

By [Dr Sudhirendar Sharma](#)

In Laporiya village in Rajasthan, a unique water conservation scheme involving Laporiya Squares has ensured bumper harvests and increased incomes



The rain gods have not smiled much recently. Yet there are smiles on the faces of farmers in and around Laporiya, a village 85 km from the tourist capital of Jaipur in India's western state of Rajasthan. Over the past two decades, the community here has worked to revive the water conservation methods and social institutions of feudal times. As a result, despite its location on the edge of the Thar desert, and an average annual rainfall of slightly more than a foot, water levels in Laporiya's wells have risen 45 feet, while crop harvests have increased between three and 12 times.

Driving this turnaround is Laxman Singh, 42, descendant of a former feudal landlord family who also holds a degree in social work from Rajasthan University. Singh's integrated community mobilisation and conservation efforts that began in Laporiya in the 1980s have now spread to 98 other villages in the districts of Tonk, Jaipur and Pali. Best estimates indicate that 40,000 families have benefited from this strategy, implemented on 30,000 hectares of land.

Background

After the feudal system was abolished in 1950, a power vacuum emerged at the local level in this part of Rajasthan. The *de jure* village authority was a traditional and democratically elected council of five wise men called the panchayat. Unfortunately the local panchayat, that lacked fiscal and enforcement authority, proved incapable of leading the community through years of transition. Village common property (pasturelands and forests) began to deteriorate, the victim of uncontrolled access. At the same time, cultural forces that ensured the maintenance of infrastructure like embankments, storage tanks and percolation ponds slowly became eroded.

In this arid part of Rajasthan, average rainfall coupled with poor irrigation systems translate into extremely difficult conditions for villagers and little hope of a good harvest from farmlands. A few years of drought push communities to the brink of collapse.

By the 1970s, 40% villagers would migrate in search of jobs every year; around 75% of the cattle would be driven to greener pastures in the adjoining states of Uttar Pradesh and Madhya Pradesh.

Getting off the ground

Banking on the energy of the local youth, Singh led a campaign during the drought year of 1977 to rebuild broken embankments, repair existing percolation tanks and de-silt community ponds. Combining his education in social work with his family's status in the region proved to be a strong foundation for success. Within a few years, 40 nearby villages were drawn in. Singh continued his restoration work for nearly a decade, supporting it with his own funds and volunteer labour. It was not until 1986, when his work was relatively mature, that he secured outside funding and established an institutional base called the Gramin Vikas Navyuvak Mandal (GVNML), roughly translated as the New Village Youth Welfare Association.

The launch of this community group coincided with the first major challenge to Singh's strategy. A small group of individuals, who had encroached upon a 60-hectare patch of traditional village common land, began to take on the fledgling GVNML. While it was a relatively small piece of land, the battle proved strategic in two ways. First, from a hydrologic standpoint, the 60 hectares were situated on a ridge and thus, if not treated under the GVNML's programme, downstream lands would receive less and poor quality water. Second, from a community mobilisation standpoint, such concentrated opposition undermined the sense of cooperation and equal distribution of benefits that the group was attempting to instill.

The squatters argued that neither the village nor the GVNML had the authority to evict them. The GVNML considered seeking help through the courts, but ultimately decided to avoid the long, uncertain legal process. Instead, it helped set up a gram samiti (a traditional council of 11 village elders) drawn from the 189 village households, to apply pressure on behalf of the entire community. As the treatment of land afforded demonstrable economic benefits to all, the bargaining powers and legitimacy of the gram samiti increased, adding credibility to its eviction orders.

With its authority established, the council devised certain principles for shramdaan (voluntary labour), for drawing up rules to govern the maintenance of systems and for inculcating a value system for the holistic development of the village.

This people-centred system of governance slowly began to find its place. The council played a key role in treating pastureland, in rehabilitating old irrigation tanks and in de-silting percolation tanks -- buttressing the work of the GVNML. As a result, there were bumper harvests. By 1996, assured irrigation to 300 hectares of land downstream of the tank had increased crop harvests 12 times. Land that, in the past, supported one meagre rain-fed crop now supported two harvests per year -- driving a jump in household income by a factor of 3. Though such levels were difficult to sustain during scanty rainfall, water conservation had a lasting impact on farm incomes. A three-fold increase in harvests was ensured even after a third consecutive year of poor rains. With avenues for year-round on- and off-farm employment available in the village itself, migration was brought under control.

To bring prosperity to farms, the now-upbeat village named one tank 'Ana Sagar' ('Sea of Foodgrain') and the two percolation tanks 'Dev Sagar' ('Sea of the Gods') and 'Phool Sagar' ('Sea of Flowers') respectively. The tanks soon became hubs for community gatherings and meetings.

