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ACFI NEWSLETTER

MAY 2023

Food prices end year-long slide to stoke inflation risk

REUTERS
Rome, 5 May

The United Nations food agency's world price index rose in April for the first time is a year, but is still some 20 per cent down on a record high hit in March 2022 following Russia's invasion of Ukraine.

The Food and Agriculture Organization's (FAO) price index, which tracks the most globally traded food commodities, averaged 127.2 points last month against 126.5 for March, the agency said on Friday. The March reading was originally given as 126.9.

The Rome-based agency said the April rise reflected higher prices for sugar, meat and rice, which offset declines in the cereals, dairy and vegetable oil price indices.

"As economies recover from significant slowdowns, demand will increase, exerting upward pressure on food prices," said FAO Chief Economist Maximo Torero.

The sugar price index surged 17.6 per cent from March, hitting its highest level since October 2011. FAO said the rise was linked to concerns of tighter supplies following downward revisions to production forecasts for India and China, along with lower-than-earlier-expected outputs in Thailand and the European Union.

While the meat index rose 1.3 per cent month-on-month, dairy prices dipped 1.7 per cent, vegetable oil prices fell 1.3 per cent and the cereal price index shed 1.7 per cent, with a decline in world prices of all major grains outweighing an increase in rice prices.

"The increase in rice prices is extremely worrisome and it is essential that the Black Sea initiative is renewed to avoid any other spikes in wheat and maize," said Torero, referring to a deal to allow the export of Ukrainian grain via the Black Sea.

In a separate report on cereals supply and demand, the FAO forecast world wheat production in 2023 of 785 million tonnes, slightly below 2022 levels but nonetheless the second largest outturn on record. "(The) 2023/24 prospects for rice production along and south of the equator are mixed, largely due to the regionally varied impact of the La Nina event," FAO said.

A lst: Punjab thrust to 'chemical-free' basmati cultivation in Amritsar block famous for it

Yudhvir.Rana@timesgroup.com

Amritsar: In a first, the Punjab agriculture and farmers welfare department has taken an initiative to produce toxin-free basmati in the famous Chogawan block of Amritsar district, aiming to boost chemical-free, aromatic, long-grained rice having immense demand across the world. The department is also encouraging farmers to produce the crop and has recruited 365 'kisan mitras' (farmer friends) to motivate and educate farmers on basmati cultivation.

The pilot project has been launched in collaboration with the Punjab Agro Industries Corporation (PAIC), Amritsar chief agriculture officer Jatinder Singh Gill said. He said under the project, 10 agrochemical compounds (insecticide, pesticide, and fungicides) banned by Punjab Agricultual University wouldn't be

For representation

PILOT PROJECT

sprayed on basmati. "This is being done to avoid rejection of our basmati in the international market due to the presence of traces of these chemical compounds beyond the permissible limit, which causes huge loss of foreign exchange," Gill said, adding that Amritsar basmati, especially from Chogawan block, has immense demand in Middle East, Europe and America.

He said the department had shortlisted farmers who would be part of the pilot project.Chogawan has an edge over basmati grown in other areas, owing to its alluvial soil and climatic conditions due to its proximity to the Ravi river, the Amritsar CAO said.

The government's aim to encourage farmers to grow basmati is that it is transplanted in the first week of July, almost a month after the translation of paddy (parmal variety of rice) which will prevent the depletion of underground water due to the onset of monsoon. Farmers are being encouraged to cultivate Pusa Basmati 1121, Pusa Basmati 1718, Pusa Basmati 1509 and Punjab Basmati 7 varieties, which are purchased by private millers. Last year, Pusa 1121 was sold between Rs 3,500-4,000 per quintal, as against paddy which fetches around Rs 2,060 per quintal.

In all, 776 villages in Amritsar have around 1.08 lakh hectares under basmati cultivation, which the department aims to increase up to 1.4 lakh hectares this season.

Farmers of Majitha, Jandiala, Tarsikka, and a part of Attari block transplant Pusa Basmati 1509 early so that their farms are ready for sowing peas and potatoes after harvesting in September. Gill informed that they were in the process of recruiting 'kisan mitras' who would be between 45 and 60 years of age and have an experience in cultivation in at least 1or 2 acres of land. Kisan mitra's would be paid Rs 5,000 per month from May to November.

Two villages have been assigned to each kisan mitra, barring the villages having less than 100 acres of land and unpopulated villages in Ajnala and Chogawan blocks.

Govt taking measures to stop diversion & black marketing of fertilizers

STATESMAN NEWS SERVICE
NEW DELHI, 9 MAY

The government is taking multipronged measures for deterrence against any malpractices and ensuring quality fertilizers for the farmers.

These measures have resulted in averting the diversion and black marketing of fertilizers in the country.

Special teams of dedicated officers called Fertilizer Flying Squads (FFS) have been formed to keep a strict vigil and to check diversion, black marketing, hoarding and supply of sub-standard quality fertilizers across the country.

The Fertilizer Flying Squads have conducted over 370 surprise inspections across 15 states/UTs which included mixture units, Single Superphosphate (SSP) units and NPK (Nitrogen, Phosphorus, Potassium) units.

Consequentially, 30 FIRs have been registered for diversion of urea, and 70,000 bags have been seized of suspected urea (from Gujarat, Kerala, Haryana, Rajasthan, and Karnataka (excl. GSTN seizure). Of which 26199 bags have been disposed of as per FCO guidelines). The FFS has also inspected three border districts of Bihar (Araria, Purnia, W.Champaran) and 3 FIRs have been filed against urea diverting units; 10 including 3 mixture manufacturing units in border districts have been deauthorised.

A total of 112 mixture manufacturers have been deauthorised due to several discrepancies and lapses found in documentation and procedures. Sample testing has also been ramped up with 268 samples tested as of now, of which 89 (33%) have been declared sub-standard and 120 (45%) found with neem oil content.

For the first time, 11 persons have been jailed under the Prevention of Black Marketing and Maintenance of Supplies (PBM) Act for diversion and black marketing of urea in the last year. Several other legal and administrative proceedings have also been exercised by states through the Essential Commodities (EC) Act and Fertilizer Control Order (FCO).

These steps have resulted in keeping a check on the diversion of urea meant for farmers for agricultural purposes. Despite the world facing a fertilizer crisis due to various global downturns, the Government of India is providing urea to farmers at reasonably subsidised rates (a 45 kg bag of urea costing approx. Rs. 2,500 is being sold at Rs. 266). Besides agriculture, urea is also used in many other industries too, like UF resin/glue, plywood, resin, crockery, moulding powder, cattle feed, dairy, and industrial mining explosives. Any illegal diversion of this highly subsidized urea meant for the farmers and agriculture for non-agriculture/ industrial purposes by many private entities results in a shortage of urea meant for farmers.

Apart from these, new innovative practices are being encouraged, such as new mixture modules that have been developed in the Integrated Fertilize Management System (IFMS) by the Department of Fertilizers.

Nano fertilisers can reduce subsidies

UTTAM GUPTA

Nano fertilisers can yield better results but they can't perform miracles. For a substantial reduction in subsidy, the Govt must implement agri reforms

On April 26, 2023, Union Minister for Home and Cooperatives Amit Shah launched liquid nano-diammonium phosphate (nano-DAP) developed by the Nano Biotechnology Research Centre (NBRC) (Kalol) of Indian Farmers Fertiliser Cooperative (IFFCO). During the current fiscal, IFFCO plans to produce 50 million bottles (500 ml) of nano-DAP which will be scaled up to 180 million bottles by 2025-26. According to US Awasthi, Managing Director of IFFCO, by then imports of DAP might not be required; currently, India imports over 50 percent of its DAP requirement.

Earlier, on October 17, 2022, Prime Minister Narendra Modi launched liquid nano urea also developed by NBRC. IFFCO started its production on August 1, 2021, and produced 29 million bottles (500 ml) till March 31, 2022. The central government has also roped in public sector undertakings (PSUs) such as Rashtriya Chemicals and Fertilisers Ltd (RCF) to make it. During 2022-23, the total production of nano-urea was 50 million bottles of which IFFCO produced 27.5 million.

According to the Union Minister for Chemicals and Fertilisers Mansukh Mandaviya by 2024-25, India will be producing around 440 million bottles of nano urea and after 2025 India need not import urea as domestic production of conventional and nano liquid urea could be sufficient to meet domestic demand.

Urea imports decreased from 9.83 million tons in 2020-21 to 9.13 million tons during 2021-22 and further down to 7.48 million tons during 2022-23. Whether or not these can be brought down to zero by 2025, we can only wait and watch. As for DAP, these are early days as production has just started.

A tantalizing claim refers to the possibility of nano-fertilisers enabling the complete elimination of fertiliser subsidies. For a better understanding, let us look at some basics.

To make fertilisers affordable to farmers, the Centre controls the maximum retail price (MRP) of urea at a low level unrelated to the cost of production and distribution, which is higher. The excess cost over MRP is reimbursed to the manufacturer as a subsidy, which varies from unit to unit depending on its cost. For non-urea fertilisers, it fixes 'uniform' subsidies on a per-nutrient basis for all manufacturers and importers. Subsidy on every ton of fertilizer produced and sold multiplied by the total tonnage gives the total subsidy paid from the Union Budget.

Fertilizer subsidy went up from an already high of Rs 162,000 crore during 2021-22 to Rs 253,000 crore during 2022-23. The budget estimate (BE) for 2023-24 is Rs 179,000 crore (this reduced allocation is no consolation as invariably, the actual payment turns out to be higher than the BE; for instance, during 2022-23 the actual was more than double the BE of Rs 105,000 crore).

Nano urea is urea in the form of a nanoparticle containing nitrogen particles of 20–50 nanometres in size. It provides nitrogen to plants in liquid form as an alternative to conventional urea. A 500ml bottle of nano urea is equivalent to a 45kg bag of conventional urea. While the former is available to farmers for Rs 240 without any subsidy support, to supply the latter at the same price, the government has to give a subsidy of Rs 2410. If all of the conventional urea is replaced by nano–urea, the urea subsidy can be brought down to zero.

THE INNOVATOR ALSO CLAIMS THE EFFICIENCY OF NANO UREA IS OVER 80 PER CENT AGAINST AROUND 40 PER CENT FOR CONVENTIONAL STUFF

(The writer is a policy analyst)

Likewise, nano–DAP provides nitrogen and phosphate nutrients to plants in liquid form as an alternative to conventional DAP. A 500-ml bottle of nano-DAP is equivalent to a 50-kg bag of conventional DAP. While the former is available to farmers for Rs 600 without any subsidy support, the latter is made available at more than double this price or Rs 1,350 and that too with the government giving a subsidy of Rs 2650. If all conventional DAP is replaced by nano–DAP, DAP subsidy can be brought down to zero. Additionally, farmers will need to pay half of what they currently pay.

If a similar outcome is possible in the case of a third major fertilizer viz. muriate of potash (MoP) (currently IFFCO is working on nano-Potash as well besides micronutrients such as nano-Zinc, nano-Boron, etc), overall the government could save on the entire gargantuan payout on fertilizer subsidy. It seems to be too good to believe. There is something amiss. Take the case of urea. The basic material for making nano urea is none other than conventional urea. The former contains by weight 85 to 99.98 per cent of the latter, 0.01 to 5 per cent of quinhydrone, and 0.01 to 10 per cent of calcium cyanamide. The upper end of the range is 99.98 per cent, almost the entire raw material (even at the lower end 85 per cent, it is overwhelming) for making nano urea is conventional urea.

Then, how can the cost of producing the former at Rs 240 be a tiny fraction of the latter's cost at Rs 2650? This could be possible if only nano urea is mammoth times more efficient than conventional urea. To unravel this, let us look at the equivalence ratio between the two.

A 45kg bag of conventional urea contains 46 per cent nitrogen (N) nutrient or 20 kg (45×0.46), whereas a 500ml bottle of nano urea has 4 per cent 'N' or 20 grams (500x.04). In other words, urea in nano form with a mere 20 grams can achieve what conventional urea does with 20 kilograms. The former is 1000 times more efficient than the latter. If agriculture experts can demonstrate, this indeed is the case then India could be heading for a revolutionary transformation with zero fertilizer subsidy budget. But, that is daydreaming.

The innovator (read: IFFCO/NBRC) also claims the efficiency of nano urea is over 80 per cent against around 40 per cent for conventional stuff. Furthermore, nano urea increases crop yield by 3-16 per cent. Its use causes less soil, water and air pollution. These claims don't take us into a land of fantasy though the claim with efficiency gain is somewhat inflated.

Normally, urea is applied in two dosages: one, basal application being even spreading of solid fertilisers over the entire field before or at sowing or planting; two, top dressing which involves applying fertiliser directly to the leaves as opposed to in the soil. Nano urea is meant to replace conventional urea only in top dressing even as basal application is entirely in solid form.

This means that the benefit of 80 per cent efficiency (albeit of nano urea) will be available only on 50 per cent of the total quantity of fertiliser applied. Hence, the achievable effective efficiency would be 60 per cent (80×0.5 + 40×0.5). In other words, the efficiency gain with the use of nano urea would be only 20 per cent instead of 40 per cent as revealed by a plain reading of numbers.

This together with a yield increase of 3-16 per cent puts nano–urea in a vantage position; the same when used in conjunction with conventional urea will give promising results. Likewise, the substitution of conventional DAP by nano–DAP (according to Shah, replacement of up to 20 per cent in crops such as sugarcane and wheat is possible) can deliver gains in efficiency of use and increase in yield.

To conclude, nano fertilizers can yield better results but they can't perform miracles. For a 'substantial' and 'sustainable' reduction in subsidy, the government should implement long-pending reforms such as the removal of all controls on fertilisers and direct benefit transfer (DBT) of subsidy to farmers.

Godrej Agrovet launches PYNA brand of cotton herbicide

Our Bureau
Bengaluru

Godrej Agrovet Limited's (GAVL) crop protection business on Monday announced the launch of its umbrella brand PYNA for its selective cotton herbicide.

GAVL is the sole manufacturer of selective cotton herbicide — pyrithiobac sodium — and has three weed management products for cotton — Hitweed, Hitweed Maxx, and Maxxcott — which will be sold under the PYNA brand.

CUTTING DEPENDENCY

GAVL also said it will be extending the PYNA brand logo to co-marketers such as Bayer CropScience, Rallis India, Dhanuka Agritech, PI Industries and Indofil Industries among others, who have their own products based on the active ingredient pyrithiobac sodium sold under the umbrella brand. Easy and safe to use, PYNA brand products aid farmers reduce dependency on manual and mechanical methods of weed control too, the company said in a statement.

Rajavelu NK, CEO, Crop Protection Business, GAVL, said, "Globally, India has the largest area under cotton cultivation. However, with only 10 per cent of the total cotton acreage area treated properly, it has not only impacted the productivity but also farmers' profitability. Hence in order to enable sustainable cotton production, we are happy to bring our 3-marquee offerings under PYNA brand."

"In order to ensure quality supply to farmers every time, we are excited to partner with co-marketers to leverage PYNA brand. The same will allow them to leverage the trust that Godrej brand has earned amongst the farmers in the last 36 years and collectively tap 90 per cent untapped cotton acreage,"Rajavelu added.

EXCLUSIVE

GAVL is the sole manufacturer of selective cotton herbicide — pyrithiobac sodium

HERBICIDE USAGE

Further, Rajavelu said the use of herbicides has picked up with the growing labour shortage and rising costs. The cotton crop grows at a slow pace during the initial stages. Additionally, due to wider spacing between crops, weeds impact the cotton yield by up to 45-50 per cent. With PYNA brands providing a broad window of weed management options from seed sowing to the active flowering stage of crop, farmers can now get a longer duration of the weed-free crop. PYNA brands minimise the crop–weed competition and helps to establish the cotton crop in the early stages, which directly has a positive impact on the yield, the company said.

GAVL, Rajavelu said, was the first company to introduce post-emergent selective cotton herbicide, Hitweed, in 2007. Witnessing the need to protect the cotton crop during the early post-emergent phase viz. 7-15 DAS, it launched Hitweed Maxx in 2019 which enabled farmers to get superior crop safety and better efficacy. In 2023, the company launched Maxxcott — a pre-emergent herbicide eliminates growth of major weeds in cotton, ensures good growth of cotton seedlings and reduces further spread of major weeds.

SUBSIDY AMOUNT TOUCHED ₹2.52 TRILLION LAST FISCAL

Direct transfer for fertiliser subsidy unlikely in FY24

States showing hesitation in approving policy

SANDIP DAS
New Delhi, May 11

THE UNION GOVERNMENT is unlikely to roll out direct benefit transfer scheme for fertiliser subsidies this fiscal due to reluctance shown by states.

Sources told FE the idea of direct cash transfer was objected to, as under that model, the farmers would have to pay a substantial amount upfront for buying fertilisers prior to the actual subsidy amount being transferred to their bank accounts.

The farmers' inability to pay for the soil nutrients at market rates upfront before subsidies are transferred to beneficiaries' bank accounts is the main factor behind the state governments' hesitation in approving the policy.

"Subsidy component of the fertiliser sold is quite high while the farmers' ability to buy fertilisers at actual market rate is limited," an official said. Out of 140 million farmers in the country, around 78% have small holding of less than two hectare. Under the proposed pilot project for a modified scheme for direct benefits transfer to farmers where sales of subsidised fertilisers to farmers was to be capped, taking into consideration their land holdings has not made much progress. In case of urea, farmers pay a fixed price of ₹266 per bag (45 kg) against the cost of production of around ₹2,550 per bag. The balance is provided by the government as a subsidy to fertiliser units.

The retail prices of phosphatic and potassic (P&K) fertiliser, including Di-ammonium Phosphate (DAP) were 'decontrolled' in 2020 with the introduction of a 'fixed-subsidy' regime as part of Nutrient Based Subsidy mechanism announced by the government twice in a year.

ROLLOUT DELAYED

- The DBT plan is stuck due to farmers' inability to pay for fertilisers at market rates upfront before subsidies are sent to their accounts
- Currently, sale of all subsidised fertilisers is made through 0.26 mn point of sale devices

AS EU'S CARBON BORDER ADJUSTMENT MECHANISM KICKS IN FROM OCT...

India to Push EU Carbon Tariff Waiver for MSMEs

To seek mutual recognition of its carbon certificates with the bloc

Our Bureau

New Delhi: India will push for mutual recognition of its carbon certificates with the EU and carve outs for its micro, small and medium enterprises (MSME) with the bloc's Carbon Border Adjustment Mechanism (CBAM) kicking in from October.

In a meeting chaired by the chief economic adviser V Anantha Nageswaran and commerce secretary Sunil Barthwal on Tuesday, the government also asked industry to be prepared for the new system. Officials from ministries of finance, power and environment and industry representatives attended the meeting.

From October, domestic companies from seven carbon-intensive sectors including steel, cement, fertiliser, aluminium, and hydrocarbon products would have to seek certificates from the EU authorities to comply with the CBAM norms.

Clean Pitch

EU's Carbon Border Adjustment Mechanism (CBAM) to hit India's steel, cement, aluminium, fertilizer industry

ISSUES DISCUSSED AT GOVT, INDUSTRY MEET ON TUES

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

India to take up issue with EU at Trade and Technology Council meet next week

India has asked the EU to recognise its Carbon Credit Trading Scheme (CCTS) being finalised by the power ministry.

While the CBAM has no exemptions for MSMEs, India will seek carve outs as around 40-45% of the affected companies in these sectors are MSMEs. They had exemptions in the EU's earlier Emission Trading System.

"We have to have carbon auditors. India is dealing with the issue both at bilateral and multilateral levels to ensure that our industry doesn't get hurt," said an official.

"Bilaterally, we are asking the EU to have a mutual recognition agreement and give a carve out for MSMEs," the official said.

As per the official, India is also likely to raise these issues in the upcoming meeting of India-EU Trade and Technology Council (TTC) in Brussels on May 15-16, where commerce and industry minister Piyush Goyal, external affairs minister S Jaishankar and minister for railways, communications, electronics and information technology Ashwini Vaishnaw would participate.

'India committed to sharing best practices in agriculture sector with other nations'

STATESMAN NEWS SERVICE
NEW DELHI, 12 MAY

India today declared its firm commitment to continue to share its best practices and build capacities with other countries in the agriculture sector, bilaterally as well as in collaboration with international organisations, so that they too become self-reliant and food secure nations.

"The welfare of the farmers and overall development of the agriculture sector has been the top priority of the Government of India," Union Agriculture and Farmers Welfare Minister Narendra Singh Tomar said.

He was chairing the eighth meeting of agriculture ministers of Shanghai Cooperation Organization (SCO) member countries held through video conferencing. Russia, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, China and Pakistan participated in it.

The SCO countries adopted the Smart Agriculture project. Expressing satisfaction over the smart agriculture action plan and the initiative of innovation in agriculture, Tomar said that Prime Minister Narendra Modi's emphasis was on the overall development of agriculture in the country through technology. In this direction, India has taken several concrete steps to promote smart agriculture.

