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THE HINDU

Studying our planet's future

K.P. Krishnan who heads the Indian Arctic programme talks about the crisis facing polar bears and the immediacy of climate change

The north and south polar regions stand out for their grand icy landscape, fascinating life, and its extreme environment. The image that is often construed is that of people wrapped in furry clothes on sledges driven by dogs across the white glaciers, of penguins, polar bears, and the amazing Aurora. But for scientists like K.P. Krishnan these regions hold a mirror to the future of this planet. India began its scientific endeavours in the Arctic in 2007 when a team of five scientists initiated studies in the fields of Arctic microbiology, atmospheric sciences and geology. This ignited a long-term programme of regular scientific activities, all coordinated by the National Centre for Antarctic and Ocean Research (NCAOR), Goa. Krishnan, who is a Scientist-D at NCAOR, made his first expedition to the Antarctic in 2007 and the Arctic in 2008. He now heads the Planning, Coordination and Implementation of the Indian Arctic programme.

“Since my first visit there have been visible changes in the polar regions. I think there needs to be a greater sense of urgency among decision-makers and awareness by the public regarding the global importance of changes taking place in these realms. It is a sensitive issue. When we wax eloquent about climate change what needs to be noticed and addressed is the huge loss of sea ice in the Arctic,” says Krishnan, who is principal investigator of the long-term monitoring project of Kongsfjorden, (an inlet on the west coast of Spitsbergen, an island which is part of the Svalbard archipelago in the Arctic Ocean), for climate change studies.

Krishnan continues, “There is some amount of sea ice that is perennial and some that melts and returns annually. Now, this is critical. For if you don't get enough that means it becomes a threat for the ecosystem that depends on it. You must have seen photographs of polar bears feeding on something it is not supposed to feed on. Why is this happening? The hunting behaviour of the polar bears is such that it stands on the sea ice,

dives a hole and catches the seal as it pops up. With polar bears deprived of this, it needs to find other places for food, often trespassing into human habitations, ”says Krishnan who did his Bachelors in Zoology from Sacred Heart College, Thevara.

The polar bears have never faced periods as warm as what it experiences now. And this could get worse in the coming years.

IndARC, India’s underwater observatory in the Arctic, works to provide data crucial to understand climate patterns in the polar region and its possible influence on the Indian monsoon that is vital to agriculture in the subcontinent. This observatory in the Kongsfjorden, is expected to help Indian researchers collect primary data on long-term climate variability in the Arctic.

When we wax eloquent about climate change what needs to be noticed and addressed is the huge loss of sea ice in the Arctic

Voice-controlled app can help you track calories

MIT researchers have developed a new voice-controlled app that may help obese people to lose weight by logging calorie counts and other nutritional information after every meal.

The system parses the description and automatically retrieves the pertinent nutritional data from an online database maintained by the US Department of Agriculture (USDA), researchers said.

The data are displayed together with images of the corresponding foods and pull-down menus that allow the user to refine their descriptions - selecting, for instance, precise quantities of food. But those refinements can also be made verbally, researchers said.

A user who begins by saying, “for breakfast, I had a bowl of oatmeal, bananas, and a glass of orange juice” can then make the amendment, “I had half a banana,” and the system will update the data it displays about bananas while leaving the rest unchanged, they said.

Researchers at the Massachusetts Institute of Technology (MIT) concentrated on two problems.

One is identifying words' functional role — the system needs to recognise that if the user records the phrase “bowl of oatmeal,” nutritional information on oatmeal is pertinent, but if the phrase is “oatmeal cookie,” it is not.

The other problem is reconciling the user's phrasing with the entries in the USDA database.

Through the Amazon Mechanical Turk crowd-sourcing platform, they recruited workers who simply described what they had eaten at recent meals, then labelled the pertinent words in the description as names of foods, quantities, brand names, or modifiers of the food names.

Researchers used machine-learning algorithms to find patterns in the syntactic relationships between words that would identify their functional roles.

The water-energy nexus



That water and energy are connected should be intuitively known to us yet it escapes us at crucial times. Consider the thermal power plant at Raichur. It is failing to operate because there is no water in Krishna river. Now sandbags are being thrown across to ensure that the meagre flows can be directed so that power-starved Karnataka will get its electricity. In none of the awards made by various tribunals for Karnataka is there a demand for or an allocation to, for generation of power. The State has to

scramble from within its overall allocation to find waters for electric plants. This is mind boggling.

