Livelihoods lift with DIY water supply

From harvesting just one rice crop each year on a tiny patch of land, the East India Plateau’s poorest farmers now have the means to create new social and economic opportunities through water-harvesting technology made available by ACIAR.

BY MELISSA MARINO AND GIO BRAIDOTTI

The rolling hills of the East India Plateau have long proven a poverty trap for the region’s rice farmers. Considered among the poorest in India, these farmers use traditional farming practices, low inputs and monsoonal rains to produce just one rice crop a year, often harvested from less than 1 hectare of low-lying land. The result is a losing battle to produce enough food to feed even one family.

To close the livelihood gap, men immigrate in search of seasonal work with women taking on roles previously done by men, but struggling with a lack of support and resources, especially labour and access to technical know-how.

On the surface, there appear to be few options to nurture enduring development and spring the poverty trap. But to agricultural scientists experienced in integrated land and water management, the view of these subsistence farms is very different. Scientists like Dr Peter Cornish, from the University of Western Sydney, see potentially productive land going unused...
on the higher and sloping parts of the landscape and enough annual rainfall for additional, market-oriented crops. … if only the water could be made available where it is needed.

Dr Cornish says that the annual monsoon provides 80% of the region’s rainfall, which totals about 1,200 millimetres. A massive 60% of the total is lost to run-off.

The solution, he says, is to capture and store rainfall upland and use it to bring that land under cultivation while creating market access for these new crops. There is, however, a trick to the strategy: the need for technology that does not require start-up capital, expensive heavy machinery and ongoing operating costs.

As it turns out, a rural development organisation within India, PRADAN, has been developing do-it-yourself water-harvesting technology to capture run-off and tap shallow underground sources.

“PRADAN had trialled water-harvesting techniques on a small scale but they wanted to run a more scientific evaluation and then improve and apply the technology in different landscapes,” Dr Cornish says.

With support from the Indian Council for Agricultural Research and ACIAR, a 4-year project was launched in 2002 that allowed two villages to adopt and test PRADAN’s water-harvesting technology. That meant digging water-storage pits in the uplands and building a network of channels to funnel rainfall to the pits. In turn, this increased infiltration of monsoonal rain to the shallow groundwater, which could then be accessed after the monsoon using seepage tanks in lower-lying areas.

Next came the provision of agronomic expertise and the introduction of new crops for use at the upland sites. This was made available to farmers using participatory techniques that saw the farmers—especially women—identify research questions and carry out field trials, always with the support of PRADAN.

Project executive, Ms Kuntalika Kumbhakar, says PRADAN played a major role in ensuring local participation in the project. “We mobilised and organised the community and got the works executed in the field,” she says. “The organisation has a knack for being creative and open to new ideas, and working with a sizeable number of families the information spreads.”

The participatory model saw women become enthusiastic agents of change, and in response the project was expanded to help develop agronomic know-how. This came to include mentoring on appropriate fertiliser use and weed management through the use of line planting. Another example is the introduction of short-season rice varieties, an innovation that increases opportunities to plant a second crop in the rice paddy, typically mustard or wheat.

ACIAR research program manager Dr Mirko Stauffacher says that with water-harvesting technology making it possible for the farmers to expand and diversify production of agricultural commodities, the project continued to support the villagers by looking at market access for the surplus produce.

“The project looked at water management very holistically—it was not just about providing people with water for different parts of the landscape, but looking at overall food security and farm profitability,” he says. “And the team managed to do that very well, for example, by exploiting opportunities to supply vegetables such as tomatoes and gourds to markets out of season.”

Freed from reliance on one annual rice crop, livelihoods within the participating villages improved, driving socioeconomic changes that are visible to the eye. There are improvements in diet, housing and livestock ownership, and money for incidentals, such as books for children’s schooling. But the social changes run even deeper. There are gains in women’s prestige within the communities and more cohesive social structures as income opportunities within the villages help prevent the seasonal exodus of men in search for work.

“That had such a positive impact that practices developed in this project have spread beyond the two villages in the absence of any formal extension activity,” Dr Stauffacher says. In response, ACIAR is planning a follow-up project specifically geared to facilitate a technology roll-out to other communities.

“What we want to know is how we can help spread benefits across many communities in this area,” Dr Stauffacher says. “So basically we are looking to understand how to scale out project outcomes and then, within a couple of years, actually do it.”

![Farmers and project team inspecting a newly dug seepage pit in Pogro watershed.](image)