The Indian minister said that over the years, India has performed well in the agriculture sector, contributing to global food security with food grain production, registering a significant growth in exports, and exports of agricultural and allied products have crossed Rs four lakh crore.

Tomar said that India's public distribution system and price support system for farmers was unique in the world. "It is the good result of the foresight of our policy-makers, efficiency of agricultural scientists and tireless hard work of farmers that today India was self-sufficient in food grains. India was a leading producer of many commodities like cereals, fruits, vegetables, milk, eggs, and fish.

He said the rich agricultural research has played an important role in solving the issue of food security, improving the income of farmers and agriculture workers and also for the sustenance of the people. Efforts were being made by the Government of India to make the country self-reliant in the agriculture sector with concerted efforts in innovation, digital agriculture, climate-smart technologies, development of high-yielding, biofortified varieties, and agricultural research. Efforts were also being made to improve the life and livelihood of the farmers by making their agriculture sustainable and friendly.

Organic fertilizer lab inaugurated

The Hindu Bureau
THIRUVANANTHAPURAM

Agriculture Minister P. Prasad on Wednesday inaugurated a referral laboratory for testing the quality of organic fertilizers at the Soil Science Department of the College of Agriculture, Vellayani.

The lab is equipped to test organic fertilizers, determine their quality and extent of adulteration. The lab also has facilities to test the quality of water used for irrigation. The facility, established at a cost of ₹2.79 crore, will benefit farmers, manufacturers, researchers and the student community, the government said.

Mr. Prasad also inaugurated a quality testing lab for honey and a central instrumentation facility centre at the college.

The honey testing lab has been set up with a financial assistance of ₹2.65 crore under the Rashtriya Krishi Vikas Yojana (RKVY).

Kalliyoor grama panchayat president K.K. Chandhukrishna presided.

Bayer CropScience Q4 profit up 4% at ₹159 cr

BAYER CROPSCIENCE ON THURSDAY reported 3.79% increase in net profit at ₹158.5 crore for the March quarter, as against ₹152.7 crore in the year-ago period. PTI

Dhanuka Group plans to invest in more agri start-ups

Our Bureau
New Delhi

Agro-chemical firm Dhanuka Agritech has said it is open to invest in more start-ups to support young entrepreneurs in the agriculture sector after making investments in two firms, including ₹30 crore in Gurugram-based agri drone manufacturer IoTechWorld Avigation for a minority stake in 2021.

"There are many young entrepreneurs who have great products and technologies. We are ready to support them," Dhanuka group chairman RG Agarwal said on Wednesday. The company will invest in more such start-ups if it finds right opportunity, he said.

Agarwal said IoTechWorld has a lot of orders booked as drones are now increasingly being used in the agriculture sector for spraying pesticides and other activities. The other start-up where Dhanuka has invested makes IoT- and AI-based equipments for farm sector like soil sensor, he said.

MAJOR CHALLENGES

Making a pitch for the integration of technological advancements, such as artificial intelligence, with the farm sector, he said, "These technologies can help in identifying crop diseases and pests attack in advance, as well as assist in the efficient use of fertilizers and water management. With the help of these technologies, farmers can make informed decisions based on real-time data and plan their crops better."

He said the supply of spurious pesticides is one of the major challenges in the agrochemical sector as it hurts interests of both farmers and manufacturers. Dhanuka has already adopted QR code on all its products to check the menace of sales of spurious products in the par-

DIVERSION OF SUBSIDISED UREA

Ministry cracks down on spurious fertiliser rackets

Illegal units raided across 15 states, 70,000 bags seized

SANDIP DAS
New Delhi, May 9

TO CURB DIVERSION of highly subsidised urea for industrial use and manufacturing of spurious products, the fertiliser ministry's flying squads recently conducted 370 surprise inspections across 15 states and Union Territories which covered units manufacturing soil nutrient varieties such single superphosphate (SSP) and NPK (nitrogen, phosphorus, potassium).

Fertiliser minister Mansukh Mandaviya on Tuesday said after inspection of 220 units which manufacture mixed fertilisers, 112 units have been ordered shut.

During inspection of 130 urea manufacturing units, the products of 120 were found to have neem oil content which is not permissible, Mandaviya said.

As per a government stipulation only subsidised agricultural grade urea is allowed to contain neem. The government has directed units to ensure 100% neem coating on all subsidised agricultural grade urea in the country since 2015.

Networks involved in illegal manufacturing of fertilisers were busted in various states including Gujarat, Haryana, Rajasthan, Karnataka, Tamil Nadu, Bihar and Maharashtra

The fertiliser ministry has registered 30 FIRs for diversion of urea, and 70,000 bags have been seized in Gujarat, Kerala, Haryana, Rajasthan and Karnataka.

"Any illegal diversion of this highly subsidised urea meant for the farmers and agriculture for non-agriculture/ industrial purpose by many private entities results in shortage of urea meant for farmers," according to a fertiliser ministry note.

In case of urea, farmers pay a fixed price of ₹266 per bag (45 kg) against the cost of production of around ₹2,550 per bag. The balance is provided by the government as a subsidy to fertiliser units.

FLYING SQUADS IN ACTION

- To curb diversion of highly subsidised urea for industrial use, fertiliser ministry's flying squads conducted 370 surprise inspections
- After inspection of 220 units which manufacture mixed fertilisers, 112 units were ordered shut for lapses; 30 FIRs were filed for diversion of urea

Mixed trend in summer sowing

GAINS & LOSSES. Acreage under paddy and oilseeds lower, but coverage of pulses and coarse cereals up

Our Bureau
Bengaluru

Pulses such as green gram (moong) and coarse cereals such as bajra and jowar continued to gain acreage in the ongoing summer cropping season. However, paddy and oilseeds acreage trail last year's levels, so far.

Overall, the area under the summer crops is marginally lower at 69.20 lakh hectares (lh) as of May 12 compared with 70.39 lh in the same period a year ago, latest data from Agriculture Ministry show.

The area under pulses crop stood higher at 19.61 lh, an increase of 6.3 per cent over 18.44 lh a year ago. Farmers are seen planting more area under green gram as the acreage was 16.14 lh against 14.97 lh a year ago. The area planted under urad was marginally up at 3.24 lh (3.20 lh in same period a year ago).

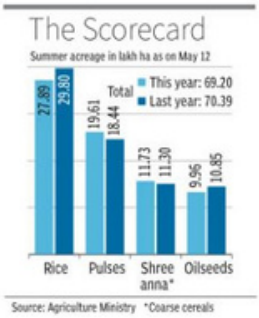
COARSE CEREALS

The overall area under coarse cereals was up at 11.73 lh (11.30 lh). The area under bajra is up at 4.69 lh (3.98 lh), marginally lower at 6.65 lh (6.94 lh).

Jowar acreage was marginally higher at 0.25 lh (0.18 lh), while ragi was lower at 0.14 lh (0.20 lh).

The acreage under paddy as on May 12 was lower at 27.89 lh against 29.80 lh a year ago. The overall acreage under oilseeds crops also trailed at 9.96 lh against 10.85 lh a year ago. The area under groundnut was down at 4.78 lh (5.35 lh), while sunflower was flat at 0.31 lh.

The area under sesamum was higher at 4.58 lh (4.47 lh). The acreage under other oilseeds was down at 0.29 lh (0.73 lh).



PRE-MONSOON RAINS

As of May 4, the live storage of 178.19 billion cubic metres (35 per cent) of the total live capacity of 178.19 BCM.

Meanwhile, the country as a whole has received 24 per cent more rainfall in the pre-monsoon, so far. From March 1 till May 12, the country has received 111.9 mm of rains against a normal 90.2 mm, as per IMD data.

At least 21 sub-divisions accounting for 69 per cent of the country's area, have received excess rains, so far. Nine sub-divisions accounting for 22 per cent of the area have received normal to excess rains, while six sub divisions, accounting for 9 per cent of the area, have received deficient rains.

Summer sowing in the country is known as *zaid* season, which is normally between the rabi harvest and

Integrate AI, drones with farm sector to increase farmers' income: Dhanuka Chairman

PNS ■ NEW DELHI

Dhanuka Group chairman RG Agarwal made a strong pitch for the integration of technological advancements, such as drones and artificial intelligence, with the agriculture sector to enhance crop yield, reduce costs, and ultimately improve the income of farmers. The Dhanuka Group is a prominent player in the agrochemical industry, with a mission to empower farmers by providing them with innovative solutions. Addressing a press conference here, Mr. Agarwal said drones and artificial intelligence are two of the most promising technologies that can revolutionize the agriculture industry.

Drones have already been used in the agriculture sector for spraying pesticides and other activities, but they can be promoted on a larger scale through public-private partnerships. We are also supplying the first drones approved by DGCA for use in agriculture as well as spray services, he said.

He said the implementation of advanced technologies like drones and artificial intelligence will enable farmers to compete more effectively in the global market while improving the efficiency of their farming operations.

Govt expects EU carbon tax to hurt only 1.8% of exports

Experts say Indian exporters may have to incur additional costs after the tax comes into effect

Ravi Dutta Mishra
ravi.dutt@livemint.com
NEW DELHI

The world's first carbon tax, approved by the European Parliament last month, could impact no more than 1.8% or $8 billion of India's exports, according to an internal assessment by the commerce ministry.

After being passed by lawmakers of the 27-nation bloc, the Carbon Border Adjustment Mechanism (CBAM) Bill is expected to come into force this month, empowering the bloc to charge a Carbon Border Tax (CBT) on imports of steel, aluminium, fertilizer, electricity, cement and hydrogen from January 2026.

"Of the five products in CBAM, cement, fertilizer and electricity exports to the EU are nil. And if you look at steel and aluminium, the exports are not more than 1.8% of the total exports. It is a small portion but it is a concern. But while it is a challenge for the industry it is also an opportunity (for greening the Indian manufacturing process)," a government official said.

In 2021, steel exports at $4.1 billion, and aluminium $2.7 billion were India's 5th and 7th largest exports to the EU

The carbon tax could be inflationary for Europe. BLOOMBERG

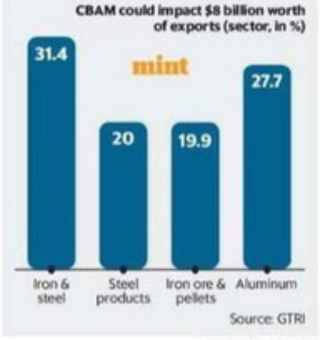
However, experts said Indian exporters may have to incur additional costs after the tax comes into effect.

Sangeeta Godbole, a former revenue officer who was part of the Indian team negotiating the India-EU free trade deal, cautioned that exporters and exporting countries will have to bear an "extremely complicated" verification bureaucracy, while compliance costs will be a substantial additional burden

$83.3 bn
Given in 2020 as climate finance by rich nations

Climate ripples

In 2021, steel exports at $4.1 billion were India's 5th largest exports to the EU



SATISH KUMAR/MINT

is built on a similar exercise which the EU attempted in the civil aviation sector in 2012. Verifiers are instructed to carry out verification with an attitude of 'professional scepticism'," Godbole said.

Just the basic information required by the EU runs into 26 columns, including how emissions are attributable to heating, cooling and manufacturing among others processes, she added.

26
No of columns to fill in for basic EU verification

target is for 2050, compared with India's 2070.

"Everyone is moving according to their own domestic condition. What the EU's carbon tax does is that it says that Europe will not take into account domestic situations in other economies. And that is a concern," the official added.

As per a Reserve Bank report, India's contribution to global emissions of green house gases has been limited, although it increased between two four-decade periods: 1950-1990 and 1991-2020.

Its share of consumption-based emissions is, however, significantly lower than production-based emissions vis-à-vis major developed countries.

"Implementation of various climate finance commitments from advanced economies has been far from satisfactory. The extent of green financing for climate change adaptation has been about 5-10 times lower than required, and the gap between the required and actual has only grown," RBI observed.

As against $100 billion per year pledged by advanced economies, an amount of only $83.3 billion was provided in 2020, and that was an increase of just 4% from 2019, the report added. While

Policies must prioritise water-food-energy triad

The development and implementation of climate-smart farm practices, including conservation tillage, improved cultivars and plant breeding technologies, innovative irrigation & water management methods such as micro-irrigation, and integrated nutrient management practices can help in minimising the impact of climate change on agriculture and vice versa. We need incentive-based policies and technological innovations for the sake of water and food security of an ever-growing population.

Surinder Kukal and Ramesh Kanwar

CLIMATE change is one of the key challenges agriculture is facing, especially in the north-west plains comprising Punjab, Haryana and western Uttar Pradesh. The major reasons for higher annual temperatures, coupled with highly irregular and intense rainstorms, are industrialisation, deforestation, increased use of fossil fuels and population growth. The decreased wheat productivity due to abnormally high February-March temperatures in 2022 and untimely rain in 2023 are the most recent examples of climate chaos in the region. The increasing water scarcity presents its own challenges, including competing demands for use in farming, industrial and domestic sectors. Groundwater is the primary source of irrigation and drinking water for more than 80% of Punjab's population. The impact of climate change on the quantity and quality of groundwater is huge. Irregular rainfall distribution in recent years, with frequent dry spells even in otherwise normal rainfall years, has put additional burden on groundwater in the state. The prolonged dry spells during the monsoon have shown an increasing trend during the past decade, thereby leading to increased extraction of groundwater to meet the irrigation demand.

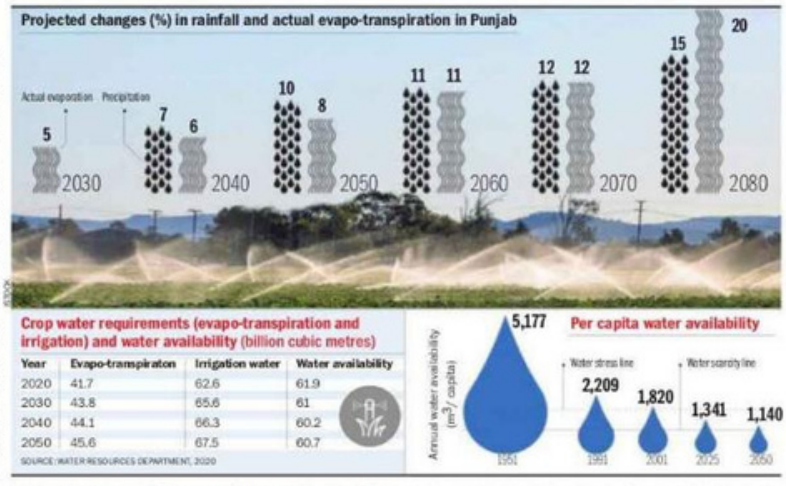
We need incentive-based policies and technological innovations to mitigate the impact of climate change on water and food security of an ever-growing population. We must take action now to develop, strengthen and sustain resilience in water and food production and distribution systems to meet the future demand of water for irrigation.

Climate change is posing a serious threat to the agricultural production system in Punjab. Lower minimum temperatures, relative humidity, rainfall and number of rainy days during the reproductive growth period of the wheat crop during February and March have been found favourable for higher grain yield. The minimum and maximum temperatures in Punjab are increasing. The seasonal minimum temperature variability and year-to-year variations put Punjab in the high-risk zone for heat stress in crop production. Rising temperatures could reduce wheat yields by 10-28% because of heat stress. The situation is similarly worrisome in Haryana.

Here are some policy measures for climate-resilient agriculture:

- The development and implementation of climate-smart agricultural practices, including conservation tillage, improved cultivars and plant breeding technologies, innovative irrigation and water management methods such as micro-irrigation, and integrated nutrient management practices can help in minimising the impact of climate change on agriculture and vice versa.
- On-farm management systems (timely planting of crops, reduced dependence on groundwater for irrigation, integrated nutrient and pest management, minimum tillage and crop rotation for carbon sequestration and improved soil health) and resource conservation technologies should be part of future farming systems.
- Research organisations must spearhead projects on the effects of climate change on water harvesting, runoff management and groundwater recharge. They should prepare a block-level water budget for Punjab and recommend incentive-based policies for water use and water conservation.
- Greater research on efficient animal and crop production systems in response to climate change is required so that the farmers can be educated about the use of climate-smart farming practices in an environment-friendly manner and keeping their farms economically viable to meet future food needs of the country. Research must focus on optimising the input use in agriculture, especially energy, water and nutrients, and developing incentive-based adaptive policies to sustain natural resources. For this purpose, we need to frame crop-specific integrated pest, nutrient and water management modules.
- Research also needs to move towards measuring greenhouse gas (GHG) emissions from agriculture and recommending farm practices that minimise GHG emissions, improve soil health and increase productivity. Elevated CO_2 emissions from agriculture and increasing temperatures should become focus areas of research.
- A policy shift towards shunning populist schemes such as free electricity to the agricultural sector needs to be discussed among various stakeholders. Such freebies could be replaced with productive incentives in the form of crop insurance, water conservation, produce storage facilities, etc.
- Farming needs to be protected from climate-related risks. The government-funded crop insurance programme needs to be implemented to cover risks to farmers from climate-related extreme weather changes such as wet and dry cycles, and extreme temperature and rainfall variations during growing seasons. The cost of crop insurance can also be funded from the tax farmers are already paying in grain markets.

Climate change can imperil food and water security. Researchers and policy-makers need to work together to develop innovative technologies, best management systems and adaptable policies to mitigate the effects of climate change and also sustain water resources.



Crop water requirements (evapo-transpiration and irrigation) and water availability (billion cubic metres)

Year	Evapo-transpiraton	Irrigation water	Water availability
2020	41.7	62.6	61.9
2030	43.8	65.6	61
2040	44.1	66.3	60.2
2050	45.6	67.5	60.7

SOURCE: WATER RESOURCES DEPARTMENT, 2020

Kukal is Member, Punjab Water Regulation & Development Authority; Kanwar is Distinguished Professor, Water Resources Engg, Iowa State University, US

IIT Mandi team to turn agriculture residue, paper waste to useful chemicals

HANS NEWS SERVICE
MANDI

RESEARCHERS at the Indian Institute of Technology Mandi have identified microbial pairs that can effectively convert cellulose - a major component present in agriculture residue and paper waste - into useful chemicals, biofuels, and carbon suitable for several industrial applications.

Plant dry matter, also known as lignocellulose, is one of the most abundant renewable materials on Earth. Lignocellulosic waste from agriculture, forests, and industries can be converted into valuable chemicals such as bioethanol, biodiesel, lactic acid, and fatty acids using a process called bioprocessing.

Bioprocessing, however, involves multiple steps and can release undesirable chemicals, requiring multiple washing and separation steps, which increases costs.

Scientists are exploring an innovative method called consolidated bioprocessing (CBP) to convert lignocellulosic biomass into useful chemicals.

This method involves combining saccharification - the conversion of the cellulose into simple sugars - and fermentation - the conversion of simple sugars into alcohol - into one step. One way to achieve this is by using a synthetic microbial consortium (SynCONS).

SynCONS are a combination of different microorganisms; in this case, two types of microbes are selected, one brings about saccharification and the other, fermentation.

A combination of microbes that is stable at high temperatures (thermophilic consortia) is particularly useful because fermentation is a heat-releasing process.

IIT Mandi scientists studied two SynCONS systems for a cellulose processing process that was followed by pyrolysis. Pyrolysis, a method that decomposes organic materials by heating them above 500 degrees Celsius in the absence of oxygen, was integrated with microbial bioprocessing.

Pyrolysis converts the unreacted raw materials and side-products formed into useful carbon. Pyrolysis also destroys the microbes after their work is done, which eliminates the need for safe disposal.

"We analysed multiple microbes to create SynCONS that could convert cellulose to ethanol and lactate. We developed two SynCONS - a fungal-bacterial pair and a thermophilic bacterial-bacterial pair - both of which exhibited effective cellulose degradation with total yields of 9 per cent and 23 per cent, respectively. After pyrolysis of the remnant biomass, we obtained a carbon material with desirable physicochemical properties," said Dr Shyam Kumar Masakapalli, IIT Mandi, in a statement.

The researchers obtained even higher ethanol yields (33 per cent) with the thermophilic SynCONS by including another engineered fermentative partner. The co-use of cellulose-acting enzymes (cellulases) for saccharification resulted in a 51 per cent yield of ethanol.

"The microbial consortia designed can be adopted for bioprocessing of cellulose to valuables such as industrial enzymes like cellulase, ethanol, and lactate. Once scaled up, this process can sustainably generate bioethanol and other green chemicals in bioreactors. The carbon obtained after pyrolysis can be used in a range of applications such as water filtration and electrodes," added Dr Swati Sharma, IIT Mandi.

We analysed multiple microbes to create SynCONS that could convert cellulose to ethanol and lactate. We developed two SynCONS - a fungal-bacterial pair and a thermophilic bacterial-bacterial pair - both of which exhibited effective cellulose degradation with total yields of 9 per cent and 23 per cent, respectively. After pyrolysis of the remnant biomass, we obtained a carbon material with desirable physicochemical properties

Govt flip-flop over banning pesticides

UTTAM GUPTA

The Union Government has reversed its earlier decision on 27 pesticides, which were banned in May 2020

The manufacturing, import, sale, distribution and use of pesticides are regulated under the Insecticides Act (1968) with a view to preventing risk to human beings or animals and for matters connected therewith. The Registration Committee (RC) - set up under the Act - registers every pesticide after scrutinising the formula, verifying claims of efficacy and safety to human beings and animals and specifying the precautions against poisoning and any other functions. It is empowered to refuse registration of any pesticide if issues pertaining to safety have not been satisfactorily adhered to.