On the other hand, since the State is predominantly groundwater-based in its supply of water for drinking, for irrigation and for even urban use, without electricity there is no access to water. Food production and the livelihoods of millions of farmers is completely based on the availability of water and energy, mainly as electricity.

In urban areas too we pay for our water through our electricity bills too and are unaware of it. Even at a household level, water has to be pumped from sumps to overhead tanks for it to be available in taps.

Cities have had to fight for dedicated power lines for water supply and distribution, and sewage treatment plants will become dysfunctional if there be no electricity and hence too need dedicated 'no-power-cut lines'. In the rural areas, Gujarat has done excellent management by delinking agricultural electricity lines from the regular village lines. This means that the drinking water sources as well as the light sources in villages can be ensured good quality, reliable electricity. Something that Karnataka must emulate.

In your own house or apartment, make sure that the pumping system from your borewell and sump to the overhead tank is optimised to ensure that water is pumped up quickly.

All forms of conventional energy — thermal, hydro-electric, nuclear — requires large volumes of water. Solar energy requires the least, at least in the operations part of it.

A solar-electricity-based system makes absolute sense not only ensuring that water is available for the household but reducing the load on thermal and hydro-electric plants, thus saving water.

By decoupling water and electricity it is possible to move towards more sustainable systems of water use. We need to focus our energies on that and that would be water wisdom.

Hot, dry weather to continue

Be prepared for a hot, dry spell, at least for a week or so, is the message one gets from the Agro Climatic Research Centre at the Tamil Nadu Agricultural University. Weather managers say that in the past few days in Coimbatore, the temperate has been unusually high, with the mercury even touching 100 degree Fahrenheit a few days ago.

Such high day temperature coupled with increase in night temperature is likely to continue for a few more days not only in Coimbatore but also in Salem, Namakkal and the western region.

The first reason is equinox, when the Sun is directly over the head and is out for about 10 hours, the second is the moisture-less soil that radiates heat and less cloud cover. Sources say that Coimbatore residents may get relief once the North Westerly wind sets in. Until such time, the temperate will remain above normal for this month.

At present, it is the South Westerly wind that is blowing through the area. Summer showers will also help bring down the mercury, the weather managers say and add that the district is supposed get 136.2 mm rain during the season that extends from March to May.

Last year the district had a bountiful summer showers with 266 mm. The South West Monsoon will start by the third week of May and as of March 25, it will be difficult to predict the monsoon as the error margin will be high.

The average rainfall during the SW Monsoon season is 205 mm. Last year, Coimbatore received less than average rainfall. The season extends from June to September.

Bidar APMC to go online today

Bidar will join the 156 Agricultural Produce Marketing Committees in the State to allow farmers sell their produce online. The system will be inaugurated on Saturday.

As per the system, farmers will be able to sell their produce to any of the 80,000 traders in Karnataka or those outside the State. They will get the best available prices from interested buyers. Their produce will be graded for free will be sold only if the farmers agree to the price quoted by the traders. Till then, it will be kept in the godown in the APMC complex. Rahim Khan, MLA, will be present during the inauguration.

Creating awareness on climate change

The Science Express will be stationed at the Mangaluru Junction Railway Station till Monday



Pooja Dukhi, a resource person, explaining the 'magic' of science to kids aged less than 10 in the Science Express stationed at Mangaluru Junction Railway Station on Friday.

Smriti, a class 4 student from a Mangaluru school, was puzzled to know that even the Earth has fever, upon entering the Science Express Climate Action Special train stationed at Mangaluru Junction Railway Station on Friday.

The resource person in-charge of the coach explained that due to unregulated human activities resulting in greenhouse gas emission, the temperature on the Earth is constantly on the rise.

Impact

The next coach had information about the impact of climate change in India and why the country should be concerned about it.

She was told there are steep variations in monsoon and increase in temperature directly impacting agriculture, water, forests, biodiversity and human health. The next two coaches had information on how one has to adapt to climate changes, though there are efforts to mitigate them.

Miniature display

There was a miniature display of road space occupied by different modes of transport; while pedestrians occupied a meagre space, cars occupied the largest space with bicycles and public transport coming in between. Children were coaxed to go either for non-motorised transport or public transport.

Going back to earlier practices of using earthen utensils, utilising locally available foodgrains, conserving as much water as possible, using energy efficient technologies, exploiting clean sources of energy, etc., are some of the ways of mitigating climate change, she was told.

