

## Laxman Singh and the Water Warriors of Laporiya

"Once upon a time, long, long ago," tells a village elder, "A herd of cows went to a pond for a drink of water. While all the cows drank, the Gau Mata (mother cow) stood back. When asked why she wasn't drinking, she replied that the pond was polluted. It hadn't been worshipped before being made available as a watering hole. So how could she drink from it?"

In Laporiya, a village in India's north-western state of Rajasthan, the Gau Mata drinks happily from the ponds. Laxman Singh and his Water Warriors, youth volunteers in the Gramin Vikas Navyuvak Mandal (GVNM), have ensured that villagers view water as a sacred and precious commodity worthy of conservation and worship. Laxman has used the village's rich religious and cultural values and its traditional customs to help him. Over decades, hard work has turned his village into a lush arable land, which supports both livestock and agricultural production, in an otherwise parched and barren landscape.



For Laxman, the solution to reviving the area lay not in calling in technical experts but in reviving traditional rainwater harvesting systems. "Like a survival skill," explains Laxman, "Water conservation techniques have traveled down generations in Rajasthan. What we need today are not experts from outside, but an awakening of the expertise within." Laxman's focus over the years has been on training youth to absorb and make use of local wisdom and to implement indigenous blueprints for democratic water management. Through these efforts, the lives of over 42 000 families have been improved.

The work is far from finished. An immediate goal of the GVNM is to consolidate the natural resource management work begun in Laporiya. About 200 surrounding villages have expressed interest in adopting the Laporiya model. GVNM members have begun preparing blueprints of the agricultural and pasture lands in these villages. Says Laxman, "We now have to help them complete them, so that they can continue the natural resource management work on their own. We want to create a self-sustaining model in every village so that they can continue even after we leave." But a number of obstacles have yet to be overcome, not least of which are lack of resources and opposition from forces with political clout.



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## Background

Rajasthan is a semi-arid and drought-prone state situated in at the edge of the Thar desert of western India. Historically, communities in this state controlled their resources independently, and developed a range of community specific water management models. Under the feudal system, landlords controlled large tracts of land, some of which was leased to villagers for a range of uses. Agricultural land was restricted, and the majority of the population maintained large herds of cattle. As the land was under direct control of the landlord, it was reasonably well managed. For instance, forests were protected for game, pastures were developed to maintain the herd, and water was harvested and conserved to sustain the population. Landlords were also responsible for the welfare needs of the villagers.

After independence, India's land was distributed among the people according to the tenets of socialism. Pastures and uncultivated land were designated as village common lands, but were soon invaded illegally. Mismanagement and degradation ensued. As land was freed up, many villagers sold their cattle and switched to cultivation. Local control and management of water and forests was lost and passed into the hands of central government bureaucrats.

Water resources were brought under the control of a public water supply system managed by central government. Traditional community structures broke down and conflict over water and other resources occurred along caste lines. Wells fell into disrepair and villagers were hard-pressed to get enough water for their day-to-day domestic needs, let alone for the growing amount of land under cultivation. Urban migration became a growing trend.

Growing up in Lajoriya, Laxman witnessed his once green village turning into barren pastureland. Already drought-prone, the area's water problems were exacerbated by lack of maintenance of existing water ponds. Shortly after independence, the village's lifeline and only irrigation reservoir, Ann Sagar, broke its embankments during heavy rain. It remained broken for over twenty years. Lajoriya's water problems worsened over the next four decades as water wells dried up. Laxman explains, "In spite of there being rain, it was like the land was absolutely dry. There was no moisture in the soil. The entire water would flow out of the village into the river." By the late 1970s, government records described Lajoriya as barren with highly saline landscapes and denuded pasturelands, capable of producing only one low-value monsoon crop. During summer months, 40 percent of the population migrated to the cities in search of jobs and, due to lack of fodder some 75 percent of livestock was moved to nearby states. By 1991, two reservoirs in the village were silted up and the water level in the irrigation and drinking water wells were some 60 feet below the surface.