From time to time, the Ministry of Agriculture and Farmers' Welfare (MoA&FW) — the nodal Ministry for the regulation of pesticides — orders a review of the registered pesticides with particular reference to the risk these pose to human beings, animals and the environment. Based on examination by a committee of experts, it arrives at an appropriate decision on "whether to allow their continued usage (with additional precautions, if any) or prohibit their use completely."

In July 2013, the MoA&FW set up an expert committee under Anupam Verma to study the continued use or otherwise of a total of 66 pesticides, which are banned in two or more other countries, but continue to be registered for use in India. The committee submitted its report in November 2015.

In December 2015, the Government accepted the report and based on its recommendations, ordered a review of 27 pesticides (including 12 insecticides, eight fungicides and seven herbicides, comprising almost 130 formulations) to be completed by 2018. Till the completion of recommended studies and the review, it allowed continued usage of the 27 pesticides.

In December 2016, it issued a draft ban order on 27 pesticides seeking public feedback. During 2017-18, it constituted two more committees to look at public feedback on the draft order. Meanwhile, in December 2019, the RC set up another committee (this was a 'sub-committee') to review the proposed ban on 27 pesticides. In May 2020, the RC accepted the recommendations of this sub-committee and sent it to the MoA&FW for taking a final decision.

> THE SC MAY HAVE PUT A BRAKE ON THE GOVERNMENT'S DIFFERENT STROKES NOW. BUT, EVERY BIT OF DELAY IN TAKING THESE PESTICIDES OFF FARMERS' FIELDS WOULD MEAN CONTINUED DAMAGE TO HUMAN AND ANIMAL HEALTH AND THE ENVIRONMENT

(The Writer is a Policy Analyst)

In a gazette notification issued on May 14, 2020, the MoA&FW issued a draft order intended to ban the manufacture, usage and storage of these 27 pesticides and sought comments or suggestions from stakeholders over 45 days.

The notification said: "Sixty-six insecticides, which are banned or restricted or withdrawn in other countries but continue to be registered for domestic use in India, were reviewed by an expert committee set up by the MoA&FW. The Ministry considered recommendations of this committee and recognised that use of 27 insecticides is likely to involve risk to human beings and animals as to render it expedient or necessary to take immediate action". It also mentioned the names of the pesticides proposed to be banned.

At the same time, the ministry also set up another panel under the chairmanship of TP Rajendran, former assistant director general of the Indian Council of Agriculture Research (ICAR), and a well-known expert in the field. Based on the recommendations of this panel, on February 15, 2023, the Union Government came out with a Draft notification seeking to lift the ban on 24 out of the 27 pesticides which were banned as per its earlier order.

The February 15, 2023 order was challenged by Civil society groups in the Supreme Court (SC) which will take up the matter after the summer vacation. Meanwhile, the Centre has submitted an affidavit saying this was "merely a proposal and has not attained finality". A spate of committees to deliberate on a given subject matter by itself looks weird. Apart, a number of anomalies can be seen in the manner it was handled.

First, as per the decision on the Anupam Verma committee report taken in December 2015, the government needed to wait for the 'completion of recommended studies and the review' by 2018. Only thereafter, it could decide what to do with the 27 pesticides. Then, how come it issued a draft ban order before that i.e. in December 2016? It was seeking public comments and set up committees (albeit two) to examine those comments on something it couldn't have made up its mind as the study reports weren't available.

Second, instead of taking the Anupam Verma committee report to its logical end, in December 2019, another sub-committee was set up (this time by the RC) and based on its recommendation, the government issued a draft order on May 14, 2020, banning all the 27 pesticides. If, the intention was to go by the latter then why did it spend so much time and energy on the former?

Third, the government had no intention of even staying with this decision as alongside it set up another committee (read: TP Rajendran). Based on its recommendations, on February 15, 2023, it has come up with another draft notification that reverses its May 14, 2020. ALAS! even this is not final.

Going by what it has stated in the affidavit submitted to the SC it is just a proposal on which feedback from all stakeholders concerned has been taken; that is "to be reviewed by the central government in consultation with the RC, considering all aspects related to technical and scientific requirements, substitutes available, farmer's interest, safety of the pesticides, toxicity and efficacy concerns, updated status of required study and submission of data in compliance to recommendations of the various expert committees, etc.", and a final decision will be taken accordingly.

Pesticides are hazardous substances with the potential of damaging impact on human health and the environment. If, following a review based on scientific studies, it is concluded that any pesticide is harmful then the government must not delay a decision on its withdrawal. The RC sub-committee had indeed found some of the above pesticides have severe health effects viz. hormonal changes, neuro-toxic effects, reproductive and developmental health effects, carcinogenic effects as well as environmental impacts such as toxicity for bees.

For others, adequate data needed for regulatory purposes are not available. There are 17 pesticides in this category also referred to as "deemed to be registered pesticides" in the country. These were in use before the Insecticides Act (1968) came into force. The concerned companies were required to generate the required data to convincingly demonstrate their safety and efficacy to the regulator. But, that hasn't been done to date. Thus, there was a strong case for banning all 27 pesticides. This is precisely what May 14, 2020, did.

The volte-face now to let 24 remain in use (the decision to ban the other three pesticides is inconsequential as the manufacturers are no longer making them) is untenable. Dr Rajendran's argument that "all chemicals and pesticides including the toothpaste we use is harmful for human health. What matters is the dosage, the formulation composition and the way humans have been asked to use the product" is generic; it can't be a credible basis for arriving at the decision.

Farmers flag crop loss risk if 27 pesticides banned

Panel also says farmers were apprehensive of availability of alternative pesticides

SANJEEB MUKHERJEE
New Delhi, 14 May

The T P Rajendran committee, constituted by the Centre to study the vexed issue of banning 27 popular pesticides, has said of the 1,135 responses it received from various stakeholders, around 55 per cent were from the farming community and they expressed concern over the possible loss to their crops if the pesticides are withdrawn from the market.

The panel, on whose recommendation the government is believed to have "watered" down its May 2020 draft gazette notification banning popular pesticides, reducing the number of proscribed ones from 27 to three, said farmer groups with which the panel and its members interacted emphasised the cost-effective protection these 27 pesticide-based formulations gave over several decades.

The panel was constituted in January 2021 to study all the aspects related to the safety, toxicity, efficacy, the updated status of data, etc of the 27 pesticides.

The panel was initially given three months to submit its findings but it got more time due to the pandemic.

The pesticides were recommended to be banned because they were perceived to be hazardous to human health.

Meanwhile, the farmers, according to the panel, were apprehensive of the availability of alternative pesticides, which were found to be costlier than the banned ones.

Some farmers were of the view that the pesticides caused no adverse health problems, said the panel's report, which was recently submitted to the Supreme Court as part of an affidavit by the Centre.

Also, in the affidavit the Centre told the Supreme Court the proposal to lift the ban on 24 of the 27 pesticides "has not attained finality".

The panel in its findings said the quantity of crops saved from pest damage because of the use of the pesticides was "overwhelming" as against the adversities to crop pollination apprehended.

The expert panel was constituted by the government to study all aspects related to safety and toxicity of the 27 proposed-to-be-banned pesticides

The 693 farmer groups and individuals who made representation to the panel included representatives from the All India Farmers Association, Young Farmers Association of Punjab, and Pineapple Farmers' Association.

The panel said from the government side, the Ministry of Chemicals favoured lifting the ban on the grounds that the pesticides industry had made substantive investments in plants and machinery to manufacture these pesticides and many of these were micro, small, and medium enterprises.

"The closure of these units due to the ban will put the agro-chemical industry in jeopardy," the panel said, quoting the responses from the Ministry of Chemicals.

The food ministry, according to the panel's report, said banning pesticides such as Malathion and Deltamethrin could make foodgrain storage in the country vulnerable to pests and losses.

The Department of Commerce, quoting industry players, highlighted the adverse impact of banning the pesticides on exports. Of the annual pesticide export worth around ₹27,000 crore, the share of the 27 pesticides was ₹8,000-10,000 crore.

The Rajendran panel said several trade bodies like the Coffee Board, Tea Board, and United Planters Association and even some state governments did not favour continuing with the blanket ban.

Upgrading the quality of agricultural higher education in India

Agricultural universities need to attract the best talent with the promise of jobs, writes RC Agrawal

Blended learning, which combines face-to-face teaching with online classes, can help agricultural universities overcome resource constraints while providing high-quality and relevant agricultural education to meet the demands of the market and serve the objectives of the nation.

For the Indian Council of Agricultural Research (ICAR), which is tasked with setting the curriculum and maintaining the standards of agricultural higher education, the pandemic was an accelerator, not the driver of blended learning. Under the National Agricultural Higher Education Project (NAHEP) started during 2017, which is $165 million project with a 50:50 share of the World Bank and the government of India being executed through ICAR, thrust is being given to the quality and relevant agricultural education in the country.

These were to be spent on the 74 educational institutions that ICAR oversees. Of these 63 are state agriculture universities (SAUs), three central agricultural universities, four ICAR-deemed universities, and four central universities with agricultural faculty. In addition, there are private colleges. The SAUs are state-funded but they have to abide by the teaching and research standards set by ICAR. Agricultural universities need to attract the best talent with the promise of jobs that can compete with other enticing ones, both in terms of pay and satisfaction. The undergraduates, post-graduates and doctorates should find ready placements. This has not been the experience over the past few decades.

Agricultural science has changed. The Green Revolution was based on the breeding of plants with desirable traits through careful observation and selection. Recombinant DNA technologies have made vast genetic improvement of crops possible since the 1970s. The genomes of important crops have been sequenced. The sequencing data can be effectively utilised with new plant breeding technologies like market-assisted breeding (MAB), gene editing (GEd) and genetic engineering (GE) technologies. India has inadequate competency in the areas of genomics, gene discovery, plant-pathogen interaction, genetic engineering and genome editing. It also lags in precision breeding with the help of markers. We need to improve the competency of students and young scientists in these areas.

NEW TRENDS

Some action in this direction has already taken place. Students and faculty from 62 of the 74 institutions that had pitched for NAHEP support have been sent abroad for six to 12 months for research and training. The Agri-DIKSHA and e-Krishi Shiksha web education portals are up and running. These are part of the Blended Learning Platform, which was launched in March. The course content of undergraduate, postgraduate and doctoral courses has been upgraded.

The need for experiential learning

Under NAHEP, 117 new pilot courses will be crafted for agricultural universities to offer. Last year, the curricula of 79 disciplines were re-designed. These improve the existing syllabi and make them more contextual and relevant to the needs of students in terms of competitiveness and employability. Several changes have been incorporated in common academic regulations relating to credit load requirements and their distribution and the system of examination and internship during the master's programme. Provision has been made for PhD scholars to enrol for online courses and take advantage of e-resources through e-learning and teaching assistantship.

Agricultural education cannot be entirely online. Students have to work in labs and visit fields and villages. Practicals and project-based assignments cannot be dispensed with. The courses of a typical undergraduate programme in agricultural and allied sciences are well-structured with about 18 to 24 credits of theory and practical classes per semester depending on the year of standing. There are course coordinators, student advisors, and a few councilors for each batch of students across graduation levels. Students engage with them in curricular and co-curricular activities. Blended learning will not skip these essentials, but it will complement experiential learning through virtual and augmented reality labs, virtual classrooms and engaging videos. They will be able to opt for customised courses and learn at their own pace. There will be room for online collaboration.

(The author is deputy director general, Agricultural Education, Indian Council of Agricultural Research (ICAR))

Agricultural education cannot be entirely online; students have to work in labs and visit fields and villages for practicals and project-based assignments

Cops crack whip on sale of spurious seeds

MOULI MAREEDU | DC
HYDERABAD, MAY 18

Police officials have started cracking the whip on the sales of spurious seeds in rural areas, with raids held at fertiliser shops. Suryapet and Nalgonda police detained several miscreants under the PD Act for the sale of spurious seeds. They have also convened a meeting with agriculture department officials to prevent such activities. Suryapet DSP, P. Nagabushanam, agriculture department officer Janamiya and others conducted surprise raids at fertiliser shops in Suryapet town. "We raided several fertiliser shops across Suryapet and verified the purchase and sale records of several shops," the DSP said.

Technologies for efficient water use in kharif season

CROPTALK

The increased demands of irrigation will deplete Punjab's groundwater table to below 300 metres by 2039. On top of that, the heat and uneven rainfall of the kharif season results in higher evaporation. Since this problem calls for a judicious use of water, Punjab Agricultural University has recommended certain strategies for it for the major kharif crops.

RICE TRANSPLANTATION

Rice is the main water guzzler crop of Punjab. For saving water, the farmers should do its transplantation after June 20 and grow only PAU-recommended, short-duration varieties. Even the fields with laser leveller before transplanting to save 10-15% water and increase the yield by 5-10%. Keep the fields flooded for the first 15 days and thereafter irrigate those after two days when the ponded water has infiltrated the soil. But take care not to let the field develop cracks. The PAU advises the farmers to keep their fields under just 2 inches of standing water. In heavy textured soils, rice can be transplanted on beds to save about 25% water.

DIRECT SEEDING

Rice can also be sown directly into the field (direct-seeded rice) under tar-wattar condition. Apply the first irrigation after 21 days after sowing. Thereafter, irrigate the fields at 5-to-7-day interval, depending upon the soil type. Another option is direct dry seeded rice, in which the first irrigation should be just after the sowing; second after 4-5 days of sowing, and the subsequent ones at 5-7 days interval, depending upon the soil type. Stop irrigating the fields before 15 days of harvesting, which will help in timely sowing of the succeeding rabi crop.

COTTON

Cotton needs 4-6 irrigations, depending upon seasonal rainfall. Apply first irrigation after four to six weeks of sowing and then subsequent ones at two to three weeks of interval. For light textured soils and crop sown on the ridges, the first irrigation could be advanced. Sowing of crop on the ridges and irrigating through furrows saves considerable amount of water. Where the water quality is poor, the pre-sowing irrigation should be with the canal water and afterwards tubewell water could be used. Where the water is saline (EC 10 dS/m), apply rice-residue biochar@16 quintal/acre to reduce the adverse effect of salinity and increase the seed yield. The crop should not suffer from water stress at flowering and fruiting stages, otherwise shedding of flowers and fruits will lower the yield. Prevent water stagnation during early growth stage and drain away the excess water if there is such a situation. The last irrigation should be by the end of September to hasten the boll formation. Surface drip irrigation is recommended for cotton crop that's irrigation at 7-day interval with laterals placed at 67.5 centimetres apart and drippers placed at 75 cm apart, with a dripper discharge rate of 2.2 litres an hour. Start fertigation of 100 kilograms of urea (45 kg of N) per acre at 35 days after sowing in 10 equal splits in 110-120 days at 7-day interval.

Rice is one of kharif season's major water-guzzling crops

MAIZE

For maize sown from the last week of May to mid-June, trench sowing is recommended for easy and economical irrigation during hot summer. The crop requires 4-6 irrigations, depending upon the rainfall. Adequate water supply is essential throughout the crop growth season, particularly at pre-tasseling, silking and grain filling stage. Maize can tolerate heavy rain, provided the fields are well drained. Flooding at early stages causes great damage to the crop, so if the condition persists, drain off the excess water.

To avoid the adverse effect of rainfall at the seedling emergence, PAU recommends sowing the crop on the ridges. If the crop is damaged due to excess water, then apply two sprays of 3% urea (3 kg urea in 100 litres of water) at weekly interval. In case of moderate damage, broadcast additional 25 to 50 kg urea per acre. The university recommends sub-surface drip irrigation for maize, wheat, and summer moong, in which the drip lines are placed at 20 cm depth with lateral spacing of 67.5 cm at drippers placed at 20 cm. Apply sub-surface drip irrigation at 3 days interval with 80% of the recommended NPK. Apply 20% of NPK at sowing and remaining P and K in 7 splits. Nitrogen should be applied in 7 splits at 9-day interval starting from 15 days after sowing. This method of irrigation enhances system productivity.

SUGARCANE

Sowing sugarcane in 20-25 cm deep trenches saves irrigation water and prevents lodging. Mulching with 20-25 quintals per acre of paddy straw, rice husk, sugarcane trash, or tree leaves between the rows, after the germination of crop (by mid-April), lowers the soil temperature and conserves soil moisture. Irrigate the crop at 7-to-12-day interval during the hot and dry months of April to June. In the rainy season, adjust the irrigation depending upon the rainfall. Drain away the excess water, if the fields are flooded.

In winter, irrigate the fields at monthly interval.

(By Jeevanjot Dhaliwal, Madhu Dhingra and M S Kahlon, Department of Soil Science Punjab Agricultural University, Ludhiana)

AGRIWEATHER

The Chandigarh regional centre of the India Meteorological Department (IMD) has warned of thunderstorms/lightning in Punjab and Haryana from Tuesday till Thursday. The weather office has also warned of a heatwave in Haryana on Tuesday. Rainfall is also likely in many parts of both states from Tuesday till Thursday.

For your views, suggestions and feedback, write to us at crop.talkTOI@gmail.com

In the pink of health

AGROCHEMICALS. Why investors can add on the stock of PI Industries

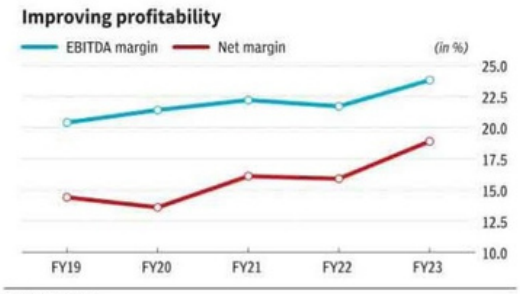
GETTY IMAGES/ISTOCKPHOTO

Nalinakanthi V
bl. research bureau

Investors with a two-three-year investment horizon can consider accumulating the stock of crop protection maker PI Industries on dips. Incorporated in 1946, PI Industries has presence across the entire agrochemical value chain — right from R&D to distribution.

Besides strong technological competencies both in terms of chemistry and engineering, the company has a strong brand portfolio and a large pan-India network connecting it to over 70,000 retail touch points. PI's decision to foray into contract development and manufacture of pharmaceutical chemicals, through the recent acquisitions in India (TRM India and Solis Pharmachem) and Italy (Archimica S.p.A) which are profitable already, will help it gain foothold quickly in the Pharma CDMO space, in addition to giving it access to a US FDA-approved facility near Milan.

At the current price of ₹3,483, the stock trades about 42 times its trailing twelve-month earnings. With the management's guidance of 20 per cent growth in revenue and improvement in operating margins, one can expect 18-20 per cent annualised earnings growth for the company over the next two years, implying a 35 times FY24 earnings and 30 times its FY25 estimated earnings. Investors with a moderate risk appetite can consider accumulating the stock on declines, for three reasons.



Source: Company

ACCUMULATE

PI Industries
₹3,483.95

WHY

- Interesting portfolio of products and services
- Pharma foray will complement and strengthen
- Strong balance sheet

DIFFERENTIATED

First, PI Industries, which is among the leading producers of crop protection chemicals, has a differentiated portfolio of products. The product basket includes 19 insecticides, 7 fungicides and 9 herbicides. In addition to its branded generic business in India, the company has forged partnerships with innovators to develop and manufacture several patented products. One such is with Japanese innovator Kumiai to make products such as byspiribac sodium and pyroxasulphone, to name a few.

In the custom synthesis business, PI does custom research, development, and manufacturing of novel molecules for innovators. The company's strength lies in its ability to cater to the innovator's requirement end-to-end — right from synthesising complex chemical compounds to scaling the product to meeting the requirement post commercial launch. The strong product portfolio, about 4-5 new launches every year, has insulated the company from the pricing pressure in the home market due to channel stocking, etc.

In addition to crop protection products, the company also has 4 specialty products such as Biovita, a natural fertiliser, which helps increase microbial activity and nutrient availability to plants.

PHARMA FORAY

Second, the company's move to foray into pharma CDMO will not only de-risk the business but also help it tap into the large global CDMO market which was pegged at $131 billion in 2019 and growing at high single digit. The company, through its subsidiaries, has acquired the Indian subsidiaries of Therachem Research Medilab (TRM), US and a few of their assets for a consideration of $75 million ($50 million upfront and balance as milestone payment).

TRM with a few molecules in Phase 2 and 3 of drug development will serve as a good launchpad for PI Industries' CDMO foray. TRM had a revenue of $33 million with a normalised operating profit of $14 million as of March 2022, translating into an operating margin of 42 per cent. The acquisition price of $75 million is at an attractive 5.2 times operating profit versus 38 times for Divi's Laboratories, although the latter is much larger in terms of scale of operations.

