

DROUGHT'S VICIOUS CYCLE

Despite 40 years of efforts and huge resource allocation, drought continues to hit the same districts every year

SUSHMITA SENGUPTA | NEW DELHI

CONFLICTS SIMILAR to those in Marathwada are brewing across the country, which faced an extremely dry southwest monsoon and even drier winter monsoon. In November 2018, the Jharkhand government declared 18 of its 24 districts drought affected. In Koderma district, which received 55 per cent less rainfall than what it usually receives, farmer Ashok Turi of Dhargaon village says his savings are drying faster than the waterbodies around the village. After his kharif crops failed due to deficit rainfall last year, Turi had invested in sowing rabi crops on his 2.5 hectare (ha) farmland this winter. But they too have failed to germinate. "I may soon have to work as a daily wage labourer to sustain my family," says the 50-year-old. Condition is no different for Deep Narayan Yadav. He took the risk of hiring water lifting motor pumps at the rate of ₹200 per hour and sowed wheat in one-third of the 1.2 ha farm. But he could not arrange sufficient water and his entire field has turned brown. In north interior Karnataka, which falls in rain shadow area, Subanna Biradar says the loss in productivity has been over 50 per cent despite using borewells. He grows sugarcane on his 1.2 ha farm with the help of a single borewell. The situation is no better in Bihar, West Bengal, Goa, Gujarat, Tamil Nadu, Meghalaya, Karnataka and Arunachal

How funds fail

The money allocated to drought proofing and relief programmes so far is seven times the budget of MGNREGS for 2018-19

| Programme | Money released/allocated (In ₹crore) | Year |
|--------------------|--------------------------------------|-----------------------|
| DDP+IWDP+DPAP | 7,739.0 | 1995-96 to 2007-08 |
| DPAP+DDP+IWDP+IWMP | 806.8 | 2008-09 to 2013-14 |
| IWMP | 11,032.0 | 2009 to February 2018 |
| MGNREGS | 229,100.0 | 2012-17 |
| NDRF | 2,746.0 | 2015-16 |
| SDRF | 7,480.9 | 2015-16 to 2016-17 |
| PMKSY | 65,000.0 | 2015-2018 |
| NRDWP | 45,800.0 | 2012-17 |
| NCCF | 4,116.4 | 2001-2005 |
| Total | 3,73,821 crore | |

Note: Desert Development Programme (DDP); Drought Prone Area Programme (DPAP); Integrated Watershed Development Programme (IWDP); Integrated Watershed Management Programme (IWMP); National Calamity Contingency Fund (NCCF); National Rural Drinking Water Programme (NRDWP); Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS); Pradhan Mantri Krishi Sinchai Yojana (PMKSY); National Disaster Relief Fund (NDRF)

Source: Questions in Lok Sabha, Rajya Sabha, India Stat, Media reports and Economic and Political Weekly December, 2018

Pradesh where more than 50 per cent of the districts received deficit rainfall.

Surprisingly, drought is not new to India. On an average, every third year gets a drought in these areas. Rainfall data over the past century indicates that there has been a severe drought every eight to nine years. The government's concentrated efforts to make the country drought-free also date back to the 1970s. So far, it has introduced 10 national programmes, and invested some ₹3,97,011 crore since the 1990s to drought-proof the

country (see 'How funds fail'). "Over the past 20 years, the government has not only increased money allocated to drought-mitigation measures, but is also employing sophisticated tools like the geographic information system (GIS) for preparing action plans keeping climate change in mind," says Biksham Gujja, chairperson, AgSri Agricultural Services Pvt Ltd in Hyderabad that works on livelihood development and food security.

