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AGRIBUSINESS

COMBINING TRADITION WITH BUSINESS



UZBEK AGRICULTURE: PROGRESS AND ACHIEVEMENTS



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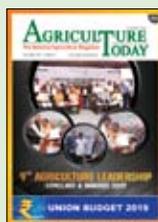
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From the Editor's Desk

EXPANDING AGRIBUSINESS NEEDS RESPONSIBLE INFRASTRUCTURE

Agribusiness is today a multimillion dollar enterprise and much coveted for its investment opportunities. Being of vast proportions, and spanning from input side – cultivation process- output processing to marketing, each link is dynamic and significant, demanding innovation, investment and interest. Many new companies have spawned, bigger corporates have expanded and organizations have evolved to take advantage of this booming and enterprising opportunity.



The \$5 trillion agribusiness industry represents 10 percent of global consumer spending and 40 percent of employment. The incredible achievement that India attained in the food front opened up the gates of agriculture towards a bigger market. The surpluses created trade, and today India successfully exports many agricultural commodities to different parts of the world. Post green revolution, India has consistently cloaked higher levels of food grains production. India ranks second in global production of fruits and vegetables and is a leading exporter of mangoes and bananas. Agri Exports have perennially increased echoing the burgeoning production front. India was the ninth largest exporter of agricultural products in 2017. The food and grocery market in India is the sixth largest in the world. The food processing industry contributes 32 per cent of this food market and is also one of the largest industries in the country, contributing 13 per cent of total exports and six per cent of industrial investment.

On the input side, several sectors contribute actively to sustain the momentum of Indian agriculture. Indian seeds market is expected to grow at a CAGR of 14.3% during 2018-2023, reaching a value of more than US\$ 8 Billion by 2023. Agrochemicals are indispensable components aiding plant growth. Their market has grown considerably over the years. Currently, India is the world's 4th largest producer of agrochemicals. With a marked reduction in the availability of labour for agricultural operations, India is experiencing a shift towards agricultural mechanization. The Government has introduced several schemes and policies that support greater mechanization of Indian Agriculture. When it comes to judicious use of resources, micro irrigation becomes an enterprising opportunity in India. The Economic Survey 2018-19 suggests that "focus should shift from 'land productivity' to 'irrigation water productivity'. The current domestic industry is estimated at around Rs. 4,500-5,000 crores and is considered to be highly competitive. Besides this, precision agriculture, weather forecasting, ICT, etc., are creating ripples in agrispac.

Despite the advances in production front, India is yet to create infrastructure that can support the augmented food production scene. The record food grain production that has become an yearly affair seldom translate into higher earnings for the farmer. Lack of appropriate storage facilities, warehouses, godowns, cold storages have led to wastage of agricultural commodities incurring heavy losses. If doubling farmers' income has to become a reality, agri infrastructure must be developed at accessible location and cost. India needs more investments in cold storage considering the heavy losses the country incurs by way of wastage of fruits and vegetables.

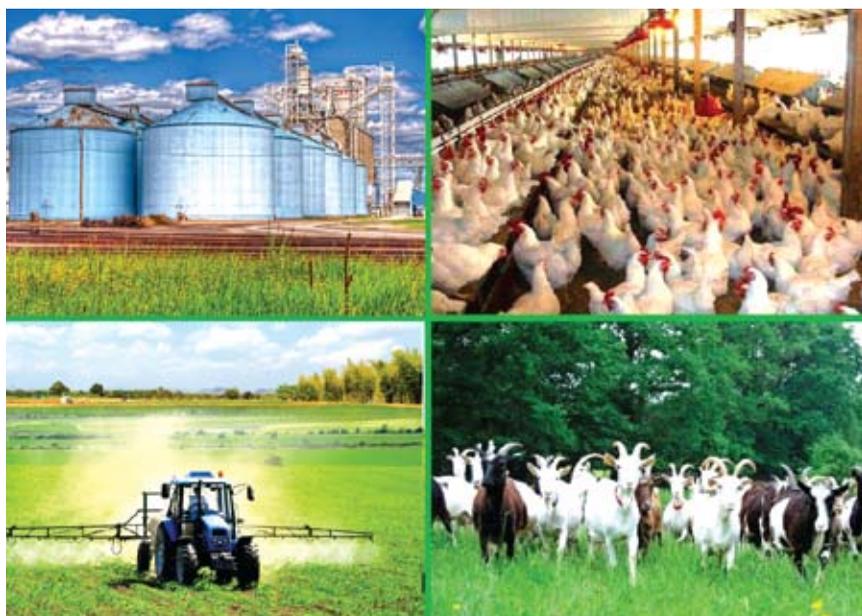
There are immense opportunities for agribusiness in India. The production front has been more or less consistent in its performance. However, India is less competitive when it comes to accommodating the excess produce thereby cascading into price fluctuations and farmer distress. If India needs to keep up with the momentum of the production side and maintain the buoyancy of burgeoning agribusiness opportunity, considerable planning and investments need to go the way of infrastructure.