PI has acquired the assets of Archimica including its plant in Milan, which will provide the company access to 24 DMFs (drug master files for API) and a US FDA approved API (active pharma ingredient) manufacturing facility. With a utilisation of just about 50 per cent and about 12 APIs yet to be commercialised, there is significant scope for growth in the business, from the current revenue and operating profit of $45 million and $7 million respectively. Also, Archimica's GMP and US FDA compliant facility will help the company in manufacturing the late-stage innovative molecules that are currently under TRM's fold, when these molecules are commercialised.

IMPRESSIVE NUMBERS

Third, the company with negligible debt of ₹46 crore and ₹2,243 crore cash equivalents, which includes the ₹2,000 crore QIP proceeds, done in July 2020, is well-positioned to pursue inorganic growth opportunities, which can strengthen the business over the medium term.

In FY23, the company's revenue grew 22.5 per cent to ₹6,492 crore, while operating profit rose 34 per cent to ₹1,542 crore. Over the last three years, the company has managed to grow revenue by 24 per cent and profit by 39 per cent annually. Operating profit margins have improved from 21 per cent in FY20 to 24 per cent in FY23.

CONCERNS

The impact of a possible El Nino phenomenon remains to be seen, given that some purchase of agrochem products particularly the ones that are used prior to the pest emergence, happens ahead of the monsoon. However, one cannot rule out impact on its domestic sales should the market remain docile, and monsoon play havoc.

Arya.ag, Bayer partner to promote sustainable agriculture

Our Bureau
Mumbai

Agtech firm Arya.ag has joined hands with Bayer CropScience in a strategic collaboration aimed at promoting sustainable agriculture.

The partnership aims to scale up a sustainable crop production model that optimises resource utilisation and delivers economic benefits to all farmers, farmer producer organisations and other stakeholders involved in the food value chain.

The collaboration marks a significant milestone for both companies, and under the MoU, Arya.ag and Bayer CropScience will work together on several projects to achieve their sustainability goals. Arya.ag will offer its services to Bayer's network of farmers through its e-market platforms in the identified territory, establishing a market linkage partnership between the two companies and benefiting farmers with better access to services.

Supply of Bt cotton hybrid seeds may be tight this year

WEATHER IMPACT. Seed production in 2022 hit by excess rainfall; demand high this year

Vishwanath Kulkarni
Bengaluru

Amid hopes that the cotton acreage in the upcoming kharif season will exceed last year's coverage, the Bt cottonseed market is witnessing tight supply of branded hybrids, mainly in the central and south zones, as the seed production was impacted last year due to excess rains, vendors said.

Unseasonal rains in April and May this year have resulted in early planting of cotton in key producing States of Gujarat and Maharashtra, while the planting in nornthern States of Punjab, Haryana and Rajasthan is almost in the last stages. "The movement of branded cotton hybrid seeds is going fast and the market feels there will be some tight supply situation in central and south zones," said M Ramasami, Chairman, Rasi Seeds. As a result, all the carry forward stocks will be exhausted this year, he added. In Maharashtra, the government does not allow the sale of Bt cotton seeds before June 1. However, sales have taken place over the past few days, Ramasami said.

MARKET DEMAND. The Bt hybrid cotton market is estimated to be around 4-4.5 crore packets of 450 gm each

MINIMUM STOCKS

The Bt hybrid cotton market in the country is estimated to be around 4-4.5 crore packets of 450 gm each and the industry normally has a carry-forward stocks of 1-1.5 crore packets. "This year the carry-forward stocks of Bt hybrids from last year were at a minimum and the seed production last year was impacted by the excess rains," Ramasami said.

Despite the recent fall in cotton prices triggered by the heavy market arrivals, seed players expect that the fibre crop would sustain the growers' interest as other competing crops such as maize and soyabean are witnessing a bearish trend.

"There was a good demand for maize last year around this time. Now that it is not there and the expectation that soya may also come down, cotton may be a preferred crop in areas of Maharashtra, bordering Madhya Pradesh," he said.

Ram Kaundinya, Director General, Federation of Seed Industry of India (FSII), said the supply situation is tight in Bt cottonseeds. "Cotton hybrids, especially popular products, are in tight position because of increase in demand. Last year production suffered due to rains and other factors. Production has not come up to expectations." he said. Kaundinya estimates cotton area could go up by about 8-10 per cent this year.

HIGHER ACREAGE

Cotton was planted in 130.49 lakh hectares last year, higher than 123.72 lakh hectares in 2021.

Satyendar Singh, CEO, Seed Business of Crystal Crop Protection Ltd said the sentiments for cotton were okay this year. "Last year there was a positive sentiment because of the price. This year it is not negative," he said. "Prices of competing crops have crashed significantly. Cotton still has decent returns compared to other crops. There is no negative sentiment, neither from the trade or farmers. Overall, the area may remain the same, if not increase." he said.

Direct seeding of paddy taking root in some States

PRAGMATIC SOLUTION. Labour shortage, late rains pushing farmers to adopt new method that reduces water requirement by 15 per cent

Agriculture compulsory subject for Classes 6 to 8

MACROSCAN.

CP CHANDRASHEKHAR, JAYATI GHOSH

Is India's rural economy diversifying?

Data seem to suggest that rural employment diversification could be reversing due to lack of opportunities beyond farming

Insufficient economic diversification, from low value added to higher value added activities, has been one of the important failures of the Indian development trajectory.

Despite decades of relatively high growth of GDP, most of the work force remains trapped in low-value employment in agriculture and other primary activities, along with low-paying services. This pattern is unlike the successful late industrialisers like Japan, South Korea and more recently China.

The continuing preponderance of workers in primary activities in India is also unlike most middle-income countries at present. In the rural economy in particular, the slow pace of diversification has created an unstable and unviable situation as workers remain crowded into agriculture even as that sector show significant declines in share of GDP.

However, trends over the past two decades do point to some employment diversification, especially in rural India. Of course, this must be seen in the context of extremely low and even declining work participation rates for both men and women. Figure 1 shows how employment rates for rural males are not only very low by global standards and have remained broadly stagnant over four decades.

WOMEN'S WOES

For rural females, the trend is even more concerning — from the very low rate of only 34 per cent, the employment rate fell thereafter, collapsing to as low as 17.5 per cent in 2017-18. This severe fall in women's recognised employment was responsible for the absolute decline in total employment over the period from 2011-12 to 2017-18. There was a slight recovery in the most recent period, 2021-22, although the rate was still less than 27 per cent, well below the rate of four decades earlier.

It is important to remember that these work participation rates do not capture all work, but only recognised employment, including self-employment. This excludes a very large amount of work performed in unpaid form by (mainly) women in the process of activities that ensure household consumption and survival.

Such activities consist not just of unpaid care work within households, but also essential activities like fetching water and fuelwood, kitchen gardening, poultry raising etc. If such unpaid work is recognised (though it is not remunerated) more than 85 per cent of women in India are actively engaged in "economic" activity.

The work participation data for women are further muddied by the fact that a significant proportion of recognised women workers (around one-third in rural areas) are described as "unpaid helpers in family enterprises" — typically farms.

Indeed, it is the shift in women in and out of recognised employment in agriculture that has been the most significant mover of employment changes in the past two decades. Other than this, employment has stagnated — a remarkable feature of an economy that has supposedly grown relatively fast.

However, there have been changes in the structure of employment in these four decades, particularly for male workers. Figure 2 provides a sense of the sectoral changes in employment for rural male workers. There is a continuous decline in the share of agriculture from 77.5 per cent in 1983 to 51 per cent in 2021-22.

CONSTRUCTION BOOST

However, the pace of the decline slowed considerably in the last decade. The biggest shift was to construction: more than half of declining share of agriculture is explained by the rise of construction as a major employer, which accounted for 16.6 per cent of rural male employment by 2021-22. Throughout this period, the share of manufacturing barely budged, remaining at 7-8 per cent, indicating the failure of rural industrialisation to take off to any meaningful extent.

Among services, trade hotels and restaurants more than doubled their share of male employment, and transport services also increased. But a significant proportion of these also remain relatively low-paying activities.

For rural females, even this limited diversification of employment was much less evident. The share of agriculture declined, but only from 87.5 per cent in 1983 to 73.2 per cent in 2017-18 — and then remarkably showed a renewed increase in 2021-22 to 75.9 per cent. Manufacturing employment provided work for 6.4 per cent of rural women in 1983, and this increased to 9.8 per cent in 2011-12.

More than half of declining share of agriculture is explained by the rise of construction as a major employer, which accounted for 16.6 per cent of rural male employment by 2021-22

But in the decade thereafter it declined once again, to account for only 7.9 per cent of rural women recognised workers in 2021-22. Construction increased significantly though it still accounted for only 5.3 per cent of rural female employment. Other services, mainly community and personal services, also showed substantial increases (from 2.8 per cent in 1983 to 8.9 per cent in 2017-18) but then declined again for the most recent period, to 6.8 per cent.

SHRINKING OPPORTUNITIES

This suggests that the recent "revival" in the share of agriculture in women's employment reflects the decline of other activities in terms of viable employment opportunities.

Indeed, the increase in the share of women in agriculture is almost exactly equivalent to the declining shares of manufacturing, trade hotels and restaurants, and other services. Since the latter are better representations of the desired economic diversification, it is likely that some women were essentially forced back into being recorded as employed in agriculture because of lack of other options. Most of this is in the form of self-employment or unpaid help in family farms, since wage employment (whether regular or casual) is less likely to be a "refuge" sector.

Even this, however, does not reflect any particular dynamism given the overall decline in women's recognised work participation especially since 2004-05. Figure 4 presents the share of women employed in agriculture as a proportion of the total rural female population. This declined continuously over the decades, reaching only 12.8 per cent in 2017-18. The subsequent increase to 20.2 per cent in 2021-22 seems to be more of a distress move, as noted above, but even that remains well below the levels of earlier decades.

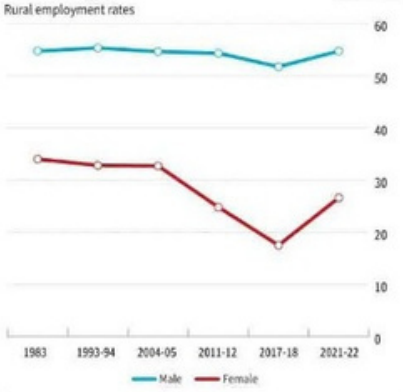
There are many reasons for this extremely uneven performance of economic diversification, both in general and particularly across gender. Some are structural and systemic, some reflect medium-term processes (such as how the rural economy has fared over the period of economic globalisation) and some reflect short-term policies (such as the ill-fated demonetisation of November 2016 and the imposition of GST in July 2017, both of which were major shocks for the rural economy).

But overall they reflect a continuing failure of the development project, which policy makers can ill afford to ignore.

Gender gap

CHART 1

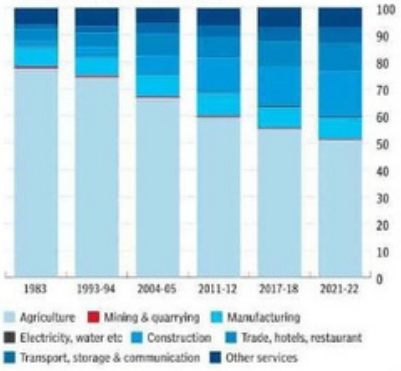
Rural employment rates



Structural changes

CHART 2

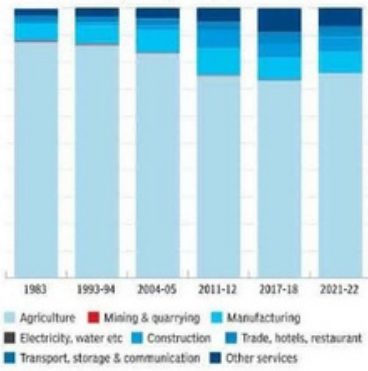
Rural males - Employment by sector (%)



Agri 'revival'

CHART 3

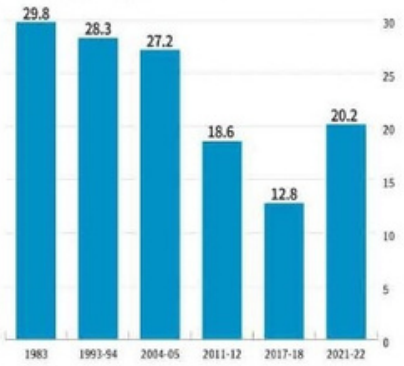
Rural females - Employment by sector (%)



Dipping trend

CHART 4

Women employed in agriculture as % of total rural females



TNAU gets promising response from farmers for its online sales service

The Hindu Bureau
COIMBATORE

Tamil Nadu Agricultural University (TNAU) has been able to generate encouraging response from the farming community to its AgriCart online sales portal service, launched a month ago to facilitate the farmers and the general public to purchase quality seeds and inputs at their doorstep.

The online platform addresses the main issue of availability of quality seeds for the farmers.

Unlike in the past, the university has been witnessing fast sale of quality seeds, crop boosters and bio inputs, through the online platform ideated and executed by a team led by Vice-Chancellor V. Geethalakshmi.

Almost the entire quantity of paddy seeds to be utilised for the kuruvai season have been sold.

Another notable aspect is the rapid sale of vegetable seeds for kitchen garden, roof garden, and home garden, according to the TNAU faculty overseeing the online business.

Attractive suffixes are coined for the boosters for the crops: groundnut 'rich', maize 'maximum' and pulse 'wonder'.

The seeds, bio-inputs and biofertilizers are being delivered at the doorsteps of the farmers across the State from the university's 40 research stations, 15 Krishi Vigyan Kendras, and its constituent colleges, much to the relief of the farming community.

The TNAU, in all likelihood, will get into a tie-up with the postal department for carrying out the delivery services, university sources said.

Simultaneously, the farmers are being apprised about the terms and conditions, and the copyright factor. They are made to understand that all content made available through any TNAU AgriCart, such as text, graphics, logos, button icons, images, audio clips, digital downloads, data compilations, and software is the property of TNAU or its content suppliers. The content, the TNAU has emphasised, is protected by the State, national and international copyright laws.

WayCool Foods, IIT Madras join hands to offer climate-smart agricultural practices for farmers

PTI ■ CHENNAI

WayCool Foods, an agricultural supply chain startup company, on Saturday said it has entered into a partnership with Indian Institute of Technology-Madras here to further expand its offerings to improve farmers' income and profitability.

Through this MoU, WayCool Foods would provide technical solutions for seeding and expansion of the Regenerative Agriculture Sustainable Architecture (RASA) tech stack. It would also offer its domain knowledge of the agri-supply chain from soil-to-sale and further strengthen the design and structuring of the agri-stack.

"Partnership with IIT Madras will further boost our continuing efforts towards driving adoption of regenerative agriculture among Indian farmers. Our on-field experience has demonstrated commercial benefits to farmers when they adopt regenerative agri practices thereby improving income," WayCool Foods Managing Director Karthik Jayaraman said. "We are confident that synergies between WayCool Foods and IIT Madras will provide farmers with access to the most advanced technologies equipping them to take proactive measures to combat climate change...," he said.

IIT-Madras has developed and built the RASA Tech Stack in 2022 which would aid the farmers to monitor and fine-tune their cultivation.

"Through this collaboration, we hope to create innovative solutions that can address some of the key challenges faced by the farming and agriculture industry today," IITM Pravartak CEO M J Shankar Raman said.

"Be it leveraging sensor technology and data science techniques, we believe we can help improve crop yield, reduce waste and increase farmers' income. This will also create new opportunities for growth," Raman said.

Dyes, organic chemical exports fell sharply

Parag.Dave
@timesgroup.com

Ahmedabad: India's dyes and organic chemicals exports have experienced a significant decline in the last financial year, primarily due to weak global demand.

Dye exports have decreased by 22.67% in volume terms, while organic chemicals exports have reduced by around 33%. Only dye intermediates exports have seen a strong increase of 46%, while other categories such as inorganic, organic, and agro chemicals exports have decreased.

In the previous financial year, 2021-22, all categories, except inorganic chemicals, had registered an increase in exports compared to the previous year. However, the global economic crisis in 2022-23 has adversely affected the Indian chemicals industry.

Gujarat is a major hub for dyes and dye intermediate chemicals, accounting for around 70% of the country's total production. Bhupendra Patel, Chairman (Gujarat region) of Chemexcil, said, "The past year has been challenging for the dyes segment. The textile industry has faced low demand worldwide due to weak economic conditions in the US and Europe, directly affecting demand for dyes. Several companies have temporarily halted production, and factories have been operating at 50-60% capacity. The significant decrease of approximately 23% in dyes exports is likely unprecedented."

He further explained that while dye intermediates and inorganic chemicals have shown an increase in value, it is mainly due to price rises and the stronger dollar against the Indian Rupee.

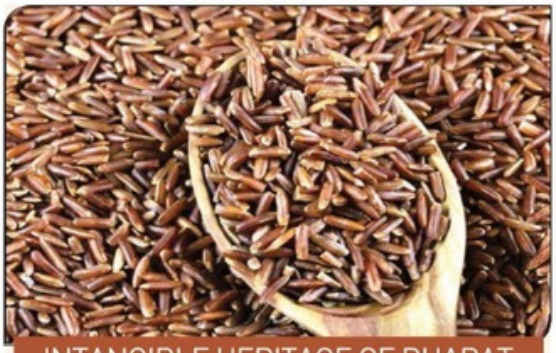
Manish Kiri, MD of Kiri Industries Ltd, said, "The previous financial year was difficult for the industry, with significantly fewer orders and a challenging domestic market for dyes and organic chemicals.

The revival of demand will depend on the geopolitical situation. Some intermediate products have experienced a revival in recent months, and Gujarat-based plants have resumed the production of intermediates. The fiscal year 2024 will be better."

DARK HUES

*Provisional; Figures are in tonnes; Growth figures are for 2022-23 compared to 2021-22; Source: CHEMEXCIL

Chemical	2020-21	2021-22	2022-23*	Growth
Dyes	4,73,041.74	5,44,599.14	4,21,146.07	▼22.67%
Dye intermediates	54,679.68	57,561.34	84,583.97	▲46.95%
Inorganic chemicals	18,27,386.87	26,00,486.96	24,90,083.66	▼4.25%
Organic chemicals	70,73,660.23	68,78,305.76	45,68,210.13	▼33.59%
Agro chemicals	5,33,487.04	6,48,628.20	6,30,322.26	▼2.82%



INTANGIBLE HERITAGE OF BHARAT

God's own food!

Grown in Kerala's picturesque environments adorned with valleys, hillocks, rivers, forests etc., Navara rice is not just a nutritious and easily digestible food item but also holds paramount medicinal value; opening up of marketing channels can make it profitable for the farmers who have preserved it against all odds

AUTHOR

SANJEEV CHOPRA

Navara rice (*Oryza sativa*), associated with Ayurveda, is considered a high-energy food for people of all ages — from lactating mothers and suckling babies to senior citizens. It was the first farm product to receive the Geographical Indication tag in the country back in 2007.

The application was first submitted by P Narayanan Unny, the proprietor of Navara Eco Farm, but it was rejected on the grounds of being 'too exclusive.' Unny was advised to include all the Navara rice growing farmers in Palakkad and the neighbouring districts of Malappuram, Calicut, Wayanad, Kannur, Trichur, Ernakulam, Kottayam, and Alleppey. The registry sought assurances that the interests of other Navara rice growers would be represented by the society. Unny consulted with stakeholder farmers, the Kerala Agriculture University, rice millers and traders, and also sought assistance from the National Bank for Agriculture and Rural Development (NABARD) for seed purification, multiplication, and expansion of the cultivation area. This also established the protocol for other commodity groups and associations to apply for GI. Ever since 2007, when Navara received the GI tag, it has been in the same league as Champagne, Basmati and Darjeeling tea.

Let's take a moment to visualise the picturesque environment in which Navara is grown. This rice bowl is adorned with valleys, hillocks, rivers, forests, mountain streams, and water bodies, lending credence to Kerala's description as God's own country.

The many qualities of Shashtika

The Sanskrit name for Navara is Shashtika, a crop that grows in sixty days. The first references can be found in ancient Ayurvedic scriptures like the *'Sushruta Samhita,'* which dates back to 400-200 BCE. The *'Ashtanga Hrudaya'* dates back approximately to 400 CE. There are two clear types: the white-glumed (husked) Navara and the black-glumed Navara. A 12th-century Ayurvedic text, *Ashtangahridayam*, also provides detailed information about the numerous benefits of Navara, which is called Njvara in Dravidian. Often, the white-glumed variety is referred to as Navara, while the black glumed variety is called Njvara to create a distinction. According to Meenakshi Bajaj, a dietician at Tamil Nadu Govt. Multi Super Specialty Hospital, Chennai, "In Ayurveda, the white Navara is medicinally superior. Njvara (black-glumed) has been used in conventional Ayurvedic treatment since the age of Charak (600 BC). Njvara grains have been used in several Ayurvedic treatments since time immemorial."