Coach 8 listed out over a 100 positive action ideas that can reduce carbon footprints thereby promoting sustainability.

Coaches 9 and 10 had an exhibition by the Department of Biotechnology on bio-resources and nature conservation, while Coach 11 had an exhibition by National Innovation Foundation showcasing select innovations by common people. One of the displays there included a cost-effective milking machine by Raghava Gowda of Dakshina Kannada, which can be operated either by hand or by power.

Initiative

Science Express Climate Change Special Train will remain at Mangaluru Junction till March 28 and is open to general public, students, teachers and children between 10 a.m. and 5 p.m. It has been travelling across India for seven years.

The train has so far covered over 1.22 lakh km receiving more than 1.33 crore visitors at its 391 halts in 1,404 days.

It has now been redesigned on the theme “Climate Change” and from October 15, 2015, it is running as “Science Express – Climate Action Special (SECAS)”.

It is a unique collaborative initiative of the Department of Science and Technology, Ministry of Environment, Forest and Climate Change and Ministry of Railway.

With a mission

Science Express Climate Action Special Train remains stationed at Mangaluru Junction Railway Station till Monday

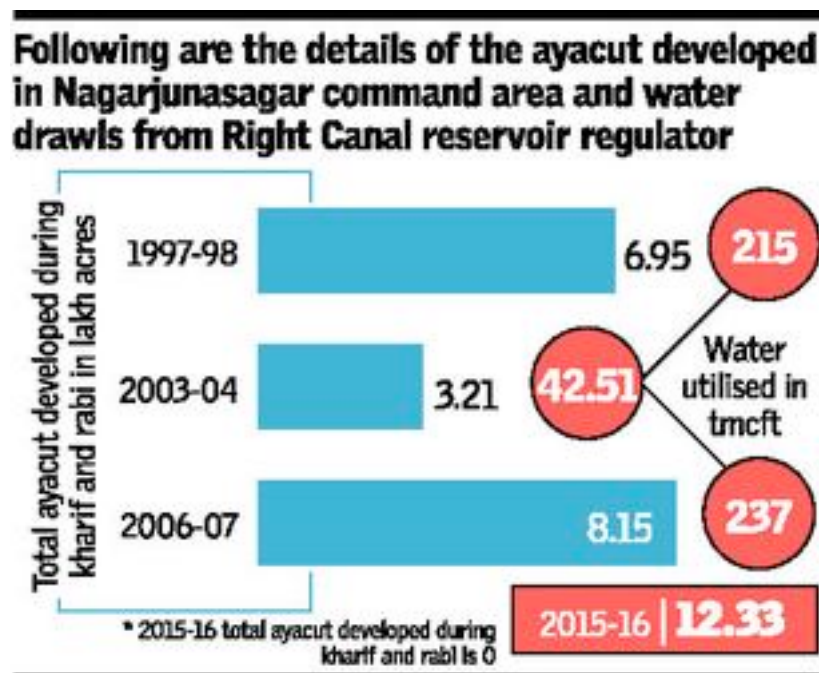
It is open between 10 a.m. and 5 p.m. and entry is free

Of the 16 air-conditioned coaches, eight are dedicated to climate change

One each coach is dedicated to children and hands-on-laboratory

The train's next call is Ashokapuram in Mysuru, between March 30 and April 2

NSP draws plummet to a record low



For the first time in two decades, the total drawals from Nagarjuna Sagar Right Canal Reservoir has plummeted to a record low 12.33 tmcft pointing to a grim situation staring at Krishna Western and Eastern Delta.

Alarming dip

The alarming dip in storage levels in Nagarjuna Sagar Project meant that not even a single tmcft of water has been utilised for agricultural purposes in the ayacut for both khariff and rabi. Irrigation authorities started releasing 6,000 Cusecs of water on Wednesday to meet the drinking water requirements of villages in Palnadu region of Guntur District and Ongole Municipality in Prakasam district.

“This is the first time that the total drawals from the NSP RCR has fallen below 15 tmcft. Even in successive drought years during 2002-2003, 2003-2004, we were able to draw 44.58 tmcft and 42.51 tmcft of water respectively. But, the situation is definitely alarming,” said NSP Canals Superintendent Engineer M.V. Krishna Rao.

