

Tackling climate change in Gorakhpur

The people of Gorakhpur district, UP, have come to expect heavy rains followed by long dry spells as a consequence of climate change. But they are no longer allowing climate change to affect their crops. At shared learning dialogues, they are learning about the benefits of multi-cropping, alternative farming, soil management and seed autonomy. **Surekha Sule** reports



"Earlier there used to be continuous low-intensity rain, with the river Rohini swelling two or three times due to heavy rains in Nepal. But now it rains incessantly here, bringing flash floods every now and then, followed by a long dry spell which is very bad for our crops," says Ramdeen. He is a farmer from Makhanaha village (Campierganj block, Gorakhpur district) in eastern Uttar Pradesh.

"Earlier the monsoon season would start in June and end in September; our village used to get flooded twice or thrice in July and August. But in 2009 the rain arrived on May 24, and in June itself we had floods," says Rajendra, who also lives in Makhanaha. Villagers speak of odd weather patterns with floods becoming more frequent due to heavier rainfall over fewer days. Earlier, the floodwaters would recede within a week; now the land remains waterlogged for a month, destroying the kharif crop. Excessive rain, floods, waterlogging, drought -- all in one season!

In contrast to earlier years, when 70% of the average annual precipitation fell over an 80-day period, the same amount now falls in just 50 days. The indications are that climate change has increased the intensity and frequency of extreme weather events, complicating weather predictions, according to the Gorakhpur Environmental Action Group (GEAG).

Shakuntala Devi, another villager, says: "Earlier it used to get cold during Dassehra (October) and we needed sweaters and *rajais* (quilts). But now even after Diwali there is no sign of winter." Bhanamati Devi agrees: "We used to wait for the arrival of *kadakul* birds (sparrow) to sow wheat after Diwali. These birds flock here at the onset of winter, and that is the right time for us to sow wheat. This year there has been no sign of the birds."

Indeed, farmers were worried about the wheat crop. A late winter means late sowing of wheat. The winter (rabi) wheat grain is aided in the ripening process by warm winds following peak winter. This time around, however, because of the late sowing the fear was that the winds may blow in before the ripening stage, destroying or badly affecting the crop. Gorakhpur's potato crop was affected too because of late winter fog, and then the onion crop was in danger of rotting thanks to a long hot spell. The essential foodgrain, arhar (a pulse), that requires cold weather during its flowering phase has also been affected by a delayed winter. In short, traditional cropping patterns have been seriously disturbed by the extreme weather.

The Himalaya in Nepal descends steeply towards Uttar Pradesh with rivers running into the flat plains (the terai) of eastern Uttar Pradesh, flooding them during the monsoon. River embankments, built to control the water, are often breached by the swirling waters.

Analysing the agro-climatic situation in eastern Uttar Pradesh, Dr Shiraz Wajih (who formed GEAG in 1975) says that Nepal is usually blamed for releasing water and causing flash floods. Instead, he explains, it is a simple relationship between the plains and the hills; with floods comes the problem of heavy siltation (the 1998 flood deposited silt to a depth of six feet, in places). Rivers sometimes change course, forming new lakes. Embankments that are designed to mitigate the effects of flooding are often breached by flash floods. Floodwaters enter villages and fields and then cannot return to the river channel. Various works -- such as roads and canals, or projects under the National Rural Employment Guarantee Scheme (NREGS) -- act as barriers to the natural flow of water. Drainage should in fact be a priority in the handling of flood-related problems. These may seem like localised issues, says Dr Wajih, but their impact adds up at the macro level making the entire region vulnerable.

Shared learning dialogue

Most villages in the terai region of eastern Uttar Pradesh find themselves in a similar situation. With a view to identifying effective mitigation measures, the Gorakhpur Environmental Action Group organised shared learning dialogues (SLDs) at the village, district and state level. "During these SLDs, focus group discussions on local issues were supplemented with recent information drawn from scientific journals and regional research on the implications of climate change on regional flood dynamics," says a policy brief from the group. "Much of the information available on the impact of climate change was very general. Despite this generality, when used to support discussions with regional stakeholders, it was extremely useful for identifying a potential course of action to mitigate the impacts of climate change." SLDs also highlighted the risk of continuing reliance on conventional strategies such as embankments, where existing

technical problems like breaching or blocking of drainage are likely to become worse with climate change.

The GEAG dialogues have shown that while strategies designed for the micro level seem to be working, much more is needed for a particular region. A few strategies suggested by GEAG are: better access to climate and weather information and early warnings (the creation of village information centres has been discussed, also SMS-based text services as mobile phone usage in the villages is high); development of points of refuge (raised grain banks and raised houses) in which people and their assets can shelter during a flood; diversification of livelihood and cropping systems; improved drainage; development of insurance systems; and new sources of groundwater for irrigation in drought-prone areas.

The strategies identified through SLDs were implemented by farmers in the village of Sarekhurd (Mehdawal block). Farmers were accustomed to growing foodgrain both during the kharif and rabi seasons. The kharif crop was uncertain and depended on the length of waterlogging -- when the entire area was inundated, no farming was possible. When that happened, farmers looked to rabi crops like wheat, gram, peas, lentils and chickpea to sustain them and their families. In a year of excessive flooding, the wheat was sown late and productivity declined. Most of the time the village experienced food insecurity; migration to cities was extremely common.

