

## A Tractor without a Steering Wheel: A Maverick at Work

**W**hy would somebody design a tractor that is driven like a bullock? Instead of using reins, there are two joysticks to turn, accelerate or stop left and right wheels independently. The very idea of doing away with the steering wheel would not even occur to most automobile designers. But, Bachubhai Savajibhai Thesia is no ordinary designer. He is 10<sup>th</sup> pass, self-taught inventor and innovator, and engaged in designing different devices. He lives in village Kalavad, 30 km, away from Jamnagar having several provision stores and also blacksmith workshops.

The motorcycle on which he came to receive us on the road is actually not just a motorcycle. Even that he uses for ploughing and interculture. In this case he has taken the cues from others. Modifying existing designs of products to make them more useful for fellow farmers is his obsession. A bulb with a small circuit and the name of the owner inside it is one such product. But then there are a whole range of applications for irrigation, electricity testing, peeling the chickpea pods from the plants, multi purpose pump to cut iron, lift

water, grind flour and do several other operations, which we saw in his house.

Fifty-seven years of his life, he has carried himself very lightly but has always been brimming with ideas. He

saw new opportunities in what appeared to us like junk, spread all over his house. He kept on showing us one after another innovations of his, some 20 or 30 years old and some very recent.

### Early Life, Family and the Experimental Ethic

When we were looking at his farming tools, his wife, Jayaben while making tea for us interjected, “so far as farming is concerned, I give the tips. He hardly knew any farming when he started going to farms.” Jayaben recalled how 32 years ago when she came to this house after marriage, Bachubhai seldom went to farm. She worked hard on fields and he sat in his *karyashala* pursuing all the experiments. She had once suggested him to look for jobs just like his younger brothers, instead of wasting time. But she now adds that had his father been alive, he would have been very happy. Bachubhai is known as ‘Khopadee’ (a brainy) in this small township. To many he may appear a persistent explorer of crazy ideas, but his reputation as a serial innovator has spread far and wide. His workshop and many unfinished projects testify to that. There is no dividing line between his living rooms, workshop and the junkyard. And yet, there is a serene orderliness in this chaos. His simplicity and humility becomes evident when he describes his experiences, in a very unassuming manner, not a trace of self-glorification or for that matter, no attempt to mask many failures.

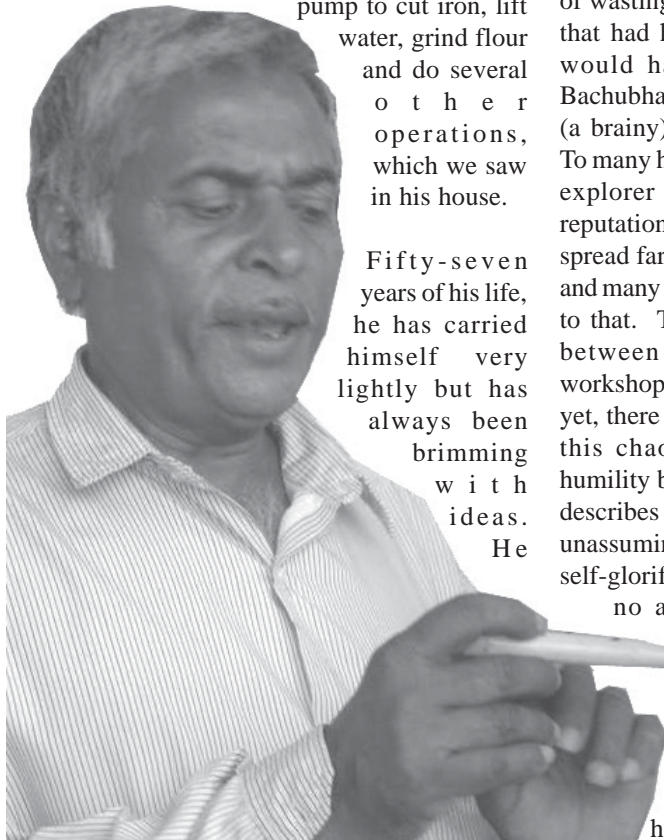
While his mother was making the fire ready to roast freshly harvested chickpea pods, his wife was combing the

Pods of the plants. This appeared quite queer. We had never seen somebody using a big iron comb to pull the pods off the plants. But, the device was very effective. We joked with Jayaben that she should not complain about Bachubhai, he after all innovated devices for her also and she agreed.

