every part of different innovative machines to a perfect finish. He wishes that someone should take over the business part and let him concentrate only on his innovations. At the end of the day, he goes back to the same workshop and spends the rest of his day perfecting his innovative works or completing an unfinished task.

Manipur may be on the margins of the socio-political consciousness of the country but it is at the heart of innovative spirit of India. Manihar Sharma has proved that insurgency of mind can be a prime mover for transforming lives at grassroots and making life easier for common people.

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[1]http://www.pumpsdelhi.com/automatic_pump_controller.html, http://www.indiamart.com/achalaengineering/electronicproducts.html, http://www.tradeindia.com/selloffer/1496982/Automatic-Water-Level-Controller.html?source=rss-lead, http://www.pumpsdelhi.com/automatic_pump_controller.html, NIF database

[2] http://www.classifieds.ivarta.com/Bangalore-Automatic-Pump-Controller-Level-Indicator-Home-Appliances/43913.htm, http://cgi.ebay.com.au/ELECTRIC-WATER-Pump-Digital-Control-pressure-switch_W0QQitemZ170271191567QQcmdZViewItemQQimsxZ20081014?IMSfp=TL081014124001r15001