



INTERNATIONAL YEAR OF
MILLETS
2023



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ONE EARTH • ONE FAMILY • ONE FUTURE



BASAI WEEKLY NEWS UPDATES

FEBRUARY 26-MARCH 04, 2023

Why unusual weather is the new normal

A warm February after a surprisingly hot March last year are alarming signs of changing climate patterns. Are we ready?

SEEMA SACHDEVA

LOOKING at the cloudless sky, 71-year-old Inderjit Singh Sekhon, a farmer in Sangrur, enters his fields with a heavy heart. There have been barely any rains this winter while the mercury has been rising steadily. With summer conditions in February itself, he fears that the wheat productivity will be low like last year, or maybe even worse, since even higher temperatures have been predicted this year. "The weather has been playing havoc with the crops. February and early March are the months when the wheat crop will enter the reproductive stage. Too much heat in this period can make the pollens sterile, besides affecting the yield and size of the crop. The frost had already affected the potato crop this season. The rising temperatures will increase the possibility of insect attack by aphids, which suck the sap and weaken the crop," he says.

"Last year, the early sown crop didn't get affected much since the heatwave had started around March, and most of the crop had already matured. But a warmer February is likely to impact this year's early crop," says Dr Pavneet Kaur Kingra, head, Department of Climate Change and Agriculture Metrology, Punjab Agricultural University (PAU), Ludhiana. The researchers are already working on developing heat-resistant varieties, she says, adding that the PAU has been issuing advisories to farmers on minimising heat stress on crops by light watering and drip irrigation. If needed, 2 per cent potassium nitrate mixture should be sprayed in a phased manner, she says.

According to a report prepared by the scientists of the Indian Council of Agricultural Research-Central Research Institute for Dryland Agriculture, Hyderabad, the intense heatwave of March-April last year had brought down the wheat yield by up to 25 per cent in several districts of Punjab, the biggest contributor to India's food-grain buffer stock. This year, the productivity is likely to get even worse as the temperatures are expected to rise. A study published by the National Mission on Strategic Knowledge for Climate Change under the National Action Plan on Climate Change in 2016 had projected that if the temperature rise is from 2.5°C to 4.9°C, the yield of rice will drop by 32-40 per cent and that of wheat by 41-52 per cent. A warmer February is leading to the possibility of a hotter summer this year.

The northwest region, including Punjab, Haryana, Himachal Pradesh and New Delhi, is already witnessing above normal tem-



The sudden rise in temperature in February itself this year, it is feared, can severely impact the growth and productivity of the wheat crop. REUTERS

peratures. The Indian Metrological Department (IMD) has expressed the possibility of the spring season being altogether missed with an early onset of summer. According to Manmohan Singh, head of IMD, Chandigarh, Punjab and Haryana, the northwesterly winds (*paschimi vikshobh* in Hindi), or the extratropical storms arising in the Mediterranean Sea, Black Sea and Caspian Sea, are responsible for the winter rains and a dip in the temperature. These have been very weak this year, leading to the rising temperatures. "Mercury is already up by 7-8°C in Haryana, 4-6°C in Punjab and 6-7°C in Chandigarh. Summer temperatures are likely to soar much above the normal this year," he says.

This is the new normal, points out Anjal Prakash, an author of the Intergovernmental Panel on Climate Change (IPCC) 2022. "Climate change is here and now. In more than 2000 years of world history, this is for the first time that the earth has warmed up 1.1°C. The end of the century target of 1.5°C is likely to be breached by 2050 itself. Variable weather patterns are the first signs of climate change. Earlier, we could predict the weather. Our festivals like Makar Sankranti and Pongal were based on the changing seasons but the weather patterns have become too striking. This is likely to severely affect climate sensitive sectors like agriculture. Due to the lack of predictability, farmers will not be able to sow or harvest in time, which will affect the overall yield."

"The weather change and higher temperatures are on expected lines as the

weather cycles are shifting from La Nina to El Nino phenomenon. We are in a two-year cycle and the extreme temperatures will continue till next year," says Dr Ravindra Khaiwal, Professor of Environment Health, Department of Community Medicine & School of Public Health, PGIMER, Chandigarh. "The increase in temperatures can lead to heat-related illnesses, such as heat stroke, dehydration and exhaustion, particularly for vulnerable populations, such as the elderly, children, and outdoor workers. This will increase the burden on health-care systems," he adds.

"For those living in urban spaces, the impact will be even more daunting, physically as well as economically. The rising temperatures will superimpose on the already hot environment in cities and increase the demand for water and electricity, besides adding to the requirement of coolers and air conditioners," says Prakash. Meanwhile, at 9°C above normal, Delhi recorded the third highest February temperature at 33.6°C since 1969, while Churu recorded 40°C on February 16, the earlier record being set on February 28, 1953.

Shimla, the capital of the hill state of Himachal Pradesh, broke the previous record of February 23, 2015, of 14.2°C minimum temperature by recording 14.4°C on February 18. This was 11°C above normal. For the state to which tourism contributes about 7.5 per cent of the GDP, the absence of snow saw tourists giving a cold shoulder to this once-favourite winter destination. Those who had come to holiday in the hill

state were seen enjoying ice-creams.

The rising temperatures in the hills has made Shimla-based DP Bhatia sceptical of the future of tourism industry in the Queen of Hills. Says Bhatia, who has been working in the hotel industry for close to five decades, "There were times when as soon as it would snow in Shimla, tourists, from Chandigarh, Punjab, Haryana and Delhi would make a beeline to witness its white beauty. For the first time in many years, there's been no snow in Shimla. The scanty snowfall in the higher reaches of Narkanda and Kufri was not enough to bring tourists to the hill station. Weather is becoming too unpredictable." It is time to stop depending on snow to promote the state's tourism industry, he says. "We need to think out of the box and promote lesser-explored destinations like Hattu, Tattapani, Kharapathar, etc. We also need to highlight local culture, cuisine, nature walks, besides offering options like basking in the winter sun," he adds.

The soaring temperatures in Shimla saw a slight dip after it received its first winter rain on February 21. Horticulture expert SP Bhardwaj says, "Such a long spell of drought hasn't been seen in 17 years. The state was already heading towards 23-24°C temperatures, generally seen in March. Thankfully, the rain has led to a fall in the mercury. The chilling of apple is almost complete. Now there is good chance of uniform flowering of apples. If the heatwave had continued unabated,

NEW CHALLENGES CROP UP

- The rabi wheat crop is in its reproductive stage in the month of March. A sudden rise in temperatures during this period can enhance the maturity of the crop.
- Proper grain development gets affected, which can lead to the shrivelling of grains. This may result in a significant reduction in productivity.
- Studies have found that a 1°C rise in temperature may lead to 6 per cent reduction in the productivity of wheat.
- The heatwave conditions can become disastrous when the high temperatures are accompanied by deficit rainfall. Such weather conditions were experienced in March and April last year, leading to up to 25 per cent fall in wheat productivity.
- To prevent damage to the crops, it is essential to maintain adequate soil moisture and minimise heat stress. Light irrigation or drip irrigation should be done. If needed, a 2 per cent mixture of potassium nitrate should be applied.
- Selection of suitable crop varieties, tolerant to heat stress, should be used according to the prevailing weather conditions.

the yield would have gone down."

The rising mercury has been leading to increased forest fires as well. Last April saw 750 incidents of forest fires in Himachal. A report of the Forest Survey of India has attributed this number to the spike in temperature.

The increasing temperature also adds to the risk of built environment. A worrying report released recently by the Cross Dependency Initiative has stated that nine states in India, including Punjab, are among the world's top 50 regions at risk of damage to built environment due to climate change hazard.

Says Prakash, "Punjab lies in the Terai region of the lower edges of the Himalayas. Its rivers are majorly fed from the melting glaciers of the Himalayas during the summer. A rise in temperatures will see the melting all the year round, thus bringing about a change in the river regimes. We do not have enough infrastructure to manage this kind of change yet."

Climate change has been taking place due to human intervention, and if the 2050 threshold is breached, there will be no going back, says Prakash. "The low carbon emissions recorded during the pandemic have revealed that all is not lost and we still have a few years to reverse this mess. All countries of the world need to come together and help reduce the carbon emissions," he says. To this end, "we can contribute by protecting our water bodies and planting more trees, both of which are major carbon sinks."



