

# ACFI NEWSLETTER

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## ACFI IN NEWS

### Don't sell pesticides but control pests, NITI Aayog's Ramesh Chand tells industry

**Prabhudatta Mishra**

New Delhi

India's pesticides industry, which has become world's second biggest exporter after China, has been cautioned to be vigilant as many western countries are shifting from agrochemicals to biopesticides and even in the domestic market the official focus has been shifting towards soil conservation through natural farming. Still, it has potential to raise its growth from current level of 9 per cent.

Addressing an event organised by Agro Chem Federation of India (ACFI) on Wednesday, NITI Aayog member Ramesh Chand said: "I have seen it (staying away from chemical pesticides) in many countries. The Netherlands hardly sells any agrochemicals. The entire



Ramesh Chand, member of NITI Aayog

West is going in that direction. I think in the long run this (Indian agrochemical) industry is required to pay attention to this aspect. Perhaps, the industry needs to move from selling pesticide to pest-control and to offer solutions like integrated pest management."

He appealed the industry to ponder why many Western countries are shifting from agrochemicals to biopesti-

cides. Chand suggested Indian companies to conduct business responsibly complying with issues related to ESG (environment, social, and governance) which is much talked about now.

Chand said India's agriculture GDP has grown by average 4 per cent in last decade, ahead of China's 3-7-3.8 per cent. The agrochemical industry needs to focus on innovation to minimise pollution and also come out with a document on ease of doing business with compliances, he added.

#### **ROBUST GROWTH**

Highlighting the agrochemical industry's impressive growth between 2017-18 and 2022-23, the NITI Aayog Member said much of this growth rate happened during the Covid-19 pandemic years when the production activities were seriously disrupted.

Chand further said if India can achieve a nine per cent growth rate in the absence of favourable China factor, the Chinese competition is not as hard it was in the past. "As the competition from China is unlikely to remain at the level witnessed in the past, the agrochemical industry may grow at much higher pace, at any rate in the realm of possibility," he said.

According to industry data, the total turnover of agrochemicals industry in India was about \$10 billion (about ₹83,200 crore) in 2022-23 against \$6 billion in 2017-18. India's exports in agrochemicals was \$5.5 billion in 2022-23, second highest in the global trade after China with \$11.1 billion. USA, which itself the third largest exporter of agrochemicals, is also India's largest buyer; while Brazil and Japan are other top destinations.

## 'Agrochem Industry can Grow at Higher Rate'

New Delhi: India's agro-chemical industry has the potential to grow more than the current 9% notwithstanding the competition from China, government think tank Niti Aayog member Ramesh Chand said.

Chand also observed that many Western countries are shifting from agrochemicals to biopesticides and the Indian industry needs to pay attention to this aspect.

He urged the Agro Chem Federation of India (ACFI) to come out with a document on ease of doing business in agrochemicals.

The Niti Aayog member was addressing a panel discussion on the occasion of the sixth annual general meeting of ACFI in the national capital on Wednesday.

"The agro-chemical industry has achieved a miracle growth of 9%... much of this growth rate has happened during the pandemic years when the production activities in the country were seriously disrupted," he added. -PTI

## 'Agro-chem can grow more than 9%'



Niti Aayog member Ramesh Chand was addressing a panel discussion.

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"The agrochemical industry has achieved a miracle growth of 9%... much of this growth rate has happened during the covid-19 pandemic years when the production activities were seriously disrupted," he said.

Despite economic and production disruptions, the domestic agrochemical industry had shown an impressive growth between 2017-18 and 2022-23, he added.

That apart, India's exports have crossed \$5 billion and even surpassed China according to different data sources, Chand said.

PTI

## भारतीय कृषि-रसायन उद्योग 9 % से अधिक बढ़ सकता है : नीति आयोग

एजेंसी | नई दिल्ली. नीति आयोग के सदस्य रमेश चंद ने कहा कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा नौ प्रतिशत से अधिक बढ़ने की क्षमताएं हैं। चंद ने कहा कि कई पश्चिमी देश कृषि रसायनों के स्थान पर अब जैव कीटनाशकों का इस्तेमाल कर रहे हैं और भारतीय उद्योग को इस पहलू पर ध्यान देने की जरूरत है। उन्होंने एग्रो केम फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों के व्यापार को आसान बनाने पर एक प्रस्ताव लाने का आग्रह किया। नीति आयोग के सदस्य चंद ने बुधवार को राष्ट्रीय राजधानी में एसीएफआई की छठी वार्षिक आम बैठक के अवसर पर एक चर्चा के दौरान यह बात कही। उन्होंने कहा, "कृषि रसायन उद्योग ने नौ प्रतिशत की उल्लेखनीय वृद्धि हासिल की है... इस वृद्धि दर का अधिकतर हिस्सा कोविड-19 वैश्विक महामारी के वर्षों के दौरान हासिल हुआ।

# Indian agro-chemical industry can grow over 9%: Niti Aayog

NEW DELHI

INDIA'S agro-chemical industry has the potential to grow more than the current nine per cent notwithstanding the competition from China, government think tank Niti Aayog member Ramesh Chand said. Chand also observed that many Western countries are shifting from agrochemicals to biopesticides and the Indian industry needs to pay attention to this aspect. He urged the Agro Chem Federation of India (ACFI) to come out with a document on ease of doing business in agrochemicals.

The Niti Aayog member was addressing a panel discussion on the occasion of the sixth annual general meeting of ACFI in the national capital on Wednesday. "The agro-chemical industry has achieved a miracle



growth of nine per cent... much of this growth rate has happened during the Covid-19 pandemic years when the production activities were seriously disrupted," he said.

Despite economic and production disruptions, the domestic agrochemical industry had shown an impressive growth between 2017-18 and 2022-23, he added. That apart, India's exports have crossed \$5 billion and even surpassed China according to different data sources, Chand said. The Niti Aayog member further stated, if India can achieve a nine per cent growth rate in the absence of favourable China factor, the China competition is not as hard it was in the past.

## Agro-chemical biz set to grow above 9%: Niti

**New Delhi, Sept. 7:** India's agro-chemical industry has the potential to grow more than the current nine per cent notwithstanding the competition from China, government think tank Niti Aayog member Ramesh Chand said.

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stry has achieved a miracle growth of nine per cent... much of this growth rate has happened during the Covid-19 pandemic years when the production activities were disrupted," he said.

Despite economic and production disruptions, the domestic agrochemical industry had shown an impressive growth between 2017-18 and 2022-23, he added.

That apart, India's exports have crossed \$5 billion and even surpassed China according to different data sources, Chand said.

The Niti Aayog member further stated, if India can achieve a nine per cent growth rate in the absence of favourable China factor, the China competition is not as hard as it was in the past.

"We can easily raise this

growth rate from nine per cent to anything in the realm of reality," he said.

On biopesticides, Chand said the industry needs to ponder why many Western countries are shifting from agrochemicals to biopesticides.

"The entire West is going in that direction. I think in the long run this (Indian) industry is required to pay attention to this," he said. —PTI

## चीन के मुकाबले 9 फीसदी से अधिक वृद्धि दर हासिल कर सकता है कृषि-रसायन उद्योग : प्रो. रमेश चंद

नई दिल्ली, (वीओ)। घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है।

एग्रो कैम फेडरेशन ऑफ इंडिया (एसीएफआई) द्वारा बुधवार को नई दिल्ली में आयोजित सालाना आम बैठक के दौरान एक पैनल चर्चा में अपने विचार व्यक्त करते हुए प्रोफेसर रमेश चंद ने कहा, 2016 के बाद से कृषि-रसायन सेक्टर की विकास दर उछाल के बाद 8-9 फीसदी पर पहुंच

गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज्यादातर बढ़ोतरी कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है।

कृषि-रसायन क्षेत्र के विकास में कृषि क्षेत्र की भूमिका पर रोशनी डालते हुए रमेश चंद ने कहा पिछले 10 सालों और पिछले 5-6 सालों में कृषि क्षेत्र में अभूतपूर्व विकास हुआ है।

## चीनी प्रतिस्पर्धा के बावजूद भारतीय कृषि-रसायन उद्योग 9% से अधिक बढ़ सकता है : नीति आयोग

नई दिल्ली, 7 सितंबर। नीति आयोग के सदस्य रमेश चंद ने कहा कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा नौ प्रतिशत से अधिक बढ़ने की क्षमताएं हैं। चंद ने कहा कि कई पश्चिमी देश कृषि रसायनों के स्थान पर अब जैव कीटनाशकों का इस्तेमाल कर रहे हैं और भारतीय उद्योग को इस पहलू पर ध्यान देने की जरूरत है। उन्होंने एग्रो कैम फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों के व्यापार को आसान

बनाने पर एक प्रस्ताव लाने का आग्रह किया। नीति आयोग के सदस्य चंद ने बुधवार को राष्ट्रीय राजधानी में एसीएफआई की छठी वार्षिक आम बैठक के अवसर पर एक चर्चा के दौरान यह बात कही।

उन्होंने कहा कि कृषि रसायन उद्योग ने नौ प्रतिशत की उल्लेखनीय वृद्धि हासिल की है। इस वृद्धि दर का अधिकतर हिस्सा कोविड-19 वैश्विक महामारी के वर्षों के दौरान हासिल हुआ जब उत्पादन गतिविधियां गंभीर रूप से प्रभावित थीं।

# चीन के मुकाबले 9 फीसदी से अधिक वृद्धि दर हासिल कर सकता है कृषि-रसायन उद्योग: प्रो. रमेश चंद



नई दिल्ली, प्रत: किरण संबदादा

घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है।

एग्रो कैम फेडरेशन ऑफ इंडिया (एसीएफआई) द्वारा बुधवार को नई दिल्ली में आयोजित सालाना आम बैठक के दौरान एक पैनल चर्चा में अपने विचार व्यक्त करते हुए प्रोफेसर रमेश चंद ने कहा, हाइड्रोजन के बाद से कृषि-रसायन सेक्टर की विकास दर उछाल के बाद 8-9 फीसदी पर पहुंच गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच



सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज्यादातर बढ़ती कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है।

कृषि-रसायन क्षेत्र के विकास में कृषि क्षेत्र की भूमिका पर रोशनी डालते हुए रमेश चंद ने कहा पिछले 10 सालों और पिछले 5-6 सालों में कृषि क्षेत्र में अभूतपूर्व विकास हुआ है। उन्होंने कहा कि हाइड्रोजन के वाजपेयी जी के कार्यकाल में कृषि क्षेत्र में 4 फीसदी विकास का लक्ष्य तय किया था, किंतु हमने वह विकास 10 साल में हासिल किया। भारत के सात प्रमुख राज्यों में 7 फीसदी से भी अधिक बढ़ती दर्ज की गई है तथा

उत्पादन, सेक्टर की आय एवं किसानों की आय में इस तरह की बढ़ती स्वतंत्र भारत के इतिहास में, 7 या 10 सालों की किसी भी अवधि में भी कभी नहीं हुई है।

उन्होंने कृषि-रसायन उद्योग का आह्वान किया कि जहां तक हो सके कच्चे माल के लिए आयात पर निर्भरता कम करने के लिए अवसरों का उचित उपयोग करें।

उन्होंने कहा हाइड्रोजन दो प्रकार होते हैं। एक, जो निर्यात को समर्थन देने के लिए बेहद जरूरी है और दूसरा- जैसे हम बहुत अधिक मात्रा में खाद्य तेल का आयात करते हैं, जिसे कम करने के लिए हम अपनी अप्रयुक्त भूमि का उपयोग कर सकते हैं। जब प्रधानमंत्री मोदी जी अस्मानिर्भरता के बारे में बात करते हैं, उनका यह तात्पर्य नहीं होना कि अफ़को सभी प्रकार के आयात रोक

दने चाहिए। कृषि रसायन क्षेत्र में कुछ आयात जरूरी हैं।

उन्होंने कहा कि पब्लिक ट्रेडिंग में उपलब्ध आंकड़ों की बात करें तो भारत रूपए 14000 करोड़ कीमत के कच्चे माल सहित कृषि रसायनों का आयात करता है और वहीं रूपए 43000 करोड़ का निर्यात किया जाता है। इस तरह का आयात हमारे लिए हानिकारक नहीं है, किंतु चीन की स्थिति इसे और कम करने के अच्छे अवसर प्रदान करती है।

उन्होंने एग्रो कैम फेडरेशन ऑफ इंडिया से अग्रह किया कि कृषि रसायन क्षेत्र में कारोबार को सुगम बनाएं और उद्योग जगत से सवाल उठाया कि क्यों पश्चिमी देश कृषि रसायन से हटकर बायो-पेस्टीसिड की ओर रुख कर रहे हैं। उन्होंने कहा मैंने कई देशों में ऐसा देखा है। नैटवर्क अब न के बराबर कृषि रसायन बेचता है। पूरा पश्चिमी क्षेत्र इसी दिशा में रुख कर रहा है। मेरा मानना है कि लम्बी अवधि में भारतीय उद्योग को भी इसी पहलु पर ध्यान केन्द्रित करना होगा। संभवतया उद्योग जगत को पेस्टीसिड के बजाए पेस्ट-कंट्रोल (कीटनाशकों के बजाए कीट नियंत्रण) पर ध्यान देना होगा और इंटीग्रेटेड पेस्ट मैनेजमेंट (समेकित कीट प्रबंधन) के लिए समाधान खोजने होंगे। उन्होंने सलाह दी कि भारतीय उद्योग को ईएसजी (पर्यावरण, सामाजिक एवं प्रशासन)

से जुड़े मर्कों का अनुपालन करते हुए जिम्मेदारी से कारोबार करना होगा और ध्यान केन्द्रित करना होगा। पैनल चर्चा में हिस्सा लेने वाले श्री परेशित मुन्ना, चेदरमैन, एसीएफआई ने कहा, हमारा एसेसिएशन उच्च गुणवत्ता के कृषि रसायनों को किराया दाम पर उपलब्ध करके किसानों की आय बढ़ाने के लिए प्रतिबद्ध है। इसके लिए हम प्रोफेसर रमेश चंद और अन्य हितधारकों के कोमती सुझावों पर अमल करेंगे। अर्धजीव बोस, महासचिव, एसीएफआई, ने भी इसी तरह के विचार व्यक्त करते हुए उद्योग जगत से कहा कि उन्हें भारत के कृषि उत्पादन को बढ़ाने और आयात पर निर्भरता कम करने पर ध्यान केन्द्रित करना चाहिए। इससे पहले एसीएफआई के महानिदेशक डॉ. कल्याण गोस्वामी ने जानकारी दी कि एसीएफआई कृषि रसायन क्षेत्र के लिए अनुकूल प्रणाली के निर्माण हेतु कार्यरत है, जो कृषि रसायनों के निर्यात को बढ़ावा देगी तथा भारत को विदेशी निवेश के लिए आकर्षक गंतव्य के रूप में स्थापित करेगी। पीआई इंडस्ट्रीज के मैनेजिंग डायरेक्टर, मर्वक सिंघल, एफएमसी इंडिया के अध्यक्ष रवि अन्नावरूप, बेयर ग्रॉप साईंस हेड ऑफ आल्टरनेट बिजनेस मॉडलस अजीत सिंह तथा सिन्जेटा के चीफ सस्टेनेबिलिटी ऑफिसर के सी रवि भी पैनल चर्चा में मौजूद थे।

## चीन के मुकाबले 9 फीसदी से अधिक वृद्धि दर हासिल कर सकता है कृषि-रसायन उद्योग : प्रो. रमेश चंद

नई दिल्ली, (वीओ)। घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है।

एग्रो कैम फेडरेशन ऑफ इंडिया (एसीएफआई) द्वारा बुधवार को नई दिल्ली में आयोजित सालाना आम बैठक के दौरान एक पैनल चर्चा में अपने विचार व्यक्त करते हुए प्रोफेसर रमेश चंद ने कहा, 2016 के बाद से कृषि-रसायन सेक्टर की विकास दर उछाल के बाद 8-9 फीसदी पर पहुंच

गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज्यादातर बढ़ती कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है।

कृषि-रसायन क्षेत्र के विकास में कृषि क्षेत्र की भूमिका पर रोशनी डालते हुए रमेश चंद ने कहा पिछले 10 सालों और पिछले 5-6 सालों में कृषि क्षेत्र में अभूतपूर्व विकास हुआ है।

## चीन के मुकाबले 9 फीसदी से अधिक वृद्धि दर हासिल कर सकता है कृषि-रसायन उद्योग: प्रो. रमेश चंद

नई दिल्ली, 8 सितम्बर (देशबन्धु)। घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है। एग्रो कैम फेडरेशन ऑफ इंडिया एसीएफआई द्वारा नई दिल्ली में आयोजित सालाना आम बैठक के दौरान एक पैनल चर्चा में अपने विचार व्यक्त करते हुए प्रोफेसर रमेश चंद ने कहा कि 2016 के बाद से कृषि-रसायन सेक्टर की विकास दर उछाल के बाद 8-9 फीसदी पर पहुंच गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज्यादातर बढ़ती कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन

गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है।

कृषि-रसायन क्षेत्र के विकास में कृषि क्षेत्र की भूमिका पर रोशनी डालते हुए रमेश चंद ने कहा पिछले 10 सालों और पिछले 5-6 सालों में कृषि क्षेत्र में अभूतपूर्व विकास हुआ है।

उन्होंने कहा कि "हमने वाजपेयी जी के कार्यकाल में कृषि क्षेत्र में 4 फीसदी विकास का लक्ष्य तय किया था, किंतु हमने वह विकास 10 साल में हासिल किया। भारत के सात प्रमुख राज्यों में 7 फीसदी से भी अधिक बढ़ती दर्ज की गई है तथा उत्पादन, सेक्टर की आय एवं किसानों की आय में इस तरह की बढ़ती स्वतंत्र भारत के इतिहास में, 7 या 10 सालों की किसी भी अवधि में भी कभी नहीं हुई है।

## चीनी प्रतिस्पर्धा के बावजूद भारतीय कृषि-रसायन उद्योग 9% से अधिक बढ़ सकता है : नीति आयोग

नई दिल्ली, 7 सितंबर। नीति आयोग के सदस्य रमेश चंद ने कहा कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा नौ प्रतिशत से अधिक बढ़ने की क्षमताएं हैं। चंद ने कहा कि कई पश्चिमी देश कृषि रसायनों के स्थान पर अब जैव कीटनाशकों का इस्तेमाल कर रहे हैं और भारतीय उद्योग को इस पहलू पर ध्यान देने की जरूरत है। उन्होंने एगो केम फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों के व्यापार को आसान

बनाने पर एक प्रस्ताव लाने का आग्रह किया। नीति आयोग के सदस्य चंद ने बुधवार को राष्ट्रीय राजधानी में एसीएफआई की छठी वार्षिक आम बैठक के अवसर पर एक चर्चा के दौरान यह बात कही।

उन्होंने कहा कि कृषि रसायन उद्योग ने नौ प्रतिशत की उल्लेखनीय वृद्धि हासिल की है। इस वृद्धि दर का अधिकतर हिस्सा कोविड-19 वैश्विक महामारी के वर्षों के दौरान हासिल हुआ जब उत्पादन गतिविधियां गंभीर रूप से प्रभावित थीं।

## 9% से अधिक बढ़ सकता है भारतीय कृषि-रसायन उद्योग

नई दिल्ली, 7 सितंबर-(भाषा)

नीति आयोग के सदस्य रमेश चंद ने कहा कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा नौ प्रतिशत से अधिक बढ़ने की क्षमताएं हैं। चंद ने कहा कि कई पश्चिमी देश कृषि रसायनों के स्थान पर अब जैव कीटनाशकों का इस्तेमाल कर रहे हैं और भारतीय उद्योग को इस पहलू पर ध्यान देने की जरूरत है।

उन्होंने एगो केम फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों के व्यापार को आसान बनाने पर एक प्रस्ताव लाने का आग्रह किया। नीति आयोग के सदस्य चंद ने बुधवार को राष्ट्रीय राजधानी में एसीएफआई की छठी वार्षिक आम बैठक के अवसर पर एक चर्चा के दौरान यह बात कही। उन्होंने कहा, कृषि रसायन उद्योग ने नौ प्रतिशत की उल्लेखनीय वृद्धि हासिल की है... इस वृद्धि दर का अधिकतर हिस्सा कोविड-19 वैश्विक महामारी के वर्षों के दौरान हासिल हुआ जब उत्पादन गतिविधियां गंभीर रूप से प्रभावित थीं। चंद ने कहा कि आर्थिक और उत्पादन व्यवधानों के बावजूद घरेलू कृषि रसायन उद्योग ने 2017-18 और 2022-23 के बीच प्रभावशाली वृद्धि की। उन्होंने कहा, हम इस वृद्धि दर को आसानी से नौ प्रतिशत से अधिक भी बढ़ा सकते हैं।

## देश का कृषि-रसायन उद्योग: प्रो. रमेश चंद

नई दिल्ली। घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है। एसीएफआई बैठक प्रोफेसर रमेश चंद ने कहा 2016 के बाद से कृषि-रसायन सेक्टर की विकास दर उछल के बाद 8-9 फीसदी पर पहुंच गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज्यादातर बढ़ोतरी कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है। कृषि-रसायन क्षेत्र के विकास में कृषि क्षेत्र की भूमिका पर रोशनी डालते हुए रमेश चंद ने कहा पिछले 10 सालों और पिछले 5-6 सालों में कृषि क्षेत्र में अभूतपूर्व विकास हुआ है। उन्होंने कहा कि हमने वाजपेयी के कार्यकाल में कृषि क्षेत्र में 4 फीसदी विकास का लक्ष्य तय किया था, किंतु हमने वह विकास 10 साल में हासिल किया।

## Move from selling pesticide to pest-control, says NITI Aayog's Ramesh Chand

Updated - September 07, 2023 at 09:51 PM.

Time to look at integrated pest management as West is shifting to biopesticides

BY PRABHUDATTA MISHRA

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Ramesh Chand, member of Niti Aayog The Hindu SANDEEP SAXENA | Photo Credit: SANDEEP SAXENA

India's pesticides industry, which has become world's second biggest exporter after China, has been cautioned to be vigilant as many western countries are shifting from agrochemicals to biopesticides and even in the domestic market the official focus has been shifting towards soil conservation through natural farming. Still, it has potential to raise its growth from current level of 9 per cent.

Addressing an event organised by Agro Chem Federation of India (ACFI) on Wednesday, NITI Aayog member Ramesh Chand said: "I have seen it (staying away from chemical pesticides) in many countries. The Netherlands hardly sells any agrochemicals. The entire West is going in that direction. I think in the long run this (Indian agrochemical) industry is required to pay attention to this aspect. Perhaps, the industry needs to move from selling pesticide to pest-control and to offer solutions like integrated pest management."

He appealed the industry to ponder why many Western countries are shifting from agrochemicals to biopesticides. Chand suggested Indian companies to conduct business responsibly complying with issues related to ESG (environment, social, and governance) which is much talked about now.

## Indian agro-chemical industry can grow over 9 pc notwithstanding Chinese competition: Niti Aayog

PTI • Last Updated: Sep 07, 2023, 11:32 AM IST

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### Synopsis

India's agro-chemical industry has the potential to grow beyond its current rate of nine percent, despite competition from China, according to Niti Aayog member Ramesh Chand. He suggested that the industry should pay attention to the shift from agrochemicals to biopesticides in Western countries. Chand also urged the Agro Chem Federation of India (ACFI) to create a document on the ease of doing business in agrochemicals. He noted that despite disruptions caused by the Covid-19 pandemic, the domestic agrochemical industry has shown impressive growth.

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## Indian agrochemical industry can grow over 9 per cent notwithstanding Chinese competition: Niti Aayog

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The Niti Aayog member was addressing a panel discussion on the occasion of the sixth annual general meeting of ACFI in the national capital on Wednesday.

NEW DELHI: India's agro-chemical industry has the potential to grow more than the current nine per cent notwithstanding the competition from China, government think tank Niti Aayog member Ramesh Chand said.

Chand also observed that many Western countries are shifting from agrochemicals to biopesticides and the Indian industry needs to pay attention to this aspect.



Niti Aayog member Ramesh Chand (Photo | Twitter)  
© Provided by The New Indian Express

## Indian agro-chemical industry can grow over 9% notwithstanding Chinese competition: Niti Aayog

*Ramesh Chand also observed that many Western countries are shifting from agrochemicals to biopesticides and the Indian industry needs to pay attention to this aspect.*

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# INDIAN AGROCHEMICAL INDUSTRY CAN GROW OVER 9%, CHINESE COMPETITION NOTWITHSTANDING: NITI AAYOG

Despite economic and production disruptions, the domestic agrochemical industry had shown an impressive growth between 2017-18 and 2022-23, said government think tank NITI Aayog member Ramesh Chand.

## Chinese competition dwindling, Indian agrochemical industry can grow at over 9%: Member, Niti Aayog

September 7, 2023 - by Agriculture Post - Leave a Comment



*Amid easing Chinese competition, Niti Aayog member Professor Ramesh Chand expressed hope that India's agrochemical industry may grow at much higher rate than current 8-9 per cent clocked in the last 5-6 years*

Amid easing Chinese competition, [Niti Aayog](#) member Professor Ramesh Chand expressed hope that the Indian agrochemical industry may grow at a much higher rate than the current 8-9 per cent clocked in the last 5-6 years.