After offering us the roasted pods, his old mother, Dahiben, relaxed herself swinging on the ‘jhoola’. The wisdom of 90 years reflected on her smiling face. She told us how Bachubhai was always the kind of person he is and how his life took a turn after his father passed away. The eldest among three siblings, Bachubhai neither had the aptitude nor the interest to take up agriculture, his family’s traditional occupation. Unlike other children his age, Bachubhai had keen interest in electronics and other mechanical works. Whenever he accompanied his father to the fields he would make different things resembling devices and instruments, out of the wet soil of the field. There must be something wrong with him, Dahiben had once thought, as he wept and cried almost continuously for nearly a month after his birth.

While the mother was praising her son, Bachubhai’s wife voiced her opinions from the kitchen. She said that earlier she had no interest in her husband’s innovations and added, ‘*temne khub paisa khoto kariya...hu khetar ma jaine kaam karati hati ane te ghar ma betha betha kai nu kai karata rehta hata.*’ (Bachubhai was wasting money trying different things out while I was looking after the farm. He would stay in the house tinkering with one or other thing).

His mother recalled that there have been bad times too. During the drought period in 1996 they had to survive on the 20 year old *Jowar* kept in an underground pit. Bachubhai is a down to earth and





a simple man who has nothing more to his life than his family and his love for innovations; amply evident in the amount of junk (read parts of innovations on page 10) he has in his home. Not looking at others to work out a solution, he himself goes ahead and finds one.

The story of the radio transmitter is an interesting one. More than a decade and half ago, he started broadcasting, of course, on experimental basis at the same frequency at which local radio station was broadcasting its programmes. A case was filed against him and he was about to go to jail, when a local leader came to his rescue. His wife interjected jokingly to say, “May be the jail term would have saved him from toiling in the farm”.

### **From Electrical Repairs to Farming Innovations: A Transition**

When we went to field, his friend for twenty years Ghanshyam Bhai also came along. On the way Bachubhai narrated his story of transition from an electrical experimenter to a farmer innovator. After completing his education till class tenth he did a course in radio repairing for six months. He then opened Jyoti Radio Service in 1984 and ran it for over fifteen years. With the advent of televisions slowly, his business slowed down prompting him to do another course in television repairing and open a shop, Bhagyalakshmi Televisions, which had to be closed down after the death of his father.

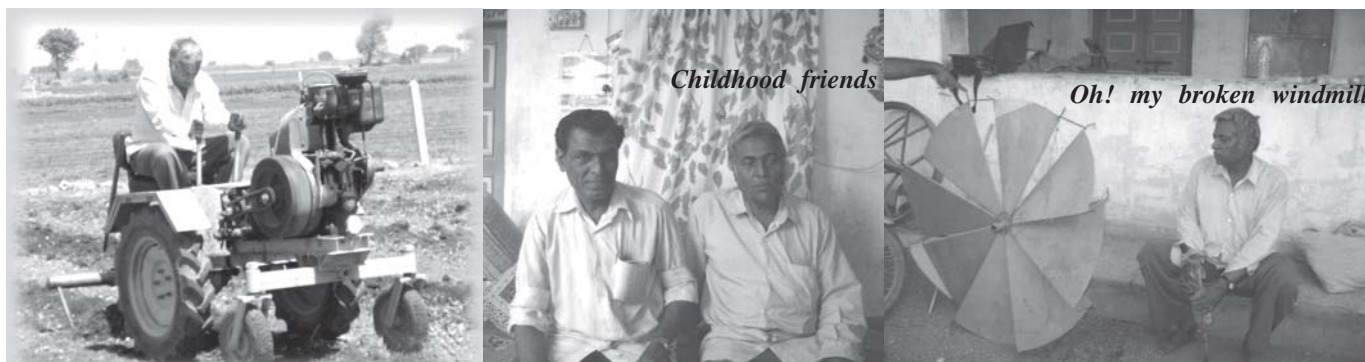
He told us how he had this inkling that he would have to take care of the farming after his father’s demise as his brothers who were engaged in business would never come back. He therefore had to learn the ropes of farming from his aged father during his last three years of life. He proudly shared the fact that his son, Pankaj bought a van for his grandfather, which was used to carry him from home to field and back.

It was a hot sunny day but the cool winds and Bachubhai’s enthusiasm infused a new energy in us. He rode on his small wheel rotary tractor which was operated through a joystick. Bachubhai knew that the limelight was on him that day so he took all the 360 degrees twists and turn, which were indeed fascinating to see. He had masked his gearbox with card boards. A simple diesel engine was fitted on a chassis made specially for the tractor using an old axle of used vehicle. The idea of making a joystick came from the rope tied to the bullock cart oxen. As you pull the rope on the left or right side, the animal turns and when you pull it hard, it stops. This tractor worked exactly like that.

It could take sharper turns than any other tractor available in the market. He could maneuver the tractor with great ease using the two joysticks.

