



Tree seed broadcaster and innovative water management practices

AGROFORESTRY TECHNOLOGY AND WIDE SOCIAL IMPACT NATIONAL FIRST

Premjibhai Patel (70) has been planting millions of trees, developing new models of financing and designing check dams and evolving new techniques of irrigating freshly planted tree saplings in dry regions. All these have been feats of an extraordinary maverick. Premjibhai, after having had a busy life in a city as a trader, decided to go back to his roots. When he noticed these roots drying up, he decided to develop new devices for scattering seeds on road sides- about 45 billion seeds. All this was done from his own pocket too. If even one percent of these survives it would mean millions of trees. He started this work from his homeland Saurashtra and moved on to other regions in the states of Gujarat, Maharashtra, Madhya Pradesh and Rajasthan. At seventy years, his spirit is still young- he continues to experiment, innovate and explore newer ways of revitalizing the resource management system in dry regions.

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Genesis Premjibhai was born in Bhayavadar village in Upleta Taluka, Rajkot district. Although he belonged to a farming community, he took to trading as a profession and soon became a distributor for Reliance Textiles. Till 1975, he conducted his business in Upleta and later moved to Mumbai. But he never liked Mumbai. Frustrated by the lifestyle in Mumbai, he yearned to retire and do something that would make a difference to the world. He pondered over this for two years, considering various options such as politics and social service. But he was repelled by each of them because of the 'filth' (moral decadency) in each.

He recalls how a character in a play written by Manubhai Pancholi, a well known educationist in Gujarat, kept coming back to his mind over and over again during this period. The character, Gopal Bapa, was an old man who generated employment for many young, unemployed people through horticulture, by growing trees such as

'*amba*', '*bor*' etc. Drawing inspiration from this character, he decided to venture into tree planting. To begin with, he supported tree planting around temples in his own village. He selected the areas surrounding temples, for doing so, simply because people do not cut the trees around temples. He hired a person to organize this work and paid for all the expenses incurred. Once the temples in his village were covered, he moved on to plant trees around temples in two other villages. Then in 1984, he entrusted this work to a local voluntary organization, Gokul Goshodhan.

Later in 1987, his son, Shri Rayjibhai Patel, who is an industrialist in Ahmedabad, sent him an article from *Suvichar* (a local magazine) on Elzeard Bouffier's work (originally a story titled "The Man Who Planted Trees", written by famous French writer Jean Giono). Elzeard Bouffier is depicted as a shepherd who devoted his retired life to tree planting. He supposedly created a forest 10 km wide and 50 km

long in 35 years. So moved was Premjibhai by the story that he decided to spend the rest of his life doing the same. He discussed his plans with his son, who supported him whole-heartedly.

Planting trees: scaling up

Thus in 1987, Premjibhai returned to his village in order to fulfill his dream. In the beginning he set out every morning with a bagful of seeds and a small spade in his hands. He would wander around the fields in his village and plant seeds on the bunds of fields and along road sides. People who knew his wealthy background used to express slight derision and wonder why he was doing this.

By and by, Premjibhai felt the need to scale up his activity. He bought a motor-cycle to increase his mobility and at the age of 55 he learnt to ride a motor cycle. He used it for both procuring seeds as well as sowing them. Each day he would set off on his motor cycle taking along a bag of seeds with him and stopping randomly at any village on the way. After locating individuals or institutions with a good reputation of voluntary service, he contacted them and tried to motivate them to volunteer in the work of ecological restoration. He also contacted local schools and wherever he found the teachers responsive, he recruited school children for this task. He gave all of them seeds requesting that they sow them. When he ran out of seeds, he bought more from any dealer he came across and resumed his journey



to find collaborators. In this way he had travelled over 1, 40,000 km, during the first five years, on motor cycle.