Despite this success, the sustainability of the transformation still troubles Laxman Singh: "Until the development process gets deeply integrated into society and the culture, the long-term success of this work may remain a big question," he says.

Some of this integration is already taking place. Digging into the history books, the villagers recently discovered that their ancestors set aside a particular day to revere water bodies that sustained life. The practice has been revived and is now an annual event. On this day, villagers offer prayers at Dev Sagar and organise rallies to spread the water conservation message to nearby communities

The system of Laporiya Squares

Range management in near-desert conditions is a significant challenge. The GVNML and the village council are confronting the challenge in an innovative, effective way.

The nearly flat (1-2% slope) community pastureland on the upper reaches of the village form starting points. This large patch is divided into rectangular units of varying sizes (the average being 66 metres x 132 metres). Each unit is enclosed by 1.5-metre-high dykes, built from soil within the square, along the three sides that lie towards the lower part of the gradient.

Called *chauka* (square), this zigzag pattern on the land allows rainwater to enter the square and fill it up. Excess rainwater then flows into the next square, and so on. Apart from allowing the collected water to percolate, different moisture levels within a square add to the diversity of grass that grows here -- providing fodder security (via diversification) to the 2,900 large and small animals in the village.

This low-tech, high-intelligence irrigation strategy manages limited flows of water in a highly optimal fashion: the thin layer of surface flow is collected and guided to its best use in each square before the cumulative outflow reaches its final destination -- the village tank. The village tank then has more and better quality water to distribute to other pastures and farmlands.

Laporiya Squares are a distinct departure from the trenches that range managers regularly suggest, along contour lines, for soil conservation and moisture retention. In addition to being effective and adaptable, these squares are cost-effective. In contrast to the \$130 per hectare required for a conventional system, Laporiya Squares can be implemented at one-third the cost.

Quantifying the transformation

The guiding principles that led to Laporiya's ecological revival and economic transformation have continued to drive its spread. Sixty hectares of encroachments have so far been freed for common use, and over 900 hectares of community pastureland irrigated using Laporiya Squares. As the squares system improves water flow levels and management beyond the squares themselves, the total land area impact is now well over 30,000 hectares, at an average estimated cost of \$40 per hectare.

Counting the economic impact

Taking a control village (where there has been no intervention) and comparing it with the Laporiya intervention, the GVNML has calculated the economic benefits of its pastureland development strategy. At an investment of roughly Rs 250,000, the squares technique was implemented on 90 hectares of pastureland in Laporiya. Slightly smaller pastureland of similar quality, in the nearby village of Doria, was left untreated.

Five years after the intervention, in terms of milk yields, the total income from pastureland in Laporiya worked out to roughly Rs 10.5 lakh, versus Rs 3.75 lakh in Doria. Per hectare income from the land was twice as much, and the cost-benefit ratio of the investment in Laporiya was an impressive 1:4.

Unfinished agenda

The GVNML's gram samitis, thus far successful in mobilising voluntary labour and evicting squatters, are now seeking legitimacy, which has been challenged by the re-emergence of the panchayat. Following amendments to India's constitution in 1994, panchayats now fill the official power vacuum at the local level, with *de jure* jurisdiction over many of the gram samitis' functions. Unfortunately, democratically elected panchayats are often influenced by outside political forces. Elected members of the state legislative assembly each control a fund for development projects within his/her district. This 'purse-string power' allows for regional representatives to enjoy significant leverage over panchayats, resulting in a body that often lacks the apolitical judgement of village councils.

Laxman Singh and his team will have to take the strategic decision of deciding whether to develop a separate niche for gram samitis, integrate these informal councils into the panchayat structure or directly challenge the legitimacy of panchayats. Whatever the outcome, generating resources from within villages to support the GVNML's work will determine the long-term sustainability of the project, both socially and economically. As of now, village councils do not have resources at their disposal to manage and maintain the irrigation infrastructure and minimise the impact of unforeseen events. They are dependent on support from the GVNML and volunteer labour.

Singh believes that the solution lies in reinvesting a portion of the improved harvest from individual farmlands with the village council, allowing it to maintain systems and cope with unforeseen exigencies like a breach in the water tank. This, of course, suggests a new relationship between the villagers, the gram samitis and the GVNML, and throws up a whole new set of management challenges.

Banking on his 25 years of successful water management through social mobilisation, and his family's enduring stature in this part of Rajasthan, Laxman Singh appears well placed to make his reinvestment plan work. Should the rain gods smile after five years, the GVNML will work to convince farmers to part with a portion of their harvest. This will be a test for both the community and the scheme's protagonists.

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