# चीन की अर्थव्यवस्था बर्बादी की ओर एक कदम और बढ़ी, अब एक साथ लगे दो झटके से हिला ड्रैगन

चीन के व्यापार में पिछले दो वर्षों से धीरे-धीरे गिरावट आई है। चीन की अर्थव्यवस्था कोविड-19 वैश्विक महामारी के बाद अर्थव्यवस्था उम्मीद से काफी पहले ही कमजोर पड़ गई है।



Edited By: Alok Kumar @alocksone

Updated on: September 07, 2023 17:35 IST



Photo:FILE

चीन की अर्थव्यवस्था

चीन की अर्थव्यवस्था लगातार गहरी मंदी की चपेट आती जा रही है। आयात और निर्यात के आंकड़ों ने चिंता और बढ़ा दी है। जानकारों का कहना है कि इससे यह संकेत मिलने जरूर लगे हैं कि चीन की अर्थव्यवस्था बर्बादी की ओर एक कदम और बढ़ गई है। दरअसल, चीन के निर्यात और आयात दोनों में अगस्त में सालाना आधार पर गिरावट आई है। यह कमजोर वैश्विक मांग को दर्शाता है जिससे पहले से ही धीमी पड़ी उसकी अर्थव्यवस्था पर दबाव बढ़ रहा है। गुरुवार को जारी सीमा शुल्क आंकड़ों के अनुसार, अगस्त में निर्यात सालाना आधार पर 8.8 प्रतिशत घटकर 284.87 अरब डॉलर रहा। आयात एक साल पहले की तुलना में 7.3 प्रतिशत घटकर 216.51 अरब डॉलर रहा। चीन का व्यापार अधिशेष 68.36 अरब डॉलर रहा, जो जुलाई में यह 80.6 अरब डॉलर था।



## लेटेस्ट न्यूज़

चीन की अर्थव्यवस्था बर्बादी की ओर एक कदम और बढ़ी, अब एक साथ लगे दो झटके से हिला ड्रैगन

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## Argo-Chemical Industry Can Grow Past 9%, Chinese Competition Not Hard To Surpass: Niti Aayog Member

Niti Aayog member Ramesh Chand highlighted that India's exports have crossed \$5 billion and even surpassed China, according to different data sources.

By: ABP News Bureau | Updated at : 07 Sep 2023 12:36 PM (IST)

Hindi News &gt; बिजनेस

## Agro Chemical: चीन दे रहा है कंपटीशन, भारत में बढ़ सकता है ये कारोबार, नीति आयोग ने जताई उम्मीद

Agro Chemical in India: एग्रोकैमिकल्स को विशेष रसायनों में गिना जाता है. सिलिकॉन स्प्रेडर्स का उपयोग करके कृषि रसायनों के प्रदर्शन को बढ़ाया जा सकता है जो बेहतर कवरेज, आसंजन और समग्र दक्षता प्रदान करते हैं. ऐसे में आइए जानते हैं एग्रोकैमिकल्स इंडस्ट्री के बारे में ताजा अपडेट...

Written By [Himanshu Kothari](#) | Last Updated: Sep 07, 2023, 06:23 PM IST



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## अब बायो-पेस्टीसाइड पर ध्यान दे एग्रो केमिकल उद्योग, नीति आयोग के सदस्य का बड़ा बयान

प्रो. रमेश चंद ने कहा कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से आगे बढ़ेगा. पिछले 5 साल में इस उद्योग की विकास दर 9 फीसदी पर पहुंच गई है. एग्रो केमिकल उद्योग 10 फीसदी विकास दर तक की ऊंचाई पर पहुंच सकता है.

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Get latest articles and stories on Latest News at LatestLY. India's agro-chemical industry has the potential to grow more than the current nine per cent notwithstanding the competition from China, government think tank Niti Aayog member Ramesh Chand said on Wednesday.

Friday, Sep 08, 2023

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## इंडियन एग्रो-कैमिकल इंडस्ट्री में हो सकता 9 फीसदी से ज्यादा का ग्रोथ : प्रोफेसर रमेश चंद

Updated on 9/7/2023



**नई दिल्ली/ टीम डिजिटल।** घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है।

# Indian agro-chem industry can grow over 9pc despite Chinese competition: Niti Aayog member Ramesh Chand

India's agro-chemical industry has the potential to grow more than the current nine per cent notwithstanding the competition from China, says government think tank Niti Aayog member Prof. Ramesh Chand.



Team RuralVoice

Published: Sep 7, 2023 - 12:49

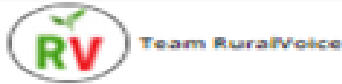
Updated: Sep 7, 2023 - 17:18

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# चीन से प्रतिस्पर्धा के बावजूद 9 फीसदी से ज्यादा की वृद्धि दर हासिल कर सकता है कृषि रसायन उद्योग: प्रो. रमेश चंद्र

नीति आयोग के सदस्य प्रो. रमेश चंद्र ने कहा है कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा 9 फीसदी से अधिक की दर से बढ़ने की क्षमता है। यह भी देखा गया है कि कई पश्चिमी देश कृषि-रसायनों से जैव कीटनाशकों की ओर स्थानांतरित हो रहे हैं। भारतीय कंपनियों को भी इस पहलु पर ध्यान देने की जरूरत है। उन्होंने एग्री केमिकल फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों का व्यापार आसान करने की लेकर एक दस्तावेज ताने का आग्रह किया।



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Updated: Sep 7, 2023 - 17:17



नीति आयोग के सदस्य प्रो. रमेश चंद्र ने कहा है कि भारत के कृषि-रसायन उद्योग में चीन से प्रतिस्पर्धा के बावजूद मौजूदा 9 फीसदी से अधिक की दर से बढ़ने की क्षमता है। यह भी देखा गया है कि कई पश्चिमी देश कृषि-रसायनों से जैव कीटनाशकों की ओर स्थानांतरित हो रहे हैं। भारतीय कंपनियों को भी इस पहलु पर ध्यान देने की जरूरत है। उन्होंने एग्री केमिकल फेडरेशन ऑफ इंडिया (एसीएफआई) से कृषि रसायनों का व्यापार आसान करने की लेकर एक दस्तावेज ताने का आग्रह किया।

नई दिल्ली में एसीएफआई के एक कार्यक्रम को संबोधित करते हुए नीति आयोग के सदस्य ने कहा, "कृषि रसायन उद्योग ने 9 फीसदी की वार्षिक वृद्धि हासिल की है। इस वृद्धि दर का अधिकांश हिस्सा कोविड-19 महामारी के वर्षों के दौरान हासिल हुआ है जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं।"

उन्होंने कहा कि आर्थिक और उत्पादन बाधाओं के बावजूद परिलु कृषि रसायन उद्योग ने 2017-18 और 2022-23 के बीच प्रभावशाली वृद्धि दिखाई है। इसके अलावा भारत का निर्यात 5 अरब अमेरिकी डॉलर को पार कर गया है और चीन से भी आगे निकल गया है। नीति आयोग के सदस्य ने आगे कहा कि अगर भारत अनुकूल चीन कारक के अभाव में 9 फीसदी की विकास दर हासिल कर सकता है, तो चीन के साथ प्रतिस्पर्धा अब उसकी कठिन नहीं है जितनी पहले थी। उन्होंने कहा, "हम इस विकास दर को आसानी से 9 फीसदी से बढ़ाकर वास्तविकता के दायरे में कुछ भी कर सकते हैं।"

जैव-कीटनाशकों के बारे में उन्होंने कहा कि उद्योग को इस बात पर विचार करने की जरूरत है कि क्यों कई पश्चिमी देश कृषि रसायनों से जैव-कीटनाशकों की ओर स्थानांतरित हो रहे हैं। उन्होंने कहा, "मेने इसे कई देशों में देखा है। नीदरलैंड खासतौर पर ही कोई कृषि-रसायन बेचता है। पश्चिम के सभी देश उसी दिशा में जा रहे हैं। मुझे लगता है कि लंबे समय में भारतीय उद्योग को इस पहलु पर ध्यान देने की आवश्यकता है।"

निर्यात को बढ़ावा देने की लेकर उन्होंने कहा भारतीय कंपनियों को ईएसजी (पर्यावरण, सामाजिक और शासन) से संबंधित मुद्दों का अनुपालन करते हुए जिम्मेदारी से कारोबार करने की जरूरत है। इस पर अब काफी चर्चा हो रही है। इसके अलावा, कृषि रसायन उद्योग को प्रदूषण को कम करने के लिए नवाचार पर ध्यान केंद्रित करने और व्यापार करने में आसानी पर एक दस्तावेज ताने की जरूरत है।

# Indian agrochemical industry shows resilience, eyes growth beyond 9% amidst Chinese competition

Niti Aayog highlights the industry's remarkable growth, surpassing 9%, and calls for a focus on biopesticides and responsible business practices.



by Staff Writer | September 7, 2023 SHARE



India's agrochemical industry has demonstrated significant growth, reaching a remarkable nine percent, even amid the challenges posed by the Covid-19 pandemic, according to Niti Aayog member Ramesh Chand. Speaking at the sixth annual general meeting of the Agro Chem Federation of India (ACFI) in the national capital, Chand highlighted that this growth occurred between 2017-18 and 2022-23, showcasing the industry's resilience during difficult economic times.

Chand also pointed out that India's agrochemical exports have exceeded USD 5 billion, surpassing even China, which underscores the industry's competitiveness on the global stage. He emphasised that if India can maintain this nine percent growth rate without depending on favourable conditions from China, it has the potential to further accelerate its growth.



# Niti Aayog predicts Indian agro-chemical industry growth over 9 per cent notwithstanding Chinese competition

To boost exports, Chand said Indian companies need to conduct business responsibly complying with issues related to ESG (environment, social, and governance) which is much talked about now.

By [Pratik Chaudhary](#) | 08/09/2023 | 07:00 AM IST

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## Niti Aayog Member Foresees Indian Agro-Chemical Industry Outpacing Chinese Competition

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### Indian agro-chemical industry can grow over 9 pc notwithstanding Chinese competition: Niti Aayog

By **Daily Excelsior** - 08/09/2023

समाचार / ख़बर

## चीन के मुकाबले कृषि-रसायन उद्योग 9 फीसदी से भी अधिक दर से हो सकता है विकसित

September 7, 2023 - by टीम डिजिटल - Leave a Comment



**नई दिल्ली।** घटती चीनी प्रतिस्पर्धा के बीच नीति आयोग के सदस्य प्रोफेसर रमेश चंद ने उम्मीद जताई है कि आने वाले समय में भारत का कृषि-रसायन उद्योग मौजूदा दर की तुलना में अधिक गति से विकसित हो सकता है। गौरतलब है कि पिछले 5-6 सालों में इस उद्योग की विकास दर 8-9 फीसदी पर पहुंच गई है। एग्रो कैम फेडरेशन ऑफ इंडिया (एसीएफआई) द्वारा बुधवार को नई दिल्ली में आयोजित सालाना आम बैठक के दौरान एक पैनल चर्चा में अपने विचार व्यक्त करते हुए प्रोफेसर रमेश चंद ने कहा, "2016 के बाद से कृषि-रसायन सेक्टर की विकास दर उछाल के बाद 8-9 फीसदी पर पहुंच गई है और उद्योग जगत 10 फीसदी विकास दर तक पहुंच सकता है। इसे चमत्कारिक विकास दर कहा जा सकता है क्योंकि इसमें से ज़्यादातर बढ़ोतरी कोविड-19 महामारी के वर्षों के दौरान हुई है, जब उत्पादन गतिविधियां गंभीर रूप से बाधित थीं। चूंकि चीन से प्रतिस्पर्धा के और कम होने की संभावना है, ऐसे में कृषि-रसायन उद्योग काफी अधिक दर से विकसित हो सकता है।"



# Agriculture officials inspect standing kuruvai, samba crops in delta districts

The inspections are carried out in the wake of reports of shortage of water for irrigation; the officials also inspect the alternative crops raised in the delta region, interact with the farmers and hear their grievances; forum wants government to sanction compensation for affected farmers

**The Hindu Bureau**

THANJAVUR/NAGAPATTINAM

Senior officials of Agriculture Department fanned out to different parts of the Cauvery delta districts on Wednesday to assess the standing kuruvai and samba paddy crop, in the wake of reports of shortage of water for irrigation.

C. Samayamoorthy, Agriculture Production Commissioner and Secretary, inspected the paddy and alternative crops raised using surface water sources in Thanjavur district.

According to an official release, accompanied by Collector Deepak Jacob, Mr. Samayamoorthy inspected the paddy crops raised using river water in Thanjavur, Orathanadu and Thiruvonam Panchayat Unions.

He also inspected the alternative crops raised in these areas.

Ramanathapuram panchayat in Thanjavur block, Paruthikkottai and Thennamanadu North in Orathanadu taluk were some of the places where the official conducted the inspection.

He interacted with the



**Taking stock:** Agriculture Production Commissioner and Secretary C. Samayamoorthy inspects a paddy field in Thanjavur district on Wednesday. SPECIAL ARRANGEMENT

farmers and heard their grievances.

### Nagapattinam

In Nagapattinam district, Director of Agriculture Marketing and Agri Business S. Natarajan inspected fields to assess the situation of paddy raised in over 61,268 acres.

According to a press release, the depletion of storage in Mettur reservoir and subsequent reduction in release of water for irrigation affected the standing paddy crops. Incidents of

crop withering were reported on nearly 30,295 acres at many villages in Nagapattinam, Kilvelur, Thalainayar, Keezhaiyur, Vedaranyam, and Thirumarugal blocks.

Along with Collector Johny Tom Varghese, Mr. Natarajan inspected the paddy fields to assess the situation of the standing crops and interacted with farmers.

In a representation submitted to the visiting officials, Cauvery Dhanapalan, president of Tamil Nadu Viva-

saya Sangankalin Koota- maippu, said farmers in Nagapattinam district had raised paddy on over 60,000 acres, expecting a bumper crop. But the Cauvery water did not reach the tail-end areas. The farmers were forced to abandon the withering crops on nearly 20,000 acres. At this juncture, the State government should ensure supply of sufficient quantum of water, at least for one month, to save the standing crops from withering, he said and urged

the government to sanction compensation for affected farmers.

Agriculture Commissioner L. Subramanian, accompanied by Collector T. Charushree, inspected the crops in Tiruvarur district.

### Paddy procurement

Meanwhile talking to reporters in Thanjavur on Wednesday, the chairman and managing director, Food Corporation of India, Ashok K.K. Meena said that paddy procurement for the 'kharif' season had been pegged at 521 lakh tonnes



Paddy procurement for the 'kharif' season has been pegged at 521 lakh tonnes

**Ashok K.K. Meena**  
Chairman and MD  
Food Corporation of India

and the Corporation expected additional paddy procurement in the 'rabi' season. Last year, 570 lakh tonnes of paddy were procured by the FCI through the State governments. Out of this, 400 lakh tonnes were used for various schemes and programmes implemented in the country and the remainder was retained by the Corporation.

### Open market sale

When asked why the State governments were not allowed to participate in the open market paddy sale of the Corporation, he said that it was a policy decision of the Central government taken with the objective of keeping the market price of rice at an affordable rate for the benefit of 60 crore people who were not covered by various food safety schemes.

# Agritourism park to come up at Ezhikkara

TIMES NEWS NETWORK

**Kochi:** An agritourism park is on the anvil at Ezhikkara near North Paravur. Palliyakkal Cooperative Bank is mooting the project so as to attract domestic and foreign tourists.

The park will provide facilities for the tourists to stay in the area and study about the agricultural practices in Ezhikkara. There will be homestays and tents

**Palliyakkal Cooperative Bank is mooting the project so as to attract domestic and foreign tourists. The park will have accommodation facilities for tourists**

for providing accommodation for tourists. According to the cooperative bank authorities, the park is being set up as part of the projects

in the agricultural sector. "The motto of Palliyakkal Cooperative Bank is to promote tourism along with agriculture. The bank authorities have been designing various projects to enhance the revenue of farmers in the area. The park project has been designed as part of this," said a bank official.

Bank president A C Shan said that the bank has identified around one-and-a-half

acres of land for setting up the first phase of the agritourism park. The main facilities of the park will be set up on this land which the bank procured on lease from a private individual. Later on, land parcels of those who are interested in the project will also be procured for the park.

There will be facilities for adventure tourism, kayaking, fishing and live cooking in the park. The bank au-

thorities said that they will also provide transportation facilities for the tourists. The park is expected to generate employment for local people as well.

The bank is cultivating rice with the support of its members and has introduced a rice brand of its own. The bank also promotes organic farming. Vegetables and flowers are being cultivated by the farmers under the aegis of the bank.

## 'Strong WTO can ensure free flow of agri goods across borders'

The G20 Delhi Declaration has devoted considerable space to food and nutritional security and called for an open and rules-based food, fertiliser, and agriculture trade worldwide. NITI Aayog member and agricultural economist **RAMESH CHAND**, in an interview with Sanjeeb Mukherjee in New Delhi, says that a robust World Trade Organization (WTO) can ensure the seamless flow of agricultural goods across borders. Edited excerpts:

**The G20 Delhi Declaration commits itself to an open, fair, predictable, and rules-based agriculture, food, and fertiliser trade. It also discusses refraining from imposing any export prohibitions or restrictions and reducing market distortions in accordance with WTO rules. However, with countries like India increasingly imposing curbs on the free flow of agricultural commodities to control domestic inflation and address local concerns, how do you believe this commitment can be achieved?**

Since the Doha Development Round, the WTO has not made significant progress. Consequently, the world has shifted towards protectionism and imposed country-specific restrictions on exports and imports.

The lack of progress in WTO rules and reduced compliance with the WTO Agreement on Agriculture have led to unilateral actions by many countries.

For instance, Indonesia imposed export restrictions on palm oil two years ago. India's restrictions on wheat and rice exports are primarily due to the evolving global trade landscape.

To ensure the free flow of goods across borders, it's imperative to strengthen the WTO, make it more transparent, and ensure it caters to the needs of developing countries like India.

**The G20 has also called for the full implementation of the Black Sea grain deal, which Russia has backed out of. What could be the impact on world food prices**

**and inflation, and would India be affected?**

A country like Russia, as a G20 member, will face pressure to adhere to the G20 agreement and avoid disrupting food, particularly grain, trade. If Russia chooses to stay away from the deal, collective action by other G20 countries may become necessary to address the situation.

**How do you think Indian farmers could benefit from the Global Biofuels Alliance?**

Emphasising biofuels will increase the demand for agri-biomass, including primary products and byproducts. This will also promote the production of energy crops.

On one hand, it will ensure increased demand for grains, oilseeds, and sugarcane, and

on the other, it will add value to the biomass that would otherwise go to waste.

**The Declaration also calls for an Agricultural Market Information System (AMIS) and Geo Global Agricultural Monitoring to enhance transparency, prevent food price volatility, and include vegetable oils in AMIS. How can these measures benefit in early price detection signals?**

Previous G20 meetings have established mechanisms such as AMIS and the Rapid Response Forum for early warning and swift action to address anticipated shocks in production and markets.

By including these in the Delhi Declaration, the G20 reaffirmed its confidence in and support for these measures, which are becoming

increasingly important in the face of rising climate uncertainties. These measures will facilitate timely preparation to address output and price shocks and help vulnerable regions and populations.

**What, in your opinion, are the key takeaways for Indian agriculture, food security, and nutrition from the G20 Delhi Declaration?**

A dedicated section in the Delhi Declaration focuses on sustainable development goals (SDGs), with agriculture playing a crucial role in their attainment. Eleven out of 16 SDGs are directly linked to or dependent on agriculture and the food sector. The section underscores the importance of food security and nutrition improvement. It is matter of concern that hunger and malnutrition have worsened globally, especially in Africa, South America, and South Asia.



**"IF RUSSIA CHOOSES TO STAY AWAY FROM THE (BLACK SEA GRAIN) DEAL, COLLECTIVE ACTION BY OTHER G20 COUNTRIES MAY BECOME NECESSARY TO ADDRESS THE SITUATION (WORLD FOOD PRICES AND INFLATION)"**

# 'Agro digitisation for green economy'

East-West Seed India, WTC Shamshabad, FICCI and Dutch Embassy organise a webinar on the Digital Agricultural Economy



GC Shivakumar,



Shijo Joseph



Deepak Pareek



Dr Venu Madhav M



Dr Prakash N

BB BUREAU  
HYDERABAD

BY providing real-time data on soil health, crop conditions, and weather patterns, farmers can make more informed decisions, and the entire agricultural value chain is impacted, paving the way for a sustainable future, said GC Shivakumar, Country General Manager, East-West Seed India, headquartered at Nonthaburi in Thailand.

He was speaking in a webinar titled 'Digital Agriculture Economy - Propelling the New Growth Curve' organised by East-West Seed India, World Trade Center (WTC) Shamshabad, and Federation of Indian Chambers of Commerce & Industry (FICCI), supported by the Embassy of the Kingdom of Netherlands.

On the occasion, Shivaku-

mar said: "We have collectively envisaged this series of virtual webinars that aim to foster progressive thinking and dialogues around pivotal issues in agriculture. The theme highlights the integration of advanced technologies into the agricultural sector to increase productivity, efficiency, and sustainability."

This transformative approach is reshaping the traditional agricultural landscape. Shijo Joseph, Group CIO and Head of Strategy & Transformation at East-West Seed Global, moderated the session, in which, nearly 300 persons actively participated from across India and Thailand. He said, "Agro digitisation revolves around sustainability, improved yield, and reduced risks. Collective efforts by Value chain players could accelerate digitisation."

Dr Venu Madhav Margam, Vice President, Kalgudi, said, "The power of digital has immense potential to revolutionise rural social commerce including benefitting small scale producers and rural women. Digital enablement, especially of rural collectives such as Farmers Producer Organizations (FPOs) and Women Self Help Groups (SHGs), is an effective means to reap collective benefits by achieving scale. Forward and backward market linkages through e-commerce can potentially decrease their operating cost and better price realisation on their outputs, ultimately increasing their incomes significantly."

Prof Prakash Nagabovanalli B Dean, College of Agriculture, GKVK, Bengaluru, said: "The Digital Agriculture Economy is a dynamic and rapidly evolving sector that is

revolutionising how we produce, manage, and distribute agriproducts. We need to orient our students to be future-ready in digital agriculture technologies, which leverage data analytics, satellite imagery (image analysis), and sensors to enable farming. Farmers can now make data-informed decisions about inputs, soil fertility status, sowing/planting, irrigation, fertilisation, and pest control. This leads to optimised resource utilisation, increased crop yields, and reduced environmental impact."

Deepak Pareek, CSO of Summaya Corporation Limited, said, "Digital technology empowers smallholder farmers, cultivating innovation in agriculture. It bridges knowledge gaps, boosts productivity, and transforms livelihoods. Embracing it, they reap a digital harvest of prosperity."

## Consensus likely on sustainable food production

SANDIP DAS  
New Delhi,

**A JOINT EFFORT** for sustainable food production through support to grain-importing developing countries and a global initiative to boost research on millets and other coarse grains are likely to be part of the G20 outcome document, as consensus has been achieved on these issues, sources said.

However, an agreement on allowing unbridled global food trade despite geopolitical tensions like Ukraine-Russia conflict is unlikely. Also, while the G20 Bali summit declaration last year denounced the trend of imposing export restrictions on food and fertilisers by many countries, further concrete action on this is doubtful at this juncture. The Russia-Ukraine conflict since last year had

disrupted the fertiliser and food grain supplies globally, and Russia recently decided against renewing the Black Sea grain deal. India, as one of the largest food grain producers, banned wheat exports last year and put bans/export taxes on several varieties of rice, to increase domestic supplies. After taking over the G20 presidency last year at Bali, Prime Minister Narendra Modi had called for depoliticising the global supply of food and fertilisers so that geopolitical tensions do not lead to a humanitarian crisis. Sources told FE that the G20 agriculture ministers' group recently recognised challenges to global food security, and persistence of all forms of malnutrition aggravated by climate change, geopolitical tension and conflicts and other systemic

shocks. It sought concerted actions to achieve 'zero hunger' as per the sustainable development goals-II by the 2030. The 18th G20 summit here is likely to reiterate the thrust on climate resilient agriculture, which uses existing natural resources sustainably in crop and livestock production systems to achieve higher long-term productivity and farm income in the face of climate

change.

An official said the thrust on increasing global food production, food safety net programmes, climate-smart approaches, one-health approach, digitisation of the agriculture sector and increasing investment from public and private sector in agriculture is likely to be included in the final summit document. Collaboration on developing sustainable, scalable and inclusive technologies, practices and innovations to address climate change and biodiversity loss, may be part of the G20 outcome. At present, consensus has

been achieved on the 'Deccan G20 High-Level Principles on Food Security and Nutrition' and millet initiative called 'Maharishi - Millets And Other Ancient Grains International Research Initiative'. In 2011, the Agriculture Deputies Group was created during France's G20 presidency to deal with volatility in global food prices. It has emerged as a key forum to enhance cooperation among G20 members on food security and nutrition due to challenges posed by the Covid-19 pandemic and the Russia-Ukraine conflict in recent years. Since its launch in 2011, the Agricultural Market Information System (AMIS), an inter-agency platform to enhance food market transparency and policy response for food security, was launched following the global spike in food prices during 2008-2010.



# Agriculture can be alternative source of income for Goans, says Sawant

TIMES NEWS NETWORK

**Panaji:** Agriculture can be an alternative source of income for Goans, said chief minister Pramod Sawant, speaking to farmers and agriculture mentors in a meeting on plasticulture and micronutrients, in Panaji on Wednesday.

Sawant stressed the need to focus on the processing industry of agriculture to create different products from coconut and various other crops. He congratulated Vijaydutta Lotlikar, an agriculturist, for the 600 handicrafts he has built from coconut shells.

"The Government of Goa salutes his creativity and innovation. Efforts need to be made to tap value-added products, such as coir, to enhance Goa's industry sector," Sawant said. "The coir indus-



**TAPPING ADDITIONAL REVENUE**

try's turnover is Rs 400 crore. Yet in Goa, we discard 95% of coir as waste. It is up to the zonal agricultural officers to make farmers aware of the importance of coir."

The chief minister also said that multiple uses of coconut will be the core objective behind reviving the coconut

industry of Goa.

The CM emphasised the need to recycle and reuse plastics in the agriculture sector and gave the example of the Palu fish sculpture installed on Miramar beach using plastic waste from the beach.