Whilst some areas in India were experiencing a the "Green Revolution," Lajoriya, a village of 189 families, remained forgotten like many other areas in the corners of India. Development in Northern India was aided by the introduction of new canals and irrigation networks plus high-yielding seeds and technology-aided methods of farming. Rajasthan too benefited from a network of irrigation canals originating at what became known as the Indira Gandhi Canal. But in 1975, Laxman, then age 18, returned from school in the city of Jaipur, to find his village on the verge of starvation.

Laxman traces his roots to the ancient Rajput royal family of Jaipur. His ancestors were rulers of Lajoriya; after Independence in 1947, they voluntarily relinquished their claims to a large portion of their lands in the village. But for Laxman, feudal responsibilities were hard to forget. He decided to

forgo a formal education and to devote his life to resurrecting the fortunes of the village. He began by organizing volunteers in his and neighboring villages to take turns in tilling each other's fields.

Says Laxman, "When a village starts becoming poor, money lenders and other vested interests from the towns and cities start buying land from the village because the people are already poor and want to sell off their land. We started feeling that why should this happen to something that is ours, and why should we give away our land to others?" Laxman continues, "If the village survives, everything else will survive but if the village doesn't, nothing will."

### **Mobilizing the Community**

Careful observation of conditions in the village led Laxman to declare, "The main problem of the village was drought and lack of water. The main cause for the situation deteriorating so much is because people were not giving proper attention; they did not know how to conserve the water. There was nobody to guide them."

Laxman, assisted by a friend and the village priest, began to repair the embankment around Ann Sagar, which had remained broken for 25 years. Realizing they were going to need more help to complete the task, they convened a village meeting. "We told people, 'Here is this pond that has broken, and either we are going to rebuild the pond or leave the village.' We told the people that we have worked today, and said, 'Please all of you come and cooperate with us.'"

A few days later 30 villagers volunteered for the work. After a week another meeting was convened at which villagers were asked "Are you not concerned with your own village?" Laxman estimated that 60 people were needed to work every day on rebuilding the embankments of the pond and he succeeded in making this a reality. "We created an atmosphere. We worked and we told others they should cooperate with us, and they told others, and this is how we created the whole atmosphere."

After this was completed, more meetings were held and a decision was taken to raise the land around the pond by two meters. In less than a year, the entire village had begun to volunteer and take part in planning a comprehensive model of water management that went much beyond the repair and construction of its ponds to include irrigation of the 300 hectares of land that the villagers owned collectively. As irrigation improved, so did the harvests.

The work needed to restore the water resources of Laporiya involved repairing broken embankments, repairing existing percolation tanks and de-silting community ponds. Laxman spent a great deal of energy in mobilizing rural youth, in eliciting voluntary contributions and in creating village councils to manage rejuvenated structures. Within a short time, the dramatic impact of the work had spread to nearly 40 villages eclipsing the official classification of the region as 'drought-prone.'

It was Laxman's grandfather, the original benevolent ruler, who had first started the work of excavating tanks and wells in the village. Laxman felt that his royal lineage gave him a responsibility to the village. It also worked in his favor when it came to mobilizing the community. Laxman explains, "When I started going out on my own with a spade and shovel to repair the only existing talaab (tank), which had been breached, people joined me because they felt beholden to help their Raja (King). When I started repairing the talaab, the villagers thought it was blasphemy that I should be doing this menial work, but I

welcomed it. The numbers gradually swelled until the entire village was involved. Caste system lines have also blurred due to this culture of volunteerism and a common goal."

"Our philosophy," says Laxman, "is that whatever work has to be done, it has to involve the people. The people must contribute to that work. The people should feel that we are self-made, in the sense that we have developed our village through our own efforts." But the restoration process did not go unchallenged. Opposition came from those who had illegally encroached upon pastureland, taking advantage of the fact that local structures had broken down. No structure in the village had the authority to evict them as the traditional institution of village governance, the panchayat (a democratically elected council of five) had fallen into disuse. In response to this absence of authority, Gram Samitis, or village councils were set up by villages, and a people-centered system of governance and decision-making was established. Once the village councils had established their authority, they began to organize villagers around the tradition of shramdaan, or volunteer community labor.