> The Sanskrit name for Navara is Shashtika, a crop that grows in sixty days

She adds, "However, considering that the glycemic index of Navara rice is 60, much lower than that of milled, parboiled rice (72), it should be consumed in moderation. Navara rice is also a rich source of fibre, which delays gastric emptying, improves satiety, and allows you to reduce the total portion size. Navara provides a good dose of vitamin B, minerals like zinc and iron, protein, and complex carbohydrates (fibre). It also consists of antioxidants, polyphenols, and flavonoids such as tricin, oryzanol, and proanthocyanidin. It is a nutritious and easily digestible food suitable for people of all age groups."

A gastronomic delight!

Navara rice powder, cooked with jaggery and milk, is found to be a nutritious weaning food, serving as a natural and nourishing substitute for processed baby foods. Broth made by adding Navara rice to meat is recommended for pregnant women as it promotes foetal weight gain. When cooked with milk and herbs, it can be used to treat internal wounds. Navara rice bran oil is utilised for a wide range of ailments and painful conditions, such as cervical spondylosis, low backache, paralysis, and rheumatoid arthritis. Ayurvedic doctors effectively employ Navara rice paste, known as *lepanam*, to treat psoriasis. The paste also serves as an excellent remedy for skin lesions. Rice gruel made from Navara is considered beneficial in preventing various diseases and is deemed a safe food for diabetics.

Navara is a key ingredient in *Navarakizhi*, a specialty treatment from Kerala's traditional medicine used to cure neuromuscular disorders. The rice, cooked in a decoction of the herb Sida (*Sida rhombifolia, Linn.*), combined with milk, makes the body supple, removes stiffness of joints, cleanses the body channels, and improves blood circulation. Traditionally, it has been consumed as a replenishing drink called *'kurikila-kakanji'* and is effective in combating fatigue.

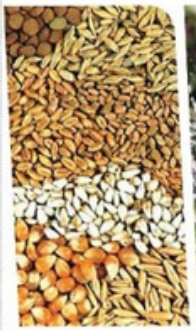
Global market for the 'food of gods'

In today's health-conscious global market, Navara rice can play a significant role if marketing channels open up to farmers who have preserved Navara rice against all odds. To ensure that farmers benefit, it is imperative to promote cultivation only after assessing market demands and sustainability prospects. While the product has found a ready export market in the Gulf, where Malayali expatriates are aware of the benefits of Navara rice, efforts should be made to position it as a naturally organic produce from God's own country in the niche markets of the US and Europe. Collaborating with APEDA, the Kerala government could host Navara-based food festivals in major Indian cities to acquaint the discerning public with this wonderful produce from God's own country.

The writer superannuated as the Director of the LBSNAA after 36 years in the IAS, and is currently a historian and policy analyst.

ECONOMIC PLANNING SERIES

Inertial factors



The skewed benefits of irrigation, fertiliser use and HYVs under the New Agriculture Strategy, coupled with heavy cost on account of high fertiliser subsidies, degraded soil, inadequate livestock development, and low levels of mechanisation, have been the main reasons behind the underperformance of the AAS sector

AUTHOR

KRISHNA GUPTA

In the last article, we saw that the Agriculture and Allied Services (AAS) sector did not quite match up to the targets set in the various five-year plans. However, production of foodgrains, oilseeds, sugarcane and cotton rose through the plan years as did productivity. But productivity levels in AAS were still much lower when compared to international agricultural nations such as China, US and Canada. In this article, we will delve deeper into the reasons for this: we will look at the progress made in expansion of irrigation and other inputs such as fertilisers and high yielding varieties of seeds.

Year	Net irrigated area (in million hectares)	Gross irrigated area (in million hectares)
1950-51	21	23
1970-71	31	38
1990-91	48	62
1999-00	57	76
2000-01	55	76
2006-07	61	85
2007-08	62	87
2008-09	63	89
2009-10	63	85
2010-11	63.6	88.6
2011-12	65.3	91.5

SOURCE: AGRICULTURE STATISTICS AT A GLANCE

Irrigation through the plans

It is well known that irrigation is critical for enhancing agricultural productivity. It is all the more important in India where large tracts don't get sufficient rainfall or where rainfall is concentrated during a few months.

There are many ways that one can irrigate one's land: canals, wells/tubewells, tanks and other sources. Over the years, wells/tubewells have become the dominant source of irrigation, with canals and tanks contributing much less to total irrigation. In 1950-51, canals contributed to 40 per cent of total irrigation, wells/tubewells 29 per cent, tanks 17 per cent and other sources 14 per cent. By 2010-11, these numbers had changed to 26 per cent for canals, 64 per cent for wells/tubewells, 3 per cent for tanks and 7 per cent for other sources.

In terms of coverage, the area under irrigation has expanded since the first plan. While net irrigated area increased from 21 million hectares in 1950-51 to 65.3 million hectares in 2011-12, gross cropped area increased from 23 million hectares in 1950-51 to 91.5 million hectares in 2011-12. As we know, gross irrigated area includes land cultivated more than once a year on account of irrigation. This means that there has been a sharp rise in the area cultivated more than once in a year from 2 million hectares in 1950-51 to 26.2 million hectares. The table shows this progress.

As a result of the expansion in irrigation, the total cropped area also went up from 133 million hectares in 1950-51 to 195 million hectares in 2011-12.

Some large projects taken up during the plans included the various multipurpose river valley development projects such as Bhakra Nangal, Chambal and Indira Gandhi Canal in North India; Damodar Valley, Farakka Barrage and Hirakud Dam in East India; Koyna and Kakrapara in West India; and Nagarjuna and Tungabhadra projects in South India. Most of these projects had flood control, power generation and irrigation as their objectives.

> The net irrigated area increased from 21 million hectares in 1950-51 to 65.3 million hectares in 2011-12

Some of the other major interventions in irrigation during the plan period were the Command Area Development Project (CADP) launched in 1974-75 and the Accelerated Irrigation Benefit Programme (AIBP) launched in 1996-97. The CADP involved various activities integral to irrigation such as cutting field channels and making drains and rotating water supply to ensure that everyone got a fair share. The AIBP, on the other hand, was a scheme to complete unfinished irrigation projects, most of which were large river valley projects. The CAD could not succeed because of lack of water availability and low participation of farmers. The AIBP saw moderate success and was able to add about 4 million hectares of irrigation potential up to 2006.

Two issues merit attention: private sector participation and participatory irrigation management through the involvement of water users' associations (WUAs). Many states such as Maharashtra, Andhra Pradesh and Karnataka have experimented with various models of privatisation of agriculture: Build-Own-Operate Systems (BOOS), Build-Own-Transfer system (BOT), Build-Own-Lease system (BOL). As for participatory management through the use of WUAs, this was mandated in the National Water Policy of 1987, but did not succeed because of non-availability of funds from the government and the lukewarm response of farmers to form WUAs.

After 2014, water resource development was given a new push with the formation of an omnibus Ministry of Jal-Shakti which looks after all issues of water resources and river valley projects, and river development in general. There has been a special emphasis on the rejuvenation of the river Ganges.

Fertilisers and seeds

Apart from irrigation, fertilisers and seeds are critical for improving productivity in agriculture. As we know, India's soil is deficient in nitrogen and phosphorus, which has to be supplied through fertilisers. India's production capacity of fertilisers has increased manifold since 1950-51. From a mere 39,000 tonnes produced in 1950-51, India's production rose to 11.9 million tonnes in 1990-91 and 16.1 million tonnes in 2013-14. However, this has had to be supplemented with imports, even though fertiliser imports have declined over the years. The state supports the production of fertilisers through large amounts of subsidies, given their criticality in agricultural production. All in all, consumption of fertilisers has also gone up from 70,000 tonnes in 1950-51 to 12.6 million tonnes in 1990-91 and 24 million tonnes in 2013-14. This works out to 0.5 kg/hectare in 1950-51, which shot up to 76.8 kg/hectare in 1990-91 and 125.4 kg/hectare in 2013-14.

While increasing use of fertilisers has been a part of the new agriculture strategy since the 1960s, there are some constraints and problems. Firstly, fertilisers are effective only when there is sufficient irrigation, which limits their use to the irrigated parts. As a result, almost 60-70 per cent of the cultivated areas that are dependent on rainfall consume only 20 per cent of the fertilisers. Another issue with fertiliser use is that it is skewed towards rabi crops which contribute to about 35 per cent of agricultural production but consume 65 per cent of fertilisers. Finally, the levels of fertiliser subsidy have crossed Rs 75,000 crores in the twelfth plan, which is a major component of government expenditure. Not only that, most of these subsidies are cornered by the more affluent farmers. Because of these reasons, there was an effort to shift to organic manure since the ninth plan. However, this has had limited impact on the high fertiliser subsidies and the skewed nature of fertiliser consumption.

Improved seeds are the other component of India's agriculture strategy since the 1960s. The HYV programme was a critical part of the Green Revolution strategy, started in 1966. By 1997-98, 76 million hectares were covered by high yielding varieties of seeds. For wheat, this number was 90 per cent, for rice it was 75 per cent and for coarse grains, it was 55 per cent. The ICAR, the National Seeds Corporation, the State Farms Corporation of India and the various research institutes and agriculture universities are involved in the research, production and distribution of breeder seeds, foundation seeds and certified seeds. A Seeds Bank was set up by the Government of India in 1999-2000 to make seeds available and develop infrastructure for their production and distribution.

Apart from fertiliser and seeds, there are many other issues that present challenges in the sector, namely soil conservation, animal husbandry and mechanisation in agriculture. While heavy fertiliser use has led to nutritional deficiency of soils, soil erosion has led to surface soil being washed away. With respect to animal husbandry, the challenge lies in improving yield of milk in cows, improving breed quality, and livestock development so that they can contribute more to the national income. Finally, mechanisation of agriculture has remained at low levels and the use of tractors and modern equipment has been limited.

Conclusion

Irrigation, fertiliser use and high yielding variety of seeds were the trinka, which comprised the New Agriculture Strategy in India since the 1960s. There have been mixed results of this strategy: on the one hand, production of foodgrains, sugarcane, cotton and oilseeds has increased manifold, such progress has been skewed in favour of certain regions (mainly Punjab, Haryana, Western UP in the initial years and parts of Rajasthan, Andhra Pradesh, Tamil Nadu, MP, Maharashtra and Gujarat in later years, i.e., only where there were irrigation facilities available) and certain crops (wheat and rice). This has also come at a heavy cost in terms of high fertiliser subsidies, degraded soils, inadequate livestock development (India has the largest livestock population of the world with 17 per cent livestock but the sector's contribution to agricultural income is very low. European countries have a very low livestock population but the sector contributes more than 50 per cent of agricultural income). Low levels of mechanisation have also constrained productivity levels in agriculture. Given these challenges, the task for our agricultural policy planners is cut out.

The writer is Addl. Chief Secretary, Dept of Mass Extension Education and Library Services, Govt of West Bengal.

FROM PLATE TO PLOUGH

INDIA MUST DOUBLE ITS AGRI-R&D BUDGET IF IT IS TO REACH LEVELS OF MORE THAN 1% OF ITS FARM GVA. TO THAT END, SUBSIDIES SUCH AS FERTILISER AND POWER NEED TO BE RATIONALISED

Sowing climate resilience

ASHOK GULATI
PURVI THANGARAJ

Respectively, distinguished professor, and research associate, ICRIER
Views are personal

AT THE HIROSHIMA Summit 2023, the G7 nations (the US, the UK, Germany, Italy, Japan, France, and Canada) stressed on achieving a global Green House Gas (GHG) emissions peak by 2025. They also committed to an "Acceleration Agenda," for G7 countries to reach net-zero emissions by around 2040 and urged emerging economies to do so by around 2050. China has committed to 'net zero' by 2060 and India by 2070.

However, the emerging trends of climate change may not give humanity the luxury of time. Severe costs are likely to be inflicted on human lives and livelihoods, especially in the agriculture sector, with every 1 degree Celsius increase in temperature compared to pre-industrial levels. India has the largest workforce (45.6% in 2021-22) engaged in agriculture amongst all G-20 countries. Hence, the impact of climate change may be disproportionately harsher for India.

The urgency for accelerated climate action rose as the World Meteorological Organization (WMO) forecast that global near-surface temperatures are likely to increase by 1.1°C to 1.8°C annually from 2023 to 2027. It also anticipates that temperatures will exceed 1.5°C for at least one year within this period. According to the Indian Meteorological Department (IMD), India experienced its fifth-hottest year on record in 2022, with an average land surface air temperature 0.51°C higher than the long-term average over 1981 to 2010, while global temperatures were around 1.15°C higher than the average over 1850-1900.

It is against this backdrop that Indian agriculture faces a double whammy. On the one hand, it has to feed the largest population (1.42 billion in 2023 and likely to be 1.67 billion by 2050), and, on the other, it has to do so against rising vagaries of nature. While India's grain production (330 million tonnes in 2022-23) gives some comfort, its nutritional challenge remains daunting till 2030.

How can Indian policy makers address this? The answer lies in focusing on Agricultural Research, Development, Education and Extension (ARDE). Research at ICRIER indicates that investing in agri-R&D yields much greater returns (₹11.2) compared to every rupee spent on fertiliser subsidy (₹0.88), power subsidy (₹0.79), education (₹0.97), or roads (₹1.10). Thus, increased emphasis on ARDE can help achieve higher agricultural production in the face of climate change.

ARDE is critical in improving resource-use efficiency, especially with respect to natural resources such as soil, water, and air. Development of seeds that are more heat resistance is already a reality. Precision agriculture, such as drip irrigation, can result in large water savings. Implementing sensor-based irrigation systems, for example, enables automated control. Fertigation and development of nano-fertilisers can help save not only on the fertiliser-subsidy front but also improve the carbon footprint. Implementing such innovative farming practices and/or products can surely help use water and other natural resources more efficiently, resulting in higher output with fewer inputs, while lowering GHG emissions. Research at Borlaug Institute for South Asia (BISA) clearly shows that mulching not only contributes to higher soil organic carbon (SOC) but also saves water and reduces GHG emissions.

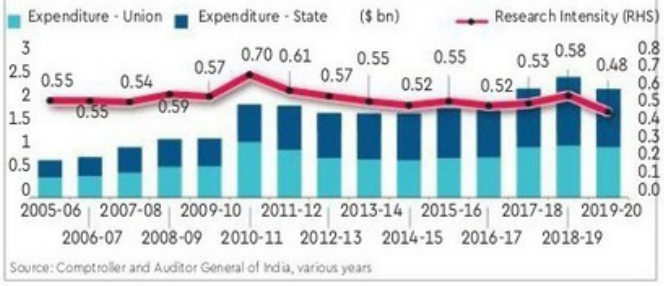
Scaling up such pilot experiments is critical for wider, more sustainable impact, and that is where one needs larger allocations of funds for agri-R&D. Our analysis of ARDE spends since 2005-06 reveals that although, in absolute terms, the total expenditure has increased from ₹39.6 billion ($0.91 billion) in the triennium ending (TE) 2008 to ₹163 billion ($2.2 billion) in TE 2020, but the research intensity (RI)—ARDE as a percent of agri-GDP—has experienced an upswing from 0.55% in 2005-06 to its peak of 0.70% in 2010-11, before declining to 0.48% in 2019-20 *(see graphic)*.

Upon examining the allocation of ARDE by sector, it becomes evident that there is a skewed distribution towards the crop husbandry sector, whose relative share has marginally increased from 75% to 76% between TE 2008 and TE 2020. In contrast, the shares for soil, water conservation, and forestry sectors have declined from 5% to 2%, while the share for animal husbandry, dairy development, and fisheries have also decreased from 11% to 8% during the same period, despite the share of livestock's value having substantially increased in the overall value of agri-produce. This imbalance needs urgent correction, especially because much of the GHG emissions (54%) within agriculture comes from the livestock sector.

However, it is crucial to acknowledge that despite the expenditures on ARDE, the overall RI in agriculture falls short of the target of '1% of the Agricultural Gross Value Added (AGVA)' recommended by the government of India's as well as the United Nations Food and Agriculture Organisation (FAO). To accomplish this, India needs to almost double its budgetary allocations for ARDE. In this context, If the Union government can reduce its fertiliser subsidy and state governments their power subsidy, and those savings are redirected to agri-R&D ensuring RI at 1% at the very least, the results would be much better in terms of food and nutritional security. But this requires political will and innovative policies ensuring that farmers incomes go up during this realignment phase.

Along with substantial increase in the budgets for ARDE, one needs to realign not just expenditures but also policies (such as fertiliser subsidy, power subsidy, etc) towards meeting the challenge of climate change. It may be noted that livestock has been growing at more than double the rates of growth of cereals, and so is the case with horticulture. But our policies and programmes are stuck with the legacy of basic staples like rice and wheat. This needs to change to give us better nutrition and less GHG emissions.

INDIA'S AGRICULTURE RESEARCH AND DEVELOPMENT EXPENDITURE AND ITS RESEARCH INTENSITY



Source: Comptroller and Auditor General of India, various years

India aims to produce 90 GW solar modulues by fiscal 2026

New PLI scheme for basic chemicals soon

A powerful climate solution just below the ocean's surface

TATIANA SCHLOSSBERG

THEY CAN BOLSTER the coastlines, break the force of hurtling waves, provide housing for fish, shellfish, and migrating birds, clean the water, store as much as 5% of the world's carbon dioxide, and pump oxygen into the ocean, in part making it possible for life on Earth as we know it.

These miracle machines are not the latest shiny tech invention. Rather, they are one of nature's earliest floral creations: seagrasses. Anchored on the shorelines of every continent except Antarctica, these plants (and they are plants, not algae, that sprout, flower, fruit and go to seed) are one of the most powerful but unheralded climate solutions that already exist on the planet.

Restoring seagrass is one tool that coastal communities can use to address climate change, both by capturing emissions and mitigating their effects, which is among the topics being discussed as leaders in business, science, culture and policy gather on Thursday and Friday in Busan, South Korea, for a *New York Times* conference, *A New Climate*.

Around the world, scientists, nongovernmental organisations and volunteers are working to restore seagrass meadows, if not to their original glory, then to something far more expansive and majestic than the barren, muddy bottoms left behind when they are damaged or destroyed.

In Virginia, parts of Britain and Western Australia, among other places, with the helping hands of committed researchers and citizen scientists alike, seagrass meadows are coming back. They're bringing with them clearer waters, stabler shores, and animals and other organisms that used to thrive there. And yet, seagrass doesn't get the attention it deserves, its partisans say.

It's impossible to know exactly how much seagrass has been lost, because scientists don't know how much there was to begin with.

Only about 16% of global coastal ecosystems are considered intact, and seagrasses are among the hardest hit. It's estimated that a third of seagrass around the world has disappeared in the last few decades, according to Matthew Long, an associate scientist in marine chemistry and geochemistry at Woods Hole Oceanographic Institution. "Globally, a soccer field of seagrass is lost every 30 minutes," Dr Long said, "and we lose about 5 to 10% at an accelerated rate every single year."

"Seagrasses are adversely affected by global stressors: deoxygenation, ocean acidification and warming temperatures," Dr Long said. But local stressors also have played a role in their withering, mainly in the form of nutrient pollution, largely from agricultural runoff and wastewater, and subsequent algal blooms and die-offs, which first choke out other plants like seagrass (a process called eutrophication) and then, as they decompose, take up all the oxygen in the water (hypoxia).

ONLY ABOUT 16% OF GLOBAL COASTAL ECOSYSTEMS ARE CONSIDERED INTACT, AND SEAGRASSES ARE AMONG THE HARDEST HIT

While the effects of climate change and growing human impacts have accelerated seagrass loss in the last few decades, it's not a new story.

On the Eastern Shore of Virginia, a strong storm in August 1933 that followed a wasting disease and overharvesting of bay scallops, wiped out what remained of once vast eelgrass meadows. (Eelgrass is a type of seagrass.) For decades, there was no eelgrass on the shore's ocean side, said Bo Lusk, a scientist with the Nature Conservancy's Volgenau Virginia Coast Reserve, though some remained on the part of the coast lapped by the Chesapeake Bay.

Dr Lusk, who grew up in the region, heard stories as a child of lush green carpets of eelgrass from his grandmother, who remembered that the shores teemed with life — until they didn't. But then, in 1997, someone reported seeing some patches of eelgrass on the shore's oceanside, likely from seeds that happened to drift south from Maryland and settled in a hospitable neighbourhood in Virginia.

After several years of experiments, Robert J Orth, a scientist at the Virginia Institute of Marine Science, devised a highly successful method of restoring seagrass, similar to methods used around the world: In the spring, scientists and hundreds of volunteers collect seeds, which they count and process over the summer and plant in the sediment in the fall.

Since 2003, when the restoration effort in the Volgenau Virginia Coast Reserve began, scientists and others have planted around 600 acres of seeds, and seagrass now covers 10,000 acres, according to Dr Lusk. Later this year, the Nature Conservancy is hoping to sell the first validated blue carbon credits for seagrass, based on this restoration effort, said Jill Bieri, the director of the reserve.

However, the success of the Virginia project has been somewhat difficult to recreate around the world. "You can't do this just anywhere," Dr Lusk said. "If the Nature Conservancy hadn't started this land protection work 50 years ago, buying up parts of the coast to preserve it, the odds are we wouldn't have the water quality we have now, and this wouldn't have been so successful."