The tractor operates on a 10 HP stationary engine and consumes around five litres of diesel in around eight hours of work. The steering had been removed and two levers had been put in its place for navigating the vehicle. The levers were connected to the left and right front wheels respectively. The motor powers the rear wheels to which brakes have also been provided.

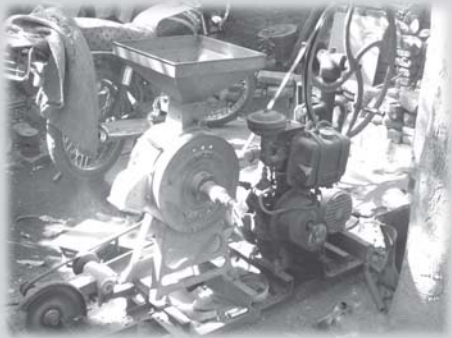
We requested him to bring his tractor to a workshop of motorcycle based ploughing machines, being organized by Honey Bee Network at Rajkot shortly. Initially, when he was contacted by the GIAN team, he was not too forthcoming. Later, he was requested to visit Mansukhbhai in Amreli to know more about what GIAN did. Bachubhai went there and learnt how SRISTI and GIAN had helped Mansukhbhai in improving his innovation, getting him recognition at national level in the Presidential Award function of NIF and getting



## Mind at Work.....

### Four-in-one!

The device has actually four-in-one functions and contains a generator, water lifting pump, a flour mill and an iron cutting machine. It operates on a three HP engine



and depending on its usage, the consumption of diesel comes to about 1.5 litres per month. The engine costed him Rs 8000 and the flour mill another Rs 2000.

### A simple Seed Sowing rolling Device

It consists of a cylindrical PVC tube with perforations at equal distance. The seeds are put inside the tube. An iron spike wheel is put on both sides of the cylinder sealed from both the ends using pvc caps. Using



a U shaped rod, the device is rolled on the field. The seeds fall on the ground from the perforations. He made two models of the device, one with smaller holes for smaller seeds and the other one with larger holes.

### Circuit for Explosion

Made 30 years ago at a cost of Rs 700, it provides 500 V power for



exploding dynamite sticks to dig open well in hard rock area.

### Bulb that You Can Call Your Own!

The modified bulb of Bachubhai elongates the life of the bulb many times due to a small circuit that he inserts. The light is good for farm though not for home because of slight quivering effect. He has been making



and selling such bulbs for the past twenty years. To prevent theft, he also puts the name chits of the owner inside the bulb. Idea of chit evolved because of frequent theft of these long lasting bulbs. The chit does not burn but gradually the ink fades with time. He sells these bulbs at Rs 15 after modifying the ordinary bulb available in the market at a lower cost. A rural innovator modifying the technology developed by large corporations!

### Motorcycle Plough Scooter Wheels in Rear

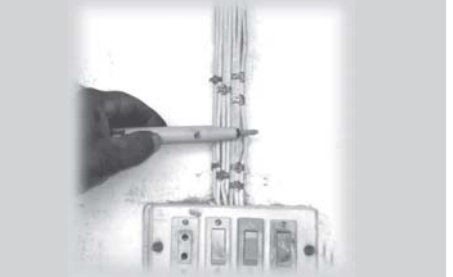
In 2004, he made a santi (multipurpose tool bar) using a Suzuki Max 100. He fitted the tyre of a scooter in the rear instead of the original wheel to get more stability during agricultural operations. Two smaller wheels were put besides the motorcycle to balance the vehicle in the field so that the driver does not need to put his legs down



every now and then. The modifications in the Suzuki Max 100 cost him nearly Rs 4000.

### Electricity Tester

This device can test current without touching wires and can be used even for concealed wiring up to one-inch depth. Detecting current, the tester shows light and also gives a mild alarm. He made this



five years ago at a cost of Rs 50. This is very useful for detecting breakage of wires.

### Metal Comb

He saw a somewhat similar comb being used in Rajkot and replicated the idea in his home. The device is a simple metal comb, which is used for removing the chickpea pods from the plant.



his technology patented in India and USA. That visit made a difference.

### Isolation of an Innovator: Just a Shoulder to Cry on

The tractor ride was followed by the display of his Bike innovation, seed distributor, water alarm system in field, chickpea comb etc. Ghanshyam told us that how Bachubhai would come to his house now and then for fabrication related work. Whenever he had something new in mind he would share with him. Ghanshyam Bhai told us that Bachubhai stopped sharing his plans with villagers as they would always discourage him. That was the reason why the two of them became good friends, as even he was interested in all this. He shared with us a secret that Bachubhai even sings very well. To our delight, Bachubhai sang an old Hindi film song on our insistence. Post lunch, some of us took a walk around

his house, which had around six junkyards and only two living rooms! We noticed that other than his normal innovations, there were lots of other things that he had tried his hands on. Bachubhai also told us of having made a radio in his school days, which is still kept there as a relic.