**Government of Madhya Pradesh
Panchayat and Rural Development Department**

**INVITING EXPRESSION OF INTEREST FOR
EMPANELMENT AS
“KNOWLEDGE PARTNER AND FACILITATOR”**

**Opportunities for
Climate Resilient Natural Resource Management and
Production Systems Improvement**

“Rajiv Gandhi Mission for Watershed Management” (RGMWM), Panchayat & Rural Development Department, Government of Madhya Pradesh is implementing “New Generation Watershed Projects” sanctioned under Watershed Development Component of Pradhan Mantri Krishi Sinchai Yojna – 2.0 (WDC - PMKSY 2.0). Climate resilient natural resource management, improving production systems (Agriculture/Horticulture/Animal Husbandry/Poultry/Fisheries etc.) and promoting alternate livelihood opportunities in rainfed rural areas are the core objectives of these projects.

RGMWM is willing to associate Academic/Research Institutions, CSR organizations and Civil Society Organizations (CSOs)/NGOs as “Knowledge Partner and Facilitator” who can advise, facilitate and assist in outcome oriented planning, implementation and monitoring of “New Generation Watershed Projects”. In this context, interested and eligible Academic/Research Institutions, CSR organizations and Civil Society Organizations (CSOs)/NGOs are invited to submit Expression of Interest for Empanelment as “Knowledge Partner and Facilitator”. Empanelled organization will have to bear all the costs of operations including cost of human resources deployed for the partnership and facilitation arrangements.

The details of project objectives, project phasing/interventions, scope of work, eligibility and information required for proposal may be downloaded from the “Tender Section” of web portal <https://prd.mp.gov.in/>

**Proposals alongwith all relevant details to be submitted in PDF on
E-mail-id : watershedmp2.0@gmail.com and sent through speed post
alongwith supporting documents**

The last date for submission of proposal is 31st March, 2023

**DIRECTOR
Rajiv Gandhi Mission for Watershed Management
IInd Floor, Vindhyachal Bhawan, Bhopal (MP)**

Shanghai hosts Millet Food Festival

Marking the International Year of Millets 2023, the Consulate General of India (CGI) in Shanghai (China), hosted a millet festival and exhibition for over 300 diplomats from over 40 countries on February 23. The attendees learnt about the super-food and nutri-cereals while also savouring around 30 millet-based dishes. Indian millets were used for making dishes such as shikanji, hummus, samosas, etc. Millet-based kheer and muffins were also prepared. At the event, samples of millets grown in India were displayed, too.



PHOTOS: SHUTTERSTOCK AND INSTAGRAM



**Prosperous Country, Empowered Farmers
Symbols of self-reliant India**

Prime Minister Narendra Modi transfers

**More than Rs. 16,800 crore to
more than 8 crore beneficiary farmers
under 13th instalment
of PM-Kisan Samman Nidhi**

27 February, 2023, 3.30 to 4.30 pm. Venue : Malini Ground, B S Yediyurappa Marg, Belagavi, Karnataka

Entire expenditure
of the scheme
is borne by
Government of India

Till date, more than
Rs. 2.25 lakh crore
transferred directly
into the bank
accounts of more
than 11 crore
farmers

Rs. 6,000 per
annum is transferred
to the beneficiary
farmers in three equal
instalments

Comprehensive
grievance
redressal mechanism
and Centralised
Helpdesk to resolve
the issues of
beneficiaries

**PM-Kisan
Samman Nidhi**

Status of applications
and benefits of the
scheme are available on
<https://pmkisan.gov.in>
and the
Mobile App



CROP ARRIVALS BEGIN

Govt wary of drop in wheat stocks

Elevated mandi prices, heatwave to hit 30 MT procurement target

SANDIP DAS
New Delhi, February 26

THE CONCERNS OVER wheat stocks with the government have resurfaced. The government's wheat procurement drive for 2023-24 marketing year may be hit with mandi rates – prices fetched by farmers – continuing to rule above the minimum support prices even amid early arrivals of new crop. Besides, possible heat-wave conditions are posing a threat to the standing crop.

At present the Food Corporation of India (FCI) has wheat stocks of 12.6 million tonne (MT) which are expected to plummet to 9.5 MT or below by April 1, the lowest since 2017. The buffer for April 1 is 7.4 MT, 27.57 MT for July 1.

The MSP for wheat for the current season is ₹2,125/quintal. Wheat procurement usually starts in April and continues for four months.

Sources told FE that the government has called a meeting of key wheat producing states including Punjab, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh on Wednesday to plan purchase of grains from farmers. The possibility of lower output and robust demand are likely to keep mandi prices elevated in the coming weeks too.

"We will be able to procure a substantial quantity of wheat from farmers in the next season. The weather pattern next month and the flowering of the crop would be crucial for eventual output," a food ministry official told FE.

To replenish the stock, the FCI and state agencies are aim-

THREAT TO CROP AMID HEAT ALERT

■ Heat wave is likely to hit wheat yield in the 2023-24 marketing year (April-June)

■ Due to this, the govt's procurement of the grain may also get impacted

■ The possibility of lower output and robust demand is likely to push mandi prices above MSP



■ Govt has called a meeting of key wheat producing states on Wednesday to chalk out measures for purchase of grain

ing to procure at least 30 MT of wheat in the 2023-24 marketing season (April-June) so that sufficient quantity of grain is supplied to beneficiaries of National Food Security Act, besides creation of adequate buffer.

"Mandi prices are likely to rule above MSP even when the new crop starts arriving in the market in large quantities by the end of March given the possibility of high temperature affecting output. Demand is remaining strong too," Mukhesh Khatod, a wheat trader from the Chittorgarh mandi, Rajasthan, said.

New crop arrivals of early sown varieties in Madhya Pradesh and Gujarat is currently fetching around ₹2,200-2,300/quintal.

Traders say that this year's temperature in the next four weeks will decide the output and thus would impact prices.

For the current crop year (2022-23), the government has estimated a record wheat harvest of 112.18 MT. Total area planted with wheat crop has risen by only 0.13 million hectare (mh) to 34.32 mh in the current crop year from the year-ago period.

The harvesting will commence by the middle of March in Madhya Pradesh, it will commence in Punjab, Haryana, Uttar Pradesh and Rajasthan in April.

India Meteorological Department as well as private weather forecaster Skymet in their prediction on Sunday have stated formation of fresh western disturbance over the western Himalayan region during February 28-March 2, which is expected to bring in rains over Punjab and Haryana.

Due to lower production and higher global demand, FCI's procurement in the 2022-23 marketing season fell by more than 56.6% to only 18.8 MT against 43.3 MT purchased from farmers in the previous year.

Recently the reserve prices of wheat to be sold in the open market from the FCI stock was cut by ₹200/quintal to ₹2,150/quintal from the e-auctions to be held till March 15, 2023. While 1.8 MT of wheat has been sold in the open market by FCI since the beginning of the month, another 0.6-0.7 MT of wheat will be sold in the next two e-auctions next month.

Onion exports at record \$523 million in April-Dec

No exports ban since Jan 2021 because of rise in output

SANDIP DAS

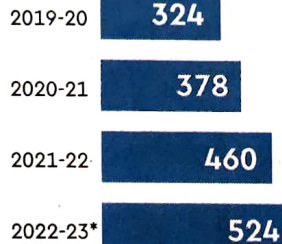
New Delhi, February 26

INDIA EXPORTED A record \$523 million worth of onion in the first three quarters of the current fiscal (2022-23), which is 16% more than the same period previous fiscal, according to a statement by the ministry of commerce and industry on Sunday.

Exporters say adequate domestic supplies because of bumper production and robust global demand have pushed up onion shipment this fiscal so far. Since the beginning of 2021, the government has not

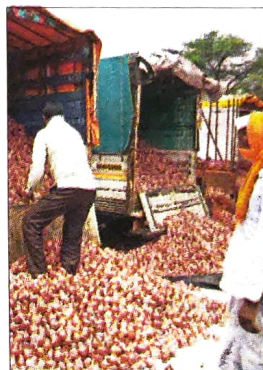
ONION EXPORTS

(\$ million)



*(Apr-Dec)

Source: APEDA



imposed a ban on onion exports which was the norm till a few years back.

"The extant export policy of onions is free and only the export of onion seed is 'restricted' and that too is per-

mitted under authorisation from DGFT," the commerce ministry has stated.

India exported 1.5 million tonne (MT) of onion valued at \$460 million in 2021-22. Bangladesh (37%), Malaysia

(14%), Sri Lanka (12%) and Nepal (8%) respectively received most of the onions exported in the last fiscal.

Onion retail inflation declined by 19.98% on year in January 2023. Negative onion inflation last month was due to a bumper output of 31.12 MT in the 2021-22 crop year, against 26.64 MT in 2020-21.

Maharashtra, Madhya Pradesh, Karnataka and Gujarat have more than 60% share in the country's onion production.

The modal retail prices of onion as per the department of consumer affairs on Saturday was ₹20/kg against ₹40/kg a year back. In December 2019, onion retail prices touched ₹100 a kg in many cities which resulted in ban on onion exports by the

government.