"Goa has at least 100 plastic industries. The government

of Goa is ready to offer all the support required for plastic recycling and reuse," the chief minister said.

Speaking at the event, agriculture minister Ravi Naik appreciated the role of polymers in the agriculture sector and called for the use of drip irrigation to increase productivity.

The event was organised by Plastivision India 2023, the All India Plastic Manufacturers Association, Maharashtra Economic Development Council, Reliance Polymer, and Bharat Agro Services and supported by the Goa agriculture department.

The 12th edition of Plastivision 2023 is expected to draw 1,500 exhibitors from 30 countries and record a footfall of over 2.5 lakh visitors from across the world.

## Agriculture Infrastructure Fund could do with a review

Kushankur Dey  
Aashi Jain  
Prajakta Jagdeo Tikhade

**P**romoting the Agriculture Infrastructure Fund (AIF) worth ₹1-lakh crore, a financing facility launched in 2020 by the Centre, is a welcome move in shaping the agribusiness environment. The scheme sanctioned 32,514 projects worth ₹25,356 crore of loans since its inception. Until March 2023, ₹9,660 crore of funds were disbursed for 19,650 projects across 26 States/UTs, indicating that only 9.68 per cent of the total funds were released.

The Lok Sabha session deliberated on the strategy for achieving the AIF scheme target by FY 2025-26. An analysis of the scheme's modalities and allocation is needed to deepen the scheme's impact.

### THE ASSESSMENT

First, the financing facility allocation to the States/UTs based on the value of the output of agriculture and allied activities is skewed. For example, over

65 per cent of the total funds were allocated to only eight States: Uttar Pradesh (₹12,831 crore), Rajasthan (₹9,015 crore), Maharashtra (₹8,460 crore), Madhya Pradesh (₹7,440 crore), Gujarat (₹7,282 crore), West Bengal (₹7,260 crore), Andhra Pradesh (₹6,540 crore), and Tamil Nadu (₹5,990 crore).

In contrast, the allocation of AIF to Punjab and Haryana is ₹8,613 crore or 9 per cent, and in North-Eastern states, it is ₹3,376 crore or 3 per cent.

Second, AIF is integrated with debt, where the interest rate subvention is facilitated up to ₹2 crore. So, the scheme's success depends on the intention and ability of financial institutions. Bankers look at the projects from their credit assessment lens, where feasibility depends on the project and the promoter.

Furthermore, farmer organisations (FPOs) are not mature enough to pass the acid test, so there is an inherent breaker to a fast-paced disbursement of the scheme. Third, credit guarantee cover for eligible borrowers is available for ₹2 crore, which is small for a standard project. Meanwhile, the availing of this



**AIF.** Fostering agri-entrepreneurship

facility differs for the type of borrower. For example, for off-farm agri projects, the guarantee will be supported by a credit guarantee fund trust for micro and small enterprises.

For farm-based projects, the credit guarantee cover can be utilised from the FPO promotion scheme of the Department of Agriculture and Farmer Welfare. Such complications could exclude the 'eligible' beneficiaries or capture the 'elite' and lead to 'crony capitalism' in agribusiness.

Fourth, the centralised governance of the Project Monitoring Unit may bring opportunities for moral hazard and adverse selection of

agri-entrepreneurs and start-ups engaged in off-farm or e-commerce interventions and enhance administrative costs.

Fifth, although there is a renewed focus on inclusivity and equity in the scheme, offering grants-in-aid for underprivileged and women entrepreneurs may increase the default (credit) risk.

Sixth, large-scale integrated projects cannot be installed singly under this scheme. Convergence with other schemes remains a crucial enabler for its success.

Seventh, this scheme will be successful for farm-gate-led hub-and-spoke models where the spokes with prescribed distance can be installed under this scheme. Guidance and mentoring for the FPOs and small-scale promoters can accelerate the adoption, and the incubators can play a pivotal role.

Dey is faculty, and Jain and Tikhade are agribusiness management students at IIM Lucknow. Input by Dr Kaushik Basu is gratefully acknowledged. Views expressed are personal.

# A radical out of the box thinking needed to rebuild agriculture

Farmer leaders and farm activists have often maintained that the suicide figures are invariably underreported

FARMER suicides show no signs of abatement. And that too in a country where a new report says that the Union Government is planning to serve G-20 Summit delegates in silverware and gold-plated utensils.

An Asian News International (ANI) report quotes CEO of IRIS India, manufacturers and exporter of luxury metalware, as saying: "We started the preparation in January 2023. We have made cutlery according to the location. We have incorporated the cutlery according to State's culture. Some cutlery is silver-coated. We have also made a 'Maharaja Thali. Some cutlery is also gold-plated..."

With the kind of rich preparations being made, as someone said it appears to be nothing short of a fat Indian wedding. I don't see any reason why we are invariably faced with a resource crunch when it comes to handholding farmers, pulling them out from deep misery and suffering they find themselves perpetually in. As per the report of the latest 2019 Situational Assessment Survey for Agricultural Households, the average monthly income of an agricultural family stands at a paltry Rs 10,218. In other words, agriculture continues to be at the bottom of the pyramid. In fact, as per the survey, a daily wager earns more than a farmer.

This comes at a time when the Centre has announced a four per cent hike in DA instalment effective from July 1, 2023 for its roughly one crore employees and pensioners. The hike will entail

an additional expenditure of Rs 12,815 crore per year. Let it be known that the hike in DA is merged with the basic pay of the employees, which means their basic pay keeps on increasing with every DA instalment.

I have never heard of any financial constraints when it comes to providing DA for employees. The financial crunch is only when we need to spend on farmers.

Now let me revert back to the issue of farmer suicides. Well, the fact that farmers continue to commit suicide in droves is a reflection of the terrible agrarian distress that continues to prevail. Burdened with mounting debt and that happens when the output price does not even cover the cost of production, farmers are often left with little choice but end their lives.

I remember, several years ago, a newspaper report had rightly termed continuing farmer suicides as a 'serial death dance'.

It truly is. After all, since 1997, and as per official figures, close to four lakh farmers had taken to suicide as the fatal route to escape the humiliation

that they face. Farmer leaders and farm activists have time and again contested these statistics saying the deaths figures are often underreported. I will not go into the reasons behind what leads to farm suicides, but it is important to look into a report that has been submitted by a senior bureaucrat in Maharashtra, which has stirred a hornet's nest.

Let's understand what he suggests in the light of hun-



dreds of other recommendations we have seen in the recent past.

If I am not mistaken, there are at least a hundred reports/studies on farmer suicides that have been prepared and submitted across the country over the years. And yet, there seems to be no let-up in the number of farmers who take to suicides.

In Maharashtra, as per official estimates, 26,566 farmers have taken their lives in the past 10 years, between 2013 and 2022, to be more precise. This implies that on an average seven farmers died by suicide every day.

A recent article in Frontline magazine (September 2) says a report filed by a Divisional Commissioner of Aurangabad, Sunil Kendrekar, has called for discontinuing all welfare schemes, implemented by both the Centre and State, and instead provide a direct income support of Rs 25,000 per hectare.

While the Maharashtra government has not accepted the report, a lot of criticism has also come from farmer unions and civil society stakeholders. Given that 206.95 lakh hectares is under cultivation, the amount spent under 26 different welfare schemes comes to Rs 31,595 crore. Against Rs 51,737 crore needed for one-time grant to farmers per year, and minus the welfare amount of Rs 31,595

ing, and come up with some out of the box thinking that can rebuild agriculture. There is certainly need for making crop insurance effective, for providing disaster relief, and, of course, implementing the National Food Security Act in right earnest. Eventually, the aim should be to enhance farmer's income.

While legalising MSP for all crops is the surest way to enhance farm incomes, the other suggestion I have is to constitute a State Commission for Farmers Income and welfare. It should be akin to the government employees, who get basic pay plus DA and in addition get a total of 108 allowances (not for everyone, but collectively).

For instance, in Punjab the average monthly income per farm household is about Rs 25,000. It should set up a target to enhance the average income to Rs 40,000 in the next two years. Similarly for Maharashtra, where the 2019 agricultural household survey had computed the average income at Rs 11,492 per month, the Maharashtra Commission for Farmers Income and Welfare, if the State Government envisages, should have a target of increasing it to Rs 25,000 in the next two years.

If we plan like this, I am sure there would be no need to put up a temporary wall or green sheets to hide the poor whenever some of the world's important leaders come.

If it was Garibi Hatao in the past, it seems to be Garibi Chhupao now. If only we were to truly aim at Sabka Saath Sabka Vikas, for which the roadmap passes through agriculture, there will be no need to hide the poor.

*(The author is a noted food policy analyst and an expert on issues related to the agriculture sector. He writes on food, agriculture and hunger)*



Devinder Sharma

# Farmers turn to 'more profitable' fig farming

**K Sandeep Kumar**

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**PRAYAGRAJ** : Select farmers of Prayagraj region, especially in Fatehpur district, have moved on from their traditional crops like paddy, wheat and pulses, and begun fig (or anjeer) farming, which is helping them reap rich dividends.

These farmers are making use of technical as well as financial support in the form of a 'financial incentive' from the horticulture department.

As per its policy, the state government is not just providing them support in their efforts but also helping them earn much more than ever before. These farmers, through fig farming, are earning as much as Rs 10 lakh per acre against Rs 1 lakh to Rs 4 lakh they used to earn earlier, say officials. Presently, Fatehpur alone has fig farming taking place on around 11 acres of land by these farmers, they added.

One such farmer is Sarvesh Chandra Mishra of Fatehpur's Mawai Pathakpur village in the Prayagraj division.

"I have started cultivating Afghani species of figs instead of traditional farming for the past two years, and I have witnessed great results. My



Farmer Sarvesh Chandra Mishra in his field showing fig trees with fruits in his field.. HT PHOTO

income has more than doubled," he said with a smile.

Sarvesh says that he started fig cultivation on his 1-acre farmland.

"I opted for fig plants of Afghan Diana variety for their sturdiness and good fruit-yielding capacity. To make the produce more appealing, I used only cow dung manure for the crop at the suggestion of horticulture department officials, and this has proved greatly beneficial. I am earning around Rs 10 lakh from fig cultivation

on my 1-acre land," he said.

For this farming, he also received an incentive amount of Rs 90,600 from the state government. Seeing his success, other farmers of the area too have turned towards fig cultivation.

Another farmer involved in fig farming is Shiv Nandan, a resident of Pathakpur village in Fatehpur.

"I used to grow paddy and wheat like most farmers till just two years back. However, when I heard that anjeer farm-



Today, I am growing fig trees on 1.5-acre land that I own in my village and the last two harvests have yielded me four times the earnings that I made through traditional crops

**SHIV NANDAN**, Farmer

ing was proving to be a success in my area and was more profitable, I decided to go for it. Today, I am growing fig trees on 1.5-acre land that I own in my village and the last two harvests have yielded me four times the earnings that I made through traditional crops," said Shiv Nandan.

Another farmer of the same village Jageshwar, too has started anjeer farming on his 1-acre land.

Speaking on the trend, deputy director, horticulture, Prayagraj division, Krishna Mohan

Chowdhary, said that around seven farmers have embraced fig cultivation in Fatehpur district and also availed the subsidy of up to 50% on the expenses under the state horticulture mission initiative aimed at encouraging dry fruit cultivation in the state.

The fact that fig farming can be done even in dry sunny and rocky areas where many other crops do not flourish is also a big advantage of taking up anjeer farming, he added.

Deputy director of agriculture, Prayagraj, Satya Prakash Srivastava, said that fig trees can withstand a range of soil types, such as sandy, loamy, and clay soils, with good drainage and thrive in hot and dry climates. "Fig tree produces two crops of figs per year. Farmers are now coming to the horticulture department to get information about anjeer farming," he added.

Anjeer is considered immensely beneficial as it is a rich source of vitamins and minerals, including vitamin A, vitamin C, vitamin K, potassium, magnesium, zinc, copper, manganese, and iron. It is known to promote digestion, good bone health, maintain blood sugar levels, and lower the risk of heart disease.

# Acid test for specialty chemical firms: Mix of weak demand, low realisations

**CAUSTIC REACTION:** Sector expected to underperform as brokerages slash profit estimates

**RAM PRASAD SAHU**  
Mumbai, 30 July

The weak April-June quarter (first quarter, or Q1) results of the largest listed specialty chemical maker, SRF, and multiple global headwinds for the sector are expected to weigh on the prospects of Indian specialty chemical companies in 2023-24 (FY24). Stocks in the sector (down 7-18 per cent) have underperformed the benchmarks (up over 10 per cent) in the past three months, and given the multiple challenges, the trend is likely to continue.

Kotak Institutional Equities expects a very weak quarter (Q1FY24) for the sector due to destocking, demand weakness across certain critical end-use industries, and price erosion amid intense competition from Chinese suppliers. It expects both revenues and margins to remain under pressure.

SRF reported a 14 per cent fall in consolidated revenues due to a muted showing across its three key categories of chemicals, packaging, and technical textiles. Falling commodity prices, leading to inventory corrections amid weak demand, saw its operating profit fall by 29 per cent. Operating profit margins also slipped by 460 basis points (bps) over the year-ago quarter and 380 bps sequentially.

## BALANCING EQUATIONS



Analysts of Motilal Oswal Research, led by Sumant Kumar, expect the chemicals and packaging business margins to remain under pressure in FY24, led by a weak demand scenario and lower realisations. The brokerage has cut its FY24 operating profit estimates for the company by 20 per cent. While most brokerages believe that there are short-term headwinds for the company, they are positive about its long-term story.

Nuvama Research believes that long-term prospects remain robust, given a strong capital expenditure pipeline across business segments, the ramp-up in spe-

cially active intermediates, a recovery in demand for refrigerant gas and fluoropolymers, especially in the US and West Asia, and volume growth.

While SRF reported a 40 per cent fall in net profit, PhillipCapital Research expects a 33 per cent decline in overall net profit of the sector on the back of a 12 per cent decline in revenues and a sequential margin correction. While key input prices have come down sequentially, they will not be able to protect the margins of chemical companies, given that prices of final chemical products have corrected at a faster pace. This is on account of aggres-

	(MP (₹))	3-month return (%)	FY24 P/E (x)	Target*	Upside (%)
Gujarat Fluorochemicals	2,699.9	-20.1	20.5	4,134	53.1
Navin Fluorine International	4,275.8	-11.8	43.2	5,188	21.3
SRF	2,169.8	-14.6	30.8	2,574	18.6
Clean Science and Technology	1,287.1	-10.9	40.8	1,517	17.8
Vinati Organics	1,811.0	-8.5	39.6	2,004	10.7
Deepak Nitrite	2,012.1	6.6	25.2	2,183	8.5
Atul	6,621.3	-3.6	36.6	6,276	-5.2

\*Bloomberg consensus one-year target price per share  
Source: Bloomberg  
Compiled by BS Research Bureau

sive Chinese competition and negative operating leverage, given weak demand.

While Gujarat Fluorochemicals, Clean Science and Technology, and Galaxy Surfactants could see their operating profits fall by up to 20 per cent, the contract business of players such as Anupam Rasthyan India, PI Industries, and Navin Fluorine International could help them perform better than the sector.

Demand weakness remains a key negative for chemical majors.

Research analyst Surya Patra of PhillipCapital Research says, "The visible economic slowdown already in Europe,

the largest target market for Indian industrial chemicals, and an impending one as predicted for the US (the second largest market) in the second half of calendar year 2023 (CY23), and the inflationary trend in both the European Union and the US (causing declines in consumer demand as well as inventory rationalisation by industries) have destroyed overall chemical demand."

Two European specialty chemical giants have reduced their sales and profit forecasts. German specialty chemical company Lanxess has recently cut its second-quarter (Q2) and annual profit forecast as there was no demand recovery in June, and ongoing destocking has continued. The demand conditions were weak in construction, electronics, and consumer products, which, coupled with customer destocking, led to the revision in profit estimates.

Swiss specialty chemicals major Clariant also revised down its sales estimates for Q2 and CY23 outlook. The lower estimates were on account of tough macroeconomic conditions, a slow recovery in China, and destocking in important user markets.

With some brokerages expecting the slowdown to extend to the July-September and October-December quarters as well, investors should take a cautious view and await signs of demand and margin expansion before considering stocks in the sector.

# Fertilizer industry on 'wait and watch' mode after China bans urea export

**ENSURING SECURITY.** Unlike in the past, Govt is hand-holding domestic companies to negotiate deals with global suppliers

**Prabudatta Mishra**  
New Delhi

The Indian fertilizer industry is on a "wait and watch mode" after China has banned urea exports and is not in a hurry to secure supplies of any fertilizer. This may help prevent any global price rise as demand in India is one of the key factors that influence rates because of import dependence.

"Unlike in the past, this government is hand-holding domestic companies to negotiate deals with international suppliers and has been meeting the burden of price increase through subsidy, except in the case of potash," an industry official said clarify-

has been imported and in pipeline can meet the demand of urea until mid-December and other fertilizers like DAP and MOP until December.

The main sowing window of rabi season is between October and December, though in case of some crops it continues until January. Farmers keep stocking fertilizers for rabi season from August-September.

#### OTHER FERTILIZERS

The industry official said since urea is completely controlled by the government, the industry is not worried. But a section of fertilizer companies fears that the Chinese decision may fuel a global price rise in DAP, Muriate of Potash (MOP), as during the



**IN A SAFE ZONE.** Whatever has been imported and in pipeline can meet the demand of urea until mid-December and other fertilizers like DAP and MOP until December

countries such as the UK are pushing for a resolution against Russia during the on-going G20 meeting in New Delhi, sources said.

Russian President Vladimir Putin recently forced Russia

export grain through the Black Sea during the war. Putin has said it will not be restored until the global leaders agree to allow Russian exports of food and fertilizer.

Unlike 2021 when there

demic, this time both China and Russia are keen to continue export and it makes a big difference, said a top executive of a fertilizer manufacturer.

#### CURRENT CFR COST

In 2022, imported fertilizer prices (FOB) reached about \$1,000/tonne from \$280-300 and that in turn increased the government's subsidy to ₹2.25-lakh crore in FY23 from ₹1.54-lakh crore in FY22. Against total sales of 58.54 million tonnes (mt) of urea, DAP, MOP and Complex (NPKS) recorded during FY23, the import was nearly one-third at 18.8 mt.

Currently, the CFR (cost and freight) price of imported urea is about \$400/tonne,

# Centre to revise national organic production policy

**Subramani Ra Mancombu**  
Chennai

Policies and procedures of India's National Programme for Organic Production (NPOP) will be revised and it will include measures to strengthen the monitoring system, the Commerce Ministry has told a Chennai-based voluntary services organisation.

"... as per the directions of the NAB (National Accreditation Board), a committee is being constituted for revision of NPOP policy and procedures," the Ministry told the Shree Shree Shree Swami Vivekananda Trust (SSVT).

Suggestions received from the stakeholders, including from the trust, will be placed before the com-

mittee for perusal, he said.

The Ministry was responding to a letter from SSVT on July 8 to Prime Minister Narendra Modi seeking "an honest introspection to revamp the organic enforcement system". SSVT said a recent audit of the European Commission emphasised the NPOP launched in 2001 as one of the best policy and procedural documents.

"It is also a fact that the European Commission audit cited lapses in the enforcement in our organic agriculture. Our Trust wrote letters on January 5, February 7 and April 8 highlighting numerous pitfalls with the view of protecting Bharat's interests..." SSVT said.

There was an immediate need to nominate competent auditors to conduct due diligence on enforcement pro-



cedures and implementation of organic farming at the level of certification bodies besides APEDA. This will help protect and preserve the label and authenticity of organic produce in the country, it said.

SSVT stressed the need for due diligence in view of repeated breach of rules, while some bodies were habitual offenders (change of

promoters and entity names) in the organic agriculture certifications.

#### AADHAAR LINKAGE

Referring to the allegations of duplication of farmers in growing organic produce, Commerce Ministry's Verma said the Agricultural and Processed Food Products Export Development Authority (APEDA) is making provisions for linkage of Aadhaar, land documents in the online system for further strengthening the system.

However, trade sources said the Ministry has been talking of such linkages for quite sometime but nothing has happened yet.

The SSVT said the role of APEDA, the nodal agency for organic exports, as secretariat and evaluation committee is vital in facilitating the

decision-making process of NAB. "Out of 36 evaluation committee members, it is interesting to note that 10 members belong to APEDA and Commodity Boards," it said.

The Minister, however, has said internationally laid down procedures are being followed in the organic certification process.

#### FARM MINISTRY'S MOVE

However, the trust said since the evaluation committee was the pillar of NPOP enforcement, its selection suggests that "there is a weak and fragile approach imbibed in the institutional framework at this level".

The Commerce Ministry's communication complements a move by the Ministry of Agriculture and Farmers' Welfare.

# Embrace biofortified food for a healthier India

Lack of awareness of biofortified crops is a major hurdle to increasing the reach and scale of biofortified food in India. Ensuring a competitive price, such as through a minimum support price mechanism, for biofortified produce in the market would incentivise greater cultivation of these crops. Allocating resources to extension activities would effectively raise awareness among farmers, the industry and consumers about the availability and advantages of biofortified crops.

**PITAMBARA AND BISHWA BANSKAR CHOUDHARY**

**N**UTRITIONAL well-being has become a significant concern in recent times. According to reports, more than half of the global population suffers from malnutrition, indicating a lack of essential micronutrients such as vitamins and minerals. Empirical research indicates that malnutrition could lead to potential economic losses of up to \$125 billion worldwide by 2030, with India alone accounting for around \$46 billion. Various forms of malnutrition result in an annual loss of 4 per cent of India's GDP. Among the nutrients, protein, lysine, tryptophan, iron, zinc, vitamin A and vitamin C are essential for human nutrition, and their deficiency leads to various health disorders. Nonetheless, increased agricultural production, economic opportunities and the National Food Security Act have contributed to food security over the years; the severity of malnutrition necessitates more agricultural interventions.

The production of micronutrient-rich non-staples such as vegetables, pulses, fruits and animal products has also increased, but their affordability is less in comparison to staple cereals for people with low purchasing power. Biofortification — the process by which the nutritional quality of a crop is enhanced through genetic manipulation that includes both breeding and transgenic approaches — could be a viable agricultural intervention to enrich micronutrient density in commonly consumed cereals such as rice, wheat and maize. The biofortified varieties are 1.5 to 3 times more nutritious than the tradi-

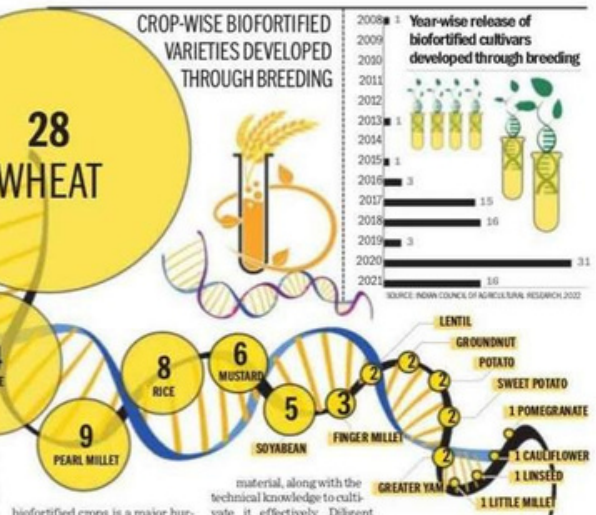
tional ones. Rice variety CR Dhan 315 has excess zinc; wheat variety HD 3298 is enriched with protein and iron, while DBW 303 and DDW 48 are rich in protein and iron. Maize hybrid varieties 1, 2 and 3 are enriched with lysine and tryptophan and finger millet varieties CFMV 1 and 2 are rich in calcium, iron and zinc.

### Developing cultivars

As per a recent report of the Indian Council of Agricultural Research (ICAR), the council has developed 87 biofortified cultivars in 16 crops that can be integrated into the food chain to enable better health of human and animal populations. Staple grains emerged as a critical food source during the Covid-19 pandemic in India due to their cost-effectiveness for low-income segments, widespread availability in contrast to perishable goods, and distribution through the Public Distribution System (PDS). Hence, even marginal enhancements in the nutritional profile of staple grains could significantly contribute to combating micronutrient deficiencies across the country.

The ICAR has started several special programmes on the development and popularisation of biofortified crops. More than four million hectares is estimated to be under cultivation of biofortified crops in India. Reportedly, by 2019-20, the council, through its vast network of research institutes across the country, had developed 21 varieties of biofortified staples, including wheat, rice, maize, millets, mustard and groundnut. These biofortified crops have 1.5 to 3 times higher levels of protein, vitamins, minerals and amino acids compared to the traditional varieties. The Government of

India has implemented programmes to address micronutrient malnutrition, such as the National Nutrition Mission (POSHAN Abhiyan). A special emphasis on the supply of fortified rice through the PDS, Integrated Child Development Services, Pradhan Mantri Poshan Shakti Nirman-PM POSHAN (erstwhile Mid-Day Meal Scheme) and other welfare schemes in all states and union territories by 2024 has been recently mooted by the government. The Harvest-Plus programme, run by the Consultative Group for the International Agricultural Research (CGIAR), merits special recognition in this context. It has forged close collaborations with the ICAR, state agricultural universities, the CGIAR's international research centres, seed companies and farmer organisations to expedite the production of iron-rich pearl millet and zinc-rich wheat and enhance the access of impoverished communities to them. However, acceptance and adoption of biofortified crops in the Indian food system are still inadequate. Globally, over 86 million people in farming households are eating biofortified food, as per reports. Research studies suggest that lack of awareness of



biofortified crops is a major hurdle to increasing the reach and scale of biofortified food in India.