Seagrass restoration will take decades of commitment, Dr Lusk said. Richard Unsworth, an associate bioscience professor at Swansea University in Wales and the founder and chief scientific officer of Project Seagrass, a British NGO that works on seagrass restoration, said that an important part of the work was the long-term promise made to the whole ecosystem - the seagrass meadows, but also the people in the community.

"The actions of fishermen, the views of boat owners, the problems of water quality — they can all be part of a complex social-cultural situation, and in the long term it will be an amazing success, but it's a slow process, not some silver bullet where you plant something and then you've saved it," Dr Unsworth said.

Community engagement has been a necessary part for seagrass success since it takes a lot of work to collect and plant millions of seeds. For Project Seagrass, that has also meant the development of a website and app, Seagrass Spotter, which allows users to upload photos of seagrass in the wild (which is then verified by scientists), to help researchers fully map the extent and types of seagrasses around the world, since mapping of seagrass globally is rather patchy.

But one place it's well mapped is Shark Bay, a remote section of the coast in Western Australia, where seagrass from 10 different meadows was discovered to be actually just one plant, possibly the biggest in the world.

There, seagrass has been growing and accumulating carbon in its plant matter, but also in the sediment, for more than 3,000 years, said Elizabeth Sinclair, an evolutionary biologist at the University of Western Australia.

But during an extreme marine heat wave from 2010 to 2011, about a third of the seagrass canopy (what is visible above the sand) died, releasing as much as nine million tons of carbon, according to one estimate.

Over the last decade or so, Dr Sinclair and her colleagues have been studying the recovery of the seagrass - the places where it's come back naturally and where it likely never will, without some assistance from scientists as well as the Malgana people, Indigenous Australians who work as rangers.

Despite warming temperatures and changing ocean chemistry, which make complete restoration impossible, it's still work worth doing, said Dr Lusk, whether it's on the crooked waterways of the Virginia coast, the rocky shores of Wales, or the sweeping, endless bays of Western Australia.

"There are so many logical reasons we should do this," Dr Lusk said. "The carbon storage is great, shoreline protection, all of this other stuff is great, and you can know that in your head but until you get in the water and spend some time really within this system, you don't have the emotional connection.

"I would keep doing this if there was no carbon stored. It just feels right to be out there." — NYT

Containers pile up at ports as imports rise

Rupali.Mukherjee
@timesgroup.com

Mumbai: Container prices have crashed nearly 40% year-on-year, giving the much-needed breather to India Inc. Typically, lower container prices could lead to reduced transportation costs, but the impact on freight rates is not always straight-forward. Multiple factors come into play, including shipping routes, cargo types and market competition, all of which can influence shipping costs. The pandemic significantly increased the volatility for containers in specific, and for the overall shipping industry in general.

"The global container logistics industry may face significant challenges in the second half of 2023, including a potential recession in the US, rising geopolitical tensions, and increasing operating costs. However, there is some positive news in the container shipping industry, particularly in Asia. Freight rates and container prices have stabilised in the region, showing resilience in the intra-Asia trade routes. This could translate into more predictable shipping rates and potentially more stable supply chains, benefiting businesses that rely on container shipping", Christian Roeloffs, co-founder and CEO of Container xChange, an online container logistics platform for container trading, leasing and management, told **TOI**.

TREND REVERSAL AFTER PANDEMIC

40ft (high cube) container rate ($)

Port	Mar '22	Mar '23	% change
Nhava Sheva	4,469	1,938	-56.6
Mundra	4,662	2,116	-54.6

20ft (dry cargo) container rate ($)

Nhava Sheva	2,377	1,272	-46.4
Mundra	2,382	1,148	-51.8

Source: Container xChange

Neermoy Shah, associate director, India Ratings and Research, feels the lowering of the freight costs will benefit companies and add to their margins as most of the freight cost particularly in mid-sized entities is borne by the company itself and they may or may not be able to pass on to their customers.

According to the data, there is now an over-supply of containers at the Indian ports, a situation starkly different from around the Covid years. The Container Availability Index (CAx) data for Nhava Sheva, Mundra and Chennai ports, indicates a significant increase in the number of inbound containers this year. The CAx value at 0.81 is well above the threshold of 0.5 since the beginning of 2023 indicating greater inbound containers at the ports consistently.

This could well be corroborated by the rising imports in the country, causing a higher number of container equipment entering the ports leading to increase in availability of containers.

Latest data by the commerce department pegged goods exports in April at $34.7 billion, which was 12.6% lower than a year ago, and a third straight monthly decline. Imports also contracted 14.1% to $49. 9 billion — the sharpest fall since the 33% decline last October. In 2022-23, export of goods and services is estimated to have increased 14.7% to $775.9 billion, while imports were around $894.2 billion, 17.7% higher, resulting in a trade deficit of $118.3 billion.

For the next couple of months till September, the scenario is not very optimistic. There is a slowdown in containerised exports due to a decline in consumer demand from the US, EU and UK markets.

El Nino threat underlines need for preparedness

India's experience with El Nino has been associated with poor rainfall and droughts. An analysis of India-specific episodes of El Nino years since 1956 reveals that foodgrain production declined in 57% of those events. Twelve El Nino episodes in 38 years had led to 9.7% drop in normal rainfall and 5.7% fall in kharif foodgrain production. This has affected the entire agriculture sector, impacting the GDP growth of the country.

HARENDER RAJ GAUTAM

WEATHER forecasts point to a transition to an El Niño state in the second half of this year. The Food and Agriculture Organisation (FAO) has reported that drier conditions will generally be observed in West Africa, Southern Africa, India, South-East Asia, Australia, northern areas of South America and Central America in the El Nino period. The World Bank had estimated that the 1997-98 El Nino cost governments $45 billion. However, in a recent study published in the journal *Science*, scientists have claimed that the average El Nino costs the global economy about $3.4 trillion and the strong one in 1997-98 caused losses to the tune of $5.7 trillion.

El Niño is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Niño is the 'warm phase' of a larger phenomenon called the El Niño-Southern Oscillation (ENSO). La Niña, the 'cool phase' of ENSO, is a pattern that describes the unusual cooling of the region's surface waters. The World Meteorological Organisation has stated that the probability of El Niño developing this year has increased from 15 per cent in April-June to 35 per cent in May-July, reaching a significantly higher likelihood of around 55 per cent during June-August. Meanwhile, the India Meteorological Department (IMD), in its ENSO bulletin, has foreseen a sharp rise in the probability of El Nino developing during the southwest monsoon.

The El Nino climatic pattern has been affecting rainfall trends in India. Severe droughts have been accompanied by El Niño events. The last major El Nino event was in 2015, when monsoon rainfall in India was 13 per cent lower. However, the IMD has forecast that the monsoon rainfall is likely to be 96 per cent of the Long Period Average (LPA) with a model error of ± 5 per cent.

Warming and droughts are the major consequences of El Nino and it has been reported that a 1°C rise in mean temperature would reduce yields of wheat, soybean, mustard, groundnut and potato by 3-7 per cent. El Niño reduced the global mean crop yield of wheat, rice and maize by 1.32 per cent, 1.33 per cent and 0.37 per cent, respectively, but increased it for soybean by 1.9 per cent. India's experience with El Nino has been associated with poor rainfall and droughts. An analysis of India-specific episodes of El Nino years since 1956 reveals that foodgrain production declined in 57 per cent of those episodes. Twelve El Nino episodes in 38 years had led to a 9.7 per cent drop in normal rainfall and a 5.7 per cent fall in kharif foodgrain production. This affects the entire agriculture sector, impacting the overall GDP growth of the country.

El Nino affects crops due to heat and drought stress. At the cellular level, as stress becomes severe, there is a loss of membrane integrity, cell membrane leakage and protein breakdown, and finally, if stress is very severe, there can be plant starvation and collapse. In 2022, a heatwave coincided with the grain-filling and development stage of wheat, leading to yellowing and shrivelling of the grain, forced maturity; this resulted in reduction of yield up to 15-25 per cent. In the case of vegetables, a significant impact was observed, especially in tomato and cucurbits. Higher body temperature and loss of appetite were observed in milch animals, causing a reduction in milk yield up to 15 per cent. The extreme temperatures resulted in a drop in egg production and increased broiler mortality. The Finance Ministry has also raised concerns over the possible impact of El Niño conditions on India and cautioned that if monsoon rain is deficient, it could lead to lower agricultural output and higher prices. CARE Ratings, in 'El Nino & Its Impact on Indian Economy', has noted that based on the data for the past 50 years, it can be said that on an average, an episode of a strong or moderate El Nino has led to deficient rainfall or drought-like situations in India which not only affected agricultural production adversely but also corresponded to lower GDP growth. However, the Ministry of Agriculture and Farmers' Welfare has projected a record wheat production of 112.7 million tonnes (MT) in the current crop season.

As there is an imminent threat of El Nino, climate mitigation and reduction in vulnerability can help in reducing the risk. The National Innovation on Climate-Resilient Agriculture (NICRA), launched in 2011, is a major initiative of the Central Government; climate-resilient technologies are being demonstrated in 151 risk-prone districts of the country and promising technologies are being identified for each district. These technologies minimised the impact of the heatwave of 2022 and could achieve yields to the extent of 95-97 per cent of the normal in the case of wheat.

The Indian Agricultural Research Institute has developed three heat-resistant varieties (HDCSW-18, HD-3410, HD-3385) by incorporating genes that are responsible for the mild vernalisation requirement preventing premature flowering. PBW 766 (Sunehri) of Punjab Agricultural University has also been evaluated to have a higher yield with minimum reduction under heat stress. For rice, the International Rice Research Institute has developed drought-tolerant varieties such as *Sahbhagi Dhan* in India, *Sahod Ulan* in the Philippines and *Sookha Dhan* in Nepal. The average yield advantage of drought-tolerant varieties over drought-susceptible ones is 0.8-1.2 tonne per hectare. Assessment efforts require sustained international cooperation on monitoring and research so that we are well prepared with contingency plans through climate-resilient technologies to mitigate the adverse impact on agricultural production.

The author is retired professor and HoD, Plant Pathology, Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan (HP)

EL NINO EFFECT ON FOODGRAIN PRODUCTION IN INDIA

SOURCE: CEIC

Data from the years 1972-73 to 2022-23		Number of episodes	Average GDP growth (%)	Average deviation of rainfall from LPA (%)	Growth in kharif foodgrain production (%)
El Nino years	TOTAL	15	5	-9.2	-5.4
	Strong	5	3.8	-13.9	-6.1
	Moderate	4	4.4	-15.8	-12
	Weak	6	6.3	-0.8	-0.5
Non-El Nino years		36	5.6	0.6	5.7

WHAT IS EL NINO?

El Nino is a weather phenomenon that occurs when ocean temperatures in the central and eastern Pacific Ocean rise above normal. The warming causes changes in atmospheric patterns, leading to a weakening of the monsoon circulation over the Indian subcontinent. As a result, the Indian monsoon tends to be weaker and less reliable during El Nino years.

WHY IS IT A CONCERN FOR MONSOON RAIN

The Met office has forecast normal monsoon rainfall this year. However, the likelihood of an El Nino weather pattern developing during the June-September monsoon season raises the possibility of less-than-normal rain. In the past, India has experienced below-average rainfall during most El Nino years, sometimes leading to severe drought that destroyed crops and forced the authorities to limit the export of some foodgrains.

MONSOON AND AGRICULTURE

- The monsoon provides about 70% of the annual rain in India and impacts key crops such as rice, wheat, sugarcane, soybean and peanuts. Agriculture contributes about 19% to India's $3-trillion economy and employs more than half of the population.
- Increased agricultural production could ease export restrictions on sugar, wheat and rice. Conversely, drought necessitates importing food and maintaining export restrictions. In 2009, poor rains forced India to import sugar, driving global prices to record highs. REUTERS

North India cotton area may remain unchanged

Vishwanath Kulkarni
Bengaluru

The area under cotton in North India is unlikely to exceed levels witnessed last year as farmers in Punjab are seen reducing the acreage in the kharif planting season. However, aided by unseasonal rains in early April, farmers are likely to bring more area under the natural fibre crop in Haryana and Rajasthan. "Cotton sowing is down in Haryana by about 10 per cent as of today. With planting to go on till first week of June, we expect it to be covered," said Ashwani Jhamb, Vice-President, Indian Cotton Association Ltd.

The area in Punjab will be down this year as farmers, faced with quality and quantity issues last year due to pest attacks, are seen shifting to paddy in some regions. However, in Rajasthan, rains in April have helped farmers to take up cotton sowing, Jhamb said.

The Indira Canal is shut due to repair works and is likely to be opened next week. Though canal water availability is an issue, farmers have benefited from early rains, he said.

Most of the districts in northern Rajasthan, Punjab and parts of Haryana have received higher than normal rains in the March-May period this year as per IMD data. While unseasonal rains impacted the harvest of rabi crops, it is seen helping farmers take up early sowing of cotton. "Overall we expect the cotton area in North India to go up by around 10 per cent," Jhamb said.

SEED SALES SAME AS 2022

During 2022-23, cotton was planted in about 2.41 lakh hectares (lh) in Punjab, 6.47 lh in Haryana and 7.77 lh in Rajasthan. "In the North, the overall area is unlikely to exceed last year's levels despite Punjab trying to boost area. Farmers, who were impacted by the pest attacks last year, have not come forward to increase the acreages" said M Ramasami, Chairman of Rasi Seeds Pvt, the largest hybrid cotton seed firm. There will be a 2-3 per cent increase in Rajasthan and Haryana, he said.

Rasi expects its sales of cotton seeds at last year's levels of 50 lakh packets in North India. The overall hybrid cotton seed market in North is seen at between 75 and 80 lakh packets, same as last year.

Satyendar Singh, CEO of seed business at Crystal Crop Protection Ltd, said "Except Punjab and some parts of Haryana, particularly Jind district, the sentiment is positive towards cotton this year. North Rajasthan is also positive and the area may increase by 15-20 per cent in Ganganagar district. In Haryana, the overall area may remain the same or see some increase, mainly in the southern part of the State." His company, which has sells 17 cotton hybrids across the country, saw sales better than last year, he said.

BLESSING IN DISGUISE. Unseasonal rains have helped farmers take up early sowing of cotton REUTERS

Future Agriculture Leaders Initiative to expand to 4 more States

Vishwanath Kulkarni
Bengaluru

Future Agricultural Leaders of India (FALI), an initiative supported by agribusiness entities to make agriculture attractive to the next generation, is expanding its operations to States such as Madhya Pradesh, Karnataka, Andhra and Telangana.

FALI has been in operation in Maharashtra and Gujarat in several government-aided schools for over nine years now, providing technical knowledge and practical experience to students of class 9 and 10 in agriculture, agribusiness and related areas imparting them with technical, business and leadership skills.

A file picture of students showcasing their innovation at FALI convention in Jalgaon

NEXT 3 YEARS' PLANS

"We are starting in Indore in Madhya Pradesh in the upcoming academic year in July. We are deep into Maharashtra in 21 districts and in five districts of Gujarat. Over the next three years, we plan to go to Andhra Pradesh, Telangana and Karnataka," said Nancy Berry, President of NBA Enterprise Solutions to Poverty, who is heading the FALI initiative.

FALI is working currently with 13,000 students in Maharashtra and Gujarat and has been attracting more number of students every year. A majority of the parents of FALI students are small farmers with under five acres of land and who rear up to five animals. It has an alumni base of over 33,000 students.

"Many FALI students go for higher education in agriculture and related subjects and have introduced improved methods into their family farms and villages," Barry said. Companies participating in the initiative are providing internships, scholarships to FALI alumni, besides helping them incubate their ideas through small venture funding.

CREATING LEADERS

FALI is a Section 8 company established in January 2021 and is led and supported by leading agribusiness entities such as Godrej Agrovet, Jain Irrigation, UPL, Omnivore, Star Agri and Rallis India among others.

"We will expand this initiative to States closer to Maharashtra and then take it all over India. We want more members to be active. As we get more support we will spread all over India." said Nadir Godrej, Chairman and Managing Director, Godrej Industries and Chairman, Godrej Agrovet Ltd.

"This initiative is all about creating leaders, who can become examples for others to follow in the villages and rural areas," said Anil Jain, Vice-Chairman and CEO, Jain Irrigation Systems Ltd. "We wanted to bring about a thought process that agriculture is not just interesting, but it is worth investing and it can be treated as a business."

The idea was to bring about an altogether different perspective to agriculture and we thought it could come only when you train young minds from the farming family, Jain said.

Practical and technical knowledge of agriculture, besides business skills are imparted to FALI students during the two years of the programme.

"We are asking them to come up with new business ideas. Also, we run competition on treating agriculture as business or any of the products and services linked to agriculture. Students who do well get invited at our headquarters in Jalgaon, where they get an opportunity to showcase their innovation" Jain said.

Honey testing lab inaugurated

PNS ■ NEW DELHI

The Ministry of Agriculture and Farmers Welfare (MoA&FW), Government of India celebrated World Bee Day on 20th May, 2023 at Raja Bhoj Agriculture College, Waraseoni Balaghat, Madhya Pradesh.

The World Bee Day celebration was graced by the Union Minister of Agriculture and Farmers Welfare Narendra Singh Tomar in the august presence of Agriculture Minister, Govt. of Madhya Pradesh, Chairman, OBC Welfare Commission, Government of Madhya Pradesh, Chairman, NDDB and other dignitaries on the dais.

In his deliberation, Shri Tomar mentioned that under the "10,000 FPO Scheme" of the Government of India, in order to strengthen the beekeepers in the country by developing the institutional framework for collective development, 100 bee keepers / honey producers FPOs have been allocated under NBHM for which

TRIFED, NAFED and NDDB have been selected. In this sequence, a total of 80 FPOs of bee keepers /honey producers have been registered. Further he stated that there is huge potential for honey production in this area which must be utilised for increasing farmer's income.

During the World Bee Day celebration, an exhibition with over 100 stalls were set up by beekeepers, processors and different stake holders of beekeeping sector to showcase the diverse varieties of honey bee and different products in beekeeping sector.

More than 1000 farmers, beekeepers, processors, entrepreneurs and all stakeholders associated with honey production attended the programme.

A workshop with three technical sessions was organized on different themes. Need of Research & Development to promote Scientific Beekeeping for Income Generation.

Driving growth through Effective Marketing Strategies for Domestic & Export Market.

Production Technology and Research & Development of Scientific Beekeeping-Experience Sharing and Challenges. Productive Partnership in Honey-Industries Insights. Marketing Challenges and Solutions (Domestic/ Global).

The programme is aimed at promoting and popularizing beekeeping nation-wide National Beekeeping & Honey Mission (NBHM) of the Govt. of India under Atma-Nirbhar Bharat.

The NBHM is implemented through the National Bee Board for overall promotion of scientific beekeeping & entrepreneurship among small & marginal farmers, infrastructure development for postharvest management and support for research & development and to achieve the goal of "Sweet Revolution".

The significant achievements in honey production through short video film were played on this occasion. The participants from the different categories were felicitated for their significant contribution in this sector.

Different honey products Start-up's/ FPOs releases of publication on bee keeping were launched. On this occasion the Honey Testing Labs were virtually inaugurated.

Micro-irrigation projects on 2.5 lakh acres soon: Khattar

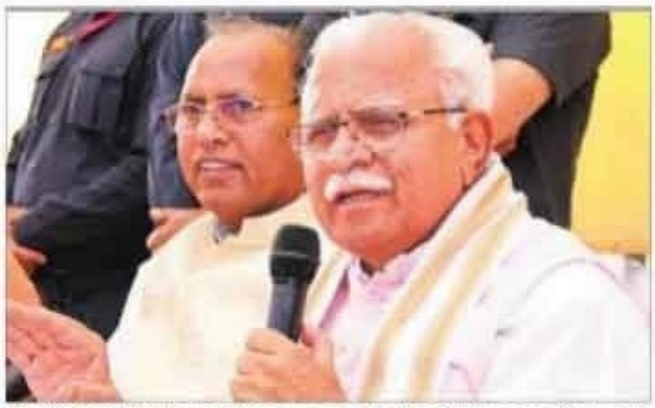
TRIBUNE NEWS SERVICE

MAHENDRAGARH, MAY 26

The state government was planning micro-irrigation projects on 2.5 lakh acres of agricultural land and constructing 4,000 on-farm water tanks to facilitate this project. An action plan was also ready for the construction of various structures for rainwater harvesting to improve the water table.

This was stated by Chief Minister Manohar Lal Khattar while holding Jan Samvad programme in Satnali on the concluding day of his three-day visit to the district on Friday. He laid the foundation stone of a micro-irrigation project worth Rs 8.21 crore for four villages and inaugurated the building of Government Veterinary Hospital.

"We have promoted micro-irrigation, which has turned out to be helpful in groundwater conservation to a large extent. In order to move this programme ahead, a target of installing 1,000 piezometers in villages by identifying low-water areas has been established under the Atal Bhujal Yojana for 2023-24," he added.