Rabi onion harvested during April-June accounts for around 65% of the country's onion production and meets the consumers' demand till the kharif crop is harvested from October-November.

Kharif harvested onions are not stored because of higher moisture content thus entering the market directly.

To address the post-harvest losses of onions, including losses incurred from inefficient storage and processing, the department of consumer affairs has announced a grand challenge for the development of 'technologies for primary processing, storage and valorisation of onions.'

India is the second biggest onion producing country in the world after China.

Modi to release ₹16k-cr as PM Kisan payout today

NEW DELHI: Prime Minister Narendra Modi will disburse cash worth ₹16,800 crore to nearly 80 million farmers under the PM-KISAN income-transfer scheme for agriculturists on Monday in Karnataka's Belagavi, an official statement said.

Under PM-KISAN, the government provides income support of ₹6,000 a year to farmers with a valid enrolment, paid in three equal cash transfers of ₹2,000 – one every four months. It was launched on February 24, 2019, when the first instalment was paid.

This will be the 13th installment under the scheme. The 11th and 12th instalments under the PM-KISAN scheme were released in May and October 2022.

Since its launch, the government has disbursed more than ₹2.24 lakh crore to eligible farmers through various instalments.

PM-KISAN is a central sector scheme with 100% funding from the central government. Identification of beneficiaries is the responsibility of state governments as per scheme guidelines. Any land-owning farming household can enroll itself subject to exclusions, such as income ceilings, tax payments and total asset value. During the Covid lockdown, ₹1.75 lakh crore was distributed in multiple instalments to support farmers. The scheme has also benefited over 30 million women farmers who collectively received over ₹53,600 crores, the government said.

HTC

Centre steps in as onion prices plummet due to supply surplus

Zia Haq

zia.haq@htlive.com

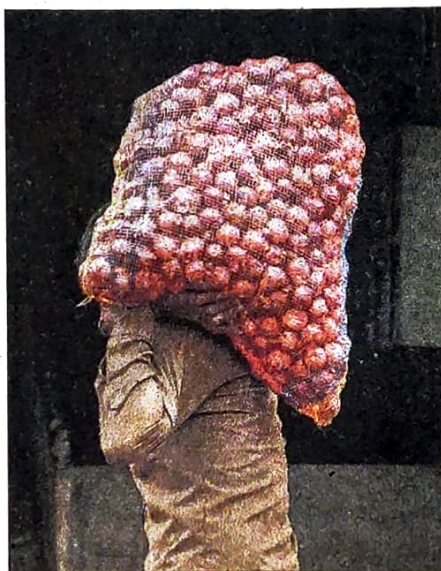
NEW DELHI: The world is battling an onion crisis, prompting a World Bank warning last month, but in India prices have fallen so low that some farmers are letting their produce rot, according to growers and traders.

The Centre has stepped in, with the consumer affairs ministry on Friday asking the National Agricultural Cooperative Marketing Federation of India (NAFED), a state-run farm produce trader, to buy out surpluses from Nashik, Asia's largest onion trading hub, and sell them in non-onion growing states so that rates would improve.

Cheap prices of onions are keeping consumers happy thanks to a glut, but horticulturists say they are getting anywhere between ₹1-2 a kg and even ₹0, after paying commissions and local market taxes.

Prices of onion, the base ingredient of most Indian dishes, are prone to volatility, with alternating cycles of gluts and scarcity. Households fret more when the bulb gets pricey, relative to other commodities.

Factors like extreme weather and inadequate or improper storage can cause supplies to go from surplus to scarce in weeks. However, when the run is good, farmers can be ruined.



The average wholesale price of onion dropped from ₹1,850 a quintal on December 26 to ₹550 on February 23. PTI

Last week, Rajendra Tukaram Chavan of Solapur, Maharashtra, the largest grower, sold 512 kg of onions for ₹512, or ₹1 a kg, to a local firm called Surya Trading. The firm deducted ₹514 towards rent, transportation and local levies, according to his invoice. All told, Chavan was paid ₹2 as net receivables.

Nashik, which is a bellwether market, has seen volumes double from 15,000 quintals a day in December to 30,000 quintals in recent days. The average wholesale price dropped from ₹1,850 a quintal on December 26 to ₹550 on February 23, as per market

reports. One quintal is 100kg.

Growers in Rajasthan, too, said they were selling below the cost of production, which varies from state to state, usually between ₹7 and ₹10 a kg.

Potato is another vegetable selling for low farm gate prices. Major producers like West Bengal, Uttar Pradesh and Punjab have seen bumper harvests. The starchy vegetable, usually priced between ₹1,400 and ₹1,500 a quintal, is going for nearly ₹350 a quintal, a crash of 76%, said Ramandeep Singh Mann, a farm expert.

On Sunday, the government said onion exports touched \$523.8 million between April to December 2022. "Yet, a price collapse points to a huge glut amid slowing exports due to restrictions on export in previous two years," said Rahul Chauhan of IGrain, a commodities tracker.

To curb exports during shortages, the government usually fixes a rate below which traders can't export, known as minimum export prices. Currently, there are no such measures.

The Centre has built a record reserve of 250,000 tonne of onions for 2022-23 to deal with potential spikes in prices during lean periods. It had released quantities from this stockpile to augment supplies, mostly in non-onion growing states.

Bill to ease biz headed for Parliament vote

Ravi Dutta Mishra

ravi.dutt@livemint.com

NEW DELHI: A reform bill which proposes to decriminalize a raft of provisions in order to make it easier to conduct business in India is expected to be tabled during the current session of Parliament resuming on 13 March, a government official aware of the development said.

The Jan Vishwas bill which proposes to decriminalize provisions under 42 Acts was introduced in Parliament in December last year, but was referred to a joint committee for further scrutiny.

"The joint committee has done six readings already and we expect the bill to be tabled during the ongoing parliament session. It was referred to the joint committee because never before has there been a bill seeking to decriminalize so many sections in one go. So, to have a closer look at the bill could be one of reasons it was referred to the joint committee," a Department for Promotion of Industry and Internal Trade (DPIIT) official said. As an example of how the bill can help businesses flourish, the official said it aims to scrap the system of fines, which can be time-consuming, and replace it with penalties.

"Fines are imposed by a judicial mechanism. That means you have to go to court. If we are removing it [fines] and replacing



The Jan Vishwas bill proposes to decriminalize provisions under 42 Acts.

REUTERS

it with a penalty, then it is effective under an administrative mechanism. So, you unclog the courts in a big way. If the penal authority is within the system, it will help the businesses," the official said. Moreover, a large number of offences are proposed to be allowed for 'compounding' — where an offender can pay a penalty to avoid being imprisoned — most notably the Motor Vehicles Act, 1988.

"For instance, when there is an e-challan and a notice comes to your house.... If you got your car registered by giving false information, that has been made compoundable. Earlier you could be jailed for it," the official

added.

The bill seeks to decriminalize 183 provisions, including those in half-a-dozen colonial-era laws such as the Indian Post Office Act, 1898, where you could be jailed for not using correct stamps, and Boilers Act, 1923, which lays down rules for the operation of steam boilers, crucial for power plants, sugar, textile, feed, auto rice mills and the pharmaceutical industry.

Jail provision for up to two years is proposed to be dropped in three sections of the Boilers Act.

The 42 Acts involved in the reform process span 19 ministries, including environment, finance, road transport and highways, posts, electronics and information technology, food production and distribution, financial services and agriculture. The Bill proposes a 10% increase in the minimum amount of penalty every three years from the enactment of the proposed Bill.

"A web of outdated rules and regulations causes trust deficit. It has been the endeavour of the government to achieve the principle of 'Minimum Government, Maximum Governance', redefining the regulatory landscape of the country under the Ease of Living and Ease of Doing Business reforms..." commerce and industry minister Piyush Goyal said in the 'statement and objectives' of the bill.

Rising temperature a threat to wheat crop, advisory issued

KARNAL, FEBRUARY 26

A committee of experts, formed by the Centre to monitor the effect of the rising temperature on wheat crop, discussed planning for the management of heat stress in the crop with experts from Haryana, Punjab, UP, MP, Rajasthan, and Delhi at the Indian Institute of Wheat and Barley Research (IIWBR) here today.

Dr PK Singh, Agriculture Commissioner, Department of Agriculture and Farmer Welfare, Government of India, along with Dr Vipul Srivastava, Director, Directorate of Wheat Develop-

ment (DWD) Gurugram, Dr Gyanendra Singh, Director IIWBR, Dr Randhir Singh, former Assistant Director General (ADG—an extension of ICAR) and others interacted with the experts.