### **Mobilizing the Youth**

Harnessing the energy of rural youth has been critical to Laxman's success. Over the years, Laxman has established over thirty Yuva Mandals, or voluntary youth associations in surrounding villages and these volunteers came to be known as Jal Jodhas or Water Warriors. The spirit of voluntarism encouraged by Laxman was formalized in 1986 when he formed the "New Youth Village Welfare Association," or Gramin Vikas Navyuvak Mandal (GVNM).

The GVNM has grown into an organization with 40 full-time workers, 8 000 volunteers and an annual budget of 4.5 million Rupees (US\$93,000) funded mainly from CAPART, a quasi-governmental body, and the government's Social Welfare Board. Laxman recognized the importance of getting control back into local hands and the water management systems he developed have been built and largely financed by residents. Each family voluntarily contributes 100 rupees towards each new project as well as volunteering labor on a rotating basis. Those who cannot contribute money contribute more of their own labor during the three months after the first harvest, May to July. The Village councils oversee the maintenance of water resources and they are supported in this work by networks of youth who have been trained to provide technical assistance.

The GVNM are involved in a number of projects ranging from promoting reforestation to increasing crop yields and protecting water resources. Strict fines are imposed against the cutting of trees and, in the beginning, each family was asked to plant at least five trees on their land. With the help of the GVNM, over a million saplings have been planted in Laporiya and surrounding villages and forests have been developed for fuel. Indirectly they have had an impact on living standards and levels of crime. Says Laxman, "Where we have not worked, half the village's resources go towards curbing crime."

### **The Road To Livelihood**

Through the late 70's and into the early 90's, Laxman laid a firm foundation for a process he calls "the road to livelihood," which became, in effect, a comprehensive community-based natural resource management strategy. "In the olden days," says Laxman, "There was no need for such resource management. There was less population and more cattle wealth. One tank (water reservoir or pond) sufficed, and cattle dung fertilized the land. People lived simpler lives close to nature and drew on

practical traditional knowledge." But by the early 1990s, drought and an increased population had led to an acute shortage of water for drinking and agriculture. Cattle were dropping dead like flies. The old wells were dry, and those that still worked were insufficient for the village's needs.

When designing solutions to local problems, Laxman's approach has always been to draw on local wisdom. In developing a water harvesting system he relied on the indigenous knowledge and traditional skills of gajdharis (indigenous engineers and experts in land and water conservation). It is after all, these gajdharis that understand the land, its percolation rate, its slope, the rainfall pattern, its flow and its recharge rate. Laxman and his village volunteers have combined simple techniques for tapping every water route and pathway of human liquid wastes in a village - diverting them through the village's natural watershed, directly to agricultural plots and pasture land. Villagers, who understand the terrain best, construct the diversions through simple conduits like canals, spillways and aqueducts. These efforts are carefully planned, monitored, and linked to the reverence villagers have for water.

Laporiya's land and water conservation system is an integrated and multi-pronged approach that relies on local participation at every step. The 'Road to Livelihood' concentrates on all aspects of village life from animal husbandry, to protecting the ecosystem, to water conservation and agriculture. Laxman explains the approach thus, "When we work in the village, we are utilizing the entire land of the village. Maybe on one piece of the land we are concentrating on irrigation. On another piece of land we might develop it as a pastureland. On another piece of land, we might do something that will improve the ecology. The government, it will just take one piece or one area of the land and try to concentrate on it."

Laxman traveled to nearby areas to study water-harvesting systems. He also studied community development under the guidance of Rajinder Singh, the 2001 Magsaysay Award winner for his work on water management systems. In 1991, Laxman and his Water Warriors began to revive the village's water harvesting systems. "I felt that my village had to overcome the crisis," Laxman said, so he began digging 50 new wells and three large natural tanks. Says Laxman, "The number of tanks excavated in our village and surrounding areas in 1991 alone was worth 2.5 million rupees (US\$52,000)."

He also introduced a unique dyke system to capture rainwater in pasturelands. The latter has been hailed by some as an astounding feat of indigenous engineering and has ensured that this once-arid village will never fall short of water. This water harvesting technique has become known as Laporiya Squares.