The Chief Minister addresses a gathering during Jan Samvad programme at a village in Mahendragarh on Friday. TRIBUNE PHOTO

DONGRA AHIR VILLAGERS HOLD PROTEST

- Residents of Dongra Ahir village organised a protest outside the house where the Chief Minister stayed after Jan Samvaad programme in the neighbouring Sihma village. They shouted slogans against the state government
- They were opposing the CM's announcement of giving Sihma village the status of sub-tehsil. "We have been raising the demand of getting the status of sub-tehsil for our village, but the CM ignored it completely and announced the same for Sihma," said one of the protesters of Dongra Ahir village

Later, while addressing the Jan Samvaad in Nangal Sirohi, the CM announced to shift the CHC being run in the old building of the PHC in a new building so that the people of the area could get better health services. He also felicitated the beneficiaries of the Mukhyamantri Vivah Shagun Yojana, automated pension scheme and meritorious students besides giving cards to the eligible beneficiaries of Chirayu Haryana.

Khattar inspected the waterworks in Bhalkhi village and said providing clean drinking water to the common man was the priority of the government. In order to provide uninterrupted water supply during the summer season, new waterworks were being constructed across the state.

Earlier in Bawania village, the CM exhorted the women to adopt self-employment by forming self-help groups. "There are immense possibilities of sewing centres, coarse grain products, pickles and other small-scale industries around the IMT to be built on about 10,086 acres in Khudana village. The women can avail its benefits by forming self-help groups,' he added.

Drone farming set to get a boost in Goa

Nida.Sayed@timesgroup.com

Panaji: To popularise the use of drone technology among farmers in Goa, the directorate of agriculture will be purchasing two drones to train them in application of pesticides, weedicides and water-soluble fertilisers using the device.

Unlike a regular drone, the agricultural drone has a diameter of 1.5m and can carry the weight of 10 litres of pesticide or 10kg of weedicide. The technology was first implemented by Fr George Quadros in Chinchinim, who fertilised fields using nano urea by spraying micro droplets of the fertiliser on paddy using an agri drone.

Unlike a regular drone, the agricultural drone has a diameter of 1.5m and can carry the weight of 10 litres of pesticide or 10kg of weedicide

"This will be of great help to Goan farmers as they will be able to save on labour force and time," said agriculture director, Nevil Alphonso. "Farmers may take time to shift to this technology from traditional farming, but we will conduct trainings through zonal agricultural offices to introduce them to this method."

The agriculture department has put up a proposal to the central government to enhance a subsidy by 10% to enable farmers to purchase their own agricultural drones.

The Centre presently offers financial assistance of 40% of the basic cost of the drone and its attachments, or Rs 4 lakh—whichever is less—under the Cooperative Society of Farmers, Farmers Producer Organizations (FPOs) and Rural Entrepreneurs' Scheme.

"The state government will add an additional 10% subsidy," Alphonso said.

To be eligible, the farmers must only purchase drones approved by the Directorate General of Civil Aviation (DGCA). They must have a drone pilot licence and fly it only up to a certain height. Farms situated near Army or Navy bases may not be permitted to fly the drones.

"The user must ensure that the pesticide or weedicide sprayed doesn't drift away with the air or travel into any waterbodies. We will set all the terms and conditions for the use of agricultural drones," Alphonso said.

The agriculture department will later also give agri drones on hire to farmers who wish to implement the technology on their farms.

Dhanuka Agritech enters agri-biological segment with 'BiologiQ' products

Our Bureau
Mangaluru

Dhanuka Agritech Ltd, an agri-input company, has entered into the agri-biological segment with the launch of its 'BiologiQ' range of products.

According to the company, BiologiQ represents a broad category of crop protection, soil health, and plant nutrition products that are derived from nature.

A media statement said that BiologiQ products can be used individually or in combination with conventional chemical products under an integrated pest and nutrition management plan to produce powerful results for the crop and the soil.

Three introductory products in the BiologiQ range are: 'Whiteaxe' biological insecticide, 'Downil' biological fungicide, and 'Sporenil' biological wilticide.

According to the company, 'Whiteaxe' is a biological solution for white grub, termites, and borers; 'Downil' is a biological solution for downy mildew; and 'Sporenil' is a biological solution of wilt, rot, and damping.

BiologiQ products can be used individually or in combination with conventional chemical products under an integrated pest and nutrition management plan

BROADER MARKET

Quoting MK Dhanuka, Managing Director of Dhanuka Group, the statement said: "We are launching three biological products – Whiteaxe, Downil, and Spornil – in the bio-agri segment. This segment is increasing globally, and we see good demand for these products in India as well. We hope that in times to come we will be introducing some more biological products in our BiologiQ range."

Manoj Varshney, National Marketing Head of Dhanuka Agritech, said, "BiologiQ will help in filling the gaps that are currently being created by the use of chemical solutions alone. We have seen that our biological products when used alone or alternately with chemical solutions under an integrated plan can produce impactful results. It also helps in addressing resistance building among pests due to regular use of chemicals."

The statement said that Dhanuka Agritech has further strengthened its herbicide portfolio by introducing two selective herbicides 'Implode' and 'Mesotrax.'

'Implode' is a selective herbicide for maize crop, and 'Mesotrax' is a selective herbicide for sugarcane and maize crops.

New agriculture policy to resolve problems of farmers, says Dhaliwal

Govt should rally behind distressed farmers not the prospering corporate honchos

The rich enjoy bank write-offs and low taxes; farmers end up in penury

DEVINDER SHARMA

AFTER the heat generated over the 20 per cent tax imposed on credit card spending abroad, an interesting debate has begun on the social media. A poster tweeted by a prominent business honcho, saying "I am a tax payer. My tax is for development of nation. Not for free distribution," attracted a lot of traction.

While the government blinked, allowing the 20 per cent tax only if the credit card spending abroad exceeds a limit of Rs 7-lakh, there were interesting and meaningful reactions on the Twitter space.

A Twitterati retorted: "Given that soldiers are standing on the border, why can't the rich pay a 20 per cent tax on credit card spending." This was a tongue-in-cheek remark draw from the dominant narrative that prevailed at the time of demonetisation.

The rich have very carefully and relentlessly created a narrative as if the nation's development is solely dependent on the revenue coming from the taxes the corporate houses pay. While I agree that those who pay a direct tax should be more concerned where their tax money is going, but to give an impression as if the rich only pay tax is wrong. After the GST was introduced, even a poor worker who wears a v-shaped chappal has to pay tax. It is also paid by ordinary citizens for essential items and that includes pre-packaged and labelled milk products, including paneer, curd and butter milk.

This flawed narrative that only the corporate pay tax has to change. As an Oxfam report says, the bottom 50 per cent population India pays two-third of the GST. The top 10 per cent pays only three to four per cent. When I say top 10 per cent, it means people who are earning Rs 25,000 per month, or more.

Well, coming back to the Twitter debate, in my reply, I tweeted: "Yes, my tax should not be used as freebie for corporate," and the fact that it evoked an overwhelming response, crossing 30,100 views so far, clearly shows that a large chunk of the society is able to grasp how the corporate walk away with huge freebies and that too in the guise of development. Their argument is that we certainly don't want our taxes for free distribution among them.

Let us first try to ascertain why people are angry that their tax money is going as freebies for corporate India. Like everywhere else, in India corporate not only benefit out of large tax breaks, reduced corporate tax and economic stimulus packages, they also get massive logistic support by way of cheap land, cheap electricity, subsidised bank credit etc. While industry thinks these are incentives for growth, even the Prime Minister had sometimes back, while addressing an ET Summit, acknowledged that what is called as incentive for growth for the industry is also a subsidy.

Besides draining the national exchequer, these freebies have also plundered the natural resource base. It has also created a huge inequality that is worsening every year.

A legitimate question that crops up is why should corporate India get away with bank write-offs while farmers are made to undergo jail terms for non-repayment of dues? Why should wilful defaulters be treated with kid gloves while defaulting farmers are jailed?

According to a UN study, $ 7.3 trillion worth of natural resources is being handed over on a platter to industries ever year. Withdraw this massive subsidy and the corporate profits will crash. Therefore, while the rich are getting stinking rich, the poor are being driven to the wall. The latest estimates show that globally, the top 0.01 per cent controls the same amount of wealth as the bottom 90 per cent population.

With so much of wealth in their hands,

and with tax sops and economic packages strengthening the bottom line, the question that needs to be asked is why should the rich get the benefit of bank write-offs and still lower taxes?

For instance, in India, prior to the pandemic, a tax concession of Rs 1.45-lakh crore every year was announced for the industry in September 2019. This huge tax break came at a time when most economists wanted money to be put in for creating rural demand. What is perhaps little known is that the tax bonanza was in addition to Rs 1.8-lakh crore economic packages that were given at the time of the global economic meltdown in 2009, which means Rs 20-lakh crore has already gone to the rich in all these years. If only this money was put in agriculture, farm distress would have been history.

On the other hand, while the government makes it a point to literally make a splash every quarter when a quarterly tranche of Rs 2,000 is released under the PM KisanNiddhi scheme to farmers, there is no parallel event to celebrate the annual release of Rs 1.45-lakh crore tax sop to the corporate.

By the end of fiscal 2021, Indian banks have written-off a whopping Rs 11.68-lakh crore of corporate bad loans. Interestingly, as of March 2022, the top 50 wilful defaulters owe as much as Rs 92,570-crore to banks. These are people who can pay but do not want to. At the same time, under the insolvency proceedings, news reports say that the top 177 corporate defaulters owed as much as Rs 8.09-lakh crore to creditors till December 2022, of which only Rs 1.51-lakh crore has been realised. Some companies have walked away with cuts exceeding 83 per cent. Similarly, the government announced a Production Linked Incentive (PLI) of Rs 1.97-lakh crore across 14 key sectors. This subsidy, in fact, needs to first go to the acutely distressed farming sector.

Sadly, some business leaders believe that the write-offs are coming from the banks and so therefore do not have a link with tax revenue. What they don't know, or perhaps they don't want to acknowledge, is that the shortfall after the banks write-offs is recapitalised by the government, which means it is coming from tax payers' money. In any case, bank's resources are also built on public money.

A legitimate question that crops up is why should corporate India get away with bank write-offs while farmers are made to undergo jail terms for non-repayment of dues? Why should wilful defaulters be treated with kid gloves while defaulting farmers are jailed? Still worse, while the defaulting corporate heads continue to have birthday bashes and there is no let down in their opulent lifestyles, it is painful to see farmers throwing onion, tomato, cauliflower, cabbage, potato, brinjal and capsicum on the streets or in nalas because they are not getting the right price for their produce. Farmers are routinely asked to raise production, and when they do it they are left with little option but to throw their produce in frustration. While corporate get hundreds of crores written-off by banks, farmers continue to suffer. The bloodbath on the farm has been happening for quite some time. In addition, we know that the wages of farm workers have remained stagnant for quite some time. These are the dominant unorganised sectors that need immediate support. If agriculture prospers, it will have a domino impact on the rural economy and thereby prop up the national economy.

This is where my tax should go. I don't want my tax to be distributed as free money to the Richie Rich.

(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)

Farmers Across Tamil Nadu Are Grouping Up Through Producer Organisations That Empower Them Against Middlemen As Well As Promise To Transform Their Fortunes

TOGETHER
we profit, divided we forfeit

Devanathan.V@timesgroup.com

For decades, farmers in T Vadipatti had to suffer the low prices middlemen offered them for their produce, watching in silent defeat as brokers walked away with all the profits. But ever since they formed a Farmer Producer Organisation (FPO) and started selling their produce themselves converting some into value added products, they have been seeing profits.

Around 800 farmers from 10 villages in and around T Vadipatti in Madurai have formed the T Vadipatti Integrated Farming System Farmers Producers Company in 2019. With the help of the government they now have set up a cold pressed oil unit and a flour mill and sell their produce directly to consumers.

"We had to give 150 free coconuts to traders for every 1,000 we sold to them. We don't have to do this with the FPO," says D Ganesalingam, a coconut farmer from Vadipatti. "Besides, we get ₹20 per kg of copra more than what the traders paid us. My income has increased by 50% because of the FPO. Moreover, farmers get dividends from the company's profit which is additional support."

The concept is picking up gradually among TN farmers, especially in the past five years. There were 903 FPOs in the state benefiting more than 5 lakh farmers till the end of 2022, say Tamil Nadu Agricultural University (TNAU) experts. Now, the number has increased to 980.

Chairman of the FPO in Vadipetti, N Chellapandi, says when farmers deal with middlemen individually, they have to sell at the lowest price, but when they come together and sell their produce in large volumes, traders have no choice but to procure it at the price fixed by farmers.

K P Kavitha, who leads a 1,200-strong FPO in Thukanaikenpalayam at Gobichettipalayam in Erode, says the initial days were hard as they struggled to find a market. "The pandemic made it harder. But we took up the challenge. We reached out to households and grocery shops with our products in Kallipatti and Gobi. People started accepting our products. Now we are sending our products to 200 retails shops including a few in Kerala under the brand name Kazhani and Yes Millets," she says.

Kazhani Farmers Producers Company Limited initially started selling unpolished rice and turmeric powder. Now it sells various millet-based products including instant dosa mix, millet health mix, millet chapathi mix and sugar free and normal biscuits made of millets. The FPO was started in 2016 with a capital of ₹10 lakh. "Our turnover last year was ₹1.3 crore. The FPO has given us the infrastructure we need to produce more volume."

Vice-chancellor V Geethalakshmi, who launched the TNAU-FPO linkage programme, says under the initiative every TNAU centre across the state will tie up with one FPO. "Middlemen would offer farmers only ₹18 per kg for paddy, ₹2 less than the government procurement price. But when the paddy is processed into rice and the rice is converted into flour it fetches up to ₹60 per kg. Similarly, if a farmer starts selling coconut oil directly to consumers instead of selling copra the profit is double." The farmers of Vadipetti, known for its coconut and millets, are now selling their produce under the brand name TIFS (T Vadipatti Integrated Farming System).

The turnover of the FPO in 2021-22, a year after it was founded, was ₹98 lakh. The next year, it was ₹50 lakh despite the pandemic.

S Natarajan, director of Agriculture Marketing and Agri Business, said Tamil Nadu is a pioneer among states in promoting FPOs and the only one to provide loan assistance to set up infrastructure for value added products manufacturing. In recent years, ₹47 crore has been disbursed to FPOs.

Various schemes are being rolled out to promote FPOs and their products. While an e-marketing platform is being created, shops are being allocated for FPOs in farmers' markets, buyers-sellers meetings are being held, and a consortium of FPOs is being set up apart from providing guidance on taking up specialty crops. Efforts are on to allocate shops belonging to corporations and other local bodies for FPOs at concessional rates. A FPO management cell, set up to receive and redress grievances, can be contacted through 7200818155.

Pics: Jackson J

BETTER EQUIPPED

WHAT IS AN FPO?

- Farmers' Producer Organisation, also known as farmers' producer company, is an entity formed by primary producers such as farmers, fishermen and artisans
- It can be a producer company or a cooperative society
- It is a hybrid of cooperatives and private companies
- The organisational set-up and membership pattern are more or less similar to a cooperative, but it functions like a private company
- The government is encouraging setting up FPOs with financial support

BENEFITS OF FORMING FPO

- Better income for producers
- Better equipped to develop value added products
- Access to improved technology and equipment for small-scale farmers
- Better bargaining power while dealing with traders
- ₹18 lakh per FPO for a period of three years is given along with credit guarantee facility and equity grant to farmer members

THEIR OWN MASTERS: Farmers can directly sell their produce to consumers

CHALLENGES FACED BY FPOs

- Due to lack of novelty in ideas and products, FPOs find it difficult to compete in the market
- FPOs sometimes fail to meet the demand of the market due to lack of market study
- Unrealistic promises made to increase membership may turn a liability if they do not meet the expectations

> **We had to give 150 free coconuts to traders for every 1,000 we sold to them.** We don't have to do this with the FPO
> D Ganesalingam | FARMER

Inclusive food systems, holistic healthcare top PM Modi's 10-point action call for G7

India gains global prominence in agrochemicals export

Climate and biodiversity

Designing a biodiversity framework that enables access to private finance is essential

Dr T PRABHAKAR REDDY
Development economist who worked with DFID, UN Women, New Delhi, and UNICEF, Gandhinagar, Patna and Indonesia. Currently, adviser to Satavahana Development Society, Hyderabad

We celebrated Earth Day on 22 April 2023 and pledged to protect and preserve our mother Earth from all crises, especially the triple environmental crisis – Climate Change, Air Pollution and Biodiversity Loss. On 22 May, we celebrated 'Biological Diversity Day' signifying the importance of the promotion of conservation of biodiversity and its sustainable use and management among others.

The origin of the problem emanated from the use of fossil fuels, in the name of industrialisation, that has resulted in pollution in the atmosphere and led to climate change which has been creating havoc in the lives of people. In addition, in the name of development, we are still resorting to deforestation and are unable to maintain the flora and fauna, greenery and sustainable environment that has ultimately resulted in biodiversity loss.

Individual Responsibility

Besides, the El-Nino effect is seen clearly in terms of dry and inadequate monsoons in the summer (drought condition) and mild weather over the Indian subcontinent in the winter which culminated in a critical situation for the farming community. According to a report, it would again adversely affect the kharif crop outputs of farming communities across India in mid-2023 due to poor southwest monsoon as happened in 2009, 2014, 2015 and 2018, and it would be followed by a three-year-long LA-Nina.

The Vision of Living in Harmony with Nature by 2050 has led to the 2020 Global Biodiversity Framework which has been signed by all the national governments to take up necessary measures to protect and promote the biodiversity in respective countries. The vision of the framework emphasised that "By 2050, biodiversity is valued, conserved, restored and widely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people".

While it augurs well we should percolate the idea down to the village level so that each and every person will take it as individual responsibility in not only protecting but also promoting the biodiversity.

Hence, there is a need for the design of a 'biodiversity strategy and action plan' by all the national governments and provinces/State governments in the implementation of the global biodiversity framework announced in Montreal, Canada, in December 2022, which is known as 'Kunming-Montreal Global Biodiversity Framework'.

Following the same, 10 State governments in India have so far prepared their own 'Biodiversity Strategy and Action Plan' (BDSAP). Though Haritha Haram of the Telangana government has been acclaimed as the best initiative in the promotion of green belt in the State, it is lagging behind in preparing BDSAP.

Four Goals

The framework has four long-term goals related to the 'Vision for Biodiversity' and 23 action-oriented global targets for urgent action slated for the decade to 2030. Goal A enunciated that the integrity, connectivity and resilience of all ecosystems are maintained, enhanced or restored substantially increasing the area of natural ecosystems while human-induced extinction of known threatened species is halted and resilience levels of native wild species are increased.

Goal B emphasised ensuring sustainable use and management of biodiversity while making sure nature's contribution to people, including ecosystem functions and services, are valued, maintained and enhanced among others.

Goal C discussed the monetary and non-monetary benefits coming from the utilisation of genetic resources while ensuring traditional knowledge associated with genetic resources is aptly protected and contributing to the promotion of conservation and sustainable use of biodiversity.

Finally, goal D reiterated that the adequate means of implementation, including financial resources, capacity building, technical and scientific cooperation and access to and transfer of technology to fully implement the framework, are secured and equitably accessible to all, especially the developing countries.

The action-oriented and output-based targets broadly include reducing threats to biodiversity, meeting people's needs through sustainable use and benefit sharing, and ensuring implementation and mainstreaming with its tools and solutions.

> Governments can adopt the Brazilian model which supports the ideas of ecological fiscal transfer, payments for environmental services, and forest concessions

Transformative Change

Therefore, the responsibility of the governments is to prepare BDSAP following the Global Biodiversity Framework and implement the same after duly conducting biodiversity expenditure review, financial needs assessment and planning for the future needs of biodiversity on a war footing and ensure necessary budgetary allocations to address the issue of biodiversity loss and environmental pollution.

Added to it, it is essential to emphasise the mobilisation of resources from Central and State governments, the private sector and corporates who are willing to contribute towards the promotion of the conservation of biodiversity. Besides, it is vital to find out new sources of private financing like corporate social responsibility, market-based financing and new forms of public financing, etc. In addition, the governments can adopt the Brazilian model which supported the ideas of ecological fiscal transfer, environmental reserve quotas, payments for environmental services, tourism and forest concessions.

However, designing a framework that would enable access to private finance is essential at this juncture. Further, it is critical to work towards bringing about transformative change in policies, programmes and activities of each and every department so as to contribute to Sustainable Development in all its three dimensions viz, environmental, social and economic.

Negotiate GM product deals with care

DUE DILIGENCE. The US-Mexico trade dispute over GM corn should prompt developing nations to ensure legal certainty and textual clarity before inking a deal

REUTERS

achin Kumar Sharma
akshmi Swathi Ganti
lisha Goswami

Genetically modified (GM) crops remain a contentious issue not only in India but also across the globe. Irrespective of the dvantages or disadvantages of GM echnology, the rules governing the nternational trade in these products ave been proactively discussed and egotiated in various regional trade greements (RTA) across the world.