The Gorakhpur group discussed with the villagers of Sarekhurd how to form a common strategy that would ensure food security whilst guarding against the effects of climate change. With this objective, three committees -- agriculture and livelihood, disaster management, and health -- were set up. Farmers who joined the agriculture and livelihood committee were given training in alternative farming methods, composting, vegetable production, cash crops, nursery, etc. As a result, they started earning more by growing four to five crops in a year. Multi-cropping instead of mono-cropping has helped stabilise incomes so that farming households that found it difficult to get two square meals a day are now able to run their households comfortably. Children who were earlier taken out of school have returned. Women's and children's health issues are being tackled, and more work in the village has helped stem migration.

Thirty-five-year-old Chulhai owns 1 acre of land in the low-lying area adjacent to the river Rapti. Frequent floods and waterlogging made the going extremely tough for him and his family of 14. Today, Chulhai considers himself empowered enough to tackle any disaster. "Floods, waterlogging or drought, any situation can be turned to our advantage through right management of time and place," he says. During waterlogging, Chulhai prepares the nursery on a raised platform and replants the saplings when the water recedes. This strategy saves him sowing time; had he waited

for the water to recede he would have lost precious time in the plants' growth cycle. During waterlogging, vegetables like bottle gourd and beans are made to grow upwards on a raised platform or ***machaan***.

Chulhai sowed Narendra, an early variety of rice, on a fifth of an acre during the kharif season. His efforts yielded six quintals of rice. After keeping some for consumption at home, he sold the remaining two quintals for Rs 2,000. During the rabi season, Chulhai grows vegetables and spices on half his land. He has divided it thus: chillies and mustard on 20% of the land; mustard and lentils on 10%; garlic, onions, radish on 5%; peas on 5%; turmeric on 2%; and gram on 2%. This diverse crop portfolio spreads his risk. The radish will be harvested first and sold, giving him a cash income. If it gets too cold and the potato crop is affected, there are pulses to fall back on. Once it gets colder, Chulhai will sow wheat on half his land. Importantly, he does not use chemical pesticides on his crops. To control pests he has sown ***saunf***, coriander and marigolds along the border of his land; this also discourages stray animals from grazing on his crops. Chulhai's farm earned him a cash income of Rs 35,000 in 2008, after factoring in the household's food requirements.

Government linkage

During a learning session at Meerpur Phoolwaria village in Gorakhpur's Jungal Kauria block, GEAG found that farmers were aware of the various government agriculture and disaster management schemes and wanted to benefit from these. The problem was scarce information on them, partly a result of poor outreach by the concerned departments. The farmers of Meerpur Phoolwaria decided to take GEAG's help. Meetings were organised where they discussed farm-related problems and how these could be overcome with the help of government schemes; the process was made easier thanks to the attendance of officials from the departments of agriculture, horticulture, animal husbandry, etc. A shortlist of achievements shows the importance of these community meetings:

- Sessions and meetings with horticulture officials helped Rambahal plant banana on part of his 3-acre farm.
- Jitendrakumar learnt about green manure from the agriculture department and now practises organic farming.
- The farmers of Meerpur Phoolwaria have begun collective farming of chickpea. Individual farming had almost ceased because of repeated crop infestations. With inputs from the government, 15 farmer groups put 5 hectares under chickpea and got 32 quintals per hectare in 2008, as against an earlier yield of 12-15 quintals per hectare.
- The soil department helped farmers protect their farms against soil erosion by

- placing bunds at strategic locations; the bunds totalled a length of around 3 km.
- Animal husbandry officials now come to the village regularly to vaccinate cattle instead of farmers having to drive their cattle to the department office, at the block level.
 - Farmers use the 90% subsidy on zinc and gypsum fertiliser and the 50% subsidy on pesticide-spraying machines and seed storage. Even so, their use of chemical pesticides and fertiliser is dropping, to be replaced by traditional remedies such as neem oil.
 - The agriculture department held three demonstrations on compost preparation.

These sessions have been successful at the individual level. Rambahal says his farming costs have dropped and his income increased thanks to the knowledge and support he received at the dialogue sessions. His wheat cultivation costs in 2006 were around Rs 8,000; his earnings totalled Rs 25,000. In 2008, his cultivation costs came down to Rs 5,000 as he used his own seeds and organic manure; his income shot up to Rs 100,000 thanks to a productivity boost from 15 quintals per hectare to 22 quintals.

Rambahal's neighbour Ram Pratap Singh complained that farmers had to wait in long queues for seeds at the block office in Jungal Kauria. And it took more than one trip to get the seeds -- a single office distributes seeds to farmers in all 170 villages in the block. Farmers say even if they are called one or two villages at a time, seed distribution takes several months. But farmers need seeds during a particular week in the sowing season. That's why GEAC insists on self-reliance as regards seeds.

Finally, the community dialogues threw up an unlikely hero in Meerpur Phoolwaria village. Farmer Mohit Prasad is famous for having gone to Brussels, Belgium, in October 2009. Prasad's visit came about through a mixture of circumstances. The effects of climate change were impacting his livelihood in agriculture, so, close to desperation, Prasad decided to migrate to Dubai in search of work. He even had his passport ready. Then the aid advocacy group Oxfam put out word that it wanted to take a farmer from India to Brussels to speak about the impact of climate change at a conference. Prasad fit the bill, made the trip, delivered his speech to an international audience, and returned to Meerpur Phoolwaria. He's now back in farming after finding that there was enough work to be done on the land. He has put the idea of migrating behind him.

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