### **Laporiya Squares**

Water harvesting in Laporiya is important not only because the area is prone to drought but also to maintain soil salinity at levels suitable for crop production. This is because irrigation in arid areas results in the accumulation of salts in the soil unless regularly flushed. Build up of salinity can result in reduced crop yields and soil stability problems. Laxman, the Water Warriors and the village elders ingeniously introduced a technique that speaks volumes about the ecological understanding of the villagers.

Beginning work on the near flat (1-2 % slope) community pastures on the upper reaches of the village, they began building chaukas (squares), a system of low berms and shallow pits, to recharge the local groundwater and to regenerate the communal pasture land. The chauka system divides the open, grassy plains into 100-hectare cells. Within each cell, the runoff is carefully managed with the system of berms to ensure that the monsoon rainwater, which comes in intense bursts, is spread over the entire area. The

zigzag pattern on the land allows rainwater to enter the square and fill it up as per the available depth. Excess rainwater then flows into the next square and so on. At the downhill end of the cell, the excess water collects in a tank, which is used for watering livestock. Building the berms requires moving a lot of earth, but the villagers get double-duty for their work by making clever use of the empty pits as well. Their shallow, flat-bottomed pits turn into micro-marshes during the monsoon season. Grasses that thrive in wet environments are seeded in the pits to maximize forage production. Differential moisture levels within a square add to the diversity of grasses that can grow within a unit area - adding to the fodder harvest for the 2,900 large and small animals in the village.

Laporiya Squares are a distinct departure from the conventional trenches that conservationists promote for soil conservation and moisture retention. In addition to being effective and adaptable, the squares are cost effective. In contrast to Rs.6000 per hectare of investment for the conventional system, the square system is three times less costly. "Government departments," says Laxman, "were promoting construction of trenches and contour bunding. We had seen these and concluded (and we were right) that these do not promote natural growth of grasses. Besides, there are a lot of useful varieties of grass that require shallow water. They cannot survive in deep waters."

Laporiya Squares, however, have yet to win recognition from experts or government agencies which continue to cast doubt over the efficacy and adaptability of the unique system. In response Laxman points to the visible evidence of success. And Laporiya does indeed appear an oasis in an otherwise arid landscape. Interestingly, the pastures are not fenced; nor is grazing prohibited. Says Laxman, "Look at villages where we haven't worked, and you will realize. The quality of water is bad, with salinity and a concentration of minerals. There are several cases of dehydration and gastric diseases."

## **Reviving Traditions**

For Laxman, reviving traditional systems for water harvesting and managing was not sufficient to prevent wastage of water, or to ensure sustained conservation. It was also necessary to leverage the village's rich religious and cultural values and its traditional customs to make people understand the need to conserve water in this arid land. Says Laxman, "I therefore placed all natural resources on a pedestal in the form of deities to preserve the sanctity of the environment."

In the past, villagers had practiced reverence for life-giving water-bodies on a daily basis as well as during annual festivals. Laxman and his Water Warriors encouraged a revival of these practices. Today, the village is dotted with small temples and fluttering commemorative flags dedicated to the guardians of the water preserves. There is a small shrine next to each little tank or well. It is dedicated to traditional Hindu gods and goddesses - primarily the mighty Shiva, who controls the cosmic cycle in his role as both creator and destroyer, or Durga, the goddess who represents the victory of good over evil, the symbol of female energy and emancipation.

Laxman's strategy has been to coordinate construction with the traditional festival season. Festivals occur in November and December. When the work on Ann Sagar began in 1990, Singh revived a traditional festival called Devudhni Igyaras, which falls on the 11th day after Diwali, the Indian festival of lights. Diwali occurs after the first harvest season is finished, and it ushers in the second season of the farming calendar. Devudhni Igyaras is considered an auspicious time to initiate new activities, including the de-silting of water bodies and all other activities connected to the soil. There is an air of festivity in

the village on the designated day. The villagers begin a procession to the fields and pasturelands amid much fanfare. "Behind all these rituals is the need to conserve scarce resources rather than any kind of religious fanaticism," Laxman says. "Reverence for natural resources is common to all religions and is woven intrinsically into the customs of the land."

