‘Agents of change’ help secure monsoon farmers

Farming communities in India are learning to manage water so that it is available for agriculture beyond the monsoon season

BY **MELISSA MARINO**

If Indian farms are small by Australian standards, then those in some of its most impoverished states, Jharkhand and West Bengal on the East India Plateau, are absolutely tiny—even by Indian standards. Mostly less than one hectare, these diminutive farms struggle to produce enough food to feed one family. Traditional subsistence farming, that relies on low inputs and monsoonal rains, deliver only one crop each year, despite enough water for additional crops to be grown. The key is capturing this water and better utilising it.

Not only does a single crop deny the farmers an income stream from the possible sale of additional crops, it also leaves them vulnerable to drought or other elements. If their crops don't grow, they don't eat.

But that is starting to change through a project addressing better water resource management and cropping practices as a way to improve livelihoods, and is based on participatory processes that emphasise the role of women in facilitating change.

The first partnership of significant scale between ACIAR and a non-government organisation (NGO) in India, the project combines the resources and expertise of Australian partners led by Professor Peter Cornish from the University of Western Sydney with the hands-on know-how of Indian rural development group PRADAN and the Indian Council for Agricultural Research.

When the idea for the project was first raised some years ago, ACIAR decided to try a relatively new approach to the challenge of achieving update and adoption from research projects.

PRADAN, with its long history of working for community development in the region and experience in meeting farmer's needs across six Indian states, provided the answer to boosting uptake while doing good research—engage the community and, in particular, the women at all stages of the project.

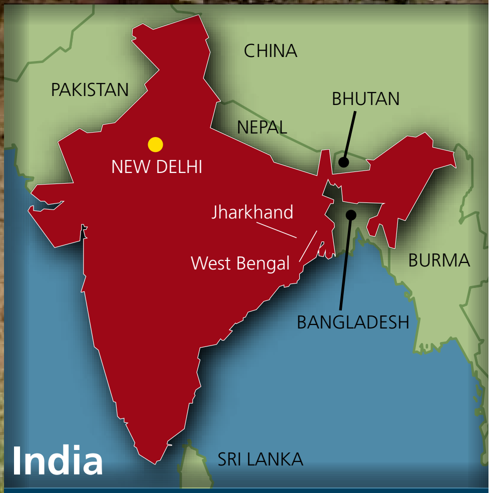
PRADAN always mobilises women in the community first, to ensure their work is effective. When project executive Kuntalika Kumbhakar first enters a community, she establishes self-help groups for women, creating a platform for action by teaching them to manage finance or the goals of a particular project.

"I anchor the program for women's self-help groups (SHGs), monitoring and supervising the program, developing training modules and implementing them," she says.

Ms Kumbhakar says PRADAN has played a major role in ensuring local participation in the project. "We are mobilising and organising the community and getting the works executed in the field," she says. "The organisation has a knack for being creative

Villagers construct a seepage pit to capture shallow groundwater for crop irrigation.

PHOTOS: PETER CORNISH



PARTNER COUNTRY: India

PROJECT/DESCRIPTION: LWR/2002/100: Water harvesting and better cropping systems for the benefit of small farmers in watersheds of the East India Plateau

CONTACT: Dr Peter Cornish, p.cornish@uws.edu.au

Local farmers are equal partners in research, taking part in on-farm experiments.

and open to new ideas, and working with a sizeable number of families, the information spreads."

The ACIAR project began with villagers choosing a mixed-gender group to work with the research team, but the women soon dropped out. Ms Kumbhakar's expertise was enlisted by Professor Cornish when he subsequently found the men also losing interest in the project in Amagara, a village of more than 200 people in a catchment of less than 100 hectares.

"We'd negotiate all this work, we'd start it and then the farmers would be reluctant to come and weed the plots," he says. "And then Kuntalika said 'how about you bring in the women's groups', and then the women chose the farmers and the fields and they organised the labour. It seems that women are much better at organising themselves than the men, and at the moment it seems to be working quite well."

ACIAR South Asia regional manager, Dr Kuhu Chatterjee, says one reason women are the agents of change in such communities is because of the nature of subsistence farming that requires men to migrate for work seasonally, leaving women as the ongoing presence in the village.

They also seem keener on change than the men. "Women are really driving the changes all throughout the area," she says.

By embracing PRADAN'S customary approach to target women first, the project, which is halfway through its four-year duration, has now successfully engaged the community at large, and is already producing positive results from its participatory approach.

Professor Cornish says the truly participatory nature of the project, which has involved farmers in devising the trial priorities as well as conducting and evaluating the research itself, has meant they are learning how to learn.

"The farmers do almost all of the fieldwork and they participate in the data collection and interpretation of the data," he says. "They are involved from beginning to end."

