The Indian EXPRESS

How wet is the ground after rain? for first time, India gets soil moisture map

This forecast, following a joint exercise by IIT Gandhinagar and the India Meteorological Department (IMD), for the first time, provides a country-wide soil moisture forecast at seven and 30-day lead times.

Written by Sowmiya Ashok | New Delhi | Updated: October 3

Soil moisture is crucial for agriculture since it directly affects crop growth and how much irrigation is required for the area. (File Photo)

With the rabi season around the corner, a countrywide forecast prepared at the end of the monsoon season suggests deficit soil moisture conditions are likely in Gujarat, Bihar, Jharkhand, Tamil Nadu and southern Andhra Pradesh.

This forecast, following a joint exercise by IIT Gandhinagar and the India Meteorological Department (IMD), for the first time, provides a country-wide soil moisture forecast at seven and 30-day lead times.

The analysis also indicates that soil moisture conditions in western Uttar Pradesh, Bundelkhand, and Chhattisgarh are likely to be normal or surplus at the start of the rabi sowing season. Soil moisture is crucial for agriculture since it directly affects crop growth and how much irrigation is required for the area.

A team led by Vimal Mishra, associate professor at IIT Gandhinagar, uses the ‘Variable Infiltration Capacity’ model to provide the soil moisture prediction. The product, termed ‘Experimental Forecasts Land Surface Products’, is available on the IMD website and has been developed using the hydrological model that takes into consideration soil, vegetation, land use and land cover among other parameters.

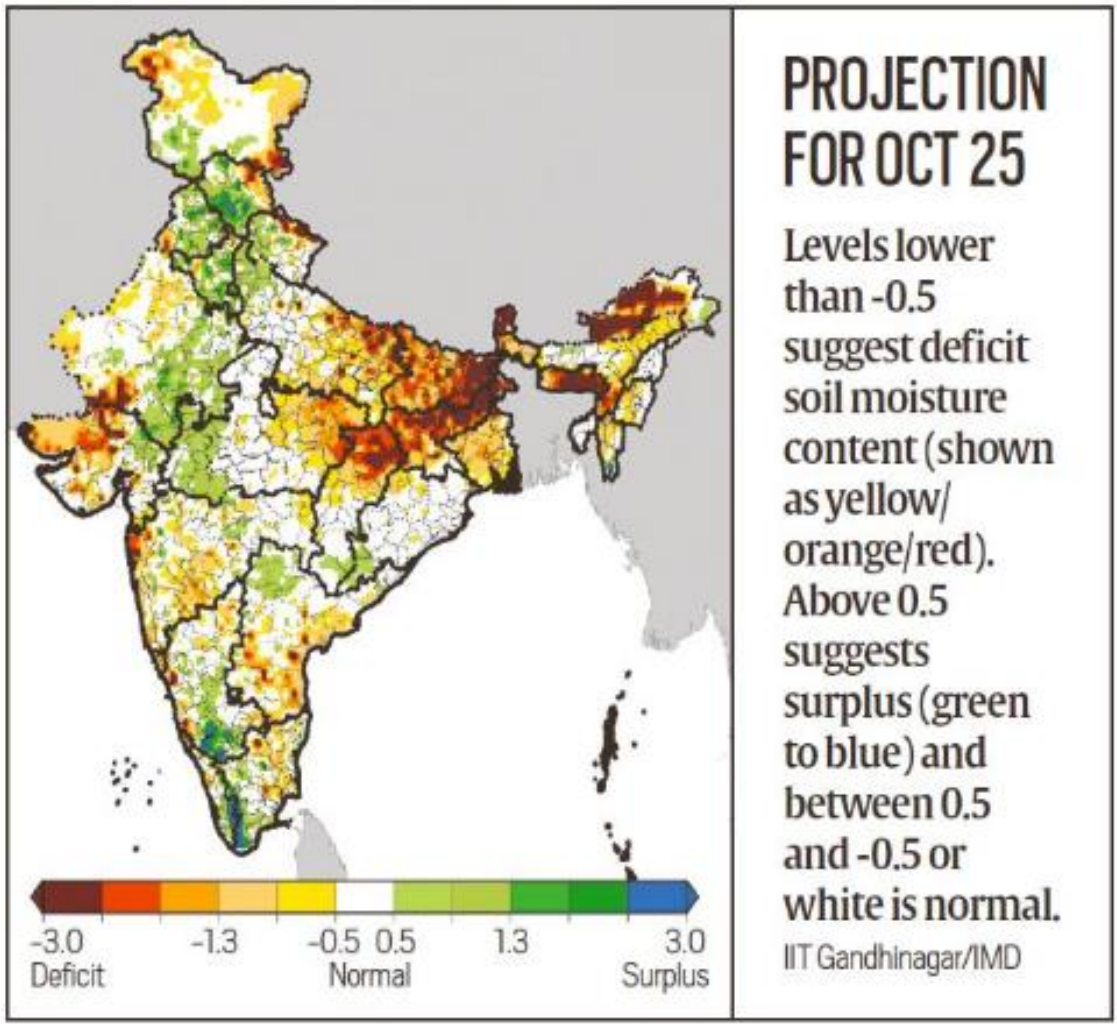
Forecasting of soil moisture holds significance for the rabi season. As per official data, the total area sown under rabi crops is around 625 lakh hectares of which wheat takes up 300 lakh hectares. Timely soil moisture forecasts will help target interventions, in terms of seed varieties for better planning in agriculture.