Laxman and the village council have revived other cultural practices to protect the trees, which for the villagers represent a circle of brotherhood. In medieval times Rajasthani women were often prey to marauding invaders. To ensure their safety, women tied friendship bands (rakhis) on the wrists of their brothers and other men they thought could protect them. Once such a string was tied, a man was bound to protect his "sister" under any circumstance and the "sister" in turn pledged to look out for his welfare anywhere, anytime. This practice was remembered in the festival of Raksha Bandhan ("the protective tie of brotherhood"). This festival has been revived to stress the importance of trees in this barren environment. On Raksha Bandhan day, trees are anointed with tilak (a holy substance made with vermilion and sandalwood). The entire village lines up, holding a 300-foot long string, and each person takes a little bit of it to create a rakhi. The priest chants a prayer saying "All trees are our brothers and sisters, and we vow never to kill them." Then the villagers tie their strings around the trees and pledge protection. This action guards against destruction of the forest.

Beyond this, the village council imposes a fine of 1,100 rupees on anybody caught cutting a tree. Instead of a fine, the violator may be told to plant two trees in place of the one he cut and to contribute five kilograms of grain to feed the birds. "The latter is better," says Laxman, "Because when there's a question of money, corruption creeps in."

Says Laxman, "Ritual and regeneration have become part of the lives of the people of Laporiya and strengthen their belief that they can beat the drought and never thirst for water again."

### **Quantifying Success**

After Laporiya's main tank Ann Sagar (Ocean of Grain) was restored, the villagers constructed two more percolation tanks to recharge groundwater and to supply the remaining needs of the villagers and their livestock. Out of reverence, they named them Phool Sagar ("Ocean of Flowers") and Dev Sagar ("Ocean of the Gods").

Downstream from Ann Sagar, Laporiyans grew wheat for the first time in 20 years. The amount of irrigated land area increased to 300ha out of a total of 1500ha, and the village's agricultural production increased more than 12 times. The land that could barely support a meager rain-fed crop in the past can now produce two irrigated crops per year. Household incomes have risen from a mere Rs.500-700, to as high as Rs.17 000. In 1996 there was a bumper harvest. Village silo bins overflowed with fodder and grain. Though these levels of harvests are difficult to sustain during low rainfall seasons, water conservation has had a lasting impact on family incomes. Even after three consecutive years of poor rainfall, increases in harvests have tripled. In 2001 Laporiya made headlines as the only village in the district that did not require aid in the form of water tankers when all the surrounding villages suffered from lack of water. Despite an average rainfall of just 348mm, water levels in village wells have risen by 45 feet.

The model developed by Laporiya has impacted over 90 villages in the three districts of Tonk, Jaipur and Pali. As many as 40,000 families have benefited from cultivation of 30,000 hectares of land. And there have been other sorts of benefits too. Women are being empowered by women's organizations that are springing up everywhere. They tackle issues of savings, loans, and other social issues such as child marriage and dowry. "There is a strong culture of volunteerism, and along with it, awareness is growing among the women," said Ramkanya Devi, leader of the women's volunteer force in the neighboring village of Avda. "They now sit in on all meetings that address village welfare issues."

The GVNMM has made an attempt to quantify the economic impact of its programs. Taking a control village (where no intervention has been made) and comparing it with Laporiya, GVNMM has computed the economic benefits of its pastureland development. An investment of Rs.234,029 was made to develop 350 bigha of pastureland in Laporiya as against no investment on 280 bigha of pastureland in village Doria. In terms of milk yield, the total income from pastureland in Laporiya worked out to Rs.988,257 as against Rs.354,454 in Doria for the year 2000. Per bigha income from the land was twice as much and the cost: benefit ratio of the investment in Laporiya was an impressive 1:4. In a similar vein, GVNMM has begun computing the impact of its intervention on socio-economic aspects like women's empowerment, water availability, food, and fodder security.