The committee considers presently the maximum temperature has become constant and the minimum temperature is below average, which is an advantage. Besides, 50 per cent area was cultivated with climate-resilient varieties and 75 per cent area was sown with early and timely sown varieties which will be beneficial amid the fluctuation of temperature. In such circum-

NO NEED TO PANIC

“Wheat production dropped last year due to a sudden rise in mercury in March but there's no such worry at present. As per IMD info, there's no possibility of western disturbances in coming days. Dr Gyanendra Singh, DIRECTOR,

INDIAN INSTITUTE OF WHEAT & BARLEY RESEARCH

stances, they feel that there would be no major adverse impact on wheat yield, said Dr PK Singh.

“The IMD will have to pro-

vide a weekly forecast every Tuesday to the DWD and IIWBR to issue crop advisory. The advisory will be made available to all agencies, including KVKs, farmer producer organisations and state Department of Agriculture for wider circulation and awareness,” the Commissioner said.

Dr Singh said they were keeping a sharp eye on the situation as the group objective was to increase the alertness of state administrations and farmers on the steps they needed to take if the temperature rose beyond a point in the coming weeks.

Dr Gyanendra Singh said

they recommended frequent light irrigation to wheat crops as per the requirement. Farmers can spray 0.2 per cent muriate of potash twice at 15 days' interval or 2 per cent potassium nitrate twice at 15 days' interval.

“There is no need to panic. Wheat production fell last year due to a sudden rise in temperature in March, but at present, there is no worry as per the IMD information, no possibility of Western disturbances and strong winds in the coming days,” the Director said. “We are expecting a wheat production of 112 million tonnes,” he said. — TNS

Cong promises MSP with legal guarantee

CHANDIGARH, FEBRUARY 26

The Congress announced that farmers would be given the MSP with legal guarantee under the C2 formula of the Swaminathan Commission.

Not only loan waiver, the party would also work towards complete debt relief to farmers and making agriculture a profitable business. Along with this, agriculture will also be given government aid and banking concessions like industry. These goals have been set by the Congress during its ongoing 85th General Convention in Raipur.

The Committee on Agriculture and Farmer Welfare, led by former CM and LoP Bhupinder Hooda, presented its draft in the session and gave detailed information on the party's goals.

In his address, Hooda said due to the "insensitivity" of the present government, farmers were not only distressed and agitated but also being forced to end lives. "Buying agricultural produce at a price less than the MSP should be a punishable offence," he added — TNS

Water, power crises

Firm up contingency plans for early summer

THE onset of an early summer has triggered alarm bells over the looming water and power crises. With very little rainfall projected, hot as well as dry spring and summer months are on the anvil. In Himachal Pradesh, warnings have already been issued over the possible drying up of water bodies. Plans are afoot to devise emergency measures. Water resource management and conservation are not possible without community involvement and the adoption of innovative solutions by the private sector. Hydro-literacy in schools and civil society is vital. With 18 per cent of the world's population, but only 4 per cent of water resources, India is among the most water-stressed nations. As climate change exacerbates this pressure on water resources, the dependence on an increasingly erratic monsoon is misplaced.

Groundwater levels have declined by over 60 per cent between 2007 and 2017. Of the extracted water, almost 90 per cent is used in agriculture. Not just pollution of surface water, which has collateral losses in health-care, the country is staring at vanishing ponds, lakes, tanks and wetlands. A large share of the blame lies with rampant encroachment of water bodies, not rapidly changing weather patterns. The Jal Shakti Abhiyan was started in 2019 as a movement for water conservation, recharge and rain-water harvesting in water-stressed districts. Its rapid expansion and active participation by states, which are also monitoring encroachments, provide an opportunity to rejuvenate rivers and recharge aquifers. At the micro level, doing away with the multiplicity of departments that govern water and allied issues will give a fillip to promoting sustainable projects.

In Punjab, the effect of the sudden rise of temperature on the wheat crop has farmers worried. Electricity cuts are impacting frequent light irrigation as advised by experts. Power deficit is bound to lead to outages in several states in the coming months. The Centre and state governments need to urgently firm up contingency plans.

Tackle heat stress to sustain productivity

To combat the impact of global warming and terminal heat stress on crops, there is a dire need to identify and develop heat-tolerant varieties. There is also a need to evolve mgmt practices which can decrease the heat load on crops. Fertilisers should not be applied to the crop during a heatwave unless there is adequate availability of moisture. As heatwaves and moisture deficit are likely to intensify, it is imperative to develop abiotic stress-tolerant varieties using modern breeding techniques.

PK KINGRA

CLIMATE change is drastically affecting sustainable crop production globally. Extreme weather events, especially temperature and rainfall fluctuations, are threatening the cultivation of field crops in many regions of the world, endangering food security. High temperature is one of the most recurrent forms of abiotic stresses. Heatwaves and droughts are expected to become more frequent and severe in many parts of the world. South Asia is specifically threatened by climate extremes, especially a heatwave, as it includes mainly tropical/sub-tropical areas, which are already experiencing higher temperatures. Most of these regions have very high population density; thus, increased frequency and intensity of climate extremes may pose a severe threat to food security for the burgeoning population. Studies have predicted that 1°C rise in wheat production may lead to 6% reduction in wheat production globally. However, these reductions can enhance locally as local climates can be more severely affected by climate extremes.

Such conditions are more worrisome for the Indo-Gangetic plains, the major wheat-growing region in India, due to its vulnerability to terminal heat stress for rabi (winter) crops. Under current and future climate change scenarios, heat and water stress are the major abiotic constraints to crop productivity. Their impacts are quite severe when occurring even individually, but significant yield reductions are observed when they coincide. Although they affect crops at every growth stage, severe yield reductions are observed during

reproductive growth, especially grain-filling, thus reducing seed size and number. Studies have shown that yield losses can be as high as 50% due to increased temperatures and drought.

A heatwave is a period of abnormally high temperature, usually above 40°C in the plains and 30°C in hill regions. A heatwave is said to occur when the temperature is higher than normal by 4.5°C to 6.4°C and a severe heatwave occurs when the temperature exceeds the normal by more than 6.5°C. Heatwaves typically occur in north-west India from March to June. As the rabi crops are at their reproductive stage during March-April, heatwaves in these months are of utmost importance for rabi crops as they lead to terminal heat stress and have an adverse effect on their productivity. Although the occur-

rence of heatwaves is not a new phenomenon in our region; the increase in their frequency and intensity is a great concern.

Effect on crop production

A sudden rise in temperature in March leads to enhanced grain maturity with significant reduction in the yield of rabi crops. The increase in night-time temperature increases respiratory losses, thus creating an imbalance between source and sink and decreasing net photosynthesis. As a result of reduction in the grain formation period along with loss of carbohydrates in enhanced respiration under higher maximum and minimum temperatures, proper grain development cannot take place, leading to shrivelling of grains and consequently reduced crop yields. Such hot-weather conditions, experienced during March

2022, resulted in terminal heat stress with an adverse impact on wheat productivity in the region.

Management strategies

To combat the impact of global warming and terminal heat stress on crops, there is a dire need to identify and develop varieties which are heat-tolerant. There is also a need to evolve management practices which can decrease the heat load on crops. The following strategies should be adopted for protection of crops from heat stress:

- Provide light irrigation to the crop as maintaining adequate soil moisture is crucial to minimise heat stress. Providing water during early morning or evening is desirable to avoid evaporation losses or minimise losses due to high wind speed during daytime.
- Time of sowing of the crops

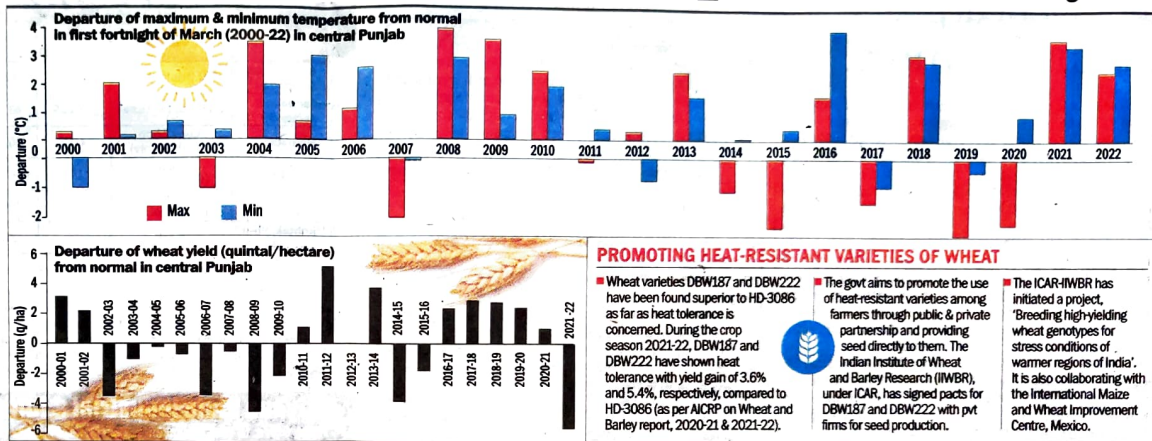
should be adjusted in such a way that growth stages most sensitive to high temperature do not coincide with the period of heat stress.