### Handholding farmers

The sustainable incorporation of biofortified crops into food systems necessitates a comprehensive approach that encompasses the entire spectrum, starting from the initial stages of crop research and development and extending to the eventual consumption of biofortified crops and food products. To begin with, it is crucial to ensure that farmers have access to affordable biofortified planting

material, along with the technical knowledge to cultivate it effectively. Diligent endeavours by governmental institutions and policy initiatives for conducting intense promotional campaigns have the potential to drive a notable surge in the adoption of biofortified crop varieties. Enhancing the seed supply chain for the cultivation and distribution of high-quality seeds stands out as a pivotal stride in propagating the use of biofortified varieties.

Ensuring a competitive price, such as through a minimum support price mechanism, for biofortified produce in the market would

incentivise greater cultivation of these crops. Allocating resources to extension activities would effectively raise awareness among farmers, the industry and consumers about the availability and advantages of biofortified crops.

Pitambar is an agri biotechnologist and independent researcher; Choudhary is a scientist (agri economist) at ICAR-Indian Grassland and Fodder Research Institute, Jhansi. Views are personal

# CMFRI scientists decode entire genome of Indian oil sardine

**Our Bureau**  
Kochi

A team of scientists at the ICAR-Central Marine Fisheries Research Institute (CMFRI) have decoded the whole genome of the Indian oil sardine (*Sardinella longiceps*), a popular food fish. This is the first time that the genome of a marine fish species from the Indian subcontinent has been decoded.

Describing the development as a “milestone” in Indian marine fisheries, CMFRI Director A Gopalakrishnan said the decoded genome will be a valuable resource for understanding the biology, ecology and evolution of the oil sardine. “This critical genome data could be used to improve



management strategies for the conservation and sustainable utilisation of the fish,” he said.

The decoded genome is 1.077 Gb in size and contains a total of 46,316 protein coding genes.

A group of researchers led by Sandhya Sukumaran, Principal Scientist at CMFRI's Marine Biotechnology divi-

sion, used next generation sequencing technology to achieve the breakthrough.

Small pelagic fish like the Indian oil sardines can be considered as model organisms to study the climatic as well as fishing impacts on the Indian Ocean resources as they respond to variations in environmental and oceanographic parameters.

The genome assembly of sardines is a valuable tool for studying how fish adapt to climate change, he added.

The researchers have also identified the genes involved in the biosynthesis of polyunsaturated fatty acids (PUFA) of the oil sardine, offering insights into the genomic mechanisms behind the high nutritional quality of these sardines.

# India's falling cotton production: the causes for worry, and the solutions

The Bt revolution had trebled India's cotton production. Post 2013-14, the pink bollworm has taken a toll on the fibre crop, even as new 'mating disruption' technologies to control the pest are showing promise



HARISH DAMODARAN

COTTON, LIKE coconut, is a source of all the three Fs: food, feed and fibre.

The white fluffy fibre or lint constitutes only about 36% of *kapas*, the raw un-ginned cotton harvested by farmers. The rest is seed (62%) and wastes (2%) separated from the lint during ginning. Cotton seed, in turn, contains 13% oil used for cooking and frying. The 85% residual cake, after extraction of oil from the seed and 2% processing losses, is a protein-rich feed ingredient for livestock and poultry.

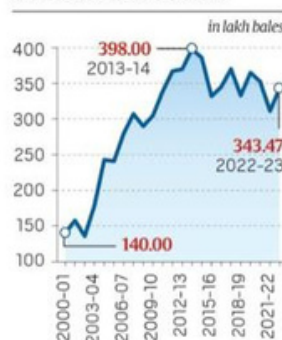
Cotton has a roughly two-thirds share in India's total textile fibre consumption. Not as well-known is cottonseed being the country's third largest domestically produced vegetable oil (after mustard and soyabean), and its second biggest feed cake/meal (after soyabean).

## The Bt revolution

Between 2000-01 and 2013-14, India's cotton production, in terms of lint, almost trebled from 140 lakh to 398 lakh bales of 170 kg each. So did the output of oil and cake to nearly 1.5 million tonnes (mt) and 4.5 mt respectively.

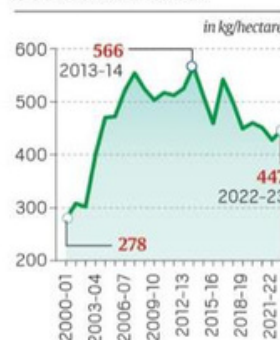
This was significantly enabled by Bt technology. From 2002, Indian farmers began planting genetically-modified (GM) cotton hybrids, incorporating genes isolated from a soil bacterium *Bacillus thuringiensis* or Bt. The Bt genes coded for proteins toxic to the deadly *Helicoverpa armigera* or American bollworm insect pest. As the share of Bt hybrids in the country's area sown under cotton touched 95%, average per-hectare lint yields more than doubled from 278 kg in 2000-01 to 566 kg in 2013-14. However, the gains didn't last. The charts show production and yields falling after 2013-14, to 343.5 lakh bales and 447 kg/hectare in 2022-23.

## COTTON PRODUCTION



Source: Ministry of Textiles; Figures for 2022-23 are provisional estimates.

## COTTON LINT YIELD



## A different bollworm

The reason for that had primarily to do with the *Pectinophora gossypiella* or pink bollworm (PBW).

The Bt toxins were originally supposed to provide protection against both the *Helicoverpa* and PBW caterpillars that burrow into the bolls or fruits of the cotton plant in which the lint and seeds grow.

Bt cotton has retained its effectiveness against the American bollworm. But in 2014, an unusually large survival of PBW larvae was detected on cotton flowers at 60-70 days after sowing in Gujarat. In the 2015 season — cotton is mostly sown in May-June, with the first harvest from around 120 days and 2-3 pickings or more thereafter every 25-30 days — PBW survivals were reported from Andhra Pradesh, Telangana and Maharashtra. In 2021, Punjab, Haryana and northern Rajasthan saw heavy infestation of the pest for the first time.

"PBW wasn't a serious pest previously. It typically appeared in the crop's later stages after the first picking, confined to central and southern India. But now, the infestation starts as early as 40-45 days after sowing at the initiation of flowering," said Bhagirath Chou-

dhary, founder-director of the South Asia Biotechnology Centre (SABC), a Jodhpur-based agricultural science organisation.

PBW is a monophagous pest that feeds mainly on cotton. This is unlike *Helicoverpa* that is polyphagous, with hosts from *arhar* (pigeon pea), *jowar* (sorghum) and maize to tomato, *chana* (chickpea) and *lobiya* (cowpea).

Being monophagous enabled the PBW larvae to develop resistance to Bt proteins over time. This was more so as farmers virtually stopped growing non-Bt cotton. The PBW population that became resistant from continuously feeding on Bt hybrids, therefore, gradually overtook and replaced the ones that were susceptible. The pest's short life cycle (25-35 days from egg laying to adult moth stage), conducive for it to complete at least 3-4 generations in a single crop season of 180-270 days, further accelerated the resistance breakdown process.

## Controlling the pest

The conventional route of spraying insecticides has had limited efficacy against the PBW larvae. These feed on the cotton bolls as well as the squares (buds) and tender

flowers, affecting lint quality and yields.

An alternative approach has been "mating disruption". It involves deploying *Gossyplure*, a pheromone chemical that is secreted by female PBW moths to attract male adults. In this case, the pheromone is artificially synthesised and filled into pipes or lures. The male adult moths are, then, attracted towards the lures and do not mate with females during their 7-10 days time. In the event, eggs aren't laid and they don't grow into larvae (which feed on the cotton plant parts), before pupating and becoming next-generation adults.

The Central Insecticides Board & Registration Committee under the Agriculture Ministry has approved two mating disruption products — PBKnot and SPLAT — for controlling PBW. "The ideal time to tag is 40-45 days after sowing, just when flowering commences. The pheromone gets released from the dispenser's nano-size pores over 90 days, by which time the farmer would have harvested two pickings and the scope for infestation is minimal," explained Chaudhary.

SABC has been conducting field experiments of PBKnot technology since 2021. "We have demonstrated a reduction in PBW mating by up to 90%, resulting in 25% higher *kapas* yields," claimed Chaudhary.

## The road ahead

As a crop cultivated in some 12.5 million hectares predominantly by smallholders — and a source of all three Fs — cotton's importance to India's agriculture and textile sector is obvious.

While Bt technology gave a huge impetus to production during the first decade-and-a-half of this century, the gains from it have been somewhat eroded by the emergence of new dominant pests, especially PBW. The threat of pest infestation has also discouraged farmers in states like Punjab from growing cotton. This only highlights the central role that new technologies — whether GM, next-generation insecticides or mating disruption — will have to play in sustaining the cultivation of this fibre, food and feed crop.

## 'More research from farm universities on dryland agriculture needed'

### The Hindu Bureau

HUBBALLI

Emphasising on the need for ensuring that the outcomes of farm research reached farmlands, Chief Minister Siddaramaiah called on the farm universities to take up extensive research on developing rain-fed agriculture in dry lands. Inaugurating the four-day annual Krishi Mela 2023 at

the University of Agricultural Sciences (UAS) in Dharwad on Saturday, the CM said that at present, around 60% of the people were dependent on agriculture and despite agriculture being the main occupation of the country, many were turning away from farming because of viability issues. Climate change resulting deficit rainfall had caused problems in the field of rain-fed agri-

culture and there was need for more research into it so as to make dryland agriculture more viable, he said.

Emphasising the role of farm universities in attracting the youth towards agriculture, he said the research by farm universities would be useful only when the benefits of research and new technologies reached the farmlands. The CM also emphasised

the need for further research in dryland farming so that if the main crop failed to deficit rainfall, then there should be an alternative crop so that the losses are minimised, he said.

**SOUTH WESTERN RAILWAY**  
E-Tender Notice No. CAO/CN/BNC/67/2023  
Dated: 05-09-2023  
The undersigned, on behalf of the



# WTO Raises Concerns Over EU Carbon Adjustment Mechanism

Members say CBAM will have discriminatory impact on their exports, raise compliance costs

Kirtika.Suneja@timesgroup.com

**Geneva:** The World Trade Organization (WTO) on Tuesday flagged unilateral environmental measures such as the mechanism and other EU Green Deal measures, along with the US' Inflation Reduction Act, as trade concerns.

It comes ahead of the implementation of the European Union's Carbon Border Adjustment Mechanism (CBAM) rules for transition from October 1.

In its World Trade Report 2023, the global trade body said some WTO members had raised concerns about the proposed CBAM, citing potential discriminatory impacts on their exports and higher compliance costs.

The CBAM will be effective from January 1, 2026, which industry experts would translate into a 20-35% tax on select imports into the EU. Though the EU has said that CBAM is part of its climate action efforts, countries like India are of the view that it is a trade-related measure.

"Countries are taking the climate challenge seriously... it is crucial that whatever policy matters they have, shouldn't be contradictory to the multilate-

ral trading system," said WTO chief economist Ralph Ossa.

As per the report, countries have raised concerns that the CBAM may also lead to the adoption of European standards by other economies and impose "significant" compliance costs on exporters. It also mentioned unilateral trade measures which had been allegedly used for "economic coercion", Indonesia's export restrictions on raw materials and China's export restrictions on gallium and germanium, as other trade concerns.

**Though the EU has said CBAM is part of its climate action efforts, countries like India feel it is a trade-related measure**

## BLOCKTRADE, SECURITY CONCERNS

The multilateral trade watchdog has also flagged the involvement of security in trade policy leading to higher trade barriers. As per WTO officials, security concerns are increasingly being cited as a reason for trade restrictions by many countries.

"There is a risk that this could lead to fragmentation in the global economy as economies resort to re-shoring and

## Green Dream

**EU CBAM, Green Deal are trade concerns: WTO report**

**Unilateral trade measures, US' Inflation Reduction Act other concerns**



**MEMBERS WORRY ABOUT DISCRIMINATORY IMPACT ON EXPORTS, HIGHER COMPLIANCE COSTS**

**EU's CBAM to hit India's steel, cement, aluminium, fertiliser sectors**

**EU CBAM TO KICK IN ON OCTOBER 1**

**20-35% tax on some imports into EU from Jan 1, 2026**

friend-shoring," it said in the report titled 'Re-globalization for a secure, inclusive and sustainable future'.

Emphasising that trade is gradually becoming reoriented along geopolitical lines, the WTO said trade between these blocs has experienced a growth rate that is on average 4-6% lower than trade within blocs since the onset of the war in Ukraine in February 2022.

As per the report, a policy shift can also be observed in regional trade policies where new forms of cooperation do not systematically take the form of binding trade agreements.

It referred to the Indo-Pacific Economic Framework (IPEF), whose members represent 40% of the world's GDP, and said it also covers trade and the digital economy, supply chains and resilience, clean energy and decarbonisation, in addition to tax and anticorruption.

The WTO said trade costs in developing economies are 30% higher than in high-income economies and that those in agriculture exceed those in manufacturing by 50%.

The reporter is in Geneva at the invitation of the WTO

## { EXPERTS EXPECT BUMPER YIELD }

# Floods, El Nino effect unlikely to impact rice output in Hry

Neeraj Mohan

neeraj.mohan@hindustantimes.com

**KARNAL :** Despite floods, heavy rains and waterlogging in July as well as the El Nino effect in August, experts expect Haryana to have a bumper crop this year provided weather conditions remain favourable.

In the second week of July, 10,000 to 20,000 acres of standing crops were destroyed by floods in the districts of Kaithal, Kurukshetra, Fatehabad, Sirsa, Karnal, Ambala and Yamunanagar, reports from the state agriculture and revenue departments reveal. The overflowing Ghaggar, Yamuna and Markanda rivers flooded huge areas of paddy crops in the state.

Even the state department also reported a fall in paddy-sown acreage in the state compared to last year — this year, 32.50 lakh acres were sown, while 34.35 lakh acres were sown in 2022. But now the state government has set a target of procuring 60 lakh MT for this kharif marketing season against 59 lakh MT procured last year. Deputy chief minister Dushyant Chautala said despite floods a



Paddy at the Ladwa grain market in Kurukshetra.

HTPHOTO

bumper paddy crop is expected this year as the state food, supplies and consumer affairs department is expecting the paddy procurement of 60 lakh MT and the state government has decided to make the payment to farmers within 48 hours of the procurement and Rs 10,000 crore have been earmarked for this procurement. With 35 lakh MT (metric tonnes), Harvana's share in total

basmati production remains around 42%. The state also produces 55 lakh MT of parml rice. Moreover, farmers in affected areas were able to resow the paddy and had enough time for re-transplantation.

Virender Singh Lather, retired principal scientist, Indian Agricultural Institute, ICAR, New Delhi, said, "Even though the floods in July had damaged huge areas under paddy crop in Har-

ana, most areas were resown by farmers. This year, the crop is healthy too. No pest attack has been reported in the state so far. With favourable weather conditions in the state, there is a strong possibility of a bumper crop."

## Rainfall above normal

According to Madan Khichad, head of the agricultural meteorology department of the Chaudhary Charan Singh Haryana Agricultural University, Hisar, between June 26 and September 4, a total of 377.9 mm rainfall was recorded in Haryana, which is 2% more than the normal rainfall of 369.3 mm. But less than normal rainfall was recorded in 11 districts in August. State agriculture department officials said less rain in August did not have any impact on crops as the sowing season was already over, but waterlogging and floods were the root cause behind the fall in the acreage of paddy in the state.

Most of the state's paddy belts are under assured irrigation. Thus, in August when the El-Nino effect resulted in a dry spell and hotter-than-usual weather, the crop was already

around two months old. However, agriculture experts predict an impact on output from parts of Fatehabad and Sirsa districts, as the paddy sowing in these areas depends on canal irrigation which was delayed due to the flooding of the Ghaggar river.

## Basmati yields higher than last year

Around 55% of the total area under paddy cultivation in Haryana is of the long-grained basmati varieties. The harvesting of early maturing and high-yielding varieties of basmati, including Pusa 1509, Pusa 1847 and Pusa 1692, has begun and the farmers said the average yield was higher than last year. "I have harvested two acres of Pusa 1509 and the yield has broken the previous record of 22 quintals per acre. This year it was around 23.50 quintal per acre," said Naresh Kumar, a farmer in Indri, Karnal. Haryana agriculture department, Kaithal, deputy director Karam Chand said, "Even if there was a slight fall in the area under paddy cultivation in the state, it won't have any major impact on the rice output."

# Climate phenomena and food security

We should base our adaptation plans on the idea that current trends will continue. It's possible that as warming increases, total rainfall in parts of India may increase but the share of extreme rain events may go up

## FULL CONTEXT

Jagdish Krishnaswamy

There has been a series of disruptive weather and climate phenomena in India this year, demonstrating the complexity of our precipitation system. There was the Western disturbance, which usually brings much-needed moisture from European seas to the western Himalaya and parts of northern India in the winter and spring. But this year, the Western disturbance lived up to its name and remained active late into the summer, snapping at the heels of the southwest monsoon.

The widespread destruction of infrastructure and loss of life due to landslides and flooding in the western Himalaya and northern India raised concerns about the sustainability and resilience of our development projects in the mountains and floodplains. Between July 5 and July 20, the affected area was estimated to be between 2,124 and 7,362 sq. km. The population affected was potentially more than 25 lakh.

### An El Niño phase

Climate-linked warming is likely to weaken winter precipitation from the Western disturbance and shift it to more intense rain events. If this happens later into the summer, its consequences will be of great concern.

Moreover, then came evidence that an El Niño phase of the quasi-periodic El Niño Southern Oscillation (ENSO) – a phenomenon in the eastern and central tropical Pacific Ocean – was intensifying and likely to affect the southwest monsoon. Not all El Niño events have adverse effects on the southwest monsoon because the latter is driven by many ocean-atmosphere-land processes. But the relationship between the two entities has been changing over time. When an El Niño affects the southwest monsoon, another ocean-atmosphere phenomenon in the Indian Ocean – called the positive-phase Indian Ocean Dipole (IOD) – could balance the consequences.

Dynamic regression models have suggested that 65% of the inter-annual variability of the southwest monsoon, over many decades, can be attributed to the combined effects of ENSO and the IOD.

### El Niño and food security

Agriculture depends on two types of water – green water which is rain-fed soil moisture tapped by food and cash crops, eventually transpiring into the atmosphere and blue water which is the water in rivers, lakes, reservoirs, and groundwater. The latter is the basis for irrigation in agriculture, apart from drinking and industry use supply, and maintains ecological flows in rivers.

The El Niño and other climate phenomena affect rainfed agriculture in many ways, from delaying the start of rains, and affecting sowing, to hot temperatures that may negatively influence plant growth and soil moisture. Despite investments in dams, reservoirs, and irrigation systems, around half of the cultivated area in India depends on green water, not blue water. Our daily diet in India – from cooking oil to diverse foods – also requires 3,268 litres of water per person per day on average, subject to regional variability. Some 75% of this footprint is green water, demonstrating the importance of rainfed agriculture to our food and nutritional security.

Even in irrigated areas, many dominant crops require green water for different



**Wrath of the skies:** The Kalka-Shimla railway track after it was damaged due to a landslide following heavy rainfall in Shimla on August 26. PTI

extents. For example, in kharif season, rice paddy under irrigation uses green water to the tune of 35%. Many staple crops like tur dal, soybean, groundnut, and maize also rely considerably on green water at this time. In the 2015-2016 El Niño year, soybean production in India declined by 28% from the 2013-2022 average.

As we have just emerged from one of the warmest and driest Augusts in many decades, one can hope that the IOD or other phenomena will help reduce the impact of the El Niño on India's agriculture, farmers, food security, food inflation, and conflicts over water-sharing between States.

### El Niño and the northeast monsoon

At the end of the southwest monsoon, the blue water stock in our reservoirs and groundwater will partially determine the fate of the rabi crops sown in winter and the overall water security. Contributions of green water from the northeast monsoon in southeast India and the Western disturbance in the north will play significant roles as well. The rabi crops of 2024 are going to bank heavily on blue water or irrigation during the summer months.

Additionally, studies have found that 43% of heavy rainfall events in the northeast monsoon (including the 2015 Chennai floods that caused widespread devastation) coincided with an El Niño.

Consider Central India's highlands, encompassing 36 districts in the States of Madhya Pradesh, Chhattisgarh, and Maharashtra, which are emerging as climate change hotspots critical for our water, food and ecological security. It includes 17 urban centres with populations over a lakh and the headwaters for five of India's 10 major river basins. The basin precipitation ranges from 699 mm in the west to 1,380 mm in the east, with an average of 987 mm per annum.

This region experiences significant and perennial water stress, driven largely by rabi irrigation with blue water. As a result, some 70-78% of the landscape experiences water stress for four or more

months in a year. Of the 17 urban centres, 11 face water stress for six to eight months, with Nagpur enduring water stress for the longest duration.

### Persistent uncertainties

The amount of monsoon precipitation has been declining since the 1950s, attributed by some climate scientists to the reduction in land-sea thermal gradient due to warming of the seas. However, indications of increased frequency of intense rain events and greater heat and moisture stress for people and ecosystems align with predictions of warming's impact on the atmosphere's water-holding capacity and acceleration of the hydrological cycle. These events increasingly interact with hydrologically incompatible land-use and infrastructure, resulting in high exposure and vulnerability to disasters.

Global climate models and their regional equivalents have failed to simulate these observed trends in precipitation, increasing the uncertainty in future projections. However, climate modellers are trying hard to improve these models.

Given the persistent uncertainties, we should base our adaptation plans on the idea that current trends will continue – more frequent intense rain, summer heat and moisture stress, and declining monsoon precipitation in some parts of the country.

It is possible that as warming continues, total rainfall in parts of India may increase but the share of extreme rain events may go up. When this tipping point will transpire is uncertain.

Attributing specific extreme rain events to climate change or natural dynamics in our complex climate systems, or both, is challenging for climate scientists. But mounting evidence suggests that a warming atmosphere is amplifying many natural dynamics within our complex climate systems.

### How we respond

In terms of agriculture and food security, there is now an emphasis on reducing dependence on water-intensive crops,

with millets being the crops of choice. Shifting to less water-intensive crops may reduce vulnerability of our food systems to phenomena like El Niño. One estimate suggests that more than 30% of blue water can be saved with such shifts in crops, with some gains in protein and micronutrients but a slight reduction in calories. However, water saved in this manner may not necessarily help recharge our depleted aquifers or restore ecological flows in our rivers: new demands for the saved water quickly emerge unless appropriate policies are in place.

There are several adaptations and alternative crop strategies available now, thanks to the work of our farmers and agricultural scientists. They include shifting to millets and alternative varieties of dominant cereals and advisories to farmers to switch to crops with shorter growing cycles. The government, both at the Centre and in the States, along with farmers, benefit from forecasts of phenomena like El Niño and their impact on the monsoon, and improvements in short-term weather forecasts and early warning systems for both intense rain and dry spells.

Based on decades of experience, it is clear that alternative short-term and long-term management of our dams and reservoirs is required to reduce the risk of dam-based flood disasters and ecological damage to aquatic ecosystems.

How we respond as a society and in terms of governance to the water and climate change crisis, which links food, water, and ecological security through diversifying our agro-food systems, a lower dependence on blue water, rejuvenating our rivers, and sustainable water-sharing between humans and nature will to a great extent determine the well-being of 1.4 billion people.

Jagdish Krishnaswamy is dean, School of Environment and Sustainability, Indian Institute for Human Settlements (IIHS), Bengaluru. The author acknowledges Kiran M.C., Geospatial Lab, IIHS for his contribution to this article. All other studies mentioned in the article are linked in the online version of the same.

## THE GIST

There is evidence that an El Niño phase of the quasi-periodic El Niño Southern Oscillation (ENSO) – a phenomenon in the eastern and central tropical Pacific Ocean – was intensifying and likely to affect the southwest monsoon.

The El Niño and other climate phenomena affect rainfed agriculture in many ways, from delaying the start of rains, and affecting sowing, to hot temperatures that may negatively influence plant growth and soil moisture.

Central India's highlands, encompassing 36 districts in the States of Madhya Pradesh, Chhattisgarh, and Maharashtra, which are emerging as climate change hotspots, are critical for our water, food and ecological security.

# ‘World can emulate India’s protection of plant varieties and farmers rights law’

## Our Bureau

New Delhi

President Droupadi Murmu on Tuesday said India’s Protection of Plant Varieties and Farmers Rights Act (PPVFR), can be emulated by the entire world to make similar laws which will help in fighting the challenges of climate change.

Inaugurating the first Global Symposium on Farmers’ Rights in New Delhi, the President said India took the lead in bringing the law on farmers’ rights way back in 2001 (it came into effect in 2005 after notified in Gazette), which is aligned to the International Treaty on Plant Genetic Resources for Food and Agriculture to protect farmers.

Under the PPVFR Act, India provides a range of rights to farmers that include use, reuse, save, share and sell the unbranded seeds of a registered variety. Besides, farmers can register their own varieties which get protection, she said.

“Such an Act can serve as



President Droupadi Murmu

an excellent model worthy of emulation for the entire world,” she said adding it also gains importance amid challenges posed by climate change and also to fulfil the Sustainable Development Goals of the United Nations.

Murmu said the challenges of climate change have put an onus on the conservation of traditional farmers’ varieties, which not only endowed with inherent tolerance to various stresses on the ecosystem but also hold nutritional benefits. These varieties can offer solution to the food and health requirements of a large population, she said.

The four-day symposium from September 12 to 15, be-

ing held for the first time since the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture in 2001, is expected to have a participation of around 500 delegates, including farmers from India and abroad.

The International Treaty on Plant Genetic Resources for Food and Agriculture is one of the most important international agreements among member countries to conserve, use, and manage plant genetic resources for food and agriculture.

## ONLINE PORTAL

The symposium is jointly organised by the United Nations Food and Agriculture Organisation (FAO), the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture, and the Government of India.

The President also inaugurated the Plant Authority Bhawan and an online portal for processing registration of plant varieties.