The total ayacut under the NSP Right Canal developed in kharif is 6.93 lakh acres and spread across Guntur, Krishna, and Prakasam districts, while it is 1.44 lakh acres in the rabi. During 2014-2015, the irrigation

authorities were able to salvage crop in kharif, but due to low water levels, could not release water for crops in rabi season.

Data of ayacut developed under Nagarjuna Sagar Right Canal and water drawals indicated that the highest drawal of 236.75 tmcft was in the year 2006-2007. In fact, the drawals had remained high during three successive years from 2005 to 2009. The drawals which used to hover around 190 tmcft started plummeting since 2012 (38.05 tmcft), but picked up again in 2013 (191.65).

Bleak scenario

The Irrigation authorities point out to a bleak scenario in the coming months as the total quantum of water in Krishna River Basin was at an all-time low of just 60 tmcft, just enough to meet the drinking water requirements. There is still 30 tmcft of water left in Nagarjuna Sagar Reservoir, but that could be just sufficient to meet the water requirements of Hyderabad.

Awareness on conservation of water-bodies

A campaign on protecting water bodies was organised under the auspices of Eco Youth - Pudukottai, a service organisation, at Munasandhai near here on Wednesday. Students and volunteers from the village cleaned a local tank of rags and plastic waste to protect the water body and conserve the groundwater table.

The Managing Director of Rose Trust, A. Adhappan, who inaugurated the campaign, said the tank in Sri Veeramakali Amman temple, has been a major source for harvesting rainwater. But, it was being used as a dumping yard for garbage and other waste materials. He urged the government to permit farmers to clear the silt deposited in these tanks for agricultural use. "It would go a long way in deepening the water bodies and augmenting the texture of farm soil and, thereby, agricultural productivity," he added.

Earlier, the volunteers of the Eco Youth – Pudukottai, took out a procession in the village and raised slogans appealing to the local villagers to protect and conserve the water bodies.

APMC launches campaign to revive online trading initiative



The mobile publicity van launched by APMC in Belagavi this week to spread awareness among growers on the benefits of online trading.— photo: p.k. badiger

The poor response to its online trading initiative has prompted the Agricultural Produce Marketing Committee (APMC) to initiate fresh measures aimed at creating awareness among the district's farmers.

Online trading was launched by the State government in 2014 in Belagavi and other districts with the objective of linking the growers directly with buyers and eliminate the exploitative middlemen. It was facilitated by the special purpose vehicle, Rashtriya e-Market Services (ReMS) with which the farmers could register.

However, vegetable growers by and large remain hesitant when it comes to embracing such technology-based trading for various reasons.

On Wednesday, APMC along with the Department of Information and Public Relations launched a mobile campaign to spread awareness on the benefits of online trading. The mobile unit will tour at least 45 major hobli centres and villages across 10 taluks in the district over a two-week period. Also, information on various schemes offered by APMC will be made available to the growers, said APMC president Shivangouda Patil.

Mr. Patil told *The Hindu* on Thursday that many farmers, because of lack of literacy, find it difficult to use the computer/mobile app-based trading system.

Also, as vegetables are a perishable commodity with short shelf-life, the buyers, who are wholesale dealers, were also hesitant to procure them online. Most want physical verification. However, there is no such problems when it comes to trading food grains in the “e-mandi”, he said. “We are trying to educate the farmers on online trading as it would be helpful to the growers to sell their produce at competitive rates offered by the buyers registered with APMC. Also, as there are no middlemen involved here, the exploitation element can be eliminated,” Mr. Patil said.

9-hour power supply to farm sector from April 1’

Minister for Agriculture Pocharam Srinivas Reddy said that from April 1 the government would give nine-hours of uninterrupted free power supply to the farm sector, and in the coming two years there would be 24-hours supply. Under the second phase of the Mission Kakatiya, a total of 10,000 tanks would be renovated

In the coming two years, there will be 24-hours supply, says Pocharam Srinivas Reddy

‘Govt. will encourage organic farming in a big way’

Principal Secretary (agriculture) P. Vijay Kumar said that it was decided to encourage the targeted 15,000 farmers to take up organic farming in kharif-2016, as a majority of farmers had shown interest in such a farming method at a workshop conducted in Kakinada recently.

While interacting with progressive farmers at ZP conference hall in Vizianagaram on Wednesday, Mr. Kumar said that farm tools needed for organic farming would be supplied at a subsidies rate through DWCRA groups.

As a pilot project in Vizianagaram district, training on how to market farm produce at remunerative price would be imparted to 300 selected farmers from 10 clusters, he said.