- Soil management by inorganic or organic amendments should be made to improve its moisture retaining capacity.
- Practices such as tillage intervention should be adopted to manage heat stress in crops.
- Fertilisers should not be applied to the crop during a heatwave unless there is adequate availability of moisture, otherwise they can have a detrimental effect on the crop.
- Appropriate method and frequency of irrigation should be followed.
- Use of crop residue and mulch application should be practised to improve moisture status of the soil.
- Selection of suitable crop varieties tolerant to heat stress should be made as per the pre-

vailung weather conditions in a particular region.

- Comprehensive research efforts are required to better understand the plant responses to abiotic stresses for their effective management.
- As heatwaves and moisture deficit are likely to intensify in the future, developing abiotic stress-tolerant varieties using modern breeding techniques is the need of the hour.
- In view of global warming and changing climatic scenarios, a holistic approach dealing with the management of different abiotic stresses needs to be followed to sustain crop productivity and ensure food security in the years to come.

The author is Professor & Head, Dept of Climate Change and Agricultural Meteorology, PAU



Farmers to get funds under PM Kisan plan

NEW DELHI: PM Narendra Modi would release Rs 2,000 each to farmers under the PM Kisan Samman Nidhi Scheme on Monday. Over Rs 16,800 crore will be deposited in the accounts of eight crore farmers. TNS

Fearing aphid attack, farmers asked to monitor wheat crop constantly

TRIBUNE NEWS SERVICE

MUKTSAR, FEBRUARY 27

With mercury remaining above normal, the Agriculture Department has asked farmers to constantly observe the wheat crop as chances of aphid attack have increased.

The department has advised the farmers to divide their fields in four parts and do a survey of the crop. Gurpreet Singh, Chief Agriculture Officer, Muktsar, said, "If there are five aphids per wheat spikelet, then the farmers should spray pesticides as per recommendation. The wheat leaves turn yellow with aphid attack and require timely action."

He said the situation was fine, but the experts had warned of further rise in temperature in the coming days.

"The rise in temperature may also decrease the wheat



Agriculture experts inspect wheat fields in Muktsar. TRIBUNE PHOTO

PREVENTION TIPS

“If there are five aphids per wheat spikelet, then the farmers should spray pesticides as recommended. The wheat leaves turn yellow with aphid attack and require timely action. Gurpreet Singh, CHIEF AGRICULTURE OFFICER

yield. We have recommended light irrigation for the wheat crop at this stage. However, fields should not be irrigated in windy weather. Besides, the farmers should spray the recommended

dose of potassium nitrate on the crop only in the evening hours,” said the Chief Agriculture Officer. Meanwhile, the officials did a field survey and said there was no trace of yellow rust.

Potato glut, growers stare at losses

RUCHIKA M KHANNA
TRIBUNE NEWS SERVICE

CHANDIGARH, FEBRUARY 27

Jagat Singh, a potato grower in Thamanwal village near Phillaur, is a worried man these days. He has harvested almost two-thirds of his potato crop cultivated on 300 acres but the price he is fetching in the market is just 40 per cent of the price he fetched in the corresponding period last year.

"I had never anticipated that the prices would fall so low. The rate of table potato is down from Rs 10 per kg last year to just Rs 4 per kg now. There are no buyers in the market for our produce, forcing us to sell at whatever rates we are offered," he rued.

Even the cost of production is more than the prices fetched by the potato grow-



SOLD AT ₹4 PER KG

“I had never anticipated that the prices would fall so low. The rate of table potato is down from Rs 10 per kg last year to just Rs 4 per kg now. There are no buyers in the market for our produce, forcing us to sell at whatever rates we are offered. Jagat Singh, POTATO GROWER

AWARE OF SHARP FALL

“The government is aware of the sharp fall in the prices of potato this year. There are 630 cold storages in the state and we will ensure that the farmers get storage facilities till they are able to get a higher price. Shailender Kaur, DIRECTOR, HORTICULTURE DEPARTMENT

ers now. Farmers estimate that the cost of production works out to be Rs 9 per kg and they are fetching only 50 per cent of their cost. This year the area under potato cultivation is 1.14 lakh hectares, up from 1.10 lakh hectare last year, which had led to a bumper crop.

The reason for the sharp fall in prices is the over production of the crop and the unsold stocks of potato, preserved in cold storages across the state from the last season. “This year, there has been a bumper crop in all potato-growing states - West Bengal, Uttar Pradesh, Bihar, Karnataka, Andhra Pradesh and Gujarat. As a result, there is little demand for the potato crop. I hope to see the demand increase by mid-March, which will give a

fillip to the prices,” says Gurraj Singh Nijjar, a potato grower from Jaganpur village near Jalandhar.

It is learnt that the losses for the potato seed growers are even higher than those growing table potatoes. “Last year, we were getting up to Rs 18-20 per kg as the rate for seed potato. This year, the price has crashed by over 50 per cent. Potato seed traders are not buying any produce this year, saying that 40 lakh bags are lying unsold in cold storage from the previous harvesting season,” rued Sukhjit Singh Bhatti, a potato seed grower.

Punjab supplies seed potato to the entire country. About 70 per cent of the potato grown in the state is seed potato, while 30 per cent is used as table potato.

36% rain deficit, HP preps up for looming...

chaired by Chief Secretary Prabodh Saxena and attended by heads of several departments and deputy commissioners (via video-conferencing), the general consensus was that the situation was not worrisome as of now, but it could "become challenging in April and May if the dry spell continues".

The state witnessed an overall rain deficiency of 36 per cent from January 1 to February 27. The most affected districts are Solan (67 per cent deficient rain), Mandi (60 per cent),

Bilaspur (53 per cent) and Hamirpur (45 per cent). The maximum crop loss due to dry weather was reported from Solan (Rs 36 crore). "The overall crop loss has been pegged at Rs 75 crore till January 10," said an official of the Agriculture Department.

As of now, water schemes have not been affected much. "Of over 10,000 water schemes, only 10-12 are facing crisis. This could change if rain continues to elude the state," said an official.

To mitigate the effects of the dry spell, Saxena has

directed the Jal Shakti Department to complete work on 12 water schemes, which are nearing completion, in a month.

The Chief Secretary also issued directions to the forest officials to keep their men and machinery ready to handle the possible forest fires in the summer season. "The departments should work closely with the State Disaster Management Authority and be ready to take timely action to handle adversities that may arise due to the dry spell," said Saxena.

36% rain deficit, HP readies for looming water scarcity

TRIBUNE NEWS SERVICE

SHIMLA, FEBRUARY 27

With the hill state witnessing a deficit rainfall this winter season, the government has pressed the alert button over an impending water crisis.

The departments concerned have been told to chalk out a strategy to mitigate the drought-like situation the state is currently experiencing. The deputy commissioners have been

PUT ON ALERT

- Dept heads told to chalk out a strategy to mitigate drought-like conditions
- DCs told to preserve and rejuvenate traditional water bodies like baolis, ponds

told to preserve and rejuvenate traditional water bodies like baolis and ponds. In a review meeting on the matter today, which was

CONTINUED ON PAGE 9

IMD warns of a severe summer, more heatwaves in most parts

Jayashree Nandi

letters@hindustantimes.com

NEW DELHI: February may have been hot (indeed, hotter than ever before), but we ain't seen nothing yet, India's weather office said on Tuesday, warning of a hotter than usual March, April and May across most parts of the country. The India Meteorological Department (IMD) said that there is a high probability of above normal maximum temperatures over most parts of northeast India, east and central India, and some parts of northwest India in the three months. There is also a very high probability of heatwaves occurring over many regions of central and adjoining northwest India in this period, it added, warning that even minimum temperatures will be higher than normal except in Peninsular India.

March will also be drier than usual across northwest India, IMD said, although rainfall will be normal at the national level.

Fears of an early summer have prompted the government to set up an interministerial committee to prevent a repeat of last year when a warm March hurt the winter wheat crop. With cereal inflation rising, and food stocks dipping, this is a scenario the government can ill-afford.

There is a nearly 50% chance of El Nino conditions setting in the June, July, August, coinciding with the monsoon season, IMD's forecast showed. But SC Bhan, head, hydromet and agromet advisory services at IMD, said a more accurate forecast can be made only in April.