## Drought looms on Sirsi taluk as crops wither amid shortage of rainfall

A staggering 2,480 hectares of paddy, 1,550 hectares of groundnut, as well as extensive acres of maize and banana crops, have succumbed to water scarcity

HANS NEWS SERVICE  
KARWAR

THE Sirsi taluk in Uttara Kannada district is facing an agricultural crisis due to an acute shortage of rain, causing paddy and maize crops to wither and dry up. Fields that were once lush green have turned into barren expanses, leaving farmers in despair and intensifying calls for an official drought declaration. The areas of

Banavasi, Badanagoda, and Santholi, which heavily rely on rain-fed paddy cultivation, are particularly affected. This year, a staggering 2,480 hectares of paddy, 1,550 hectares of groundnut, as well as extensive acres of maize and banana crops, have succumbed to water scarcity.

Among the most severely impacted are the crops in the Badanagoda region, which have dried up to the point of being unsuitable even for

cattle feed. Earlier, untimely rain and insufficient water supply had already caused damage to groundnut millets. The current situation has exacerbated the problem, with groundnut plants turning yellow and facing the risk of complete destruction if water remains scarce. The economic ramifications for farmers are dire, with each acre of destroyed crops amounting to a loss of 15 to 20 thousand rupees. Many

are grappling with the devastation of their cultivated produce, and even the prospect of more rain holds little hope for the current crop.

In response to this crisis, farmers are demanding compensation for their ruined crops and an official declaration of the region as drought-prone. They urge the government to take swift action by distributing compensation at a rate of at least 25 to 30 per cent loss per acre. The loom-

ing financial distress has raised concerns about farmers’ ability to repay loans, potentially leading to extreme measures like suicides.

The farming community appeals to both elected representatives and the government to conduct a comprehensive survey of the crop damage and to take immediate steps in providing necessary compensation. Beyond crop destruction, the situation also has repercus-



sions for local water supply. Around 31 lakes managed by the minor irrigation department, roughly 40 lakes under Zilla Panchayat, and approximately 20 lakes under Gram Panchayats are

experiencing drastic water level drops. With these lakes at risk, there is genuine concern that drinking water availability could be compromised during the upcoming summer months.

# South villages raise voice for green agri practices

TIMES NEWS NETWORK

**Margao:** Meetings are being conducted at various gram sabhas across South Goa to acquaint farmers with the state's draft agriculture policy and to enable them to share their views on ways to improve the agriculture scenario in the state.

At the recently-held Cansaulim gram sabha, former assistant director of agriculture, Amancio, explained the various aspects of the draft agriculture policy.

A progressive farmer shared the benefits of using GIS and drone technologies for land mapping and community farming. Another shared his insights on how to make farming profitable.

At the Verna gram sabha, Amancio stressed on the

**The use of fertilizers, the harmful desilting technique employed, and the faulty method of constructing bunds were some of the issues raised**

need to "cultivate our own food to prevent consumption of produce that could be laced with harmful substances that impact one's health."

The meeting are being held by Goenche Fuddle Pilge Khatir, an NGO.

"Sikkim is known as an organic state, what stops Goa from being one? Who taught Goans to use fertilizers? Our ancestors used cow dung and ashes. We never used fertilizers, not even for coconut trees. Even today

some of us use natural manure and we have no problems," said ex-zilla panchayat member J Santano Rodrigues.

Ex-sarpanch of Verna, Francis Albuquerque explained how the desilting technique that is generally used does more harm than good. "As water runs straight into the sea after desilting, it influences the recovery of groundwater reserves. We thus have no water for the crops after the rain, which was not a challenge before," she said.

Lourecina Gama, also a former sarpanch, highlighted the "faulty" method of construction of bunds by WRD. She underscored the need for taking corrective measures and stopping the "destructive" practice.

{ **SHIFT FROM QUANTITY TO QUALITY** }

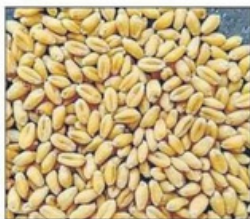
## PAU develops new wheat variety to boost immunity

**Gurpreet Singh Nibber**

gurpreet.nibber@htlive.com

**CHANDIGARH:** Punjab Agricultural University, a premier plant research institute that played a key role during the Green Revolution to make the country surplus in foodgrains, has shifted its focus from quantity to quality and from food security to nutritional security.

After the launch of a new wheat variety with high amylose starch content, known to reduce risks of type-2 diabetes, cardiovascular diseases and obesity, the university is now ready with variety that is rich in zinc. Vice-chancellor SS Gosal said the university will also launch iron-rich wheat variety soon.



**The 'PBW Zn' wheat variety bred at the PAU is rich in zinc.**

While zinc improves immune system and regulates thyroid functioning, iron helps the anaemic population struggling with low blood count.

Gosal said PAU's wheat breeding programme has undertaken extensive research on biofortification to enhance

the micro-nutrients concentration in grains. He said while efforts have been made through exogenous application, the zinc content in wheat grains remains inadequate to meet human requirements. The Covid-19 pandemic prompted global need for zinc and vitamin C supplementation in diet to boost immunity.

"We have made remarkable progress as far as foodgrain production is concerned. Now, our focus is on quality by adding micro-nutrients in foodgrain varieties, particularly wheat, which is the staple diet of a large population," said Gosal.

The university has played a key role in increasing wheat production from 6-7 quintals per acre in the 1960s to 20-22

quintals per acre now.

"In the past 60 to 70 years, we may have managed to increase the yield three to four times, but the quality has suffered. Now, the challenge is to improve quality also," said Gosal.

It takes 8-10 years to carry out research and launch a new variety, he said. Genes of wild varieties rich in nutrients are available with the university and these are crossed with high yielding varieties to breed quality foodgrains," the V-C said.

The PAU has about 5,000 quintals of seeds of starch resistant wheat variety "PBW RSI" and about 200 quintals of zinc-rich "PBW Zn". "We have asked Markfed to make arrangements for the cultivation of these varieties and mar-

keting of nutrient-rich wheat flour in the market," he said.

The university is entering a phase of nutritional security for which the support from governments, both state and Centre, is a must, the V-C said, adding that the new varieties will sell at premium rates.

According to director research, PAU, Ajmer Singh Dhatt similar upgrades are in the process in paddy varieties, but it will take some time to launch. Speaking on the new wheat varieties, he said popularity of these varieties will depend on the demand. "The university will also study the impact of these varieties on human body. For that, we will have to rope in experts from the medical field," he said.

## Scientists identify 15 new varieties of wheat, 1 of barley

Amit Kumar | TNN

**Karnal:** The Indian Institute of Wheat and Barley Research (IIWBR), Karnal, in collaboration with Mahara Prapat University of Agriculture and Technology, Udaipur, Rajasthan, organised the 62nd All India Wheat and Barley Workers Meet which witnessed participation of researchers from across the country. During the workshop, the scientists identified 15 varieties of wheat and one variety of barley.

As per the scientists, two wheat varieties HD3386 and WH1402 were identified for irrigated timely sown and restricted irrigation conditions. Both have been re-

commended for the north-western plains zone.

Besides, wheat variety HD3388 (under irrigated timely sown conditions) was identified for the north-eastern plains zone.

Similarly, GW547 (under irrigated timely sown conditions), CG1040 and DBW359 (under restricted irrigation under timely sown conditions); DBW377 and DBW327 (under early sown high fertility conditions) were identified for the central zone.

The wheat variety MPI378 was identified for irrigated timely sown conditions of peninsular zone; DBW359, NW4028, UAS478, HI8840 and HI1665 were also identified for restricted irri-

gation conditions of peninsular zone. Besides, one malt barley variety DWRB219 was identified for irrigated timely sown conditions of the north-western plains zone.

IIWBR director Gyanendra Singh said the licensing of newly released varieties DBW370, DBW371, DBW372, DBW316 and DDW55 with the farmer producing organizations (FPOs) and private seed companies will begin in mid-September.

The director added that the institute seed portal will be made operational on September 15. The farmers and growers can register on the portal using their Aadhaar cards for seed purchase.

## 30,000 solar irrigation pumps for UP farmers under Centre scheme

TIMES NEWS NETWORK

**Lucknow:** The state government will be installing more than 30,000 solar photovoltaic irrigation pumps under the PM KUSUM Yojana in the current financial year.

The state government will be spending Rs 217.84 crore on the project while the Centre's contribution will be 217.09 crore.

Uttar Pradesh New and Renewable Energy Agency (UP-NEDA) has been made responsible for rolling out the project under which a clean energy-based irrigation system will be provided to farmers across the state.

As per the guidelines issued by the Union Ministry of New and Renewable Energy, 60% of the benchmark cost of

the installation of standalone solar pumps of different capacities up to 7.5 HP will be provided as grant, 30% each of which will be borne by the centre and the state.

"Farmers interested in installing standalone solar pumps through the Agricultural Infrastructure Fund can also avail of a bank loan to deposit their share. The state and central governments will contribute 3% each of the total interest rebate of 6% on this," said a government spokesperson. The official said that these pumps would provide farmers with an affordable and eco-friendly energy source. "This move represents a substantial contribution to environmental preservation, contributing to the mitigation of climate change and reduction of car-

bon emissions. It will also lead to reduced irrigation costs as farmers would have to rely less on electricity and diesel for their operations," he added.

Interested individuals must register on the Agriculture Department's website, www.upagriculture.com. Following registration, farmers should select the pump specifications and categories for which they wish to apply for eligibility. Allocation of tokens to farmers will be based on a first-come, first-serve basis. During the application process, farmers will be required to make an online payment of Rs 5,000 as a token deposit. Subsidies for the installation of solar pumps will be provided to farmers according to the allocated targets for all districts.

# State gears up to tackle stubble burning

With paddy sown early this year, farm fires likely to begin soon

AMAN SOOD

TRIBUNE NEWS SERVICE

PATIALA,

Farm fires, which usually start after paddy harvesting in the last week of September, are likely to begin by the middle of this month because the crop was sown a week before the official date.

This season, paddy was sown on 32 lakh hectares, from which over 22 million tonnes of straw is expected to be generated. Punjab expects to utilise 16 million tonnes of paddy straw this year, though there will be challenges in ensuring that.

In 2013, the National Green Tribunal had prohibited the burning of paddy straw, saying: "The guilty will be liable to pay an environmental compensation ranging from Rs 2,500 to Rs 15,000 per incident." Farmers, however, continue to burn stubble in the absence of any strict action.

Meanwhile, after the harvest, over 10,000 officers will be in the field to curb stubble burning, with deputy commissioners heading various committees to tackle the issue of farm fires, which lead to air and soil pollution. Between 2018 and 2022, the



**49,900 INCIDENTS REPORTED LAST YEAR**

- The state reported 52,991 incidents of fire in 2019, which increased to 76,590 in 2020 – a rise of 44.5 per cent
- In 2021, the number was 71,304 in spite of spending crores on awareness drives. In 2022, Punjab saw only 49,900 farm fires

Centre has provided Rs 1,370 crore to Punjab as subsidy for buying equipment to check the menace.

The Punjab Pollution Control Board (PPCB), along with the Agriculture Department, will start monitoring the air quality from September 15 though farm fire incidents rise by mid-October and continue through November.

PPCB Chairman Adarsh Pal Vig said the department had held awareness seminars for farmers and they were hopeful that farm fires incidents would reduce considerably this season. "We have made arrangements to store paddy straw at various places and use it for different purposes to encourage

farmers not to set their fields on fire," he said.

Experts say paddy harvesting starts early in the Majha area, comprising Amritsar, Tarn Taran, Pathankot and Gurdaspur districts. "Despite floods and resowing of paddy in certain pockets, we are expecting a bumper crop. If the government fails to rein in the farm fire menace in the initial days, it will be difficult to do so later," said agriculture officials.

Farmers have already rejected the proposal to make use of the bio-decomposer spray which can clear stubble in about 30 days. As the window between paddy harvest and sowing of wheat crop is shorter than this, it is

not feasible to use this method. "When you can clear your fields with a single matchstick, there is no need to put an additional burden on machines and put extra efforts on managing stubble," say farmers.

Farmers claim that due to a short window between paddy harvesting and sowing of wheat, we have no option but to resort to farm fires. "If we sow wheat without removing straw, the rabi crop gets infested with pests and weeds," they say.

Officials of the Agriculture Department said they would create more awareness this time and "low yield cannot be linked to in-situ management of crop residue".

# Harnessing regenerative agriculture and circular economy for a sustainable future

**RANJIT BARTHAJUR**

India is one of the most climate vulnerable countries in the world today, as it faces an increasingly erratic monsoon, rising temperatures and a highly rural population that depends on both the monsoons and stable weather for agricultural incomes. A study by CEIW in 2021 found that 80% of the country's population lives in districts vulnerable to climate change along vectors of extreme weather events – floods, drought and more. By 2050, 40% of Indians are expected to face water scarcity, droughts will increase in intensity while, paradoxically, erratic monsoons are expected to lead to increased flooding. Crop yields are expected to decline by 9% and 2% of the GDP is expected to be lost by 2050 because of climate change. Coupled with declining agricultural incomes, policymakers are increasingly looking to "green economy" or "green growth" to change the outlook for the country's rural economy. The budget 2023 rightly put green growth as one of its seven priorities, pushing India towards a climate-resilient economy. It provided much needed impetus to the agricultural sector and support to farmers, to transition from small-growers into agri-entrepreneurs.

More people are also talking about circular economy: an economic model moving away from traditional linear and extractive economic systems, towards economic models that

focus on reusing resources, recycling waste and built along principles of regeneration. Linear extractive economic systems today have pushed the earth to breach many key ecological boundaries: carbon emissions, biodiversity loss, phosphorus and nitrogen overload and damaged freshwater sources. The circular economy, on the other hand, is an economic model that aims to decouple economic growth from resource consumption and environmental degradation.

## AGRICULTURE AND PLANETARY BOUNDARIES

A 2021 study published in Nature Sustainability found that the world had breached five out of key seven ecological boundaries based on data on the global economy till 2015. Since then, emissions have continued to rise, natural ecosystems continue to be over-exploited or destroyed and earth overshoot day – the day marking demand for ecological resources and services outstrips the planet's capacity to regenerate those resources – keeps moving up the calendar.

Agriculture today is one of the key stressors on the world's planetary boundaries. It accounts for nearly a fifth of the world's emissions and 70% of freshwater consumption globally. Chemicals used in agriculture, sediment and saline discharge pollute water bodies: nitrates used as fertilisers are now the most common contaminant in groundwater aquifers.



More than half of forest loss globally is due to agricultural clearances – in Asia and Africa, 75% of forest loss is because of cropland expansion. According to some scientists, the world may run out of soil for farming in the next fifty years because of damage from intensive, industrial agriculture; though some argue that this is an exaggeration. These figures paint a dire picture, but more importantly point to the urgency of a transition away from linear agricultural production to circular, regenerative systems. The goal of regenerative agriculture is to revitalise ecosystems, enhance soil health and promote biodiversity within agricultural landscapes with techniques like cover cropping, crop rotation and minimal tillage. This strategy tackles climate change, biodiversity loss and water shortages while simultaneously

ensuring the long-term viability of our food systems.

## A REGENERATIVE FUTURE

Unlike linear agriculture, which focuses on maximizing productivity – almost always at high costs to natural ecosystems – regenerative agriculture focuses on making farms and agricultural lands behave like ecosystems: self-sustaining entities that can replenish themselves through natural processes. It focuses on generating crop yields while focusing on improving, nurturing or building soil health, food quality, biodiversity improvement, water quality and air quality. In its synthesis report released last year, the Intergovernmental Panel on Cli-

mate Change (IPCC) pointed to the importance of regenerative agriculture to build the resilience of agroecosystems in the face of both climate change and environmental degradation.

India's farmlands account for 21% of its total emissions. However, effective management of farmland will mitigate its emissions by 222.44 million tonnes of carbon a year.

These solutions include mosaic restoration of agricultural land, the use of biochar, optimizing grazing intensity, nutrient management and improved rice cultivation techniques. Wild foods and heirloom crops are endangered by the spread of high-yield varieties. Imported pollinators such as the Western European honeybee are replacing indigenous bee species. The result is a weaker ecosystem for crops and diminished crop biodiversity risks food production in a world with changing weather patterns and climates. Preserving local pollinator species as well as heirloom seeds and wild varieties of crops can help farmers adapt more effectively to rising temperatures and changing growing conditions through a greater variety in crop options.

Agroforestry is gaining popularity, as well, as a form of regenerative agriculture. In comparison to industri-

alised agriculture, agroforestry sequesters 34% more carbon in soil on an average. It demands less inputs like fertilisers, as complementary natural crops and systems naturally nourish the soil by design, resulting in healthier agroecosystems that also sequester more carbon than degraded ones. When piloted in a scientifically constructed 'food forest' agroforestry model, the complementary crops that are native to the region simulate natural organic conditions, cycling nutrients back into the soil and minimising the need for water use as well as meet the demands of the local market. Pilot agroforestry programmes in communities in Assam demonstrate that regenerative agriculture not only regenerates ecosystems, raising incomes by 40% within a year and providing employment opportunities for young people – reducing migration.

Today, efforts to build circular economies have focused largely on urban economies, but attention needs to be paid urgently to the invisible challenges posed by linear rural economies. The quicker we can ramp up our collective efforts to build circular rural economies through regenerative agricultural practices, the better placed we will be to face the biodiversity and climate crisis. A nature-positive economy does not have to be a burden. It is an opportunity to invest in creating a sustainable future for India.

The author is founding director of the Baipara Foundation

# Export bans and stocking limits: are they working?

A look at the various limits and bans on wheat and rice stocks and exports in the recent past, and their impact

## DATA POINT

### The Hindu Data Team

A policy brief issued by the Indian Council for Research on International Economic Relations said that the recent steps taken by the government to curb inflation, such as wheat and rice export bans and increasing export duties, were "knee-jerk approaches rather than a well-thought-out strategy". It argued for a rational trade policy to contain food inflation which takes into account both consumers and producers.

In August 2023, retail inflation accelerated to 6.83%, which is higher than the ceiling of 6%. As food and beverages carries a 57% weightage in India's retail inflation calculation, and food inflation was 9.94%, rapid acceleration in that segment had a severe impact on retail inflation (Chart 1).

To date, the Indian government has implemented a series of actions aimed at controlling food inflation such as prohibiting the export of wheat in May 2022 and halting the export of broken rice in September 2022. Additionally, in June 2023, the government imposed stocking limits on wheat traders and millers. In July 2023, an export ban was placed on non-basmati white rice, followed by a 20% export duty on parboiled rice. In August 2023, a Minimum Export Price of \$1,200 per tonne was set for basmati rice, along with a 40% export duty on onions.

Chart 2 shows the chronology of trade and domestic stock policy measures to tame inflation of rice and wheat. Due to heatwaves, the production of wheat has suffered in the last two years. Wheat procurement by the government has also been low in the last two cycles. Wheat inflation was 9.22% in August. All this prompted the government to ban wheat exports in May 2022, argues the brief. "But

this sudden ban on wheat exports, instead of bringing wheat inflation down, led to greater uncertainty in the market and wheat inflation surged to 15.7 percent in August 2022, when GOI also banned exports of wheat flour (atta) products," says the policy brief. Just before the harvest season, wheat inflation accelerated to 25.4% in February 2023. Following this, the government off-loaded wheat under the Open Market Sales Scheme at much cheaper prices and announced wheat stocking limits, says the policy brief. While these measures did bring down inflation, the report argues that the implications of such measures on farmers who bore the brunt have to be taken into account.

Chart 3 shows trends in cereal exports in India. Data from the report shows that non-basmati exports increased from 1.38 MMT in FY20 to 6.40 MMT in FY23, by 363%. The report argues that in the fiscal year 2023, the per-tonne export value for non-basmati rice stood at \$344, falling below India's Minimum Support Price (MSP) for rice. This indicates that millers may be sourcing rice directly from farmers or that there could be an increase in rice supply due to potential distribution leakages from the expanded PMGKAY free rice programme. Chart 4 shows the offtake of rice and wheat under the National Food Security Act and PMGKY from the central pool.

In July 2023, when rice inflation was 13%, the government banned the export of non-basmati rice. Yet, inflation remained at 12.5%. Rather than imposing export duty and gradually increasing its impact, the government called for a ban which created panic among the African and Indian diaspora in the U.S., says the report.

## Policy watch

The charts have been sourced from the report, "Tackling food inflation: Is restricting exports and imposing stocking limits the optimal policy?" published by the Indian Council for Research on International Economic Relations



Chart 1 | The chart shows the trend of retail inflation (●) and food inflation (●) over time. Since food and beverages carry a 57% weightage in India's retail inflation calculation, rapid acceleration in the segment has a severe impact on the latter



Chart 2 | The chart shows the chronology of trade and domestic stock policy to tame inflation of rice and wheat

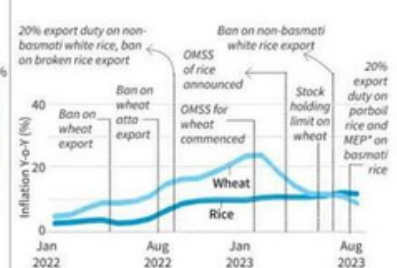


Chart 3 | The chart shows the trends in cereal exports in India. Non-basmati exports increased from 1.38 MMT in FY20 to 6.40 MMT in FY23, by 363%

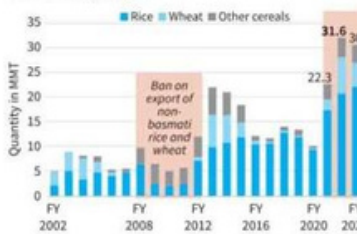
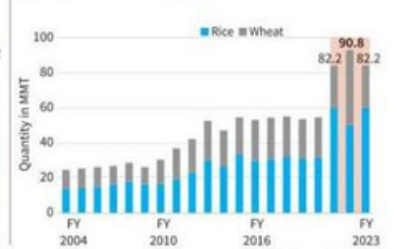


Chart 4 | The chart shows offtake of rice and wheat under NFSA and PMGKY from the central pool



# UP taps into agtech firms to make a big splash in farming

**Subramani Ra Mancombu**  
Chennai

Uttar Pradesh will use agtech in a big way to improve its agricultural production, dairy, poultry and fisheries sector. It will provide better market linkages, reduce wastage, improve cold storage infrastructure and ensure better supply to the food processing sector to become a \$1 trillion economy by 2028.

Agriculture will be among the sectors that will be the primary focus of a project undertaken by the State government to achieve its target before the deadline, says Anand Ramanathan, Partner, Deloitte India.

Deloitte India being engaged by the Yogi Adityanath government to play a key role in this effort. "The initial strategy design phase has been approved, and the implementation of various initiatives has officially commenced," Ramanathan told

*businessline* in an online interaction.

## FARM CONTRIBUTION

Currently, the northern State is a \$240 billion economy with agriculture contributing \$60 billion, including allied areas. Agriculture will have to increase to \$250 billion to meet the overall target of the State to become a \$1 trillion economy.

"It is an area where we are collaborating with different stakeholders, including private stakeholders and large multilateral donor agencies, to develop the agriculture sector," Ramanathan said.

The consulting firm is working with the agtech players. It is in touch with about 40 agtech firms where Deloitte India feels they will have a big intervention role to play on the production side.

"If you look at sugarcane. Because it's tightly controlled, there's a good understanding of production. But in other areas, it's all very dated. So can



we look at modern techniques to estimate production?" Ramanathan said.

## DATA COLLECTION

Agtech companies will be relied upon to do scientific crop surveys, better collection of data to avoid leakage and increase farmers' income. "We are enabling the agtech companies in the collection of various data on crops," he said.

Agtech companies will make a big difference with agricultural production expect-

ed to increase by 10-15 per cent and farm incomes by 5-10 per cent through better tech deployment.

Agtech will be used for better weather monitoring, forecast, understanding insurance, enabling better compensation, precision agriculture and providing better market linkages to farmers. Crop surveys can be done through drone technology and machine learning, while artificial intelligence can be used to estimate prices.

## FOOD PROCESSING

Among the allied sectors food processing is a primary target. "We've broken our plans into five broad areas," the Deloitte India partner said.

The food processing sector, a part of the industry, is being looked at from an agriculture lens as units are dependent on farm produce.

One of the focus areas in agriculture will be dairy and fisheries. "UP is the largest producer of milk but a majority of

the production falls under the unorganised sector," he said.

Therefore, the objective is to make the private sector play an important role and get the industry organised to bring in more value-addition," Ramanathan said.

## DAIRY SECTOR

On the dairy front, there is a big opportunity in using techniques to get more female calves so that the issue of stray animals can be controlled. The State has enhanced its subsidy towards this and it will result in higher productivity.

On the fisheries front, Deloitte India and the Uttar Pradesh government are looking at all ponds. There are a lot of inland ponds and one of the big efforts will be to first map them.

The main area of focus in the poultry sector will be to enable more micro clusters than big food parks. This will help set up a small feed mill or dairy or storage space.

# Farmers in 8 countries find climate change a key challenge: Survey

**Our Bureau**  
Mangaluru

Many farmers surveyed in eight countries, including India, have reported some change in weather over recent years.

Eight out of 10 farmers, who have experienced the impact of heat, anticipate reduced yields in the coming years.

These are some of the key findings from the 'Farmer Voice' survey conducted by the life science company Bayer. It had commissioned Kest CNC to independently interview 800 farmers from Australia, Brazil, China, Germany, India, Kenya, Ukraine, and the United States in equal numbers.

While 76 per cent of farm-

ers were worried about the impact of climate change in the future, 71 per cent said climate change already has a large impact on their farm.

According to the survey, climate impacts are estimated to have reduced farmer incomes by 15.7 per cent on average over the past two years.

One in six farmers in these eight countries even identified income losses of over 25 per cent during this period.

Rodrigo Santos, Member of the Board of Management of Bayer AG and President of the Crop Science Division, who addressed a select virtual media round table, said: "Farmers are already experiencing the adverse effects of climate change on their fields and at the same time they play a key role in tack-



**TAKING A HIT.** Climate impacts are estimated to have reduced farmer incomes by 15.7 per cent on average over the past two years

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## MITIGATION STEPS

The 'Farmer Voice' survey also found that farmers are taking steps to mitigate climate change and value innovation.