The Innovation

Premjibhai relates the genesis of his automatic seed sowing machine. A young man used to visit him regularly to collect seeds. Premjibhai knew that he was a committed person. So Premjibhai requested him to bring 10 to 12 other friends along with him. Premjibhai took a sack of seeds and all of them set out in a four-wheeler. He gave a bagful of seeds to each and dropped two persons at every milestone. He asked them to broadcast seeds on both sides of the road while walking down to the next milestone. This way they covered a stretch of 150 km.

Later, when Premjibhai chanced to see the growth of trees on this road, he found that the trees had grown in a very haphazard pattern as the volunteers had broadcast them with their hands. This made him think of developing a tool which could broadcast seeds uniformly from a moving vehicle. He felt that if the seeds were blown with air they would spread evenly and they might grow better. He also thought about the fan stove used in making tea. He kept on thinking of this design and discussed this idea with his daughter and son-in-law who run a steel business in Rajkot. They encouraged him. Then he bought a motor, a fan and pipe from the scrap market and started to work. In the first version the pipe was lower in height so the seeds fell near the blower pipe. In the next improved model he fitted a longer pipe so that the seeds could be blown to a longer distance.

The result was a petrol-driven mechanical blower which could be mounted on the back of a jeep. The blower, fabricated in Rajkot at a cost of around Rs 12,000, could blow seeds to a distance of 15 m. Premjibhai soon adapted it for use on railway tracks as well, to broadcast seeds on the sides of the tracks. He has two machines of this kind.

The following factors have to be considered while using the seed blower. Direction and speed of the wind are important factors for evenly spreading the seeds. If

there are strong winds, it is advisable to keep the vehicle's speed slow. On the other hand, if the wind speed is too low, the seeds could fall on the track. In this case the speed of the vehicle should be faster. It is also important to feed the seeds evenly so that they get blown and sprout at fairly regular distance.

In one year using these machines he broadcast ten tons of tamarind seeds in the villages around Ahmedabad. He says that this blower has been given to various organizations for seed broadcasting. He has no plans to replicate the innovation and sell it and so far has not received any orders for the same.

Choice of species and technology

Mesquite, locally known as '*ganda bawal*' (*Prosopis juliflora*) was Premjibhai's first choice among tree species. It is one of the hardiest species capable of surviving in arid and semi-arid regions. It is also salt tolerant. Its thorns provide it a natural defence against cattle and other grazing animals. He was well aware that this was not a very popular choice to make, but he convinced people with the following argument: "The trees of *Prosopis juliflora* are like soldiers who get killed on the battle-front while the other trees in the background remain unscathed."

However, after a while, he added more trees and grasses to his list of species to be used for reforestation. These included Flame of the Forest (*Butea monosperma*) known locally as *palash* or *khakharo*, *awali* (*Argyreia speciosa*), *neem* (margosa - *Azadirachta indica*) and *desi bawal* (babul - *Acacia nilotica*) trees and *dhaman* (*Grewia titiefolia*) grass.

These species do not need much care or protection from grazing animals and cattle. Some species of plants such as neem are vulnerable to destruction by cattle at an early stage of growth. Premjibhai has ways to overcome this. He plants such trees within clusters of thorny bushes that offer natural protection from grazing animals, when they are young and vulnerable. For reaching such hard-to-reach locations, he uses a hollow crowbar approximately five feet (1.5 m) long to convey the seeds to the selected location. One end of the pipe-like steel shaft is pointed

and the other end slightly flared. The hollow crowbar is used to dig a small pit even while one stands safely away from the thorny shrubs. The seeds are fed in from the flared end once the pit is dug.

The sites he selected for tree planting were mostly public or common property lands. They included road-sides, railway-line sides, bunds, village wastelands and other common property lands. To tackle wastelands, he often hired tractors and opened up the soil with the help of disc harrows and disc ploughs or tillers. The seeds were dibbled by volunteers in the rows in the soil opened up by the tractor.

Plantation in drought prone areas

Premjibhai has also developed a technique for the plantation of trees in places where there is a scarcity of water and which are drought prone such as Kutchh, Bhuj and Saurashtra.