Anjana
Anjana Nair

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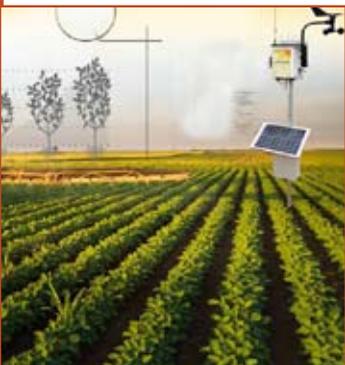
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J&K Apple to fall far from the Tree

Central government has stepped in to help apple growers of J&K

The reorganization of Indian Landscape, post scraping of the special status of J&K, has spawned a volley of opportunities for Indian agriculture and also J&K agriculture. Newer avenues and opportunities have wedged open the once tight shut valley. To normalize and placate the residents of the valley, government will be implementing newer programmes and policies to bring J&K into the mainstream.

That exercise seems to have begun with the Centre's decision to procure apples cultivated in Jammu & Kashmir directly from farmers by the Government-run National Agricultural Cooperative Marketing Federation of India Ltd (NAFED). The payment will be delivered to bank accounts of the farmers through Direct Benefit Transfer (DBT) scheme. The entire procurement process is expected to be finished by December 15 through State's agencies. The announcement was in response to the reports of threats from terrorists who have threatened apple growers not to sell their produce in the market following abrogation of the special status given to J&K under Article 370 and bifurcation of the State into two Union Territories. State-run National Agricultural Cooperative Marketing Federation of India is expected to acquire 60% apples produced in the state.

Far removed from the policies and programmes of Indian mainland, J&K now has the opportunity to reap the benefits of many of them. For instance, the current move of procurement advocates co-operative marketing of agricultural produce to benefit farmers. The procurement will be made directly from genuine apple growers and the State administration will ensure direct payment in bank accounts of apple growers through DBT. All categories of apples i.e. A, B and C will be procured from all the apple producing districts in J&K as well as designated mandis (wholesale markets). Fair

prices for various categories will be fixed by the price committee that includes a member from the National Horticulture Board. Quality Committee will ensure proper grading of varieties of apples.

The government has also decided to pump in Rs 8,000 crore to help apple and dry fruit traders in Jammu and Kashmir and refresh business sentiment in the Valley, which will include Rs 2,000 crore towards obtaining apples directly from the growers this season. The move will also be propitious for India as a whole as Kashmir accounts for production of 91% walnuts, 90% of almonds, cherry and saffron, and 70% apples in the country, which makes a total worth of Rs. 7000 crore annually. With government's resolve of increasing agri exports, addition of Kashmir products will broad base Indian offerings at the global market. These may open up investments in the hitherto estranged valley.

However, the task is more strained than it appears. For instance, NAFED may face some logistical glitches. There involves a whole set of infrastructural deficiencies and setting them right requires a good amount of investment, time and ground support. Establishing procurement centres, instituting grading and packaging facilities, arranging transport to finding labour in Kashmir valley for loading, arranging trucks for conveyance to carry procured apples from J&K across India, labour etc., are some of the works that beckon NAFED. The commission agents will also be left out in this procurement process as the government is planning a door to door procurement of apple.

Abrogation of article 370 has presented new opportunities for not only farmers in Jammu and Kashmir, but also to the rest of the country. The advances in logistics, technology and infrastructure that the rest of the country has experienced has so far eluded this region. With more inflow of investment and interest into this valley, J&K is bound to see changes in agri production and marketing, with apple leading the way.