More than 80 per cent of the surveyed farmers are

already taking or planning to take steps to apply measures that contribute to reducing greenhouse gases. The top focus areas are: using cover crops (43 per cent), using renewable energy or biofuels (37 per cent), and using innovative seeds to reduce fertilizer or crop protection use (33 per cent).

Economic challenges are the biggest priority for the farmers in these nations over the next three years. Over half (55 per cent) of the farmers placed fertilizer costs among the top three challenges, followed by energy costs (47 per cent), price and income volatility (37 per cent), and the cost of crop protection (36 per cent). The importance of fertilizer costs becomes most apparent in Kenya, India, and Ukraine.

## Cotton farmers need to be vigilant of pink bollworm

BB BUREAU  
HYDERABAD

THE cotton sown areas in Punjab were impacted with the pink bollworm infestation. With the early-sown cotton crop aged between 60 and 80 days, it is important for the cotton growing farmers to integrate all available management tactics which will serve the purpose of resistance management against pink bollworm.

“The pink bollworm penetrates the boll and is difficult to see from outside. Hence it is advisable for farmers to remain vigilant, inspect flowers and cotton bolls promptly detect signs of pink bollworm infestation, and take immediate action,” said Rajavelu N K, CEO - Crop Protection Business, Godrej Agrovet Limited.

Adopting short-duration cotton varieties, practicing crop rotation to discourage pest build up, disposing of crop residues, and optimizing fertilizer should be used to combat this threat.

## Era of agri research, education comes to end: IARI director

**New Delhi, Sept 28:** An era of agricultural research, education and extension marked by disruptive innovations has come to an end with the death of MS Swaminathan, Indian Agricultural Research Institute (IARI) Director A K Singh said on Thursday. “In passing away of Prof. Swaminathan, ends an era of agricultural research, education and extension that was full of disruptive innovation. If God appears to poor and hungry in form of bread as said by Mahatma Gandhi, that God is Dr. Swaminathan who should be worshipped by every citizen while taking daily meals,” Singh said in a statement.

Trilochan Mohapatra, former Director General of Indian Council of Agricultural Research (ICAR), said, “the country has lost the real Hero of modern Indian Agriculture.”

Mohapatra described Swaminathan as “Messiah of the Masses” . — PTI



# ‘Will review cotton import levy after talks with farm ministry’

**M. Soundariya Preetha**

COIMBATORE

A decision on removing the 11% import duty on cotton will be taken after holding consultations with the Agriculture Ministry, said Piyush Goyal, Union Minister for Textiles, Commerce and Industry, Consumer Affairs, Food, and Public Distribution.

“We need to balance the interests of the farmers and the industry,” the Minister told *The Hindu*.

“We will take a call after consultation with the Agriculture Ministry.”

On textile and apparel exports contracting for almost a year, he said export of products such as jewellery, diamonds and textiles had reduced as economic



Piyush Goyal

slowdown in several countries had impacted the demand for such products.

On extending time for fresh applications for Production Linked Incentive (PLI) Scheme for MMF (man-made fibre) apparel, fabrics and technical textiles when the industry wanted PLI Scheme 2.0, he said the two schemes targeted different segments of the textile industry.

# State for working with US on agriculture technology

STATE BUREAU

Hyderabad

Agriculture Minister S Niranjan Reddy said the State was exploring the scope for cooperation with the US Department of Agriculture (USDA) in the field of research.

A ministerial team led by him, which is on a tour of the US, held discussions with the representatives of the USDA in Washington DC. In a statement here on Thursday, the Minister said the Telangana government was keen on supporting the peasant community with advanced technology. The government had tasked itself with the responsibility of making farming remunerative so that future generations invest in agriculture and its allied sectors.

The team had discussions with the US officials on opportunities to work together in the fields of seed technology, post-harvest

management, marketing, emerging technologies, planting techniques, issues of agriculture economics and IT. The team, which visited the National Institute of Food and Agriculture in Washington DC, held talks with its director Manjit Mishra and other officials of the institute.

The National Institute of Food and Agriculture (NIFA) is an agency of the USDA. NIFA's goals are to conduct research which will improve agriculture in the US, encourage innovation of technology, provide necessary funding, increase agricultural productivity and ensure environmental protection.

Speaking at the meeting, Mishra said research was very important for agricultural development in any country. However, the role of politicians was crucial in converting that research into meaningful results. Calling Chief Minister K

Chandrashekhar Rao a visionary leader, Mishra said he met IT Minister KT Rama Rao at the World Food Prize Organization.

Under the leadership of the Chief Minister, significant progress was made in the last nine years in Telangana's agriculture sector. He knew the role of agriculture and its allied sectors in creating employment. That's why he was encouraging farmers by promoting pro-agricultural policies, Niranjan Reddy said, adding that the sector was in crisis in undivided Andhra Pradesh.

Thanks to the government's support, agriculture had become a remunerative activity. Through Mission Kakatiya, tanks and ponds were de-silted and rehabilitated. The world's largest lift irrigation projects, Kaleshwaram and Palamuru Rangareddy, were built by the Telangana government.

ICAR team reviews horticulture crop sat VRS, Rajendranagar

ICAR-CPCRI to sign six MoA for technology transfer on World Coconut Day

## ‘Centre to soon come up with PLI scheme for basic chemicals’

**SURAT:** The Centre will soon come up with a Production-Linked Incentive (PLI) scheme for basic chemicals for the promotion of the overall chemical sector, Union minister Mansukh Mandaviya said here on Saturday.

Mandaviya also said that his ministry has been working on an "international-standard" drugs and cosmetic bill which will be introduced in the Cabinet in a month's time before being passed in Parliament. He was addressing members of the Southern Gujarat Chamber of Commerce and Industry.

The government's PLI scheme is aimed at improving the cost competitiveness of domestically manufactured goods and enhancing domestic capacity and exports.

"If we support basic chem-

icals, then agrochemicals and pharma chemicals, all types of chemicals will become cheaper to make. So, in a short time, we are coming up with a PLI scheme for basic chemicals. It will be useful to promote the chemical sector," he said.

Basic chemicals, produced in large quantities, are usually sold within the chemical industry and to other industries before becoming products for the general consumer.

The Union minister of health and family welfare, chemicals and fertilisers further said that since the past year, his ministry has been working on a law for drugs and cosmetics that are of "international standard" keeping in mind India's ambition of becoming the exporter of the world.

"It (the bill) will be brought before the Cabinet in the next one month and then passed in Parliament," he said, referring to the proposed Drugs, Medical Devices and Cosmetics Bill, 2022.

The pre-Independence Drugs and Cosmetic Act was amended from time to time but needs a major overhaul, he said.

"Now that we are to become an exporter in the world, we will have to keep in mind three priorities quality, affordability and, most importantly, to create demand for the product," he said. Mandaviya said the job of the government is ultimately to work as a "facilitator to encourage the industry", and understand their issues through dialogue, discussion and deliberation.

AGENCIES

## Farm scientists told to identify novel genes in wild varieties

Framework soon to borrow from India to pay for imports in Re

Farm policy needs a paradigm shift on a priority basis

# A climate question for G20



FROM PLATE TO PLOUGH

BY ASHOK GULATI AND PURVI THANGARAJ

Can these countries come up with a model and time frame to make agriculture less damaging to the planet?

CHANDRAYAAN-3'S SUCCESSFUL LANDING on the moon, and this quarter's (Q1FY24) GDP growth rate of 7.8 per cent, will bolster India's image in the upcoming G20 final meetings, scheduled on September 9-10. India can showcase not only its scientific prowess in space technologies but also the management of its economy, which looks set to clock the highest growth rate amongst G20 countries for two successive years. This will surely be lauded by many, and Prime Minister Narendra Modi is likely to announce India's emergence on the global stage during this Amrit Kaal up to 2047, making science and economy deliver for humanity at large under the philosophy of "Vasudhaiva Kutumbakam" – One Earth, One Family, One Future.

The question before us is: How can India with its G20 presidency walk the talk to benefit the masses in the Global South for whom food and nutritional security is still a challenge, one made worse by climate change? The likely answer to this question is embedded in the Deccan High-Level Principles as outlined in the 'Outcome Document and Chair's Summary' of the Agriculture Working Group (AWG) of G20 nations that was held on June 15-17 at Hyderabad. The Deccan High-Level Principles are: One, facilitate humanitarian assistance to countries and populations in vulnerable situations; two, enhance availability and access to nutritious food and strengthen food safety nets; three, strengthen policies and collaborative actions for climate-resilient and sustainable agriculture and food systems; four, strengthen resilience and inclusivity in agriculture and food value chains; five, promote the one health approach; six, accelerate innovation and the use of digital technology, and seven, scale-up responsible public and private investments in agriculture.

These are steps in the right direction. However, implementing these principles in a time-bound manner remains a challenge. Where will the funding come to achieve all these objectives?

In any case, the AWG of G20 highlighted priority areas to encourage diversification in agriculture, promoting sustainable agriculture, and channelling financial resources towards environmentally conscious and cli-

If India can demonstrate the application of precision technologies in space, with Chandrayaan-3 by spending a fraction of the cost that the US would incur for the same feat, why can't the country use the same principle to develop technologies to help farmers overcome challenges of extreme weather events? The country could then share these technologies with other countries of the Global South. We believe this is feasible and can be done cost-effectively, provided it's on the government's priority list and there is a time-bound action plan. The ultimate goal is to enhance the efficiency and resilience of agri-value chains and promote digitisation as a catalyst for agricultural transformation.

mate-resilient farming. This involves adopting climate-smart farming practices and precision technologies for agricultural production to withstand climate fluctuations.

If India can demonstrate the application of precision technologies in space, with Chandrayaan-3 by spending a fraction of the cost that the US would incur for the same feat, why can't the country use the same principle to develop technologies to help farmers overcome challenges of extreme weather events? It could then share these technologies with other countries of the Global South. We believe this is feasible and can be done cost-effectively, provided it's on the government's priority list and there is a time-bound action plan. The ultimate goal is to enhance the efficiency and resilience of agri-value chains and promote digitisation as a catalyst for agricultural transformation. This includes the establishment of standardised agricultural data platforms as digital public goods and harnessing novel digital technologies to revolutionise the agri-food sector. Sensor-equipped drips, drones and LEOs (Low Earth Orbits), for instance, can be used in agriculture to get "more from less", saving the planet's scarce resources.

The AWG's proceedings also highlight the need to promote food and nutritional security via higher investment in agri-R&D, especially biofortification. Encouraging research in biofortification and disseminating information on fortified crop varieties to farmers is key to achieving nutritional security. ICAR scientists have already demonstrated that even basic staple crops such as wheat, rice, maize, and millet can be bio-fortified with enhanced iron, zinc, and even anti-oxidants. ICAR has created 87 varieties of climate-resistant and nutritious crops. These crops include rice (8), wheat (28), maize (14), pearl millet (9), finger millet (3), small millet (1), lentil (2), groundnut (2), linseed (1), mustard (6), soybean (5), cauliflower (1), potato (2), sweet potato (2), greater yam (2), and pomegranate (1) varieties, which were developed as a result of collaboration between national and international organisations. However, the dissemination of this research to the Global South is equally important for India. In India, Prime Minister Narendra Modi has released zinc-rich rice and

wheat, which can be shared with countries of the Global South. Biofortification is much more cost-effective compared to supplementing rice with nutrients, say iron, in our public distribution system. But India spends only 0.48 per cent of agri-GDP on agri-R&D. This needs to be doubled, if the country has to play the role of a leader.

The AWG also highlights the "significance of strengthening a rules-based, open, predictable, transparent, non-discriminatory, inclusive, equitable and sustainable multilateral trading system". It also emphasises working together to improve our food systems by strengthening local, regional, and international agri-food value chains. This can lead to affordable and accessible food, agricultural inputs, and products. A sustainable multilateral trading system with the WTO at its core, can increase market predictability and boost business confidence.

India would surely like to bring millets to the fore, even on the dining tables of G20 members. But much more product innovation and dissemination is needed to make it a part of global cuisine, akin to say quinoa.

Is it possible for India to turn this aspirational framework into a reality at home? The answer lies in re-thinking its agri-policies to prioritise the well-being of people and the planet. Current policies of open-ended and assured procurement with Minimum Support Price (MSP) for say paddy and wheat, coupled with massive subsidies on fertilisers, power, and irrigation, have caused damage to our natural resources, especially soil, water, air, and biodiversity. We need to re-purpose agri-policies to a more environmentally sustainable and nutritious food system. Can G20 countries come up with a model and time frame to make agriculture less damaging to the planet? So far, India has not come up with a major move in this direction, nor have the US or China. Time is running out and the G20 needs to work closer, faster, and smarter with demonstrable results by 2030 to feed this world and also save the planet, by making it green and clean.

*Gulati is Distinguished Professor and Thangaraj is a Research Associate at ICRIER. Views are personal*

**Era of agri research, education comes to end: IARI director**

**Activists appeal SC to bar herbicide-tolerant crops**

**Cotton farmers need to be vigilant of pink bollworm**

## Farmers in 8 countries find climate change a key challenge: Survey

**Our Bureau**  
Mangaluru

Many farmers surveyed in eight countries, including India, have reported some change in weather over recent years.

Eight out of 10 farmers, who have experienced the impact of heat, anticipate reduced yields in the coming years.

These are some of the key findings from the 'Farmer Voice' survey conducted by the life science company Bayer. It had commissioned Kekst CNC to independently interview 800 farmers from Australia, Brazil, China, Germany, India, Kenya, Ukraine, and the United States in equal numbers.

While 76 per cent of farm-

ers were worried about the impact of climate change in the future, 71 per cent said climate change already has a large impact on their farm.

According to the survey, climate impacts are estimated to have reduced farmer incomes by 15.7 per cent on average over the past two years.

One in six farmers in these eight countries even identified income losses of over 25 per cent during this period.

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Economic challenges are the biggest priority for the farmers in these nations over the next three years. Over half (55 per cent) of the farmers placed fertilizer costs among the top three challenges, followed by energy costs (47 per cent), price and income volatility (37 per cent), and the cost of crop protection (36 per cent). The importance of fertilizer costs becomes most apparent in Kenya, India, and Ukraine.

# Fertilisers are making us lose the climate plot

Study by group of researchers from GKVK and German university shows rise in fertiliser usage is leading to higher emissions of carbon dioxide

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**A**ccording to researchers from Gandhi Krishi Vigyana Kendra (GKVK), Bengaluru, and the University of Kassel in Germany, increasing use of nitrogen-based fertiliser for food production is threatening our climate goals. A study conducted by a group of researchers from the two universities highlights that an increase in fertilizer usage is leading to higher emissions of carbon dioxide (CO<sub>2</sub>).

Higher CO<sub>2</sub> emission was recorded in Bengaluru's rural areas with altered cropping patterns, depleted groundwater, and a shift of cropping pattern from rainfed agriculture to irrigated system.

"Nitrogen application signifi-

**“ The average CO<sub>2</sub> emission in agricultural plots that were rainfed and had high nitrogen content was 56.4% higher than in plots with lower nitrogen levels**



cantly affected CO<sub>2</sub> emissions in all wet season crops as well as dry season crops in the irrigated fields.

Plots with high nitrogen levels had significantly higher CO<sub>2</sub> emissions than the plots with low nitrogen across all crops and seasons. Although higher emission of CO<sub>2</sub> was noticed in all field switch high nitrogen levels, these effects were highest in agricultural plots in Bengaluru's rural-urban transition with altered cropping patterns, depleted groundwater sources, and the plots that had shifted from rainfed agriculture to irrigated sys-

tems," noted the study.

At low levels of carbon in soil, higher nitrogen levels increase microbial activities, which in turn leads to the breakdown of organic matter in the soil into mineral nutrients which are easily absorbed by plants. This process leads to higher emissions of CO<sub>2</sub>.

"Another mechanism by which higher nitrogen fertilization increases CO<sub>2</sub> emissions is the sequestration of higher carbon inputs from increased crop growth.

The study, irrespective of irrigation, noted that CO<sub>2</sub> emissions in

all crops increased significantly with the application of nitrogen-based fertiliser. However, the average CO<sub>2</sub> emission in agricultural plots that were rainfed and had high nitrogen content was 56.4% higher than in plots with lower nitrogen levels.

In the irrigated plots however, the same set of wet-season crops grown on plots with high nitrogen levels had only 12.1% higher CO<sub>2</sub> emissions than those in plots with low nitrogen levels," observed the study, which was published in Nutrient Cycling in Agroecosystem journal.

# India, 79 Others Seek Support for WTO Food Security Deal

Reach out to Arab and least-developed nations to build pressure on developed economies

Kirtika.Suneja@timesgroup.com

**New Delhi:** An 80-country coalition including India, China and South Africa has begun reaching out to Arab countries and least-developed nations to build pressure on the developed economies to ensure food security for developing nations.

The alliance of G33, African Group and the ACP (African, Caribbean and Pacific) group at the World Trade Organisation (WTO) has proposed a new method to calculate subsidies given to purchase, stockpile and distribute food to ensure food security for developing and poor nations.

It has also proposed that exports of foodgrains from public stocks to needy countries be allowed for international food aid and humanitarian purposes.

The alliance is keen to get more support for its proposals, officials said.

"The cosponsors of the proposal are reaching out to 6-7 LDCs and the Arab Group who have given support from the floor," an official said.

The coalition has suggested that a permanent solution for public stockholding should account for

## Building Coalition

► **80-member alliance** at WTO to expand reach

► **India, S Africa, China,** others to reach out to Arab nations, LDCs

► **African Group, ACP, G33** want to include inflation in food sop calculation

► **Grouping proposed** changes in WTO rules amid global food inflation



► **Present methodology** based on 1986-88 prices

► **New proposal eases conditions** to export food grain from public stocks

► **Exports key** for humanitarian, international food aid purpose

inflation and be based on a recent reference price. At present, the external reference price (ERP) used for calculating subsidies is based on 1986-88 prices.

"Production of staples has been hit in many countries and they are now concerned about their food security. Our proposal is crucial for such producers especially at a time when global food prices are rising," a second official said.

They have suggested a new metho-

dology to calculate the subsidies by either accounting for "excessive inflation" in the ERP or calculating the ERP based on the last five years excluding the highest and the lowest entry for that product. ERP is the average price of base years 1986-88 and has not been revised for decades.

The proposal assumes significance in the wake of the developing and poor countries seeking a change in the WTO's agriculture rules – a permanent solution – to

ensure policy space for their food security programmes ahead of the WTO's 13th Ministerial Conference (MC13) next year in Abu Dhabi.

At present, they have a peace clause that protects them from legal

## CALCULATING SOPs

The 80-nation alliance has proposed a new method to calculate subsidies given to purchase, stockpile, distribute food

disputes if the subsidies breach the de minimis level (10% of the total value of production of the product) but is subject to conditions such as anti-circumvention.

The grouping has also proposed to amend the anti-circumvention clause in the Bali Ministerial Declaration of 2013 as per which developing countries that procure food stocks for security "do not distort trade or adversely affect the food security of other members".

# Govt plans big push for heat-tolerant wheat

**EL NINO EFFECT.** Targets 161.22 mt foodgrains, including 114 mt wheat, this rabi; ICAR develops 1,800 climate change-resilient varieties

Prabudatta Mishra  
New Delhi

After two consecutive years of lower than expected production in wheat due to unexpected climate disturbances, the Centre has set a target of bringing 60 per cent of the total wheat area of nearly 32 million hectares (mh) under heat tolerant varieties. El Nino conditions are likely to continue at least until April when India's wheat harvesting season starts.

The government has set a production target of 161.22 million tonnes (mt) of foodgrains, including 114 mt of wheat, for the upcoming rabi season starting in October.

However, while the government reported wheat production as 112.74 mt for the 2022-23 crop year (July-June), private sector and industry experts estimate it to be between 100 mt and 105 mt. While the Food Corpora-

tion of India could procure 26.2 mt in 2023-24 marketing year (April-March), it was even lower at 18.79 mt in 2022-23, whereas the official purchase had hit record 43.34 mt in 2021-22.

Monthly average wheat prices in retail market also touched record ₹33.21/kg in February 2023 due to lower output.

Though prices came down after that, an increasing trend can be observed from June and has now reached ₹32.63.

## HIGHER DEMAND

According to Gyanendra Singh, Director of Karnal-based Indian Institute of Wheat and Barley Research (IIWBR), there has been an increased demand of varieties developed by IIWBR as farmers, aware of the risk to wheat crop, are keen to adopt latest technologies.

"Seeds availability is not an issue as in last 5-6 years 90 per cent varieties that have been released are climate



**STRONG RESPONSE.** IIWBR claims it has received 28,000 bookings for seeds (of 5 kg pack) in 30 hours after the direct sale window was opened for farmers

change-resilient. Already 50 per cent of the wheat area have been covered by these varieties," Singh said.

Asked how the production fell drastically two years back despite such high level adoption of climate change-resilient

varieties, he said even management practices also impact yield and varieties alone cannot be responsible.

Singh said there was moisture stress in wheat in 2022 in some places as farmers did not use the last round of irriga-

tion fearing water logging and it affected the crop. Besides, the moisture level in the crop was about 8 per cent, whereas normally it is around 12 per cent after harvest, he added. IIWBR has received 28,000 bookings for seeds (of

5 kg pack) in 30 hours after the direct sale window was opened for farmers for its DBW 327, DBW 332, DBW 370, DBW 371 and DBW 372, he said.

## TECH ADOPTION

While the government has adopted a multi-pronged strategy to mitigate the impact of climate-induced uncertainties on crop yields, experts argue that the rapidly increasing consumption of wheat cannot be completely reversed.

Addressing the annual Rabi Conference on Tuesday, ICAR's Director General Himanshu Pathak asked States to devise their plan for the season taking into account water availability in reservoirs, rainfall and weather forecast by the India Meteorological Department.

"In last nine years, ICAR has developed 2,200 varieties of which over 1,800 are climate change-resilient varieties," Pathak said.

# Investments in Indian agri-tech startups **fall 45%**

**Between 2021-22 and 2022-23 fiscal years primarily due to a hike in global interest rates, heightened investor caution amid rising uncertainty: Report**

## Agri-tech Startups Saga

- Number of investment deals rose from 121 in FY22 to 140 in FY23
- Total funding raised by startups fell from \$1,279 mn in to \$706 mn
- Midstream tech startups ventured into inorganic expansion via strategic acquisitions

NEW DELHI

INVESTMENTS in Indian agri-tech startups fell by 45 per cent between 2021-22 and 2022-23 fiscal years, primarily due to a hike in global interest rates and heightened investor caution amid rising uncertainty, reveals consulting firm FSG's new report.

Meanwhile, global agri-tech investments declined by 10 per cent between calendar



years 2022 and 2023, it said. Going forward, FSG expects the funding slump to continue into FY24 before springing back in FY25.

It expects that startups will continue focusing on profitability to tide over the next financial year. "Investors are likely to continue being cautious and direct their limited funding towards established business models, such as follow-on funding for companies in the mid-stream agri-tech category," it said. Commenting on the trends identified by the firm, Rishi Agarwal, Managing Director, Head-Asia, FSG, said,

**FSG report expects that startups will continue focusing on profitability to tide over the next financial year**

"The shift in investment dynamics highlights the Indian agri-tech sector's sensitivity to global economic trends. Startups must use periods of slower investment to refine their business models and drive towards profitability." According to the report 'India's Unfolding Agri-Tech Story: Updates and Emerging Themes in India's Agricultural Technology Sector', India's

agri-tech sector witnessed its most successful year in terms of venture capital funding in 2021-22 financial year, followed by a significant decline in FY23 amid a global funding slowdown.

While the number of investment deals rose from 121 in FY22 to 140 in FY23, the total funding raised by agri-tech startups in India fell from \$1,279 million in FY22 to \$706 million in FY23, it said. While FY22 witnessed a boom in agri-tech startup investments, which drove startup valuations to unprecedented heights, the correction in FY23 has led to a more prudent investment climate, it added. The report highlights that mid-stream agri-tech startups have begun to mature, with investments primarily in growth and late-stage funding rounds. For example, 56 per cent of investments in startups focusing on output linkages and quality management were in their growth and late stages.