He said organic farming would help weather natural calamities.

Farmers – Vijayalakshmi from Merakamudidam mandal and Pathivada Narayana Rao from Poosapatirega mandal – narrated their experiences in organic farming and how they improved yield per acre.



Gujarat govt to set up varsity for organic farming

The Gujarat government has decided to set up an agriculture university under the organic farming policy of the state. The location of the proposed university has not been finalised so far.

According to officials, Rs 10 crore has been sanctioned for 2016-17 for setting up the farm university, the idea for which is said to be conceived by CM Anandiben Patel. This would be the sixth farm university in the state after Anand, Navsari, Dantiwada, Junagadh and Kamdhenu universities. Kamdhenu varsity is currently operating from Krishi Bhawan in Gandhinagar and it focuses on research on cows and other cattle. Agriculture principal secretary A M Solanki said, "At present, everything is at the initial stage." The move has been welcomed by NGO Jatan and other groups working to promote sustainable organic farming in the state.

Asked about the need for an agriculture university especially for organic farming when four agriculture varsities in the state have organic farming department, Junagadh Agriculture University vice-chancellor A R Pathak said: "A separate university will focus exclusively on organic farming and research on what kind of crops can be grown in a particular area depending on the type of soil and the local climate." The university, according to agriculture department officials, could also focus on research to provide high-yielding seed varieties for organic farming.

According to the officials, Gujarat is suited for organic farming as a significant per cent of agriculture in the state is rainfed unlike in riparian

states. In fact, organic farming is gaining ground in the country with Madhya Pradesh, Himachal Pradesh, Nagaland, Mizoram, Sikkim, Andhra Pradesh, Kerala, Maharashtra and Karnataka coming up with their own organic farming policies, they said.

Under its organic farming policy, the Gujarat government plans to increase the organic farming area by 10 times in five years.

Currently, the area under organic farming in the state is around 4,500 hectare.

THE HINDU BusinessLine

Royalty row: Private, public sector cos set to come up with alternatives to Bt cotton



Monsanto's veiled threat of leaving India over royalty issue might have shocked some people who wondered what could happen to Bt cotton in the country. But for others it's of no consequence.

They claim that it is not the end of the road for cotton farmers and that there are good alternatives available for them both in Bt and non-Bt segments.

While a section of industry is unfazed saying it could look for alternatives in no time; those who are opposing the Bt technology say it is high time we looked at non-Bt options keeping in view the requirements of rain-fed areas.

The National Seed Association of India (NSAI) said Monsanto's threat, in fact, came as a big relief. "All these years, the company has restrained

us from using technologies other than the one developed by it. It forced the seed firms to sign the licence agreements that barred them from using other technologies,” NSAI President M Prabhakara Rao told *BusinessLine* .

Nuziveedu Seeds, promoted by Prabhakara Rao, teamed up with a few Hyderabad-based firms to form Swarna Bharat Biotechnics to deploy biotechnology in cottonseeds.

It tied up with the Lucknow-based public sector research institute National Botanical Research Institute (NBRI) to use a gene (Cry1EC) developed by it for the experiment.

“We had to shelve the project after we signed the restrictive agreement with Mahyco Monsanto (the joint venture that sub-licences the Bollgard technology to Indian seed firms). We will revive it and can develop a commercially usable seed in two years,” he said.

Varietals, no hybrids

The public sector CICR (Central Institute for Cotton Research) has been working on alternative technologies for cotton. Working on the premise that the technology would be more effective if used in varieties (as against hybrids in Bollgard), the Nagpur-based institute used Bt 1 (Cry1AC Mon531) into a local variety. This genetically-modified seed is expected to hit the fields in a season or two.

“Besides reducing the pressure on moisture, the technology shortens the duration of the crop,” CICR Director Keshav Kranti said.

He said being a long duration crop, hybrid cotton enhances the scope for attacks. The shorter duration varieties reduce the scope, saving time and money to farmers.

Telangana, Maharashtra

As the local variety is a lanky one, it allows the farmers to go for high density sowing, giving them better yields. The institute has done field experiments on a pilot basis last kharif and offered to give the new seed to Maharashtra and Telangana (the two dominant cotton-growing States) governments for next kharif itself.

