With nature for company

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Merging traditional way of understanding weather with science and technology can not just improve the accuracy of weather forecast but augment adaptation to climate change also.

Shape of clouds can be an important indicator of weather. Source: Robert Hensley/Wikimedia Commons

As bamboo trees bloomed with long wispy spikes, Loknath Nauri knew it would be a tough year. “More the density of the flowers, the more severe the drought we face,” he says. This was in March 2015 in the forests of southern Odisha. Around the same time, he saw black-hooded oriole building a nest with its mouth facing west. “We get monsoon rains from the west to the east. The nest normally faces the east to avoid the shower, but this year, it was the reverse which meant there wouldn’t be much rain", Nauri says. Taking cues from nature on the oncoming weather helped Nauri prioritise drought-resistant and short-term crops. Not just farmers like him but pastoralists and hunter-gatherers across India have developed this understanding of nature which help them adapt by changing crop patterns, reinforce grain storage, ensure forage and reduce property losses due to natural disasters. Watching the signs Dragonflies hovering low, spiders weaving thick webs or halo around the moon--these are all signs of imminent rain. Likewise, there are natural pointers of drought, storm, high temperatures, flooding, et al. These forecasts may range from one day to 15 days or the whole season. From biological signs like dropping of leaves of a tree to non-biological ones like the direction of the wind, the locals are in constant dialogue with nature. A **study** done by the Central Research Institute for Dryland Agriculture in Andhra Pradesh found that among the natural cues, 16.7 percent farmers used clouds as an indicator of rains, followed by the wind (10 percent) and animals and birds (8.8 percent). The rest included signs involving lightning, moon, trees etc. Though technology today offers quick and accurate forecasts, it is still unable to offer hyper localised estimates in easy-to-grasp language. On the other hand, indigenous knowledge is holistic, specific to local conditions and also subtly emphasises on living in harmony with nature. Traditional wisdom is increasingly finding acceptance in the scientific community, thanks to field studies done over the years. Animals are now well known to be highly tuned to minor variations in the atmosphere that triggers their survival mechanism. For instance, a drop of a few millibars in barometric and hydrostatic pressures due to storms in the Atlantic Ocean makes

sharks swim

to deeper waters which are less affected. Likewise, plant life has also been extensively studied in relation to weather. A recent study by the Institute of Tibetan Plateau Research found that sedge and grass species on the Tibetan plateau unfold their leaves when they sense the onset of the Indian monsoon. Another study documented ethnic forecasting methods of 19 tribal communities in Tripura. Around 30 of these forecasting methods were related to plants and fungi. “Natural signs of weather have been found to be valid through field experience. Though these may not always be accurate, dovetailing with scientific systems will strengthen forecasting,” says Anand Sharma, who works as regional coordinator of the Agromet Advisory Service Division in India Meteorological Department. **Adapting to changing climate** This assumes greater importance now as rapid climate change is impacting India’s rainfed agriculture, especially with increased focus on mono-cropping. “Climate change has puzzled even birds and animals and they are trying to adapt themselves to the changing conditions. We are also finding that indigenous methods of forecasting short-term weather are failing but those related to long term are still valid. For instance, if the nest of the weaver bird is near the ground, the monsoon will not be good this year,” says K. Ravi Shankar, principal scientist at the Central Research Institute for Dryland Agriculture. A major reason why this traditional knowledge is difficult to merge with modern technology is because it is location specific and can’t be generalised. A lack of benchmark makes it difficult to be harmonised. Hence, it needs to be rationalised, test verified and then modified to suit the conditions. “Integrating both traditional and scientific forecast methods will help in realising the opportunities and limitations for their application in farm management. Our ultimate aim is to enhance farmers’ decision making for which both science and experience are required,” says Shankar. The rural to urban migration is depriving the young generation of the wisdom of their ancestors while a push for mono-cropping is making farmers susceptible to crop losses due to sudden weather changes. Even the local sayings that used to propagate the traditional knowledge are fading from collective memory. What can be done immediately is region-specific preservation and popularisation of these natural signs. The Bureau of Meteorology, Australia, has already moved forward in this direction by preparing **seasonal calendars** with natural signs of weather forecasting used by its 12 tribal communities. See a

document prepared by CECODECON on popular folk sayings about the weather

is a good start.

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