## 'Centre to soon come up with PLI scheme for basic chemicals'

## Farm scientists told to identify novel genes in wild varieties



# Millets: The New Green Gold of Indian Agriculture

As proposed by India, the United Nations declared 2023 as the International Year of Millets while emphasising on the growing need of exporting the super crops as part of achieving Zero Hunger goal by 2030

c-Sarada.Gayathri @timesgroup.com

Indian millets are being hailed as 'super crops' across the world. The sumptuous spread of millet-based dishes at G20 was one grand celebration of the country's agricultural systems and the nutritional value it holds. Being one of the major producers and exporters of millets, India accounts for 80 per cent of Asia's and 20 per cent of the world's millet production,

and is among the top five exporters of millets globally. Catching the right nerve of the changing food trends in India, the country lagged 2018 to be the national year of millet and began raising awareness about the varied millet crops and their health benefits. Such initiatives boosted production and even doubled the exports from US \$30 million in 2019-20 to US \$64.3 in 2021-22. This year catapulted the millet to the global stage as the United Nations declared 2023 the International Year of Millets. "Millets have always been one of the prominent staples of Indian culinary practices. After the pandemic, millets, which were once a 'forgotten food', were brought back to daily consumption owing to its health parameters and organic growth. About 80 grams per day of what we consume should be millets and this can help build the health of the present and future generations of India," Mohan Shyam Prasad, MD of a leading organic products company, said. **ZERO HUNGER GOAL** Along with the rise of millet initiatives, the G20 meetings

focused on plans of different nations towards achieving the Zero Hunger Goal for developing and underdeveloped nations. Joining hands with the Food and Agriculture Organization of the United Nations (FAO), the government of India promoted millets as a key grain for achieving global food security. India also launched the 'Millets and Other Ancient Grain International Research Initiative' (MIMARISHI). The initiative during the IYM 2023 is set to facilitate synergies and collaborations between nations, research institutes, and civil society organisations to achieve Zero Hunger (SDG2) by 2030. Prof. Kamesh Chand, Member, NITI Aayog, government of India, noted in the book, 'The millet movement in India', "Millets are indeed superior cereals in terms of nutrition and resilience and also in terms of sustainability. They are ideally suited to address child under-nutrition and fit very well in nature-friendly production. Use of millets in various nutrition intervention programs and in the public distribution

- The eighteenth G20 summit, hosted by India under the theme "One earth - One family - One future", promoted millets as a sustainable and healthy option. The 'super crop' was also discussed during different G20 events and also served as a part of the fusion cuisine
- Among the vegetarian delicacies served at G20's sumptuous spread was extol millet leaf crisps topped with yogurt and spiced chutney, Kerala red rice tossed with millet crisp and curry leaf, and a cardamom scented barnyard millet pudding with fig and peach compote
- Millets are nutrient-rich superfoods that include diverse small-seeded crops like sorghum (jowar), pearl millet (bajra) and finger millet (ragi). They have the potential of feeding the increasing population without causing significant harm to the environment



which has established that regular consumption can help lower the risk of diabetes and obesity while improving cholesterol levels and contributing to lowered risk of cardiovascular disease. The research effort also demonstrated the effectiveness of millets in combating iron-deficiency anaemia and deficiencies of calcium. "With large number of people adopting the western food cultures in India, millets faced a setback. But with the central government promoting and health consciousness rising, thankfully the healthy food supplement has come to notice once again. Any disease can be treated if one eats millets. I believe, it is a great source of fibre, which cannot be found even in vegetables and fruits. That cleans our body and every human cell. In addition, it is also considered as a super crop for farmers as millets can grow on a large scale even with less water and fewer resources," Dr Khadar Vail, the Millet Man of India, asserted.

**CLIMATIC ADVANTAGE** One of the major factors that work in favour of millets, in addition to its ample nutritional values, is its sustainable consumption and production qualities. Millets grow with 60-70 per cent less water usage than rice and take half the time as other paddy crops. Additionally, millet crops consume 40 percent less energy for processing and is less vulnerable to insect attacks leading to lesser usage of pesticides. All put together, millet crops prove to be beneficial for farmers as energy, as both time and money can be saved, with also good demand rising in the country.



system will be of great help to address malnutrition and improve health of low-income households. ICRISAT, ICAR-IIMR, and the National Institute of Nutrition (NIN) are some of the key organisations leading this cause with scientific backing. The recent scientific case for consuming millets has been made through a series of studies led by ICRISAT along with NIN and others

# Govt plans big push for heat-tolerant wheat

**EL NINO EFFECT.** Targets 161.22 mt foodgrains, including 114 mt wheat, this rabi; ICAR develops 1,800 climate change-resilient varieties

Prabudatta Mishra New Delhi

After two consecutive years of lower than expected production in wheat due to unexpected climate disturbances, the Centre has set a target of bringing 60 per cent of the total wheat area of nearly 32 million hectares (mh) under heat tolerant varieties. El Nino conditions are likely to continue at least until April when India's wheat harvesting season starts.

The government has set a production target of 161.22 million tonnes (mt) of foodgrains, including 114 mt of wheat, for the upcoming rabi season starting in October.

However, while the government reported wheat production as 112.74 mt for the 2022-23 crop year (July-June), private sector and industry experts estimate it to be between 100 mt and 105 mt. While the Food Corpora-

tion of India could procure 26.2 mt in 2023-24 marketing year (April-March), it was even lower at 18.79 mt in 2022-23, whereas the official purchase had hit record 43.34 mt in 2021-22.

Monthly average wheat prices in retail market also touched record ₹33.21/kg in February 2023 due to lower output.

Though prices came down after that, an increasing trend can be observed from June and has now reached ₹32.63.

**HIGHER DEMAND**

According to Gyanendra Singh, Director of Karnal-based Indian Institute of Wheat and Barley Research (IIWBR), there has been an increased demand of varieties developed by IIWBR as farmers, aware of the risk to wheat crop, are keen to adopt latest technologies.

"Seeds availability is not an issue as in last 5-6 years 90 per cent varieties that have been released are climate



**STRONG RESPONSE.** IIWBR claims it has received 28,000 bookings for seeds (of 5 kg pack) in 30 hours after the direct sale window was opened for farmers

change-resilient. Already 50 per cent of the wheat area have been covered by these varieties," Singh said.

Asked how the production fell drastically two years back despite such high level adoption of climate change-resili-

ent varieties, he said even management practices also impact yield and varieties alone cannot be responsible.

Singh said there was moisture stress in wheat in 2022 in some places as farmers did not use the last round of irriga-

tion fearing water logging and it affected the crop. Besides, the moisture level in the crop was about 8 per cent, whereas normally it is around 12 per cent after harvest, he added. IIWBR has received 28,000 bookings for seeds (of

5 kg pack) in 30 hours after the direct sale window was opened for farmers for its DBW 327, DBW 332, DBW 370, DBW 371 and DBW 372, he said.

**TECH ADOPTION**

While the government has adopted a multi-pronged strategy to mitigate the impact of climate-induced uncertainties on crop yields, experts argue that the rapidly increasing consumption of wheat cannot be completely reversed.

Addressing the annual Rabi Conference on Tuesday, ICAR's Director General Himanshu Pathak asked States to devise their plan for the season taking into account water availability in reservoirs, rainfall and weather forecast by the India Meteorological Department.

"In last nine years, ICAR has developed 2,200 varieties of which over 1,800 are climate change-resilient varieties," Pathak said.



# India is running out of phosphorus; does the answer lie in our sewage?

A handful of countries control most of the world's reserves of phosphorus. This is a major geopolitical concern. The world's largest reserves are in Morocco and the Western Sahara region. But here, phosphorus coexists with cadmium, a toxic heavy metal

Veena Srinivasan  
Sneha Singh

**T**he problem with the fertilisation of land is as old as agriculture itself. When early humans first began to engage in settled agriculture, they quickly realised that while crops require nutrients for their growth, repeated cycles of cultivation and harvest depleted these nutrients, reducing yield over time. Early agricultural societies began to notice that certain areas produced better crops and that soils could be replenished.

This observation led to practices to restore essential nutrients in the soil necessary for plant and crop growth. Indigenous communities around the world developed methods of fertilisation, for example, using fish remnants and bird droppings (guano) as fertilisers.

This changed in the 19th century, which saw significant advancements in chemistry, leading to the creation of synthetic fertilisers as well as the identification of nitrogen, phosphorus, and potassium. They're the foundation of modern synthetic chemical fertilisers and have caused agricultural productivity to boom. The Green Revolution of the mid-20th century accelerated the adoption of high-yield crop varieties and intensive use of these fertilisers, and today these substances are crucial to sustain global food production.

But we now have a problem. Phosphorus is scarce and exists only in limited quantities, in certain geological formations. Not only are we running out of it, it also pollutes the environment. It doesn't exist as a gas, which means it can only move from land to water, where it leads to algal blooms and eutrophication.

## Geopolitics and phosphorus

The history of phosphorus spans its discovery in guano to current global supply chains. Today, a handful of countries control most of the world's reserves of phosphorus. This is a major geopolitical concern. The world's largest reserves are in Morocco and the Western Sahara region. But here, phosphorus coexists with cadmium, a heavy metal that can accumulate in animal and human kidneys when

As a result, cadmium-laden fertilisers are often applied to the soil, absorbed by crops, and consumed, bioaccumulating in our bodies. Studies have found that this accelerates heart disease. In 2018, the EU passed new legislation to regulate cadmium levels in fertilisers.

Only six countries have substantial cadmium-free phosphorus reserves. Of them, China restricted exports in 2020 and many EU countries no longer buy from Russia. So the market for safe phosphorus has suddenly exploded. This is one reason why Sri Lanka banned the import of synthetic fertilisers and went organic in 2021, later experiencing a sudden drop in crop yield that precipitated a political crisis.

Today, India is the world's largest importer of phosphorus, most of it from the cadmium-laden deposits of West Africa. Not all crops absorb cadmium at the same rate, but paddy, a staple crop in India, is particularly susceptible; Indian farmers also apply a lot of fertilisers to paddy. Other grains, such as wheat, barley, and maize also absorb cadmium, just less.

(The uptake of cadmium by crops varies based on soil quality, climatic conditions, and the type and variety of crops grown. Social and cultural factors further affect the intake of cadmium into human bodies and the severity of health effects.)

Thus, we may face a hard choice down the line: if we do not remove cadmium from the phosphorus, we may face a public health crisis; if we do, fertilisers will become more expensive.

## The phosphorus disposal problem

First, only about a fifth of the phosphorus mined is actually consumed through food. Much of it is lost directly to water bodies as agricultural run-off, due to the excessive application of fertilisers.

Second, most of the phosphorus that people consume ends up in the sewage. Most sewage in India is still not treated or treated only up to the secondary level. So even if the organic matter is digested, the effluent discharged from STPs still contains nitrates and phosphates. Of these, nitrates can be digested by denitrifying bacteria and released safely as nitrogen gas into the atmosphere, while



Phosphorus is scarce and it pollutes. It does not exist as a gas, which means it can only move from land to water, where it leads to algal blooms and eutrophication

It is then absorbed by the algal blooms that grow in response to the high nutrient supply, and when they decompose, the bacteria that feed on them consume the dissolved oxygen. The result: water bodies become oxygen-starved, leading to fish deaths. The algal blooms are also toxic, causing respiratory issues, nausea, and other ailments to people exposed to them.

## Finding phosphorus elsewhere

Since much of the phosphorus is not actually taken up by crops, one way to ameliorate the phosphorus paucity is to reduce the use of chemical fertilisers through precision agriculture. Low-input agro-ecological approaches are increasingly proving to be a viable alternative. If practised correctly, they can be achieved with little to no loss in yield, especially in smallholder farmers that cannot afford the cost of chemical fertilisers and pesticides.

But there is increasing interest in closing the phosphorus loop by mining urban sewage to produce high quality phosphorus. Interest in 'circular water economies' has in fact prompted the European Union - which has almost no phosphorus reserves of its own - to rethink the urban water cycle.

First, source separating toilets - almost two thirds of the phosphorus we consume leaves in our urine and the rest in faeces. Urine also contains large amounts of nitrogen and potassium. If we can collect this safe and concentrated waste stream, we could generate a local fertiliser source. Source-separating toilets are designed to separate urine from faeces. If they are to become mainstream, buildings and homes will require a collection and storage system, leading to a logistics system that collects and processes the urine centrally.

Second, recycling wastewater and sludge - Sewage recycling already occurs in some form in India today.

Valley-Kolar project, which transports Bengaluru's wastewater to the water-scarce regions of Kolar. But there are concerns that the quantity of nutrients may be too high and eventually degrade the soil. Similarly, in many cities and towns, farmers already take away the sludge from STPs but it is bulky to transport. So while farmers may be willing to pay to transport sludge, they cannot afford to pay an STP for the sludge itself. Thus, sewage recycling today doesn't help render sewage treatment profitable.

There is potential here for a game-changing innovation: sludge-mining from STPs to recover nutrients. Companies like EasyMining in Europe are retrofitting STPs to recover nutrients from the sewage. The end product looks exactly like conventional fertiliser and is in fact of higher quality and marketable at a comparable cost.

Mining phosphorus from sewage allows countries to control their own phosphorus production while also addressing the problem of water-body eutrophication.

## Trouble with the incentives

In theory, given the currently high fertiliser prices, these technologies are already economically viable. Why then have they not been realised?

One problem is the incentives at the sourcing and the user ends of the phosphorus value chain. In rural India, the most powerful farmers in villages are typically also the pesticide and fertiliser dealers and extend credit to farmers with smaller holdings. As a result, the latter are incentivised to over-apply fertilisers rather than to reduce them. This needs to be tackled separately, through better extension services and awareness campaigns.

In urban India, sewage is perceived to be an undignified activity historically relegated to people belonging to the so-called 'lower' castes. The regulations reflect this "get rid of it" mindset. Around the world, regulations have been framed in terms of discharge standards. Companies have to ensure nitrate and phosphate levels in effluent treatment plants are below an acceptable level. But when the regulations are written this way, treatment plant operators in India often dilute effluents with freshwater before discharging it. Dilution is not

water bodies anyway.

Even if regulation and enforcement are tightened, the fundamental problem persists: wastewater treatment is a cost centre, not a revenue centre, for most cities. No one wants to pay the high cost, not even Bengaluru, a city with a relatively high GDP per capita. And while utilities get paid to supply water, they do not gain additional revenue from treating wastewater to standards. In fact, from their perspective, it merely increases the cost of sewage treatment, further burdening them. So they tend to drag their feet until the National Green Tribunal imposes a fine.

## Creating a circular water economy

This is why fundamentally rethinking our whole approach may work. If the technology is cheap enough, can we give a concession to set up STPs with phosphorus mining plants and allow them to sell the fertiliser? To do this, we need systemic - not incremental - change.

This requires every single stakeholder to make small adjustments. Innovators need to lower the costs of sewage mining to be financially viable in India; regulators need to allow the use of urban-mined phosphorus in agriculture; and STPs need to be paid not based on discharge standards but on nutrient recovery.

And such changes, while complicated, could also solve multiple problems. India can become less dependent on uncertain geopolitical crises; farmers can procure fertilisers at affordable rates; water bodies will have some hope of becoming swimmable (after eliminating legacy nutrients in lake beds); and public health can gain from the consumption of food grown in cadmium-free soils.

(Dr. Veena Srinivasan is the Executive Director of the Water, Environment, Land and Livelihoods (WELL) Labs, a new research centre based at the Institute of Financial Management and Research (IFMR) Society and Krea University. Sneha Singh is a researcher in the Urban Water Programme at WELL Labs.)

For feedback and suggestions for 'Science', please write to [science@thehindu.co.in](mailto:science@thehindu.co.in) with the

## 'Seeds with multiple tolerance will be a game-changer'

A.M. Jigeesh  
NEW DELHI

Swati Nayak, scientist, International Rice Research Institute South Asia Regional Centre (ISARC), known for her research on climate-resilient and nutritious rice varieties, recently won the Norman Borlaug Field Award given by the World Food Prize in honour of the agricultural scientist and Nobel laureate.

Dr. Nayak had organised more than 10,000 on-farm and comparative testing for more than 500 climate resilient, high-yielding, bio-fortified and healthier seed varieties.

Placing her research in the smallholder farmers' perspective, Dr. Nayak said developing high yielding inbreds (non-hybrids) from old seed varieties and the focus on climate-resilient and climate-responsive varieties rich in micronutrients had been the

innovations of this decade. The combined efforts of various national and international organisations resulted in developing such varieties, she told *The Hindu*.

She is also focused on preserving the landrace seeds found in the country. "Lifestyle diseases are certainly a concern. We need more low glycemic index varieties of rice which are with micronutrients. Next decade should be dedicated to such kind of research," Dr. Nayak said.

Giving out the example of the traditional *Kala Namak* seed variety of paddy found in eastern India, she said own varieties have to be conserved for both scientific and cultural purposes. "We need to empower the farming community to help them produce better quality of seeds and maintaining their germplasm. It will help them in better yield and better taste of the



We need to empower the farming community to help them produce better quality of seeds and maintaining their germplasm... market positioning shall help farmers to help better price for these seeds

SWATI NAYAK  
IIRRI scientist

grain. The yield may not be competitive, but market positioning shall help farmers to help better price for these seeds," she said.

## Different accessions

Researchers around the country are trying to evaluate different accessions of seed varieties, she said. "We collect multiple accessions and assess it. We validate it for yield and market aspects. For example, we have identified two or three best accessions for

*Kala Namak* and we are now focusing on scaling and capacity building of these seeds. The seeds will be available for larger production purposes soon. There is demand. But we have to now work on how to consolidate on this demand," she said.

The effort of the scientific community is to make seeds affordable for small holders without much cost, investment and infrastructure. "Average yield is a matter of concern, especially for eastern

States. There is still room for increasing and stabilising the productivity. Bringing high yielding seeds and fighting climatic, biotic and abiotic risks. Scientists are fighting along with farmers in this process. Resilient varieties replacing the regular varieties is like an insurance. We need to ensure that these varieties are accessible to farmers," she said.

## Climate change

Maintaining that climate change is a reality and its induced damages on agriculture cannot be ignored, she said the country has a lot of climate-resilient varieties now, which can face conditions of drought and floods.

"The efforts are also to develop seeds with multiple tolerance to floods, droughts and pests. It is a package so that farmers do not have to look for so many options. The system will also be focused on what to

produce and what to grow. These new-generation varieties will be a game-changer. They will be available as options for farmers in next two or three years," she said. On fortified rice, she said her personal opinion is in favour of bio-fortified foodgrains. "Looking at the perspectives of both farmers and consumers, I would suggest that bio-fortified rice is the most low cost, intensive and affordable way to address the nutrition challenge. It will directly go into their consumption system. Bio-fortified rice can be produced in bulk volume and it is not cost intensive. It could be the future and the way forward," she said adding that the country needs good products to convince farmers for bulk production.

"A buy-back guarantee or incentives for farmers for cultivating these special varieties will give a boost to the production," she said.

# Export ban on non-basmati rice sparks debate in WTO

**CALL FOR CLARITY.** India has been asked to clarify the intended duration of the ban

**Amiti Sen**  
New Delhi

WTO members, including the US, Canada, Australia and Japan, have questioned the prohibition on export of non-basmati white rice, announced in July 2023 by India, and sought clarity on the quantity it considers adequate for domestic needs.

India has also been asked to clarify the intended duration of its export ban on wheat and broken rice imposed last year and clarify the procedures put in place to abide by the rule that such restrictions are temporarily applied.

New Delhi will have to give its replies to the queries at the Committee of Agriculture (CoA) meeting of WTO on September 27-28 where all members will respond to questions on their agricultural



**WTO TO INDIA.** Shed light on the procedures put in place to abide by the rule that such restrictions are temporarily applied

policies. "The announcement of the ban by India states it is 'to ensure adequate availability of non-basmati white rice in the Indian market and to allay the rise in prices in the domestic market.' However, it is understood from media reports that India currently has sufficient supplies to meet domestic demand," per a query

submitted to the CoA by the US, Canada, Japan and Australia.

The submission pointed out that the US Department of Agriculture in August 2023 estimated India's rice production at 134 million tonnes and stocks at 36 million tonnes for 2023-2024. "Please describe what quantity of rice India

considers to be adequate availability of non-basmati white rice in the Indian market. What quantity of public stocks does India consider adequate for domestic needs," the countries asked.

The US, the UK, the EU, Canada, Ukraine and Japan, in a separate query on export ban placed on wheat in May 2022 and broken rice in September 2022, sought an update on the intended timelines for the submission of the required ER:1 tables (on export prohibitions), stating that timely transparency on export restriction measures was important in the context of the ongoing food security crisis.

"It is important that we understand the intended duration of the measures which have already been in place for 16 months in the case of wheat, and a year in the case of broken rice," they said.

# NABARD rises to challenges of financing agriculture in India

**How NABARD is facilitating credit flow to small and marginal farmers?**

NABARD provides refinancing to Co-operative Banks and Rural Regional Banks (RRBs) primarily catering to small and marginal farmers for crop loans as well as investment loans. This refinancing is subsidised by the Government of India for farmers to avail of crop loans at 7% rate of interest. Further, if the requirement is on time, they get a subvention of 3%. Effectively, the cost of the crop loan is only 4% to the farmer. This refinancing support to co-operative banks and RRBs facilitates capital formation in agriculture for improved productivity and incomes of the farmer. The Kisan Credit Card (KCC) system, which is a cash credit system, was introduced to empower a farmer to avail loan and repay whenever there is a surplus so that his/her interest burden is less. Now, this KCC is digitised enabling farmers to walk into any mall or ATM to purchase goods and more with the KCC card.

To saturate every farmer across India, the Government of India has launched a massive KCC saturation drive in partnership with NABARD. We have associated with the process of saturation of eligible farmers under Pradhan Mantri Kisan Samman Nidhi with KCC, through Co-operative Banks and RRBs. This way, we are ensuring that no deserving farmer is deprived of farm loans on a concessional basis.

**How is NABARD prepared to address the challenges in agricultural financing, especially against the background of climate change and sustainability?**

Financing agriculture is a continuing challenge in the present-day era of climate change. In a recent survey of financial institutions

In its 42<sup>nd</sup> year of existence, NABARD Chairman Shaji KV shares insight on the continued effort of the Centre along with the apex regulatory body to make a difference in the rural credit and financing landscape of India



conducted by Deloitte, most respondents (86%) indicated that they anticipate their agricultural clients' financial needs will change due to climate change. 40% expect their clients will need longer-term loans, 35% foresee clients needing higher working capital, and 33% think clients will seek higher loan guarantees. NABARD is developing models of blended finance products. The Umbrella Programme for Natural Resource

(UPNRM), which has been in place for more than a decade, has been leveraging this strategy to attain the goals of sustainable agriculture. In the last few years, models of blended financing have been built around Tribal Development Fund (TDF) and Watershed Development projects, involving corporates for broad basing impacts from such projects. The promotion of climate-smart agriculture encourages

farmers to adopt practices such as organic farming, agroforestry, and watershed management, which help in reducing greenhouse gas emissions, conserving water, and improving soil health. In addition, NABARD supports the adoption of renewable energy promotion, sustainable irrigation practices, crop diversification and resilient farming systems. NABARD has been working in

partnership with different state governments for understanding the sectoral requirements of funds under the respective State Action Plan for Climate Change (SAPCC) and accordingly making efforts to focus on critical sectors and areas under its different financing products. About 30 projects are being implemented under the National Adaptation Fund for Climate Change (NAFCC) with a total sanction of Rs 947.5 crore to help scale up concrete

climate change adaptation interventions in alignment with the National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC).

It has also facilitated the sanction of US\$ 34.36 million under the Green Climate Fund (GCF) grant for the implementation of a groundwater recharge and solar micro-irrigation project to ensure food security and enhance resilience in vulnerable and tribal areas of Odisha.

About Rs 61 crore assistance has been facilitated from the Adaptation Fund for the implementation of six climate change adaptation projects.

NABARD has been working in more than 26 lakh hectares watershed areas, and with more than 6 lakh tribal families, with total assistance of over Rs 5,400 crore. Presently, there is a directed effort in taking up specific watershed development activities in the identified 156 vulnerable districts of the country.

The Climate Change Fund has been augmented this year by Rs 65 crore, with allocation from the Reserve Bank of India (RBI) for pilot projects on climate change adaptation and specific projects towards building up adaptive capabilities amongst the most vulnerable would be taken up this year onwards.

**What is the progress of the government's project for computerisation of Primary Agricultural Credit Societies (PACS)?**

To date, the government has approved 58,280 PACS under the project from 24 states and four union territories. A prototype of National Level PACS Software (NLPS), which is a complete ERP package to cater to the needs of all the PACS across the country, is ready and under testing. All the participating states have either floated the

tenders or are in the process of measurement hardware to be given to the PACS.

NABARD has also provided the Central Panel of System Integrators to the participating states and system integrators are in the process of getting appointed. With these three critical components now coming into position, we expect that results in terms of computerisation of pilots will be seen soon. It is expected that by December 15, 2023, all the approved PACS will be computerised. By March 2024, all 63,000 PACS envisaged will be computerised as well.

**How has NABARD made a difference when it comes to last-mile financing in India?**

NABARD is facilitating the last-mile credit delivery in rural areas through Self-Help Groups (SHGs), Joint Liability Groups (JLGs), Farmer Producer Organisations (FPOs), business correspondents, business facilitators and strengthening PACS and ensuring crop loans through Kisan Credit Card (KCC).

The Department of Agriculture and Farmers Welfare launched a sprint campaign titled "Kisan Bhagidari Prathamika Humaari" to saturate all farmers that have not yet been issued a KCC, especially the PM KISAN beneficiaries, with KCC. NABARD was entrusted to act as the nodal agency.

NABARD introduced a Special Refinance Scheme for transforming potential PACS as Multi-Service Centres with a budget of Rs 5,000 crore to be implemented over a period of five years commencing from 2020-21. The objective was to establish the supremacy of cooperatives as a grass-root member-driven, member-centric organisation providing credit plus requirements to the members.

# Conference on agri-ecosystems

## CITY BUREAU

Hyderabad

A national conference on NexGen Extension for Evolving Resilient Agri-Ecosystems was organised at PJTSAU here. On the second day of the event on Tuesday, the conference had a special address on seamless solutions, full stack and platform-based approaches in extension advisory by Dr. Shaik N Meera, Technical Expert Digital Agriculture & Extension Systems, United Nations, and International Fund for Agricultural Development, Cairo, Egypt, and ICAR ATARI, Director, Zone 10.

Meera said new-generation extension approaches should harness digital technologies to provide customised and institutionalised extension advisory

services with mission to reach un-reach. The fourth industrial revolution would focus on changing ecosystem in agriculture extension from Internet of things to internet of farmers, Meera added.

ICAR-NAARM Extension Systems Management Head Division Dr. R Venkat kumar said Indian agriculture extension enabled capacity building and skill development of extension professions, enriching targets of field level extension scientists of KVKs.

ICAR-IARI Joint Director (Extension) Rabindranath Padaria spoke on upscaling agricultural innovation and exploring emerging extension methodologies for strengthening extension research. UAS Bangalore VC SV Suresha spoke on navigating change, in building resilient agri-ecosystems.

# Govt mulls use of bamboo as low carbon emitting alternative in steel-making

**Abhishek Law**

New Delhi

India's Steel Ministry is looking at the use of bamboo and other biomass sources as low carbon emitting alternatives in steel-making. Policy decisions could be worked on, if required, Secretary Nagendra Nath Sinha said on Thursday.