Non-Bt alternatives

“But the point is it is time for us to realise the futility of the technology that is giving up within no time. We need to rely on resilient methods to take on the bollworm. About 70 per cent of all the cotton area in the country is under rain-fed areas that are not suited for the crop. We must use non-Bt cotton to help farmers face hostile conditions,” GV

Ramanjaneyulu, Chief Executive Officer of Centre for Sustainable Agriculture (CSA), said.

The CSA teamed up with farmers' cooperatives to grow non-Bt cotton in Warangal, Adiblabad (Telangana), Yavatmal and Wardha (Maharashtra) on 3,000 acres.

“We have used both varieties and hybrids and recorded an average of 6-8 quintals an acre. We have used no chemical fertilisers and pesticides,” he said.

He felt that non-Bt alternatives would solve the problem of the farmers as they were less dependent on inputs.

Higher mustard yields set to boost rabi oilseed output



Driven by higher yield of mustard seed, India's oilseed production is seen higher by about 7 lakh tonnes (lt) for the year 2015-16 rabi season, according to the industry estimates.

The Central Organisation for Oil Industry and Trade (COOIT) has pegged the overall rabi oilseed crop for 2015-16 at 77.41 lt – about 7.47 lt higher from the previous year's 69.94 lt.

Bulk of the increase is attributed to the higher yields of mustard.

Higher yields

Even though the mustard acreage had dropped by about 66,000 hectares to 64.51 lakh hectares in 2015-16 rabi season as against 65.17 lakh hectares last year, the yields were likely to be higher by 132 kg/ha at 899 kg/ha against 767, COOIT said.

As a result, the total production of mustard is estimated at 58 lt (50 lt), the trade body said.

The untimely rains this year did help the mustard crop in some growing regions.

In Rajasthan, the largest mustard producing State, output this year has been pegged at 26.6 lt by COOIT.

Similarly, in UP the production is estimated at 8.4 lt, followed by Punjab and Haryana at 7 lt, Madhya Pradesh at 3.8 lt, West Bengal at 3.1 lt and Gujarat at 2.95 lt. Production in other States is estimated at 5.7 lt.

“Mustard is the only oilseed crop that will see significant rise in production this rabi season. However, the current season’s estimate seems lower than normal crop,” said Govindbhai Patel, an oilseeds expert from Rajkot.

“Last year, hailstorm had damaged the crop. Hence, the overall oilseed crop isn’t very encouraging,” he said.

Break up

COOIT estimates rabi groundnut output at 12.4 lt against 12.85 lt in the previous rabi season.

Sunflower output is estimated at 2.4 lt (2.5 lt).

Similarly, the sesame seed output is pegged lower at 2.25 lt (3 lt), while the production of linseed is estimated at 2.1 lt, more than double the previous season’s 1 lt.

The combined area of Kharif and Rabi oilseeds during 2015-16, according the Union government and trade estimates, is about 268.59 lakh hectares and production of nine oilseed crops for the current year (2015-16) is estimated at 203.41 lt compared to 211.09 lt of last year – down by 3.64 per cent.

Imports to rise

According to Pravin Lunkad, President, Solvent Extractors Association (SEA), the total vegetable oil availability from kharif and rabi oilseeds crops for the year 2015-15 (November-October) would remain almost same as that of last year at 72.02 lt compared to 71.95 lt last year.

“In view of lesser crop coupled with higher demand for edible oils, imports during 2015-16 (November-October) is likely to increase and is estimated at 158 lt. Import of non-edible oils is likely to be 2 lt.

Total import of vegetable oils is estimated at 160 lt during 2015-16 (November-October) against 146.1 lt in 2014-15,” said Lunkad in a letter to Association members.

Commenting on the plight of the oil crushing industry in the country, Lunkad raised the issue of duty difference between crude and refined oils.

“The refining sector of the vegetable oil industry is suffering heavily and capacity utilisation has further reduced due to larger import of refined oil in the last few months due to near equal prices of crude palm oil (CPO) and refined bleached deodorised (RBD) palm oil, which used to be around \$30 to 50 previously,” he claimed.

Patel also expressed higher price trend in key oils including palm oils.

Duty difference

The import of CPO attracts 5 per cent duty, while RBD has no duty.

“RBD is being sold at the raw material price. This boosts the imports of refined oils than the crude oils. Therefore, oil millers have reduced capacity utilisation due to disparity,” said Patel.

Moreover, from April 2016 onwards, CPO export from Malaysia will attract 4.5 per cent export duty, thereby making it further costlier to import crude oils than refined oils.