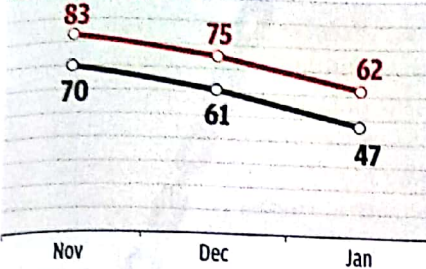
Yet, a 2018 research paper, jointly published by the Indian Institute of

All downhill

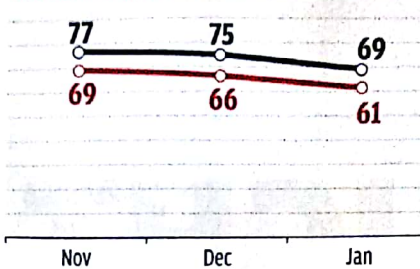
Water availability in all 91 reservoirs of the country between November 2018 and January 2019 is worse than what it was in the same period a year ago

Per cent of usable water
 — Nov 2017 to Jan 2018 — Nov 2018 to Jan 2019

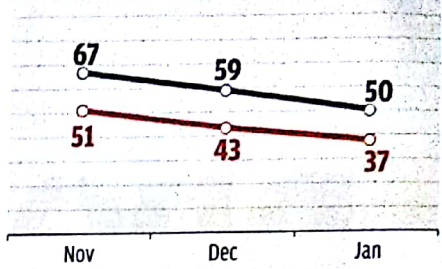
Northern region



Eastern region

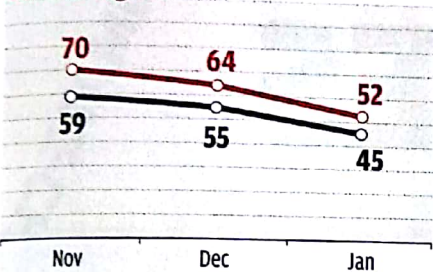


Western region

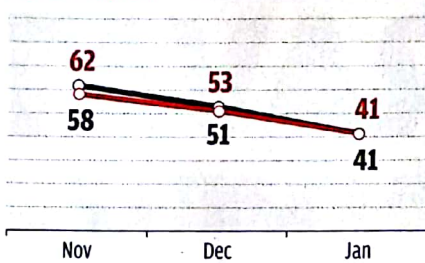


Source: Central Water Commission

Central region



South region



Technology (IIT)-Indore and IIT-Guwahati says at least 133 of the 634 districts in the country face drought almost every year; most of them are in Rajasthan, Maharashtra, Karnataka and Chhattisgarh. In southern India, Tamil Nadu was the best performer, with 56.74 per cent drought-resilient area. It was followed by Andhra Pradesh (53.43 per cent) and Telangana (48.61 per cent), while Karnataka (17.38 per cent) and Kerala (19.13 per cent) were at the bottom of the list. Among the northeastern states, Assam at 20.72 per cent had the lowest percentage of resilient area.

An analysis of usable water storage capacities in all 91 reservoirs in India shows most now hold less water during the dry months of November-January (see 'All downhill').

Where does the problem lie?

Gujja says it is difficult to answer whether the water conservation structures constructed under various programmes are efficient enough to

tackle drought. The problem lies in the fact that watershed programmes in the country are being implemented like any other government programmes. "We try to assess their efficacy by measuring bunding, silting and area covered, whereas its effectiveness depends on its impact on crop production and how it benefits the farmers," says Gujja.

Consider Karnataka, one of the least resilient states identified by the 2018 research paper. An assessment of the list of drought-prone areas between 2011-12 and 2018-19, shows 16 of the state's 30 districts get affected by drought over and again. Between 2015 and 2018, shows the website of MGNREGS of Karnataka, over 78,000 water conservation and harvesting structures have been built. More than 27,000 ponds were renovated under this scheme since 2015-16. Belagavi district's water conservation project earned Union Ministry of Panchayati Raj's award for the best effective MGNREGA implementation in the state

for 2016. But the district continued to be drought affected even post-2016.

G S Srinivasa Reddy, director, Karnataka State Natural Disaster Monitoring Centre, says the capacity of the farmers in adapting water conservation technologies is woefully low and this causes a repeat of droughts in the same districts. Ravindra Chary, acting director, Central Research Institute for Dryland Agriculture, Hyderabad, suggests long-term crop-, watershed- and water management-based solutions for drought mitigation. If water is not available, one has to plan the cropping pattern in the area intelligently.