### **Political Challenges**

For two decades the GVNMM has worked to rebuild social institutions. Gram Samitis (village councils) set up by the villagers themselves in the absence of formal local authorities, have achieved enormous success in organizing communities and managing the resources of the villages. But constitutional changes and political forces threaten to undermine these achievements. In the mid 1990's the 73rd amendment of the Constitution of India revived the panchayat system and empowered them with administrative and financial powers to 'guide integrated development of the villages.' While the elected panchayats are the legitimate political representatives, the village councils see their political agendas as anti-development. Rather than encouraging village council members to stand for election, the GVNMM has positioned itself to engage the government and other stakeholders in a dialogue to secure a place for the village councils in the developmental process. The GVNMM is aiming to get recognition for the councils to conduct developmental work for and on behalf of the panchayat.

The continued success of the village councils depends on achieving official status and on generating resources. Village councils do not have resources of their own to manage and maintain the physical structures. They rely on villages reinvesting a portion of the harvest with the councils so that they have the resources to ward off unforeseen exigencies such as a breach in the water tank. Not only does this reinvestment ensure sustainability of the Laporiya system, but also cushions the community as a whole against food and fodder insecurity in the event of drought. But even this source of income is under threat as the government has written to the village council objecting to the fine of 5kg of grain imposed by the village council for cutting trees in village common lands.

### **Looking Back**

Through their work in Laporiya and surrounding villages, Laxman Singh and the GVNMM have demonstrated that communities are capable of deciding what they need to meet their critical need for water, and of taking appropriate action. Crucial to success is that they perceive their capacity to change

the situation. Looking back, Laxman admits, "Organizing the people and motivating them towards a common goal was tough, as the upper castes in the village had their own vested interests. But persistent efforts and the fact that 'seeing is believing' really motivated the entire community to make the change."

One way that villagers 'see' the benefits of the system developed in Laporiya is through walking tours or Padyatras, which are organized annually by villages, to review the work of individual communities. The tours begin at Laporiya on the day marked by tradition for the worship of the ponds. Large groups of young water technicians, village leaders and other villagers travel to over 80 villages reviving the oral traditions of water management and encouraging re-greening. These walkathons play an important role in reviewing and critiquing the plans and decisions made by individual villages regarding land use and resource management.

And what they see is enough to convince them of the success of their approach. Water is stored in a network of community ponds, lakes and earthen percolation reservoirs. Peacocks and jungle fowl run free throughout Laporiya, darting in and out of the fields and vegetable patches. Deer and nilgai (the largest Asian antelope) roam the pasturelands alongside goats, sheep, bullocks (oxen used for plowing), and cows. In Laporiya, even the birds are not forgotten. Flocks of pigeons, parrots and other local species swoop down on raised feeding platforms that have been built for them atop the granaries. "If we have enough grain, we must make sure they do too," Singh said, as he points to water and fodder troughs built especially for animals and birds at certain locations in the village.

Says Ramjilal, head of the environmental program in the neighboring village of Sitapura, "After Laxman and his volunteers came to our village and explained everything, we formed our own village water management committee. In the past year, we have dug three tanks, built temples and shrines along them, and repaired wells. There has been a 50 percent increase in our agricultural output." Having seen success spreading to other villages, as many as 200 other villages in Rajasthan are collecting funds to follow the Laporiya experience. The GVNMs are assisting with testing design components and drawing up blueprints of agricultural and pastoral lands.

Laxman looks back proudly on his achievements. Explaining his motivation, he says, "I feel that if I left Laporiya - if I ever decided to settle in Jaipur, or some big city, then my life would be so stereotyped. I would be running after materialistic needs. I feel that if I can do something that will give this village all that it needs - water, food, then I don't need anything else. I derive a great sense of satisfaction from this."

Having set up a system of mutual interdependence and empowering the village councils through continuous nurturing and exposure to innovative ideas, Laxman has stepped aside. Responsibility for carrying forward the work is vested in the village councils, which have moved to the next stage of decision-making and control of resources, supported still by the GVNMs. But political forces continue to act against the vulnerable in the village and the administrative machinery keeps a close watch on the functioning of the village councils, as they continue to play an important role in supporting the work of resource management in Laporiya and other villages. They have yet to receive formal recognition, in the absence of which they receive no government funding. Whilst they continue to rely on voluntary contributions from villagers, long-term sustainability depends on their ability to tap into other sources of financial assistance.