Thousands of kilometers from India, rade in GM products has become a bone f contention between Mexico and the S. The reasons behind the trade ension and its linkage with S-Mexico-Canada (USMCA) trade greement merits a discussion in the ontext of a wider debate on GM roducts.

In 2020, Mexican President Andres ssued a decree to prohibit GM corn in lexico by 2024. The decree prohibits M corn based on environmental and ealth risks, achieving self-sufficiency nd food sovereignty, and cultural ppropriateness. Additionally, the use of lyphosate, a herbicide used heavily in M corn production, was also rohibited.

Notably, the domestic cultivation of M corn was not allowed in Mexico ven before this decree. In 2013, the lexican Supreme Court suspended the omestic cultivation of GM corn to reserve its traditional corn varieties. In ontrast, the imports of GM corn were ermissible in Mexico.

Corn is a staple crop in Mexico, where hite and yellow corn is mainly used for uman and livestock consumption espectively. Mexico is the second rgest importer of corn and is increasingly dependent on imports to meet its domestic requirements. In 2021, Mexico imported 17.5 million tonnes which accounted for 39.9 per cent of domestic corn consumption, whereas it was 17 per cent in 2001. Importantly, more than 95 per cent of Mexico's total corn imports are sourced from the US.

Once the decree is enforced, it would restrict the imports of GM corn posing serious implications for the US.

MEXICO-US TRADE FRICTION

This ban would adversely affect the trade interest and farm income of the US. Firstly, GM corn is highly prevalent in the US, accounting for more than 90 per cent of its domestic production. Secondly, it would negatively impact 25 per cent of the global export of corn by the US.

Thirdly, a study by 'World Perspective' forecasted that the ban would shrink the GDP by $30 billion over 10 years and would result in the loss of 32,000 jobs annually in the US, besides negatively impacting corn prices.

Fourthly, the concerns of the farmers were further compounded by Mexico's ban on glyphosate which is widely used in the US for GM corn production. Citing WHO warnings, Mexico stated that glyphosate harms human health and the environment and is a probable carcinogen causing cancer.

The National Corn Growers Association, representing US farmers, claimed that the decree is arbitrary and not based on scientific evidence. The Association urged the US government to invoke the dispute settlement provisions of USMCA to shield the interests of corn producers.

Often, developing countries are under pressure to accommodate the interests of developed countries in trade agreements.

As the US threatens to initiate a trade dispute, both countries are engaged in regular talks to diffuse the trade tension amicably. The USMCA is an RTA between the US, Mexico, and Canada which was enforced in 2020.

The agreement contains detailed provisions on Sanitary and Phytosanitary (SPS) measures, and biotechnology such as risk assessments and detailed procedural requirements in the garb of transparency, which aims to reduce trade disruptions and provide uninterrupted market access in the importing country.

By citing the USMCA provisions, the US claims that Mexico's ban on GM corn has no scientific basis and violates its commitments. On the other hand, Mexico argues that the ban is a precautionary measure to protect health and the environment, and it is not mandatory to allow the import of GM products under the USMCA. Additionally, Mexico documented various studies highlighting the adverse impact of GM corn.

These intense negotiations resulted in a revised decree issued by Mexico in 2023 which exempts GM corn for livestock consumption and industrial use from import ban.

It was a big relief for the US farmers as nearly 90 per cent of Mexico's imports consist of yellow corn which is predominantly used for non-human consumption.

Mexico's efforts, nevertheless, did not satisfy the US, which continues to oppose the import restriction on GM corn for human consumption and the use of glyphosate. To exert pressure on Mexico, the US initiated dispute settlement proceedings under the USMCA provisions.

The simmering dispute provides valuable insights for developing countries while negotiating trade rules governing GM products.

Despite a long-standing domestic ban on GM corn cultivation and related concerns, Mexico negotiated trade rules on GM products. Often, developing countries are under pressure to accommodate the interests of developed countries in trade agreements. This necessitates assessing its interests comprehensively, failure to do so can curtail its policy space, a problem confronted by Mexico.

Mexico argues that the USMCA provides enough flexibility to restrict imports of GM products on a precautionary basis to protect public health and the environment. Contrarily, the US insists on scientific evidence and risk assessment, thus diluting Mexico's right to take precautionary measures. Different scientific evidence may have different conclusions due to the lack of global consensus on the safety of GM products. Furthermore, it is a big challenge to produce timely scientific evidence without adequate scientific and administrative capacity. To prevent future pressure from varying interpretations, developing countries must focus on legal certainty and textual clarity to protect their policy space.

Currently, the issue of GM has garnered considerable attention in discussions under sustainable food systems at the WTO, requiring a cautious and informed negotiating approach. Overall, developing countries need to put their house in order before negotiating on sensitive issues rather than repenting at a later stage.

The writers work at the Centre for WTO Studies, IIFT. Views are personal

Re-imagining rice, a crop that feeds the world

The climate crisis is forcing farmers to shift their planting calendars and find new ways to grow the crop

SOMINI SENGUPTA AND TRAN LE THUY

DH ILLUSTRATION: DEEPAK HARICHANDAN

Rice is in trouble as Earth heats up, threatening the food and livelihood of billions of people. Sometimes there's not enough rain when seedlings need water, or too much when the plants need to keep their heads above water. As the sea intrudes, salt ruins the crop. As nights warm, yields go down.

These hazards are forcing the world to find new ways to grow one of its most important crops. Rice farmers are shifting their planting calendars. Plant breeders are working on seeds to withstand high temperatures or salty soils. Hardy heirloom varieties are being resurrected.

And where water is running low, as it is in so many parts of the world, farmers are letting their fields dry out on purpose, a strategy that also reduces methane, a potent greenhouse gas that rises from paddy fields.

The climate crisis is particularly distressing for small farmers with little land, which is the case for hundreds of millions of farmers in Asia. "They have to adapt," said Pham Tan Dao, irrigation chief for Soc Trang, a coastal province in Vietnam, one of the biggest rice-producing countries in the world. "Otherwise they can't live."

In China, a study found that extreme rainfall had reduced rice yields over the past 20 years. India limited rice exports out of concern for having enough to feed its own people. In Pakistan, heat and floods destroyed harvests, while in California, a long drought led many farmers to fallow their fields.

The challenges now are different from those 50 years ago. Then, the world needed to produce much more rice to stave off famine. High-yielding hybrid seeds, grown with chemical fertilisers, helped. In the Mekong Delta, farmers went on to produce as many as three harvests a year, feeding millions at home and abroad.

Today, that very system of intensive production has created new problems worldwide. It has depleted aquifers, driven up fertiliser use, reduced the diversity of rice breeds that are planted, and polluted the air with the smoke of burning rice stubble. On top of that, there's climate change: It has upended the rhythm of sunshine and rain that rice depends on.

Perhaps most worrying, because rice is eaten every day by some of the world's poorest, elevated carbon dioxide concentrations in the atmosphere deplete nutrients in each grain.

Rice faces another climate problem. It accounts for an estimated 8% of global methane emissions. That's a fraction of the emissions from coal, oil and gas, which together account for 35% of methane emissions. But fossil fuels can be replaced by other energy sources. Rice, not so much. Rice is the staple grain for an estimated three billion people. It is *biryani* and *pho*, *jollof* and *jambalaya* — a source of tradition, and sustenance.

"We are in a fundamentally different moment," said Lewis H Ziska, a professor of environmental health sciences at Columbia University. "It's a question of producing more with less.

How do you do that in a way that's sustainable? How do you do that in a climate that's changing?"

In 1975, facing famine after war, Vietnam resolved to grow more rice.

It succeeded spectacularly, eventually becoming the world's third-largest rice exporter after India and Thailand. The green patchwork of the Mekong Delta became its most prized rice region.

At the same time, though, the Mekong River was reshaped by human hands. Starting in south-eastern China, the river meanders through Myanmar, Laos, Thailand and Cambodia, interrupted by many dams. Today, by the time it reaches Vietnam, there is little fresh water left to flush out seawater seeping inland.

Climate change brings other risks. You can no longer count on the monsoon season to start in May, as before. And so in dry years, farmers now rush to sow rice 10 to 30 days earlier than usual, researchers have found. In coastal areas, many rotate between rice and shrimp, which like a bit of saltwater. Shrimp bring in high profits, but also high risks. Disease sets in easily. The land becomes barren.

Elsewhere, farmers will have to shift their calendars for rice and other staple grains, researchers concluded in a recent paper. Scientists are trying to help them.

The cabinet of wonders in Argelia Lorence's laboratory is filled with seeds of rice — 310 different kinds of rice.

Many are ancient, rarely grown now. But they hold genetic superpowers that Lorence, a plant biochemist at Arkansas State University, is trying to find, particularly those that enable rice plants to survive hot nights, one of the most acute hazards of climate change.

She has found two such genes so far. They can be used to breed new hybrid varieties.

The new frontier of rice research involves Crispr, a gene-editing technology that US scientists are using to create a seed that produces virtually no methane.

In Bangladesh, researchers have produced new varieties for the climate pressures that farmers are dealing with already. Some can grow when they're submerged in floodwaters for a few days.

No matter what happens with the climate, said Khandakar M Iftekharuddaula, chief scientific officer at the Bangladesh Rice Research Institute, Bangladesh will need to produce more. Rice is eaten at every meal. "Rice security is synonymous with food security," he said.

The New York Times

Aurangabad to host cottonseed oil, meal conclave in July

Our Bureau
Mangaluru

The Solvent Extractors' Association of India (SEA) and All India Cottonseed Crushers' Association (AICOSCA) will organise the '4th SEA-AICOSCA Cottonseed, Oil and Meal Conclave - 2023' in Aurangabad of Maharashtra on July 7 and 8.

The conclave will focus on scientific processing of cottonseed, nutritional value and better usage of cottonseed cake / meal in cattle feed to achieve high milk production.

Speakers from cotton and cottonseed fraternity, scientists, and researchers will address the delegates at the conclave. The programme will also include various panel discussions, including value addition in cottonseed supply chain, and price outlook for cottonseed, oil, cake and meal.

According to SEA, the current production of cottonseed oil in the country is about 12 lakh tonnes (lt), next to rapeseed oil and soyabean oil.

TOP CONSUMER

Gujarat consumes nearly 6 lt of cottonseed oil as direct cooking oil due. In other States, cottonseed oil is mainly used by bulk consumers such as food industry and hotels, restaurants and canteens for frying purpose.

The fried food prepared in cottonseed oil remains fresh for three-four weeks without turning rancid, says a letter by SEA of India.

Govt can't stop use of herbicide on GM crops, say activists

Nine Parliamentary constituencies in State to get food processing centres

EU's deforestation rule set to affect agri exports from India: Report

Amiti Sen
New Delhi

The EU Deforestation Regulation (EU-DR), adopted by the EU Council earlier this month, covers about 479 items exported by India such as meat, leather hide, wood furniture, paper and coffee, and is set to affect exports worth an estimated annual $1.3 billion to begin with, according to a report by a Delhi-based research body.

"The introduction of the EU-DR appears to be driven by a desire to bolster local production and exports while reducing imports. The regulation's compliance costs and discriminatory nature are concerns, as they may disadvantage smaller firms," said Ajay Srivastava, Co-founder, Global Trade Research Initiative (GTRI).

Under the EU-DR, Indian exporters to the EU must ensure that the identified products have been grown on the land which has not been deforested after December 31, 2020. Penalties for non-compliance include fines up to 4 per cent of a firm's annual turnover in the EU, confiscation of product, confiscation of revenues gained and exclusion from public procurement processes, the report explained.

As a preventive measure, the report proposed that the blockchain-enabled trace and track system being implemented by APEDA for grape exports to the EU and other regions needs to be adopted for all covered products. Exporters also need to be made aware of the compliance requirement, it said.

'DECEPTIVE NARRATIVE'

Further, India and other affected countries could consider taking up the issue at the WTO as it violates MFN and national treatment principles, it said. Combining the products covered under the EU's Carbon Border Adjustment Mechanism with the EU-DR is likely to adversely affect exports worth $9.5 billion from India, the report said.

Srivastava said that the EU's efforts at promoting "deforestation-free" products, appeared to be a deceptive narrative as the bloc extensively expanded agricultural land by cutting down primary forests, which now account for less than 0.7 per cent of its total forest area, compared to the global average of 33 per cent. "Many other countries, facing the need to convert primary forests into cultivable land to feed growing populations, have a much larger share of primary forest. The EU, however, aims to prevent others from following a similar path while having already done so in the past," he said.

Apart from India, countries such as Malaysia, Indonesia, Brazil, Argentina, Ecuador, Peru, Guatemala, Costa Rica. Colombia, Cote d'Ivoire and Vietnam are also to be adversely affected, the report noted.

Agriculture dept. clears plan to raise production of spices

State readies for mobile application in crop survey

The survey will be carried out in 110 villages between May 25 and June 15. The application has been developed by the T.N. e-Governance Agency

Dennis S. Jesudasan
CHENNAI

The app uses the geo-referenced village maps with Field Measurement Book incorporated into it.

The Tamil Nadu government will roll out a pilot project in 110 villages where the Village Administrative Officers (VAOs) will use a mobile-based application to conduct the crop survey. The data thus gathered will be used as the 'Adangal' database.

The pilot survey will be carried out between May 25 and June 15. The application was developed by the Tamil Nadu e-Governance Agency under the Union government's Agristack project.

The Departments of Agriculture and Farmers Welfare and Revenue and Disaster Management have coordinated for this project. Based on the feedback from the pilot data entry, the crop survey will be rolled out for all villages from the Kharif season this year.

A senior official told *The Hindu* that it was an attempt at digitisation, and once it became successful, it would be easier for the VAOs to enter the data. "The data will be available for the farmers to view. It will be easier to correct or modify entries as they will be available digitally."

Welcoming the measure, R. Arulraj, general secretary, VAO Association of Tamil Nadu, however, flagged the issue of patchy mobile phone signal in rural and remote areas and urged the government to look into the issue.

The app uses the geo-referenced village maps with Field Measurement Book incorporated into it. It has the data from Tamil Nilam, a land database maintained by the Revenue Department, as well as from the GRAINS (Growers Online Registration of Agriculture Inputs System) portal, maintained by the Agriculture Department.

The digitisation would make it easier for the government to monitor the fields that have not been covered and do the follow-up. All subsequent users of the crop data will find them helpful in schemes like loans and insurance.

Govt must push to privatise fertiliser PSUs

UTTAM GUPTA

Despite Govt's announcement to privatise the CPSUs, the fertilizer units remain under its control as fertiliser availability is a politically sensitive issue

In the Budget for 2021-22, Finance Minister Nirmala Sitharaman had announced the government's approach to privatisation of Central public sector undertakings (CPSUs). Privatization occurs when it sells its majority shareholding (more than 50 percent) in the CPSU and transfers control to a private entity.

For this purpose, it divided CPSUs in two broad categories—i.e. strategic and non-strategic. The strategy covers four subgroups: atomic energy, space and defense; transport and telecommunications; power, petroleum, coal and other minerals; and banking, insurance and financial services. The non-strategic category includes all other sectors such as industrial and consumer goods, hotel and tourist services, trading, and marketing.

While, the government wants to sell CPSUs in the strategic sector with the caveat that at least one (and a maximum of four) will be retained in the public sector, it will privatise 'all' undertakings in non-strategic sectors. All loss-making undertakings in the latter category will be closed.

In the follow through, the Department of Public Enterprises (DPE) and Niti Aayog identified 176 CPSUs in the non-strategic sectors and have recommended that over 60 percent of them or 106 be wound up, while the rest, considered "viable units," be privatised. But, so far there has hardly been any progress except the steel sector.

While, generally, there is resistance from the top brass within the establishment, the ministry of chemicals & fertilisers, has categorically opposed privatisation of undertakings under its ambit. The DPE/Niti Aayog had recommended privatisation of all the nine CPSUs under the fertiliser ministry, including Madras Fertilizers Limited (MFL) and National Fertilizers Limited (NFL).

Leveraging government's majority ownership and control, the bureaucrat in the concerned ministry for long has been used to calling the shots in the running of the CPSU including day-to-day interference in their management and seeking favors under a variety of quid pro quo arrangements. So, he won't let this power go away easily which is inevitable when it is privatized.

This applies to the entire bureaucracy. However, in view of political bosses having taken the decision, the resistance has to be overcome sooner than later. But, why is the ministry of chemicals & fertilizer opposing privatization?

First, being a crucial input used by farmers for increasing production of foodgrains, fertilizers are politically sensitive (in his speeches, Prime Minister Narendra Modi has often referred to shortage of urea under earlier regimes which hasn't been seen during his tenure) and the ruling establishment can't afford to take any chances when it comes to ensuring their adequate availability in every nook and corner of the country. In this backdrop, if the government has manufacturing units directly under its control, it can always ask them to increase production whenever it apprehends a shortage. This won't be possible if all these are in private hands.

If that is the thinking then the forward is for the government to classify fertilizers as a 'strategic' sector which allows for the possibility of retaining a maximum of four undertakings in the public sector and thus help address the aforementioned worry. Is that really necessary? The answer is clearly 'no'.

> THE INVESTORS COULD COME IN ONLY IF THE VALUATION IS KEPT LOW. BUT THAT WON'T BE ANYWHERE NEAR THE MONEY INVESTED IN THEIR REVIVAL. SUCH A DEAL COULD INVITE CRITICISM

(The writer is a Policy Analyst)

Already, 'adequate' and 'effective' mechanisms are in place to prevent occurrence of a shortage situation. The requirement of all fertilizers for each cropping season i.e., kharif (April to September) and rabi (October to March) is assessed by the Department of Agriculture and Cooperation (DoAC) in consultation with Department of Fertilizers (DoF), states, railways and fertilizer manufacturers. It is broken down month-wise. The supply, movement and distribution of all fertilizers is monitored through online web based "Fertilizer Monitoring System (FMS).

In this comprehensive exercise involving all stakeholders including the manufacturers, the government can always direct any plant even if it is privately owned to increase production/supplies to meet shortage if any. The latter can't say 'no' all the more because he depends on the former for subsidy support given as reimbursement of the excess of the cost of production and distribution over the maximum retail price (MRP) set at a low level.

Second, India imports 25-30 percent of its urea requirement. Urea is imported only through designated state agencies, primarily CPSUs such as the NFL. It could be argued that asking PSUs to import urea ensures more effective management of such supplies which will be jeopardized if the government has no fertilizer enterprise left within its fold (post their privatization). This argument is specious.

India also imports non-urea fertilizers where the dependence on import is much higher viz. diammonium phosphate (DAP): 50 percent; muriate of phosphate (MoP): 100 percent. Their imports are not channelized through state agencies/CPSUs even as any entity is free to import DAP and MoP. Yet, the country hasn't faced any shortage of these fertilizers. Likewise, even when urea import is left to private entities, there won't be any problem.

Besides, channelizing imports through CPSUs is pregnant with the risk of politician-bureaucrat-business nexus triggering inflated payments to exporters in exchange for commission. For instance, in the 90s, 'NFL making payment of millions of dollars for urea that never arrived' made headlines.

Third, under the New Pricing Scheme (NPS) of allowing cost and in turn, subsidy (cost minus MRP) for urea, the bureaucrat determines how much of each of the cost components such as capital related charges or CRC (these include interest cost, depreciation and return on shareholders funds), other fixed cost, cost of gas and other inputs, etc., is to be allowed for subsidy payment to each unit. Generally, units under CPSUs are allowed higher cost and higher subsidy on every ton of urea produced to accommodate their inflated expenses.

For instance, six years back, Modi - Government had approved revival plans of five plants under the Fertilizer Corporation of India Ltd (FCIL) and the Hindustan Fertiliser Corporation of India Limited (HFCL) viz Sindri (Jharkhand), Gorakhpur (Uttar Pradesh), Barauni (Bihar), Talcher (Odisha) and Ramagundam (AP). For decades, these plants had been on the ventilator guzzling thousands of crores of taxpayers money. Their revival couldn't be justified on financial viability considerations; yet, their revival was approved due to their location being in politically sensitive areas.

Entailing an investment of around Rs 40,000 crore, these plants were commissioned in 2021/2022. Given the high CRC associated with the high invested capital (Rs 8000 crore per plant on an average), their viability can be protected only if they continue to get inflated retention price under the NPS. The big question is, will they continue to get the same treatment even after their disinvestment? If not, the government won't get suitors.

The investors could come in only if the valuation is kept low. But, that won't be anywhere near the money invested in their revival. Such a deal could invite criticism. The dilemma could be behind the fertilizer ministry opposing privatization.

To conclude, the concern on account of securing adequate supplies – whether from domestic production or import – is unwarranted. As for disinvestment of CPSUs housing high-cost plants, the government will have to take a tough call. It should tell the suitor upfront that the inflated price under NPS won't continue. In lieu of this, it may accept low valuation, a price worth paying now if only to avoid the pitfalls of retaining the undertakings under public sector fold. Finally, the government should unshackle the process of share sale from bureaucratic red tape.

Address:
207, Prakash Deep Building, 7 Tolstoy Marg, New Delhi-110001

Contact Us: 011-43065365 | Email Us: info@acfiindia.com
Visit Us: www.acfiindia.com

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