“This will further hit the domestic refining industry as futures quotes showing landed cost of RBD palmolein in India will be cheaper than CPO in the coming months,” added Lunkad.

Consumers seek to buy milk from organised players, says Mahindra & Mahindra

Ashok Sharma, President and Chief Executive of agribusiness, said the company has ambitious plans for the division.

In an interview with *BusinessLine*, Sharma said the company wants to play a big role in the market, which is spread across the country and has a yearly turnover of Rs. 20 lakh crore. The company has identified dairy products, pulses and edible oils as key growth areas. Excerpts:

How do you plan to expand your agribusiness further?

In 2009, Mahindra and Mahindra became the top tractor maker in the world. But from 2007 itself, the management was thinking – what is the next level the company could reach. Then it was decided that the company must be present in the whole farming value chain.

It was realised that agriculture was a Rs. 20-lakh crore annual opportunity, with many under-served areas and lots of quality and consistency challenges. Given Mahindra’s rural connect with farmers due to the tractor business, a separate vertical for agribusiness was created in 2010.

Initially, the company started selling seeds, agriculture chemicals and micro-irrigation systems. About three years back it moved closer to farmers by dealing in horticulture products. Today, it is the largest

exporter of grapes and handles 13,000 tonnes, which is mostly exported to Europe. The grapes meet all the European Union-stringent quality and safety norms. The success in the grapes business will be replicated in pulses, edible oils and dairy products.

For better agri-products the company is always interacting with farmers.

How big is the opportunity in the Indian dairy sector?

In the dairy business, the company realised that milk distribution and sale was very unorganised. In the last ten years, the sale of loose milk has fallen from 80 per cent to 70 per cent. It means there is a shift in consumer preferences, and they want milk from organised players.

The all-India milk products market is Rs. 4-lakh crore. Even the largest player in the market manages to sell only Rs. 20,000 crore of products per year, which is only five per cent of the market. Rest of the 95 per cent still consist of small players and local sellers.

How is the company going about its milk business?

When the milk is collected from farmers, the quality and fat content in the milk are measured. The process is electronic with no human intervention. Based on these parameters, the remuneration of the farmers is set. The company also ensures that cattle are fed with better, nutritious food so that they give more milk. Once a cow is milked, bacteria start to build-up. Therefore, in order to reduce the bacterial load, the company has provided the farmers with stainless steel cans instead of aluminium cans. It reduces the bacterial load significantly.

The quality of milk is also maintained by chilling the milk at 4 degree Celsius within four hours of milking the animal.

Mahindra has also brought in a tamper-proof packing for milk pouches. If the plastic pouch gets tampered with a syringe, then it will show a blue colour at the site where it is pierced. Milk suppliers sometimes use large syringes to extract milk from the pouch and fill it with water.

The company is targeting to supply 10,000 litres of milk per day to the consumers in Indore. Once the milk business gets stabilised, curd, Lassi, Ghee and other milk products will be launched.

The agri-product market in India is a large but fragmented market. What strategy has Mahindra adopted?

For pulses, the company is targeting consumers in Mumbai. For edible oil and milk, we are tapping customers in West Bengal and Madhya Pradesh, respectively. The company wants to establish its brand in one geographical area before moving on to other markets.

For getting the supply chain in order, the company officers are working with pulses farmers in Latur region of Maharashtra and mustard farmers in Kota region of Rajasthan. The best farming practices are being shared with farmers.

Global black tea output up



Global black tea production has posted an encouraging opening for calendar 2016 with the output in January rising 6.56 per cent over January 2015. “Global black tea output has risen to 98.97 million kg (mkg) in January 2016 from 92.88 mkg in January 2015.

This increase of 6.09 mkg marks a growth of 6.56 per cent,” Rajesh Gupta, compiler of annual *Global Tea Digest* told *BusinessLine*. This is despite a sharp fall of 3.47 mkg in India, the world’s largest black tea producer where the production dipped to 17.87 mkg.

Bangladesh also posted a marginal fall of 0.05 mkg to produce 0.11 mkg. Kenya recorded a sharp rise of 8.67 mkg to reach a significant volume of 50.31 mkg. Sri Lanka produced 1.82 mkg more to reach 25.08 mkg.

Harsh winter in India pulled down the harvest resulting in lower supplies of green leaf to factories for processing and the concomitant reduced production of black tea.

Jasmine gains fragrance on demand



The prices of jasmine increased at Erode markets on Friday due to festival demand. “The demand for the flower was high and the vendors, quoting higher price in the auction, procured huge stock and marketed the same.