Gujja says there is a need to understand that watershed programmes are not meant for irrigation. Water use has to be restricted where such projects are being implemented so that the improved soil moisture gets used. Communities that use water optimally and raise crops that are less water-intensive should be incentivised, he says, adding that ponds for storing water should be encouraged but planning should be based on traditional knowledge. ■

(With inputs from Chhandosree and Shreeshan Venkatesh)

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DROUGHT AGGRAVATES POVERTY

Study shows during drought years in Rajasthan, the vulnerability of rural households to poverty increases

PURNAMITA DASGUPTA AND SMITA SIROHI

NARRATIVES OF agrarian distress in economies that depend on agriculture to a great extent have unfortunately become familiar. India has 86 per cent small and marginal farmers, who own less than 2 hectares of farmland. More than 60 per cent of the country's population depends on agriculture and allied activities for livelihood. Though there are multiple drivers of risk in such a situation, it has become apparent that the fate of Indian farmers is linked to the vagaries of nature. In particular, the occurrence of drought creates social and cultural disruptions across farming households, and brings about huge economic losses.

A vulnerability study conducted in Rajasthan provides interesting insights into the relationship between poverty and drought in rural India. This highly climate-sensitive state is hit by severe drought every three out of five years. Most of its districts have experienced anything between two to five moderate droughts, while some have witnessed four

TARIQUE AZIZ / CSE

to six severe ones in the past 30 years. Significant variations are also observed in the year-on-year deviation in rainfall during kharif season. To measure vulnerability, we developed indices using the Intergovernmental Panel on Climate Change approach that combines exposure levels with sensitivity and adaptive capacity. As expected, vulnerability is high in places where there is high exposure in terms of declining trends in rainfall, as well as high variability in rainfall, and/or high sensitivity (Jaisalmer, Jodhpur, Dholpur, Barmer and Dungarpur). If we divide the state vertically into two halves, most of the eastern part has low exposure in terms of climatic variables. However, in terms of vulnerability, almost all the districts of Rajasthan in this half experience high (Karauli, Alwar, Chittorgarh and Banswara) to moderate (Churu, Bharatpur, Kota and Jhalawar) levels of vulnerability.

Measuring poverty in drought years

Empirical evidence from the National Sample Survey Office (NSSO) data for Rajasthan has been used to explore

this idea. The conventional approach of benchmarking poverty on the basis of daily per capita intake of 2,400 kilocalorie is usually adopted. A comparison of NSSO consumption expenditure data for two years, one in 2009-10, a drought year, and the other in 2011-12, a normal year, reveals that the incidence of rural household poverty stood at 34.4 and 22.3 per cent respectively. Decidedly, poverty increases across regions in a drought year and this phenomenon was universal in four of the five agro-climatic regions in which the state was divided during the study. In the state's western region, which comprises the Thar desert, the difference in poverty percentage between a drought (31.5 per cent) year and a normal (23.7 per cent) one was 7.8 per cent. While in the north, which has a good network of irrigation canals, the poverty incidence was higher by 14.8 per cent points in a drought year, more than double the proportion in a normal year. In the mid-eastern and south eastern parts, the magnitude of household poverty was higher by 19 per cent and 17 per cent point in a drought year.

During drought, the number of poor increases substantially in areas where poverty is relatively low in a normal year. In a drought year, the share of those, who are infrequently poor and are vulnerable to poverty, increases from 19 per cent to 27 per cent, apart from a doubling of those, who suffer from chronic poverty. This is observed in both agricultural and non-agricultural households. Drought-hit regions have developed coping mechanisms to cushion the worst impacts. For instance, in some of the southern districts bordering Gujarat, road and transport connectivity are good and remittances have contributed to asset building. In a drought year, established ways of coping are quickly adopted.

The existence of a direct synergy between the Sustainable Development Goal (SDG) 2 related to zero hunger and adaptation in cropping, livestock, and food systems that are designed to maintain or increase production is recognised. Achieving and sustaining SDG 1, that is eradication of poverty, is also linked to the well-being of the agrarian sector. Poverty reduction strategies would work well to strengthen coping capacities and build resilience to reduce future vulnerability to poverty. Identifying groups and areas most vulnerable to climate change can help formulate targeted policies to alleviate current challenges and reduce future risks. ■

 @down2earthindia

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