Ms Kumbhakar says PRADAN was keen to develop some 'rules of thumb' for water harvesting and improved cropping practices based on demonstrated principles that could be followed easily and replicated in the field. Its large and established networks are expected to provide an effective means to disseminate the new techniques and promote the adoption of new technology.

Women and farmers from Pogro village, collaborators on the ACIAR project, in a teambuilding workshop.

In a region where 60% of the annual 1,200 millimetres of rainfall is lost to run-off, the project, now running in three East India Plateau villages, hinges, perhaps unsurprisingly, around water.

By finding ways to store and access run-off or shallow groundwater from the monsoon, which accounts for 80% of the year's rain, farmers can free themselves from reliance on one annual rice crop. This unlocks not only a more secure food source, but also provides a potential income from their enterprise.

PRADAN had already developed water-harvesting techniques to both capture run-off and tap into shallow subterranean flows.

"PRADAN has trialled this on a small scale and they wanted us to evaluate them more scientifically and to provide principles for applying them elsewhere," Professor Cornish says. "And what we're evaluating is if their techniques can be improved."

Water-harvesting measures that retain more of the rainfall in situ have been implemented to convert degraded uplands into productive fruit-growing areas or plantations. This will also reduce pressure to crop those uplands and may reduce flood peaks in the future.

Water harvesting in the uplands is expected to have the added benefit of increasing infiltration of rainfall to the shallow groundwater, which can be accessed after the monsoon using 'seepage tanks' in lower lying areas. Crops following rice can be irrigated from the tanks, which are recharged naturally within days.

One of the big discoveries for everyone has been the value of the residual water that remains in the soil at the end of the monsoon. "I think everyone is surprised at the potential to grow a second crop after the monsoon even without irrigation in some areas," Professor Cornish says. "We're extending the duration and the variety of cropping."

But with increased opportunities comes

the need for increased knowledge of agronomy.

"Growing two crops a year for most of these farmers is brand new so before they can use their water resources better, whether it's water captured in a pond or in a seepage tank or extracted from the soil after the monsoon, they have to improve their agronomic skills," he says.

And so the project has now expanded to develop locally relevant information on basic agronomy including appropriate fertiliser use, weed management and line planting, working closely with PRADAN and the farmers to identify the research questions and carry out the work.

Traditionally, for example, farmers in the region would broadcast seed, which makes weeds difficult to control in non-flooded crops.

Part of the program therefore is providing opportunities for farmers to experience the benefits of planting crops in rows, to achieve improved weed control and more efficient fertiliser use. "This might seem like common knowledge," Professor Cornish says. "But it's brand new for them."

Ms Kumbhakar says the communities hoped to increase their cropping options and understanding of agronomic practices, and are taking up new approaches keenly. "To date the work on cropping options and improved agronomy has been an eye-opener for us," she says. "We have come to know and understand the different use of fertilisers with a variety of crops and its interdependence with controlled irrigation."

The impact of phosphorus-based fertilisers has impressed both the scientists and the farmers in the region.

Phosphorus is naturally low in the region's soil that has been cropped for a significant amount of time with little or no fertiliser or manure. The response when fertiliser was applied, says Professor Cornish, left everyone stunned.

"We've even shown significant responses to phosphorus fertiliser in paddy rice, which is a relatively new and unexpected finding for rice," he says. "The preliminary estimate is that it increases yield by 30%."

The new techniques are opening farmers' minds to new possibilities, allowing them to grow completely new crops and old crops in new ways. Hopefully this will nearly double both the cropping intensity and the amount farmers can expect to produce in each crop.

Just one example of change in the farming system comes with new, short-season varieties of rice—a crop that helps manage risk in dry years and, with its early maturity, also increases the chance of planting a second crop using the residual soil water and some irrigation if required.

Those second crops, depending on the amount of residual water in the soil, could be rainfed or irrigated mustard, or irrigated wheat—both of which are being trialled in the region.

"Neither mustard nor wheat are new crops to anyone, but it's the short-duration rice and mustard and the sparing irrigation of mustard and wheat that are new," Professor Cornish says. "So there are different ways of growing the same crop."

And there are other benefits of the new approach to farming. By extending the cropping season in the region and increasing the diversity of crops, social cohesion will be improved by ensuring that men no longer have to leave the village in the dry season to find poorly paid work elsewhere.

Diets and the health of people in the region are also expected to improve through the addition of vegetables, fruit and pulses.

Environmental benefits including the revegetation of degraded uplands, less soil erosion and possibly reduced flood peaks are also expected. Improved water management and agronomy enable greater agricultural production by increasing plant water use, which, in turn, may reduce the amount of run-off.

The farmers in the region, like those everywhere, have a great appreciation for the value of water. "These farmers have expressions like 'water is everything', and they're right," Professor Cornish says. "This project will provide them with effective systems to reap its full potential." ■

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> — PROFESSOR PETER CORNISH

The trend is towards engaging both men and women in the planning of research experiments.