On Thursday, it was sold at ₹210/kg and today (Friday) it fetched ₹200 and all the 12 tonnes were sold within few minutes,” said Muthuswamy, President, Sathyamangalam Flower Vendors and Producers Association.

He said the Karnataka buyers were actively purchasing the flower. Muthuswamy also said that the demand for Arabian jasmine or *mullai* too increased and it was sold at ₹300/kg.

Due to low arrival of five tonnes for sale, the prices improved. He said some perfume manufacturing firms purchased the jasmine, Arabian jasmine and champak flowers.

Slack arrivals boost pulses



Slack arrival and improved demand lifted pulses, while moong and urad ruled stable on subdued buying. With demand outstripping arrival, masur (bold) rose to ₹5,350 a quintal, while masur (Madhya Pradesh) ruled at ₹5,000.

Masur dal (medium) was at ₹6,100-6,200, while masur dal (bold) ruled at ₹5,200-6,300. Chana (kanta) traded at ₹4,600-4,625 (up ₹100), while chana (desi) ruled at ₹4,550.

Similarly, tur (Maharashtra) was at ₹8,400 (up ₹200), while tur (Madhya Pradesh) went for ₹7,600-7,700. Moong (bold) was quoted at ₹6,500-6,800, while moong (medium) ruled at ₹6,000.

Moong dal (medium) fetched ₹7,100-7,400, moong dal (bold) at ₹7,800-8,000, while moong mongar ruled at ₹9,800-8,200. Urad (bold) remained stable at ₹10,500, while urad (medium) ruled at ₹9,500 a quintal.

Business Standard

Mizoram, JICA sign pact for promoting sustainable agriculture



The [Mizoram](#) government and Japanese International Cooperative Agency (JICA) on Thursday signed an agreement on 'Capacity Enhancement for [Sustainable Agriculture](#) and Irrigation Development.'

The memorandum of understanding was signed by top officials of Agriculture, Minor Irrigation, Horticulture and Soil and Water Conservation departments in the presence of state chief secretary Lalmalsawma, an official statement said.

[JICA](#) was represented by its team leader Satoru Fujita and four other officials both from Tokyo and Delhi, it added.

Experts of the Japanese company would, on the company's own expense, undertake technical cooperation project in four rural development blocks in Aizawl, Kolasib, Serchhip and Champhai districts.

The JICA had conducted development study during 2013 and 2015 and had formulated a master plan covering 20 years and the technical cooperation project would commence from October this year and continue till September 2021.

Training programmes would be conducted in Japan both for officials and farmers from Mizoram for three times during the period and the expenses would be borne by the Japanese government, the statement said.

Food processing minister asks 25% of FDI investment for agriculture infrastructure



With 100% foreign direct [investment](#) announced in marketing of food items produced in India, Food Processing Minister Harsimrat Kaur Badal has pitched for investing 25% of the inflows for creating [agriculture](#) infrastructure.

Finance Minister Arun Jaitley in the Budget had announced that 100% FDI would be allowed through FIPB route in marketing of food products produced and manufactured in India.

"I was pushing for the 100% FDI in food processing sector with a purpose to raise farmers' income," Badal said.

Therefore, now I have suggested that there should be a mechanism to ensure that at least 25% of FDI inflows are invested on infrastructure at the farm level, directly benefiting the farmers," Badal said.

The Minister further said the budget was focussed on agriculture and farmers and this decision will also help in overall growth of the agriculture sector.

"The investment should be such which leads to more mechanised farming, better irrigation facilities among others, so that the quality of produce improves and above all helps in doubling the farmers' income," she said.

The Minister has also raised this issue with the Department of Industrial Policy and Promotion (DIPP) and the Finance Ministry, a senior official said.

After the finalisation of the details on the subject, the DIPP will prepare a Cabinet note for approval, an official said.

Earlier, Badal had said FDI in food processing would lead to creation of 'swadeshi' (local) infrastructure with 'videshi' money (foreign investment).

The processing of agri-produce is also expected to double with the FDI inflows and the wastage of agriculture produce will come down, resulting in lower inflation, the Minister had said.

During April-December 2015, FDI inflows grew by 40% to \$29.44 billion. Out of which \$385.45 million was invested in the food processing sector.

The food processing sector has attracted \$5,285.66 million FDI during April 2012 to December 2015 period.