For this he made plastic pipes of seven inches diameter with a height of approx 1-1.5 feet. Each pipe has two holes on opposite sides at the top. First a pit of around half a foot is made and the pipe is put in it. The seedling is planted beside the pipe and the pit is covered with soil. Then the pipe is filled with a mixture of sand, soil and gravel. A small stick or branch is put through the two holes and the pipe is taken out. Now when water is poured on the sand, it will directly reach the roots of the plant.

By using this technique of plantation, there is no loss of water at all. The rate of successful plantation can also be increased using this method.

Propagating the idea

Premjibhai however had one rule, he never went back to check whether the individuals/ institutions he had distributed the seeds to, had actually sown the seeds or not. Nor did he check whether they used these seeds for personal gain. This was a conscious decision and perhaps this was the secret of his success in mobilizing a large number of individuals and institutions to join him in his mission.

The only safeguard he adopted in subsequent stages was to refuse seeds to those who came to him repeatedly to collect more. He would give such persons the contact addresses of reliable dealers who stock and trade in seeds. He felt that those who have experienced the success and impact of their contribution should buy the seeds and propagate the programme on their own.

As another strategic step in this direction, Premjibhai compiled a list of all the dealers who collect and sell seeds in the country and sent copies of it to all those whom he had contacted since 1987 for the seed sowing programme.

For furthering his mission, Premjibhai has also made an interesting suggestion to the district education authorities to shift the school annual vacation from April-May to October-November. This would enable students to participate in both tree-planting as well as farming operations. The authorities have so far not responded to this suggestion, but Premjibhai is not likely to give up so easily.

Check dams: new models

Presently Premjibhai is concentrating on watershed development through his own organization Vruksh Prem Seva Sanstha Trust. The work is being done through 150 nature clubs on 1000 hectares. In dry regions, water scarcity strikes any observer as the number one problem. The government has several schemes to encourage the development of checkdams on farmers' fields. Most schemes involve a lot of subsidies. The result is that people often consider these check dams as government projects and don't own the responsibility for maintaining them.

Premjibhai introduced a scheme under which people, who united to bear all the costs of check dams except cement, could apply for assistance. Once he got such requests, Premjibhai would visit them, look at the location and confirm whether the applicants deserved the help of the cement subsidy. Another novel practice he introduced was asking farmers to think and improve designs by

which they could save their labour and cost. Since farmers had to bear much of the cost, they also had the incentive to innovate and there couldn't be more striking contrasts in implementation. While government schemes had uniform design with often uniform costing norms, in this case, the variability became the hall mark of cost effectiveness and efficiency.

Premjibhai is also a fast learner. While the government has been deliberating upon the merits of the semi-circular check dam design developed by Bhanjibhai of Visavadar, Junagadh, Premjibhai tested it and also replicated it with some location specific improvements. Innovations in check dam designs have become almost a rule with him, rather than an exception.

Success in his mission

In 1987, when he began to do this work of broadcasting seeds on his own, he bought 130 kg of seeds. This amount had increased to 13 tons in 1988, 80 tons in 1989 and 90 tons in 1990 and so on. The total number of seeds which were either planted or distributed by him for planting till now is estimated to be 550 tonnes (2004). Till date he has built 1,500 check dams for which he has given the complete financial support and 400 other dams for which he has provided the cement. He has also been instrumental in laying out 50,000 feet of pipelines for recharging underground wells. While a major part of the amounts he has spent was from his own savings, his son too chipped in to support many of his activities. Premjibhai is confident that money would not be a constraint as long as he continues to possess good health and the strength to continue with his travels. Supporting this fact he quotes the instance when Bansali Charitable Trust gave him Rs 75,000 in three instalments. Similarly, Amarsinghbhai Khavecha, an NRI from USA supported the cause with Rs. 1, 00, 000. Even at 70, Premjibhai does this work with fantastic levels of enthusiasm and zeal.

(Reference: Article by Srinivas Chokkakula in Honey Bee, 7(3):3-4-5, 1996 and Vruksha-Prem Seva Trust (2004))