Biomass sources typically include wood and wood processing wastes; agricultural crops and waste materials; biogenic materials in municipal solid waste; animal manure and human sewage; landfill gas and biofuels made from biogenic alcohol.

Sinha said biomass can be considered as a low carbon-emission resource, thereby making it an attractive option to reduce emissions from iron and steel production.

Agency in a research paper noted that "bioenergy can be carbon neutral because the carbon that is released during combustion has previously been sequestered from the atmosphere and will be sequestered again as the plants regrow, i.e. if sustainably produced".

"This is one of the decarbonisation levers (use of biochar) that we said (the Centre) we should work on....there is a lot of availability of biomass; and there could be, for example, use of bamboo (as a source). But, this requires a lot of work in terms of policies like characterisation of biomass and so on," Sinha told *businessline* on the sidelines of the Indian Steel Markets Conference.

"We have take up this.....and hopefully something (will materialise)," he added.

in the steel sector is around 2.55 tonnes of CO<sub>2</sub> per tonne of steel produced. Company wise break-up shows SAIL to have an intensity of 2.5, Tata Steel at 2.12, JSPL at 2.59 and JSW at 2.49.

## EXPERIMENTS IN INDIA

Blast furnaces would need to substitute for a proportion of the coal used. Biochar — black carbon produced from biomass sources — can potentially be substituted for pulverised coal currently injected directly into blast furnaces, said a Steel Ministry official.

According to World Steel Association report, such a project was carried out with the 'Australian CO<sub>2</sub> breakthrough programme' that focussed on substituting coal used in pulverised coal injection (PCI) in the blast furnace with sustainable

# High costs & dwindling returns trouble Bt cotton farmers: Study

**U.Sudhakarreddy**  
@timesgroup.com

**Hyderabad:** A recent study conducted by researchers from King's College, London, has shed light on substantial losses farmers face in Telangana's Nalgonda district due to Bt cotton cultivation.

The study unveiled that erratic monsoons increased failures of Bt cotton crop yields. Published in the 'Climate and Environment Journal' by researcher Ambarish Kar-machedu.

"Farmers across diverse caste and class divisions found themselves trapped in

## ERRATIC MONSOONS TO BLAME

- Erratic monsoons increased failures of Bt cotton crop yields in Nalgonda

- 40% of India's Bt cotton produced in T'gana, Maharashtra

- Telangana second-largest Bt cotton producer in India

- Worst-hit were Scheduled Castes and marginal farmers

- Farmers subsequently compelled to reinvest in Bt cotton due to limited alternative cash-earning avenues



ling monsoons. Among the worst-hit were Scheduled Castes and marginal far-

financial losses," observed Ambarish. "Bt cotton was projected as a technological

economic risks for ryots escalate due to the heightened input costs associated with Bt cotton cultivation, often financed through indebted relationships with market intermediaries," he said.

The focus was on Kavarrampur in Nalgonda, which receives 80% of its annual rainfall during the monsoon season. The village, with a population of other Backward Castes, Scheduled Tribes and Scheduled Castes groups, was home to 155 households. In this context, 85% of farming households owned less than two hectares of land. Bt cotton farming emerged as

# Jaunti, where seed of Green Revolution was sown, remembers agriculture icon

**ABHINAYA HARIGOVIND**  
NEW DELHI, SEPTEMBER 28

FAR FROM Chennai, where M S Swaminathan passed away on Thursday, Northwest Delhi's Jaunti village remembers the agricultural scientist for having brought the 'Green Revolution' to it first.

High-yielding varieties of wheat were first planted in 1964 on around 70 acres in the village, which lies close to the national capital's border with Haryana. "He was a gentle, hardworking man, who did good for us and for the world," said Hukum Singh Chhikara, who was among the farmers on whose land the wheat was first sown. On Thursday, he had not heard yet of Swaminathan's death.

Rammehar Singh, 93, whose father Chaudhary Bhoop Singh, was also among the first farmers from Jaunti to have the high-yielding variety sown in his field, said, "Gehun se bhar diya desh ko. And he chose our village to begin with. Farmers from other places would come here to buy seeds, and a lot was sold at that time."



The seed processing centre is now a Delhi government dispensary. *Express*

In 1965, the Jawahar Jounti Seed Cooperative Society was set up and the farmers who were a part of it sold wheat seeds.

Swaminathan having got Prime Minister Indira Gandhi to the village in 1967 to inaugurate a seed-processing centre of the co-operative society is also a matter of pride, said Master Radh Singh, 73. "He would visit the village almost every year," said Singh. The seed-processing centre is now a Delhi government dispensary, a fading board marking its history.

For Om Prakash Chhikara, the grandson of Chaudhary Bhoop Singh, Swaminathan felt like family. "He has given a lot to the village. With the new varieties, the yield shot up and so did prosperity," said Om Prakash, a retired school teacher whose family owns 16 acres of land.

Arya Kuldeep, 60, who owns around 14 acres of land, said, "Our village is known because of Dr Swaminathan. The 'Green Revolution' began here and his work is still a matter of discussion among those of my generation and those who are older."

In the years since, much has changed. Amarjeet Chhikara, 52, the son of Khazan Singh who was also among the first farmers to have the wheat grown on his land, said, "A canal used to bring water to irrigate the fields then and the area was very fertile. The canal has stopped bringing water, and groundwater levels here are low. People here are now moving towards jobs, taking the focus away from agriculture. Since the administration doesn't focus much on agriculture, we don't get much in terms of subsidies or implements."



An undated photo of Nobel laureate Norman Ernest Borlaug and M S Swaminathan. *Photo credit MSSRF*

A former student and friend of six decades reminisces about M S Swaminathan, a man of ideas and of action

## THINKER, TEACHER, SCIENTIST, SAVIOUR

Professor P C Kesavan

I first met Professor M S Swaminathan in 1962 when he gave a lecture on the "changing concept of the gene". He had explained the nature of the gene and how it could be related to classical or Mendelian genetics. It was a fantastic lecture.

I approached him immediately after and said, "I want to be your student." He told me to apply for a PG admission at the Indian Agricultural Research Institute (IARI), New Delhi, and said admission would be based on my performance.

That year, I applied for PG admission and secured the top rank. Based on my performance I was assigned to do my PhD under Professor Swaminathan. He was happy to accept me as a student.

He advised me to take several courses, some of them in the physics department. I was nervous about taking physics courses as I was weak in the subject. I explained my apprehension to Professor Swaminathan, who asked me to meet the head of the department. The HOD advised me to study basic mathematics as well. I returned to Professor Swaminathan, terribly upset. He looked at me



NATURE FOR ALL: M S Swaminathan at the touch and smell garden he created for the visually impaired

calmly and said, "Physics and math are important to every branch of science. So, learn them well."

I followed the advice he gave me in 1963, and my destiny took me to so many places and positions, including the Bhabha Atomic Research Centre (BARC) in the 1960s, which was when I truly realised the foresight of Professor Swaminathan. The physics courses stood me in good stead during the five decades of my active research in radiation biology.

MSS was a great scientist with a wide spectrum of knowledge and interest. He was never limited and did not allow himself to be limited.

He was a great teacher, who would simplify complex issues.

Despite his heavy schedule he would meet students at 11am every day and have discussions over a cup of coffee

plex issues. Despite his heavy schedule he would meet students at 11am every day and have discussions over a cup of coffee.

One day, he dropped in with a handwritten note, which mentioned 'indirect effects of ionisation radiation', and said, "Maybe you can work on it for your PhD." I went to the library to look for a textbook on the subject, but did not find any. I went back to him and told him so. He drew my attention to an article in a scientific journal which dealt with the subject. This revealed how he was reading articles on science subjects beyond agricultural genetics.

In June 1967, I was leaving for Canada. I went to



FIELD OF VISION: M S Swaminathan's interest in science went beyond agriculture

his house in IARI to say goodbye and he invited me to stay for dinner. At the end of the meal, he brought out a mango, and offered it to me. "It's something you will miss in Canada," he said. He later drove me to the airport and as it was my first international trip, and along the way explained various formalities to be completed at the airport.

I returned to India four years later and joined the School of Life Sciences at Jawaharlal Nehru University, New Delhi. In 1980, I was invited by the Department of Atomic Energy (DAE), Government of India, to join BARC and lead the biology group as director. At the end of the tenure, DAE appointed me Homi Bhabha Fellow and instituted it at the MS Swaminathan Research Foundation (MSSRF), Chennai. This again reveals the importance accorded by DAE to MSSRF.

While accepting the fellowship, I informed the gathering I had become a student of Professor Swaminathan for the second time in my life. My association with Professor Swaminathan widened my understanding of the need for sustainable development, which requires simultaneous attention to ecology, economics, and social needs. In this regard, we published scores of research papers,



M S SWAMINATHAN

August 7, 1925 - September 20, 2023



EVERGREEN HERO: Swaminathan believed sustainable development should be a blend of ecology, economics and basic needs

some in prestigious scientific journals such as the Philosophical Transactions of the Royal Society. Under his leadership, MSSRF harnessed science and technology to solve social problems such as the lack of livelihoods and hunger. He focused especially on women's empowerment in rural areas. He set up 'village knowledge centres' and women were in charge of establishing lab-to-lab, lab-to-land, land-to-lab, land-to-land connectivities, enabling them to contact scientists and technologists. These are stories illustrative of Professor Swaminathan's personality; not exhaustive, of his qualities.

I remember one day he looked around MSSRF and said we had such a rich biodiversity, but one of the visually impaired would not experience. In a flash, he followed up thought with action and created a touch and smell garden for the visually impaired.

MSSRF developed many new ideas and innovations and put them up for demonstration in rural

areas. Since MSSRF was primarily a research institution, he believed it was left for other agencies to replicate and intensify. Innovation was a guiding principle in MSS's approach. For example, to combat 'hidden hunger' (malnutrition caused by deficiencies of vitamins and minerals especially in rural areas), he set up nutrition gardens to remedy nutritional maladies.

Although polite and soft-spoken, he never hesitated to call a spade by a spade. When he was the head of the division of genetics in IARI, a superior officer wanted action to be taken against a scientist on deputation at an international conference who failed to return on time. He had overstayed by a day to discuss scientific issues with fellow researchers. Professor Swaminathan explained this to the officer. Yet the officer wrote on the file, "Was it inevitable?" Professor Swaminathan wrote in a reply on the same file, "Nothing but death is inevitable." The file was closed.

Despite the fact that Professor Swaminathan changed the image of India as the "begging bowl" in the early 1960s to "breadbasket" in 1988, he was not given the Bharat Ratna. This gives an erroneous impression that successive governments have not done justice to Professor Swaminathan and agriculture as a whole.

(The writer is a former executive director at MSSRF)  
Email your feedback to southpole.tol@timesgroup.com

# Swaminathan's advice was not to turn Green Revolution into greed revolution

M S Swaminathan, renowned agricultural scientist, development thinker and father of India's Green Revolution, passed away on Thursday.

I knew him for four decades and it is difficult to cover all his achievements in this piece. I will mention only a few of them.

He is considered the main architect of the Green Revolution for his leadership and role in introducing and further developing high-yielding varieties of rice and wheat. India became self-sufficient in rice and wheat due to the Revolution.

When American agronomist Dr Norman Borlaugh received the Nobel Prize in 1970, he wrote: "The Green Revolution has been a team effort and much of the credit for its spectacular development must go to Indian officials, organisations, scientists and farmers. However, to you Dr Swaminathan, a great deal of credit must go for recognising the potential value of the Mexican dwarfs. Had this not occurred, it is quite possible that there would not have been a Green Revolution in Asia."

As Swaminathan noted in one of his writings, the Green Revolution was possible because of the synergy between technology, public policy and farmers. Public policy, particularly in terms of providing remunerative prices and procurement mechanisms, was crucial for the success of the Revolution.

In other words, technology alone will not succeed unless it is accompanied by public policy in terms of remunerative prices and marketing. As early as 1968, Swaminathan appealed to farmers not to harm the long-term production potential for short-term gains. He advised them to avoid the temptation to convert the Green Revolution into a greed revolution.

He later coined the word 'evergreen revolution', where technologies help farmers improve productivity without harming the ecology, and the country achieves sustainability in agriculture.

Swaminathan was an institution builder. He shaped the Indian Council of Agricultural Research (ICAR) and



S MAHENDRA DEV

institutions abroad like the International Rice Research Institute (IRRI). He also established the M S Swaminathan Research Foundation (MSSRF) at Chennai.

At MSSRF, he did a lot of work on hunger and malnutrition. According to Swaminathan, hunger has three major dimensions: The first is calorie deprivation;

the second is protein hunger due to inadequate consumption of pulses, milk, eggs, fish and meat; and the third is hidden hunger caused by the deficiency of micronutrients such as iron, iodine, zinc, vitamin A and vitamin B12.

He advocated farming system research (FSR) – it involves crop-livestock-fish integration in research – to strengthen linkages between agriculture and nutrition.

Swaminathan, as a nominated member of the Rajya Sabha, introduced the Women Farmers' Entitlements Bill in 2012 to strengthen the livelihood security of rural women.

The National Commission on Farmers, which Swaminathan chaired, recommended that the minimum support price (MSP) be set at least 50 per cent higher than the weighted average cost of production.

Swaminathan was a wonderful human being and a down-to-earth person. I enjoyed a trip with him to Pakistan in 2014 when the University of Agriculture, Faisalabad, gave him an honorary doctorate.

When I was chairman of the Commission for Agricultural Costs and Prices, I discussed the role of MSP with him several times. I learnt a lot from his advice and his writings on agriculture and different subjects on development.

Swaminathan had a gift for explaining complex concepts in terms everyone could understand. His life and work inspire many people, including the youth. We will miss him.

*The writer is a former director and vice chancellor of IGIDR, Mumbai.*

## Farm policy needs a paradigm shift on a priority basis

Adhocism continues to be the defining feature of export and import of agricultural produce. After economic reforms of more than 32 years, one would expect a transparent foreign trade policy pertaining to farm goods, a policy based on data with clearly specified trigger points for restrictions or outright ban on the export or import of any particular item. That doesn't seem to be happening. A news report on Thursday indicated that the government is likely to ban sugar exports from October 1, towards which a notification is expected. The sugar season begins in October and ends in September of the next year. While India sold a record 11 million tonnes (MT) of sugar in 2021-22, exports were restricted to about six MT in 2022-23 to avoid a shortfall in domestic markets and control prices, even as there is the issue

of ethanol production using sugar. Towards this, about 45 LMT of excess sugar was diverted for the sugar season 2022-23. The government wants this to go up to 60 LMT by 2025.

It is not only sugar whose export and import face mood swings of the powers that be, there are also other commodities that are subject to such whims and fancies. There was a ban on rice export in July, which saw prices soar by 20 per cent in key exporting countries like Thailand and Vietnam. Lest one forgets, India is the world's biggest exporter of the grain.

Three points need to be made here. First, the concern over domestic prices seems to have eclipsed all other concerns. While inflation, especially food inflation, is an issue no government can afford to ignore, the solution must be sought elsewhere,

not in arbitrary orders like banning export of one item or import of another. The government's endeavor should be on supply-side push rather than executive fiats. In general, government intervention, like import and export bans, should be the exception rather than the rule; and it should happen when things go out of hand, not just because someone in the system or close to it has some apprehensions or misgivings about skyrocketing prices. Secondly, if the interests of consumers are important, so also are those of farmers and other stakeholders in the agriculture sector. Frequent government interventions in the sector erode the sector's policy predictability, which is very important for its brisk growth. Let the forces of market strive to strike a balance between the interests of farmers

and consumers. And, finally, it is time the policy and decision makers did a cost-benefit analysis of government intervention in agriculture.

Reacting to the rice ban export in July, Ashok Gulati, professor at Indian Council for Research on International Economic Relations (ICRIER), said that India is overproducing rice, which was impacting water availability. "Rice area planted as of today is more than that of last year. Our procurement has always been way above what we need on rice. We are overproducing... In Punjab, for example, the water table is being depleted like anything and creating greenhouse gas emissions," he said. In fact, the entire agriculture policy needs a paradigm shift. The need of the hour is a policy that is data-based, reasonable and predictable.



## Era of agri research, education comes to end: IARI director

**New Delhi, Sept 28:** An era of agricultural research, education and extension marked by disruptive innovations has come to an end with the death of MS Swaminathan, Indian Agricultural Research Institute (IARI) Director A K Singh said on Thursday. "In passing away of Prof. Swaminathan, ends an era of agricultural research, education and extension that was full of disruptive innovation. If God appears to poor and hungry in form of bread as said by Mahatma Gandhi, that God is Dr. Swaminathan who should be worshipped by every citizen while taking daily meals," Singh said in a statement.

Trilochan Mohapatra, former Director General of Indian Council of Agricultural Research (ICAR), said, "the country has lost the real Hero of modern Indian Agriculture."

Mohapatra described Swaminathan as "Messiah of the Masses".

— PTI

# Sustainable farming key to shaping our destiny: academic

# Not warming up to El Niño

As the climate pattern's dark clouds gather, its potential impact on rabi crops overcasts the Centre's fiscal arithmetic.

**SANJEEB MUKHERJEE & INDIVJAL DHASMANA** write



At first glance, it may appear that rising food inflation and potential populist measures ahead of the forthcoming elections could disrupt the Centre's fiscal arithmetic for the current financial year. However, official numbers indicate that the situation is not yet alarming. Nonetheless, the looming threat of El Niño and its potential impact on rabi crops could turn the situation adverse later in the year.

Various measures implemented to control escalating food inflation, such as selling tomatoes and onions at subsidised rates, have not significantly increased government expenditure.

However, the reduction in prices of liquefied petroleum gas cylinders for domestic and commercial use may impose an additional burden on the exchequer. It is still not clear who will bear the burden of this price cut — the government or the oil marketing public sector units. It is understood that the government might give one time grant to these companies. Last year too, the government gave a one-time grant of ₹22,000 crore to these three companies. However, profits of these PSUs — Indian Oil Corporation (IOC), Bharat Petroleum Corporation Ltd (BPCL) and Hindustan Petroleum Corporation Ltd (HPCL) — have swelled in the first quarter of financial year 2023-24 (Q1FY24) and the trend is on, sources said. OMCs have pegged the cost of cut in prices of domestic LPG cylinders at ₹7,500 crore.

"The fiscal cost of combating high food inflation has been negligible thus far. The government may generate some revenue through the imposition of export duties on certain commodities," noted former chief statistician Pronab Sen.

Last month, the government imposed a 40 per cent duty on onions and a 20 per cent duty on parboiled rice exports to ensure their availability for domestic consumption.

Food inflation rose to a three and a half year high of 11.51 per cent in July this year, compared to 4.31 per cent in the previous month. This increase can be attributed to rising prices of tomatoes, rice, wheat, *jeera*, and some pulses.

Food inflation was not this high even during the lockdown periods of the first Covid wave in 2020.

The burden on the government's coffers may arise primarily from major

## SUBSIDY SPEND SO FAR...

(in ₹ crore)

	BE (2023-24)	FY23*	FY24**	% change
Food	197,350.00	64,287.78	68,494.25	6.54
NBS***	44,000.00	11,599.05	24,561.46	111.75
Urea	131,099.92	33,680.71	47,473.88	40.95
Petroleum	2,257.09	139.45	466.26	234.36
<b>Total</b>	<b>3,74,707.01</b>	<b>1,09,706.99</b>	<b>1,40,995.85</b>	<b>28.52</b>

\* From April to July 2022; \*\* From April to July 2023; \*\*\* Nutrient-based subsidy; BE: Budget Estimates  
Source: Controller General of Accounts

## HOW CENTRE SPENDS

■ Total major subsidy (₹ crore)†

† Includes food, fertiliser, and fuel  
BE: Budget Estimates  
Source: Controller General of Accounts



subsidies, particularly food and fertiliser. If the government decides to extend the free foodgrain scheme beyond December this year, the burden on food subsidy could escalate.

The government's expenditure might also swell if it chooses to increase the amount provided under Pradhan Mantri Kisan Samman Nidhi (PM Kisan) from the current ₹6,000 per farmer.

Among major subsidies, the central government spent approximately ₹68,594 crore on food subsidy in the first four months of 2023-24 (FY24), according to data sourced from the Controller General of Accounts (CGA).

This represents a 6.54 per cent increase compared to the corresponding period of the previous year. This translates into a monthly food subsidy expenditure of approximately ₹17,148 crore.

If the Pradhan Mantri Garib Kalyan Anna Yojana is extended beyond December, as is likely, the additional expenditure could rise by roughly ₹12,500 crore for January-March of FY24 due to the difference between supplying foodgrains at public distribution system prices and providing them for free, according to some reports.

The Budget has estimated food subsidy at ₹1.97 trillion for the

current financial year.

Raising the PM Kisan entitlement by an additional ₹2,000 per farmer, beyond the ₹6,000 distributed annually to nearly 90 million farmers, would result in an extra expenditure of approximately ₹18,000 crore on top of the already budgeted ₹60,000 crore in FY24.

Next comes the fertiliser subsidy. CGA data reveals that actual spending on the nutrient-based subsidy (NBS) regime and urea subsidy has been significantly higher in the first four months of FY24 compared to the same period in the previous year. Expenditure is in the region of 112 per cent higher for NBS and almost 41 per cent higher for urea subsidy.

This increased expenditure occurred despite a considerable softening of global fertiliser prices since April. This was mainly due to the higher prices at which old stocks were imported.

Between April and July 2023, the landed price of di-ammonium phosphate (DAP) decreased by nearly 16 per cent, while that of urea declined by around 15.31 per cent.

Domestically, the cost of production has also decreased. The Centre's NBS subsidy allocation for the April-September 2023 period for nitrogen is down by 81.08 per cent, phosphorus

by 9.25 per cent, potassium by 61 per cent, and sulphur by 16.5 per cent.

However, there is a catch. Global fertiliser prices, especially for DAP and urea, have started to rise since August due to China's ban on DAP imports and increasing demand from countries like Brazil.

Market expectations are that both DAP and urea rates will continue to firm up, as they had reached multi-year lows in recent months.

In August, the landed price of DAP increased by 20 per cent compared to July, while urea prices rose by 30 per cent in the same period.

India annually consumes 30-35 million tonnes (mt) of urea, of which 7-9 mt are imported, while the domestic consumption of DAP is 10-12.5 mt, with local production accounting for 4-5 mt, and the rest imported.

Fertiliser demand typically peaks between April and June for the kharif harvest and October and December for the rabi sowing season.

DAP demand is higher during the rabi season, while nitrogen, phosphorus, and potassium consumption increases during kharif.

Will these price increases threaten fertiliser subsidies, which have already risen due to high-priced carryover stocks?

In response to this query, Ankit Jain, vice-president of ICRA, told *Business Standard*, "The government's subsidy budget of ₹1.75 trillion for FY24 is likely to remain adequate. Additionally, in the case of urea, India's import dependence this year is expected to be lower than in previous years at 4-5 mt."

Despite the rise in subsidies and committed spending on salaries and pensions under this head, revenue expenditure amounted to ₹10.63 trillion in the April-July period of FY24, constituting 30.4 per cent of the budgeted ₹35.03 trillion for the entire year. This was higher than the 28.7 per cent recorded in the corresponding period of the previous financial year.

The increase in subsidies in the first four months may be primarily attributed to pending payments from the previous year. Sen noted that any increase in subsidies this year could be rolled over to the next year.

Mahendra Dev, former director and chairman of the Indira Gandhi Institute of Development Research and former chairman of the Commission for Agricultural Costs & Prices, however, holds a different perspective on the question of inflation and populist schemes disrupting fiscal calculations.

"There is pressure on fiscal deficit due to giveaways by the Centre and states, and the combined deficit of both may be at risk. Unless, of course, there is a big cut in government expenditure, which is challenging in an election year," said Dev.

As far as the Centre is concerned, its fiscal deficit of ₹6.05 trillion in the first four months of the current financial year has already reached 33.9 per cent of the budgeted ₹17.87 trillion for the entire year.

This deficit is significantly wider than the 20.5 per cent recorded in the April-July period of 2022-23, primarily due to front-loading of capital expenditure, tax devolution, subdued corporation tax and excise duty collections, and slow disinvestment proceeds this time.

The government has projected its fiscal deficit to come down to 5.9 per cent of GDP in FY24, down from 6.4 per cent in the previous year. The deficit stood at 6.4 per cent in Q1 of FY24.



# Farm scientists told to identify novel genes in wild varieties

## **The Hindu Bureau**

HYDERABAD

Senior agricultural scientist and former Deputy Director General (crop sciences) of ICAR E.A. Siddiq has suggested the scientific community to identify genes that have not been identified so far in wild varieties of crops and study them for improving the productivity, particularly in paddy. Speaking at a meeting organised by Professor Jayashankar Telangana State Agricultural University (PJ TSAU) on “identification and utilisation of novel genes of value and relevance for improvement of crop varieties suiting future challenges to Indian

Agriculture” here on Saturday, he underscored the importance of unexplored genes from the wild varieties so that they could be utilised in the present day research programmes to improve productivity. He opined that the modern breeding techniques developed in the field of genetics would help better study of genes among the wild varieties having unique qualities and bring them to light for the benefit of mankind.

Former Director General of ICAR Trilochan Mohapatra praised the efforts of the agricultural scientists in bringing new initiatives such as 2-line breeding in hybrid rice and transgenic mustard helping in the de-

velopment of new hybrid varieties. However, there is a need to convince the legal system to further promote this kind of technologies with improved awareness and spreading the new techniques.

About 100 agricultural scientists from PJ TSAU, ANGRAU, ICAR, ICRISAT and other institutions participated in the five technical session held as part of the dialogue to improve crop productivity with the help of gene technology.

Former VC of PJ TSAU V. Praveen Rao, former Director of IOR Vishnuvardhan Reddy, Deepak Patel, Raghurami Reddy, Venkat Ramana, Sameer Kumar, Durga Rani were among those who participated.

# Framework soon to borrow from India to pay for imports in Re

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