Still, summer will be severe in most parts of the country, he admitted. And there will be an "enhanced probability of heat waves", Bhan added.

IMD will start issuing colour coded heat wave warnings every five days from Wednesday.

HT reported on February 10 that there is an almost 50% probability of El Nino conditions pre-

vailing during June, July and August, and a 58% probability in July, August-September according to the latest probabilistic estimates of the US National Oceanic and Atmospheric Administration (NOAA).

El Nino is characterised by an unusual warming of waters in the eastern equatorial Pacific; its opposite, La Nina is characterised by unusually cooler waters in the same area. Together, the phenomenon is called the ENSO (El Nino Southern Oscillation), and it has a high correlation with warmer summers and weaker monsoon rains in India.

Experts said India should focus on developing heat action plans as soon as possible. "Responding to this forecast, state governments should prepare immediately. Some states have already done this. Heat can have deadly impacts on the vulnerable population," said M Rajeevan, former secretary, ministry of earth sciences.

HT reported on February 17 that maximum temperatures began to rise in mid-February with many areas in the west and northwest India recording temperatures that are 5 to 10 degree C above normal. The warming seemed to be as bad, if not worse, than the conditions in 2022, when much of India skipped spring season entirely.

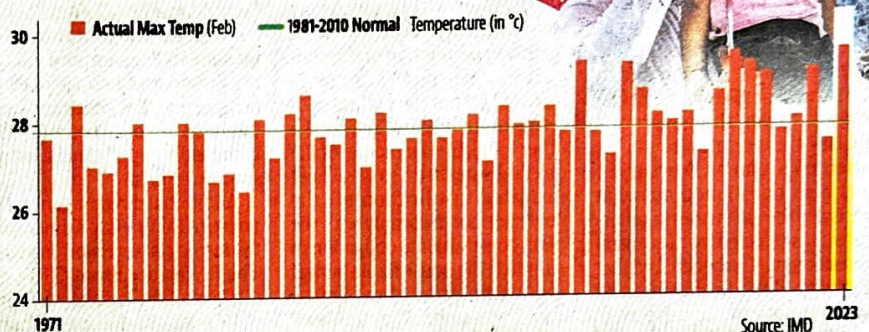
The spring heatwave last year led to at least 90 deaths across India and adjacent Pakistan, triggered a glacial lake burst in northern Pakistan, and led to forest fires in the hills of Uttarakhand. March 2022 eventually had the highest-ever average temperature recorded nationally. It also hit India's wheat output.



READ: Centre forms panel to save wheat crop from heat

Max temperature in Feb since 1971

February in northwest India usually marks the end of winter and beginning of spring, with max temp rarely crossing the early 20s.



Warmest Feb in 122 yrs ends

Soumya Pillai and Jayashree Nandi

letters@hindustantimes.com

NEW DELHI: This February was the hottest in India since 1901, the earliest year for which data is available, with maximum temperatures touching 29.54 degrees Celsius (monthly national average). The five warmest Februaries in India have all been in the last 14 years, indicating the impact of climate crisis.

Even in terms of minimum temperatures, the month was the fifth warmest since 1901 (the warmest was February 2016).

The average maximum or day temperature was 1.73 degrees Celsius (°C) above normal over the country and average minimum temperature, 0.81°C above normal, the India Meteorological Department said on Tuesday.

"We are seeing that progressively, over the years, winter period is getting shorter but more intense and the summer-time is becoming more gruelling and prolonged. While local fac-

tors do play a role, climate change is also impacting temperature..." said Mahesh Palawat, vice president (meteorology and climate change) Skymet Weather Services. The national average was pushed up by northwest India (the region includes Delhi) which saw the warmest February in 122 years; central India saw the second warmest February. IMD data shows that in February, the average maximum temperature recorded over northwest India was 24.86°C. In Delhi, the average maximum temperature was 27.7°C.

February in northwest India usually marks the end of winter and the beginning of spring, with maximum temperatures rarely crossing the early 20s.

According to forecasters, over the last decade, maximum temperatures in February have peaked and crossed the 30-degree Celsius mark in the region. For instance, in February 2021, the maximum temperature crossed 30°C on seven occasions. March has also been witnessing

a similar trend. Last year, northwest India recorded the hottest March and April in 122 years.

Weather forecasters explain that while lack of rainfall in the region was the immediate local reason for the warm February, the larger context of the impact of climate crisis and global warming cannot be ignored.

There was a 68% deficiency in rainfall in February across India with 75% deficiency over northwest. "The entire northern hemisphere has been dry and warm in February. There was a large deficiency in rainfall which led to clear skies and higher solar insolation. An anticyclone was also persisting over Arabian Sea which led to subsidence of warm air temporarily over west. This led to exceptional warming," said SC Bhan, head, hydromet and agromet advisory services, IMD.

Naresh Kumar, senior scientist at IMD, said while February might be considered a spring month by laypeople, it is categorised as a winter month as per the weather office's calendar.



DELHI POLLUTION CONTROL COMMITTEE

DEPARTMENT OF ENVIRONMENT (GOVT OF NCT OF DELHI)
5TH FLOOR, ISBT BUILDING, KASHMERE GATE, DELHI 110006

www.dpcc.delhigovt.nic.in

PUBLIC NOTICE

In compliance of Plastic Waste Management Rules, 2016,
as amended till date notified by Ministry of Environment, Forest and Climate Change,
Govt. of India following commodities are prohibited:-



Carry bags made of virgin or recycled plastic shall not be less than 120 microns in thickness [w.e.f. 31st December, 2022].



The sale of banned SUP biodegradable (without CPCB certificate and oxo-biodegradable plastics is in violation of PWM Rules.



Plastic sheet or like used for packaging, wrapping the commodity less than 50 microns in thickness [except where the thickness of such plastic sheets impair the functionality of the product].



Non-woven plastic carry bags less than 60 Gram per Square Meter (GSM).



Sachets using plastic material used for storing, packing or selling gutkha, tobacco and pan masala.

Apart from above,
Manufacturing, Import,
Stoking, Distribution,
Sale and Use of below
mentioned 19 SUP
commodities have also
been prohibited w.e.f.
1st July, 2022

- Ear buds with plastic sticks
- Plastic sticks for balloons
- Plastic flags • Candy sticks
- Ice-cream sticks • Plates
- Plates Polystyrene (Thermocol) for decoration • Cups • Glasses
- Forks • Spoons • Knives
- Straw • Trays • Wrapping or packing films around sweet boxes • Wrapping or packing films around Invitation cards
- Wrapping or packing films around Cigarette packets
- plastic or PVC banners less than 100 micron • Stirrers



Grievances with respect to Manufacturing, Import, Stoking, Distribution, Sale and Use of above commodities and banned SUP items and other violations of provisions of PWM Rules, 2016 can be lodged through:-



"Green Delhi App", a Mobile App of Delhi Govt.



"SUP-CPCB", a Mobile App of CPCB.

Download the App:



Member Secretary
DPCC

How India can fortify public distribution governance

In the 1980s, it was said that out of every rupee spent by the government, only 15 paise reached the intended beneficiary. Though anecdotal, it was a reflection of the massive challenge of leakages in public distribution. Establishing a reliable public distribution system (PDS) was a difficult task, especially in a country as populous as India. The federal structure also introduced varied complexities. However, in the last decade, direct benefit transfer (DBT) and the Jan Dhan-Aadhaar-Mobile (JAM) programmes have achieved great results. A review of performance reports published by the Comptroller and Auditor General in 2021 and 2022 shows a massive drop in leakages and errors.

Since the inception of DBT in 2013, ₹28 lakh crore has been transferred through the route (for over 300+ central and 720 state schemes), with ₹5.5 lakh crore transferred during the Covid lockdowns. By March 2021, DBT had generated a total savings of ₹2.2 lakh crore for central schemes alone due to the removal of 94 million duplicate, corrupt, or non-existent beneficiaries across databases. PDS and similar schemes contributed about ₹1 lakh crore in savings by removing about 40 million fake accounts. The Ujjwala Yojana scheme alone resulted in savings of ₹72,000 crore. Money saved implies more spending, newer schemes and further inclusion.

Evidence of financial inclusion is the Pradhan Mantri Jan-Dhan Yojana (PMJDY), which has enrolled over 480 million beneficiaries with accumulated savings of over ₹189,000 crore in February, which implies that the poor now have funds for food, take care of emergencies, and potentially invest too.

Digitisation has streamlined the transfer process, resulting in substantial time savings, reduced errors and cost of governance and eliminated malpractices. A quick digital transfer process has enhanced trust in the system and has increased the money in circulation by reducing money inventory at various points.