“India has been working on its own high-resolution soil database that is essential for soil parameters used in the modelling. However, the database is not available for the entire country currently. Once available, we will replace it with that information,” Mishra told The Indian Express. At present, the IIT Gandhinagar team is using the IMD’s grid-level observations and forecast products of rainfall and temperature.

“Based on observed conditions at present, Gujarat, parts of Maharashtra, Chhattisgarh, Jharkhand, Tamil Nadu and parts of Andhra Pradesh are deficient in terms of soil moisture right now. This means that if there is not enough rainfall in one or two months, these are regions which will demand heavy irrigation whether that comes from groundwater or surface water storage (reservoirs),” Mishra said.

“In Gujarat, a look at the monsoon season rainfall this year shows rainfall deficit, while the Narmada basin also received inadequate rainfall. The Sardar Sarovar reservoir may not have received enough storage and since the catchment of the reservoir did not receive normal rainfall. In these conditions, the state may face water stress, which can result in excessive groundwater pumping for irrigation.”

Mishra said that forecasts for the Bundelkhand region look favourable at the moment. “In Uttar Pradesh and northern Madhya Pradesh, this year, the rainfall was good. Tamil Nadu is showing dry conditions but if the state gets good rain from the Northeast monsoon, the current soil moisture deficit is likely to go away,” he said.



In Bundelkhand, most farmers keep their land fallow or just grow some fodder crop during the kharif season since the rains are unpredictable and there could be extended dry spells after sowing. They then mainly cultivate the rabi crop using the soil moisture left behind by the monsoon rains. It is a similar trend in Bihar, in low lying areas of Seemanchal and Kosi belt, where no crop is grown during Kharif because of inundated lands.

Mishra pointed out that soil moisture provides crucial information needed for crop growth in different parts of the country. Through this joint project, the IMD has provided this information from mid-July onwards. The product has become operational on an experimental basis that will be further enhanced based on the inputs from the stakeholders.

“Crucial information needed for agriculture is not revealed only through rainfall data,” said Mishra. “Even if you have a normal rainfall, if the temperature is abnormally high, it can rapidly deplete the soil moisture. So essentially soil moisture gives us more information on what is needed for crop growth in different parts of the country.”

Ministry of Earth Sciences Secretary Dr M Rajeevan said that the link between rainfall data and soil moisture is extremely important. “The IMD is collaborating with IIT Gandhinagar which uses a land surface model to forecast soil moisture content,” he said. The team from IIT Gandhinagar will train IMD officials to take over the project, according to said.

Source: *https://indianexpress.com/article/india/how-wet-is-the-ground-after-rain-for-first-time-india-gets-soil-moisture-map-5383688/*