Among other things that he had made were a sugarcane juice extractor albeit of a smaller size, groundnut pod breaking machine, a motor coil winding machine, a manual pipe bender, slide projector for schools, a windmill, radio transmitter that works at small distances, voice amplification system, circuit for explosion- made thirty years ago at a cost of Rs 700 providing 500 V power, a metal stand used for tube well digging now innovatively used as a 'jhoola' at his house, motor lifting machine, etc. Interestingly Bachubhai also claims to have made a helicopter thirty years ago.

Similarly ten years later he made a motor operated mini model aeroplane, which is commonly shown in Durga puja pandals or other such melas. Bachubhai is now busy making a remote control tractor. The frame is similar to the rotary tractor. Bachubhai is planning to put some circuits in it so that it can be operated through remote. Lack of funds prevents him to work on it further.

*Why should an innovator have to struggle so much? It was a reflection on our network as well that it took so much time for us to discover him, and his outstanding experimental journey. Why have we not yet evolved a culture of encouragement for such pervasive creativity at community level?*

*These are not simple questions; answers to these will determine the shape our destiny will take as a country in future.*

*Let the search for more Bachubhais continue.....*



NATIONAL INNOVATION FOUNDATION, INDIA

## The Sixth National Biennial Competition for Scouting Green Grassroots Unaided Technological Innovations and Traditional Knowledge

### Co-sponsors



Honey Bee Network



CSIR



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### The competition

The NIF, set up by Department of Science and Technology, GOI, seeks entries of unaided technological innovations and traditional knowledge developed by an individual or group comprising farmers, artisans, fishermen and women, slum dwellers, workshop mechanics, students, local communities etc., in managing natural and/or other resources. The innovations can be in machines, gadgets, implements, or processes for farm operations, household utility, transportation, energy conservation or generation, reduction in drudgery, creative use of biodiversity, development of plant varieties, generation of herbal remedies for human or animal health or developing new or any other low cost sustainable green technology related to various aspects of survival in urban and rural areas. Creative ideas for innovative technologies which have not yet been reduced to practice are also welcome. Communities developing People's Biodiversity Register (PBR) or People's Knowledge Register (PKR) are encouraged to register/link their knowledge base with the National Register at the NIF.

### The awards

The best three innovations and traditional knowledge practices will be awarded Rs 1,00,000, Rs 50,000 and Rs 25,000 each in different categories. In addition, individuals and/or organizations that make extraordinary contributions in scouting grassroots innovations and traditional knowledge may also get awards worth Rs 50,000, 25,000 and 15,000 respectively besides recognition to many others. There will be several consolation prizes of Rs 10,000 each in different categories depending upon the number of entries and incremental inventiveness and potential social and environmental impact. Three most outstanding innovative ideas may be given prizes of Rs 50,000, 25,000 and 15,000 in addition to consolation prizes of Rs 5,000 each. There are special prizes for innovations by or dealing with, physically challenged people. The

innovations /ideas of professionally trained persons are not considered for award or financial support. There are special awards for journalists writing about grassroots innovations and/or traditional knowledge and creating greater awareness about NIF's missions. *The award money may be revised in due course.*

### Students

Young inventors and innovators are invited to send their ideas or innovations for a special category of awards for them. These should be unsupervised, an outcome of their own creativity, without any support from their teachers or outsiders. There will be prizes worth Rs 15,000, 10,000 and Rs 7,500 for the best three entries and several consolation prizes of Rs 5,000 each in this category.

### How to participate

Individuals or groups may send as many entries as they wish on plain paper providing a) genesis of the innovation and traditional knowledge b) its background and c) educational qualification and occupation, accompanied by photographs and/or videos if possible and any other information that may help in replicating the innovations/traditional knowledge. Herbal entries may be accompanied by dried plant samples to enable proper identification procedure. The **Sixth National Competition started on February 1, 2007 and entries would be accepted till December 31, 2008.** Every entry should include the **full postal address**, to facilitate further communications.

### Where to send entries?

National Coordinator (Scouting & Documentation), National Innovation Foundation, Bungalow No. 1 Satellite Complex, Premchand Nagar Road, Ahmedabad 380015 Gujarat Toll Free No 1800 233 5555 Fax: (079) - 2673 1903 email: campaign@nifindia.org; www.nifindia.org

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