But there are still opportunities to enhance India's public distribution governance. First, it is crucial to strengthen the technical infrastructure and provide further transparency. There have been some instances in the past — such as the lack of traceability of maternity

benefit payments as reported by the Niti Aayog in 2020, issues reported in the PM-Kisan Yojana, or Aadhaar's de-duplication functionalities — which need addressing. The databases also need continuous clean-ups, including further biometric verifications at every point. Technical and operational gaps leading to inclusion or exclusion errors must be plugged to ensure the money reaches the intended beneficiaries.

Second, while JAM has brought the rural poor within the ambit of the banking system, issues such as the lack of access to a COP (confirmation of payee), network failure and point-of-sale malfunctions have led to a high number of dormant or low-activity accounts. Over 80 million Jan-Dhan accounts in 2022

were declared inoperative, which is a major burden on the banks, and suggests that several beneficiaries are not availing their rightful benefits. There is a need to track and reactivate such accounts.

Third, the discovery of and access to benefits could be eased further. Enrolling in government schemes is complex due to varying eligibility criteria, and the multitude of documents and identity requirements. When foreign governments rely on just one Indian document, the passport, why can't various departments and states also rely on just one document or ID? Simplification will allow superior beneficiary identification as well as enable deeper analytics for sharper targeting of schemes to those who need them the most.

Finally, the design and prioritisation of benefits could be assessed more broadly: From transfer of money to the needy to empowerment in broader ways. Jan Samarth is a step in the right direction to enable easy access to government credit schemes for individuals and small and medium enterprises. It is high time the government considers extending DBT as the sole means of distribution. A wealth of data on the impact of government schemes and citizens' feedback could inform the design and implementation of future policies. This will strengthen the foundation for a new and revolutionary era in public distribution governance.



Ashish Garg



Sidharth Madaan

Ashish Garg is managing director and senior partner, BCG. Sidharth Madaan is partner, BCG

The views expressed are personal

Cattle 40% of all mammals by mass, wild animals 6%

Kabir Firaque

letters@hindustantimes.com

NEW DELHI: Almost 40% of mammals by mass in the world are cattle, and with India accounting for around 30% of the world's cattle according to the US Department of Agriculture, Indian cattle should account for around 12% of the world's mammalian biomass.

That may come as a surprise, but a new census shows a vanishing natural world in which it is humans who are throwing their weight around, literally. In addition to the cattle, humans themselves account for 36% of the world's total mammalian biomass, and other domesticated animals for 18%. Only the remaining 6% is wild mammals.

To be sure, mammalian biomass is just a fraction of total animal biomass (6.5%), which itself is a fraction (0.47%) of the biomass on Earth; plants account for the most (over 80%). And within animals, insects account for the most (45%). There may be a scientific basis to the giant bugs that dominate B-movies after all.

But neither insects, nor Indian cows is the subject of the global census of wild mammal biomass, described by the Weizmann Institute of Science in Israel as the first of its kind, which was published on Monday in PNAS. The metric it uses is wet biomass, as opposed to dry biomass, which would have

measured the biomass after removal of moisture content.

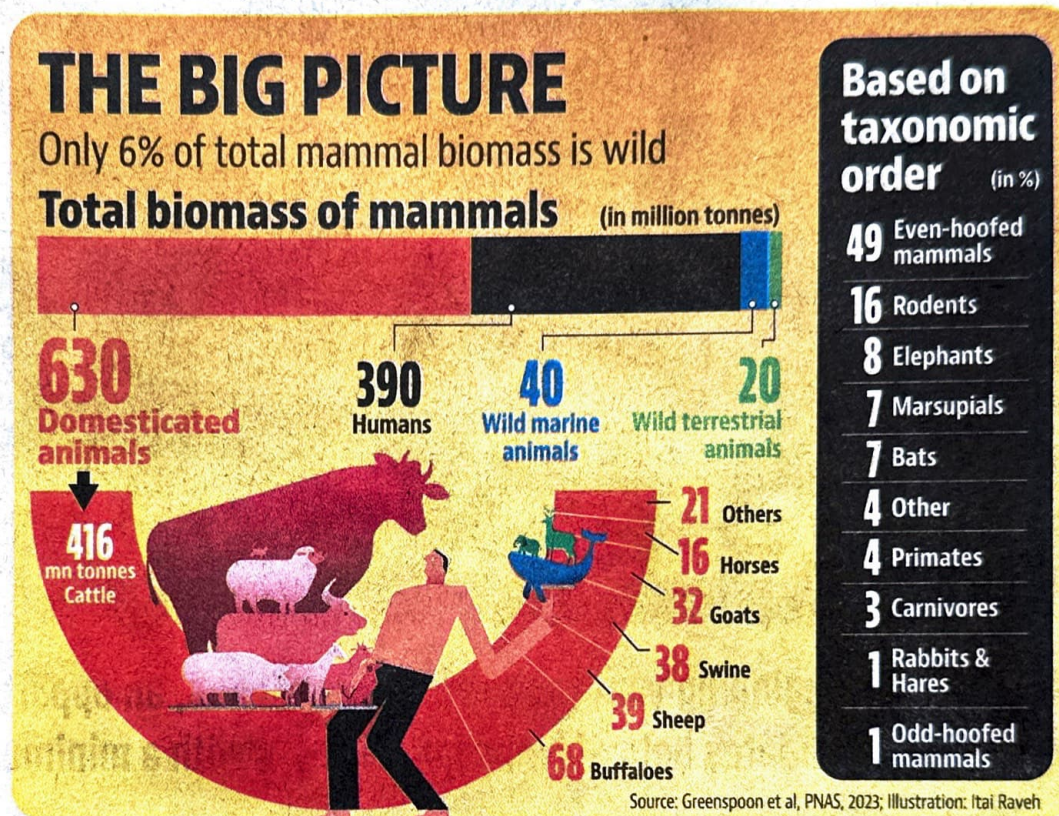
Wet biomass was calculated from population counts for some species and modelled for others, using an artificial intelligence-based tool.

"We were able to attain global population reports accounting for about half of the total biomass of wild land mammals. To infer the total mass for the remaining species, we used the available global population report to train a machine learning model based on species-specific properties, such as ranges, body size and diet," professor Ron Milo, who heads a lab in Weizmann's Plant and Environmental Sciences Department, said in an email response.

The human hand

In 2020, a team from Milo's lab calculated the mass of all human-made objects, ranging from skyscrapers to newspapers, and found that the total surpassed the total biomass on the planet, plants and animals combined.

The new study has now found that the biomass of domesticated animals has reached 630 million tonnes – 30 times the weight of all wild terrestrial mammals (approximately 20 million tonnes) and 15 times that of wild marine mammals (40 million tonnes, mostly whales of various species). The domination of domesticated animals, combined with the total



Based on taxonomic order (in %)

- 49 Even-hoofed mammals
- 16 Rodents
- 8 Elephants
- 7 Marsupials
- 7 Bats
- 4 Other
- 4 Primates
- 3 Carnivores
- 1 Rabbits & Hares
- 1 Odd-hoofed mammals

Bambi leads in the wild

The reason cats outweigh the world's largest land mammal is, to state the obvious, their higher numbers. African elephants, in fact, are only third among wild mammals in the list. The white-tailed deer, the species featured in the Walt Disney classic Bambi (1942), heads the list at 2.7 million tonnes for 45 million individuals. It is followed by the wild boar (1.9 mn tonnes, 30 mn individuals). The 1.3 mn tonnes for African elephants comes from half a million individuals.

Indian elephants are not among the top 10 wild terrestrial mammals, whose biomass accounts for 40% of the 20 mn tonnes. "The total biomass of Asian elephants is about one tenth that of African elephants," Milo said. The biomass of some other large Indian mammals, too, is low. "There are only a few thousand Royal Bengal tiger individuals, as well as a few thousand Indian rhinoceroses. Their contribution to the total biomass is therefore smaller than one might expect given their world renown," Milo said.

In sheer numbers, bats (1,200 species) account for a fifth of all land mammal species, and two-thirds of all wild land mammal individuals, but make up only % of the biomass of this section.

Rodents, which account for a higher number of species but fewer individuals than bats, combine for 16% of the total wild mammal biomass. Even-hoofed mammals, which include the Bambi species, account for nearly half the 20 mn tonnes.

human biomass of 390 million tonnes, now offers yet another perspective of humanity's impact on the planet.

"The more we're exposed to nature's full splendour, be it through films, museums or nature tourism, the more we might be tempted to imagine that nature is an endless and inexhaustible resource. In reality, the weight of all remaining wild land mammals is less than 10% of humanity's combined weight, which amounts to only about 6 pounds (about 2.7kg) of wild land mammal per person,"

Milo said.

"In other words," he added, "our research shows, in quantifiable terms, the magnitude of our influence and how our decisions and choices in the coming years will determine what's left of nature for future generations."

Cattle dominate

Of the 630 million tonnes domesticated mammal biomass, cattle alone contribute 416 million tonnes.

Other mammals reared for meat and milk, such as buffaloes (68 million tonnes), sheep (39

mn tonnes), pigs (38 mn tonnes) and goats (32 mn tonnes) also figure high, followed by pack animals such as horses, camels, and donkeys.

The total of 630 mn tonnes does not include pet dogs and cats, Milo said.

Dogs have a total mass above 20 mn tonnes, similar to the combined biomass of all wild terrestrial mammals. Domestic cats come lower at about 2 mn tonnes, but even that is much higher than the combined biomass of all African savanna elephants (1.3 mn tonnes).



PICK OF THE DAY

Boosting Income Generation of Forest Dwellers



- Chhattisgarh Government is procuring Kodo, Kutki and Ragi at support price

- Quantity of purchase of minor forest produce has increased by more than 78 times

- Number of MFP collectors increased from 1.5 lakh to over 6 lakh

Chhattisgarh tops in Minor Forest Produce procurement; purchase of 65 minor forest produce at support price implemented

The Chhattisgarh Government has undertaken several measures to protect the rights of forest dwellers and tribal people of the state. This includes increasing their revenue through the sale of Minor Forest Produce (MFP) and other forest-based activities. This includes boosting their income through Minor Forest Produce (MFP) and forest-based activities.

In a first, Kodo, Kutki, and Ragi have been procured at support prices in the state. Under the leadership of Chief Minister Bhupesh Baghel, the Millet Mission is also being implemented to promote minor cereal crops.

In Chhattisgarh, 74% of the country's MFP is collected. In the interest of the MFP collectors, the state has decided to increase the number of MFP purchased at support price from 7 to 65, which is nine times more. As a result, during the past four years, the number of collectors has increased by more than four times.

In 2018-19, the number of MFP collectors was 1.5 lakh, which has now increased to 6 lakhs. In addition, the amount of MFP purchased has increased by more than 78 times, from 540 metric tonne in 2018-19 to 42,000 metric tonne in 2021-22.

Among all the states in the country, Chhattisgarh is the highest contributor in MFP collection. This

year, the state government has paid Rs120 crore to the MFP collectors. Over the last four years, over 13 lakh Tendupatta collectors and 06 lakh MFP collectors have earned an additional Rs250 crore in annual income as a result of the Chhattisgarh government's public welfare programmes.

Along with the collection, processing of minor forest produce is being done through 129 Van Dhan Vikas Kendras. Besides, a total of 6 C-Marts and 30 Sanjeevani Kendras have been established on the Chief Minister's initiative to sell 134 herbal products under the brand name 'Chhattisgarh Herbals'.

In comparison to other states, the Chhattisgarh government has made better provisions for the PESA law, so that local self-governance can be strengthened in forest areas and people living in the forest can receive more rights. The government has made numerous efforts to increase employment and self-employment opportunities for tribals and boost their income.

In the interest of the collectors, the collection rate for tendu leaf has been increased from Rs2,500 to Rs4,000 per standard bag. Tendu leaf collectors have been paid Rs2,146.75 crore as remuneration, with an additional Rs339.27 crore paid as incentive over a four-year period.

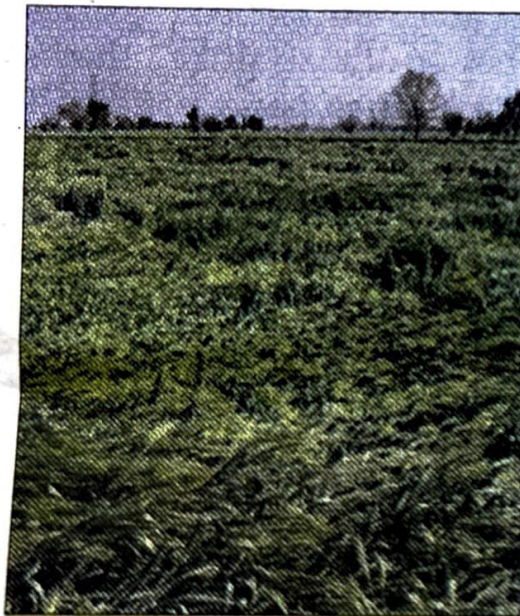
High-velocity winds flatten wheat crop

TRIBUNE NEWS SERVICE

MUKTSAR, MARCH 1

A mild rainfall accompanied by speedy winds last midnight flattened the wheat crop at some places in the district. It has, however, decreased the temperature, which may prove beneficial for the standing crop.

Farmers of Gurusar village here were disappointed and



demand a compensation from the government. "The yield will decrease now. This is a natural calamity and the government should give a compensation to farmers," said Ranjit Singh, a farmer of Gurusar village. The district witnessed 4 mm rainfall in the last about 24 hours.

Gurpreet Singh, Chief Agriculture Officer, Muktsar, said, "We have got the

reports that wheat crop has flattened at some places. The crop has, however, flattened only at the fields, which were recently irrigated by farmers. We are hopeful that half of the flattened crop will stand again, but it will have an adverse effect on the yield. However, as of now, we have not prepared any field report in this regard."

Govt sets 34mn-tonne wheat purchase target

Zia Haq

Zia.haq@htlive.com

NEW DELHI: The Centre has targeted to purchase 34.1 million tonne of wheat from farmers this year, a goal that crucially hinges on conducive weather amid warnings of crop-damaging heatwaves in the coming weeks.

The limit set for wheat procurement, announced by food, commerce and consumer affairs minister Piyush Goyal on Thursday, is substantial and largely in line with previous levels, especially in the pre-Covid years before a free food allocation scheme was announced.

Last year, state purchases were abnormally low at 18 million tonne, down nearly 58% from the previous year after a disastrous spell of heatwave cut output by 2.5% to 106 million tonne. In 2021, the government bought nearly 43 million tonne. This year the Centre's requirement has come down because of

the discontinuation of the Pradhan Mantri Garib Kalyan Anna Yojana, the free food scheme.

The target implies the government expects a record wheat output of nearly 111-112 million tonne as projected. "It (the target) strikes a fine balance between national food security needs and trade, but weather is the key factor," said Abhishek Agrawal of Comtrade.

Goyal also asked states to set up a massive network of centres to purchase millets covering all districts that grow them, which will come handy in case there is a weather shock to wheat.

The Centre is required by law to provide cheap grains to nearly 800 million people. This year too, the Centre has proposed to distribute grains free of cost.

The country is watching out for extreme weather after forecasts of high chances of heatwaves this month through May that could roil the farm economy amid rising prices of staples.

Farmers queue up to purchase Basmati variety seeds in Delhi

KARAM PRAKASH

TRIBUNE NEWS SERVICE

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Farmers from Punjab travelled hundreds of kilometres all the way to New Delhi to buy seeds of Pusa Basmati 1847, for its high-yielding capacity and in-built resistance to blast and blight diseases.

Farmers said they — to get the authenticated seeds of the *this new improved variety of Basmati* — deemed it appropriate to buy it from the three-day Pusa Krishi Vigyan Mela (PKVM) 2023 being held at Indian Agriculture Research Institute (IARI), New Delhi.

The high-yielding variety is an improved version of the popular Basmati PUSA Basmati 1509. The variety has already become a hot favourite of farmers in Punjab. Hun-

dreds of Punjab farmers queued up since Thursday morning to get the seeds of PUSA — which was launched last year. The IARI had given 1 Kg seeds per acre of the PUSA 1847 to farmers for trial last year. It was the results of this improved variety — which is said to be highly resistant to the blast and blight diseases — that made the farmers to travel all the way from Punjab to New Delhi.

The farmers expressed that they had an apprehension of not getting the authenticated seeds of this variety from elsewhere except IARI. The IARI has already claimed that this variety would 'revolutionise' Basmati cultivation.

The 35-year-old Hoshiar Singh of Lehal Kalan village of

Sangrur, who had reached the Pusa Krishi Vigyan Mela, said, "This is a low-cost high yielding variety of Basmati. We have received good feedback from the farmers — who had cultivated this variety last year."

Another farmer said, "The input cost per acre has reduced by Rs 2,000 since we don't have to spray pesticides as the variety is resistant to blight and blast diseases."

Dr AK Singh, Director of, the Indian Agriculture Research Institute (IARI), said, "We distributed seeds to around 10,000 farmers on Thursday — most of them from Punjab. The yield of this variety is around 30 quintals per acre, which is higher than PUSA 1509. This variety is resistant to bacterial blight and blast disease.