Banana's Climate Trail

Banana yield is expected to come down considerably owing to climate change

Climate change has already started to ring alarm bells globally. Research and development in many parts of the world have dedicated their resources to study and arrive at solutions to many of the potential threats. Agriculture in most parts of the world, being critically dependent on climate, has become an important area of focus in this sense. While many studies have been conducted on the impact of climate on general agriculture production, specific studies pointing at important tropical crops are absent. Banana, an important tropical crop, has recently become an object of interest to researchers. A recent study has pointed out that climate change may lead to a significant decline in banana production in India, the world's largest cultivator and consumer of the crop.

Banana, an important fruit crop, providing food, nutrition and income to millions in both rural and urban areas across the globe, seems to take the beating at this hour of climate backlash. Researchers, led by Dan Bebbler from the University of Exeter in the UK, studied both the recent and future impact of climate change on the world's leading banana producers and exporters. The study shows that 27 countries – accounting for 86 per cent of the world's dessert banana production – have on average seen increased crop yield since 1961 due to the changing climate, resulting in more favourable growing conditions. However, the study, published in the journal *Nature Climate Change*, also suggests that these gains could be significantly reduced, or disappear completely, by 2050 if climate change continues at its expected rate. It suggests that 10 countries – including the world's largest producer and consumer of banana, India and the fourth largest producer, Brazil – are predicted to see a significant decline in crop yields. The study also highlights that some countries – including Ecuador (the largest exporter) and

Honduras, as well as a number of African countries – may see an overall benefit in crop yields.

It is bad news for India considering the impact this crop has on the lives of millions of farmers. To begin with India is the largest producer of this crop. A large scale decline in production of the crop is bound to deleteriously affect the farmers. Also, India is the largest consumer of this fruit and a decline in the fruit output would lead to import. The concerns therefore are multifold; highly nutritious and accessible fruit like banana will become costlier to an average Indian and the farmers' income from the crop would savagely decline.

The study has pointed out that by 2050, any positive effects of climate change on average global banana yields, though likely to continue, will be significantly lessened. Ten countries are predicted to show at least a negative trend, if not strong declines in yields. They include some of the largest producers such as India and Brazil, as well as Colombia, Costa Rica, Guatemala, Panama and the Philippines, all of which are major exporters. A warning has been issued and a deadline has also been declared. The countries that are expected to suffer worse can form a consortium and studies can be initiated to prepare banana for potential climate change. An open exchange of ideas is going to be critical. The practical solutions that already exist, scattered across banana producing countries, should be assimilated to develop a multipronged strategy or plan to combat the yield loss. Diseases such as *Fusarium Wilt* which are not only devastating and dependent on environmental conditions need to be studied. Investment in technologies like irrigation, tissue culture, protected cultivation, resistant cultivars can also make an impact on yield management. Agriculture in either case is a risky business. However, a proactive approach can save millions- their livelihood, their interest, their life!

Blended

Ethanol blending receives impetus

The government has approved an increase in the price of ethanol to be procured by public sector oil marketing companies (OMCs) from sugar mills for blending with petrol for the 2019-20 supply year from December 1. The Cabinet Committee on Economic Affairs (CCEA) has also allowed conversion of old sugar into ethanol. The move expected to help mills deal with the current overproduction of sugar will also be helpful in ensuring timely payments to farmers.

Currently the sugar situation in the country is that of surplus. The cash strapped mills are caught between maintaining the excess stock and payment to the farmers. The 2018-19 sugar season (October-September) will close with all-time-high stocks of 136 lakh tonnes (lt), which is equivalent to six months of domestic consumption. Even if production falls from 329.5 lt to a projected 270-280 lt in the new season and exports nearly double to 60 lt — the country consumes only 265-270 lt a year — stocks will remain at levels where mills will still struggle to pay farmers. As of now, the outstanding cane dues of over Rs 10,000 crore exists. These will mount further as crushing for the 2019-20 season begins in a month's time. To save the mills and cane growers, government has rested hopes in Ethanol.

Ethanol, a valuable by product of sugarcane industry is derived from molasses. Usually C molasses is allowed for the production of ethanol. Mills typically crush cane with a total fermentable sugars (TFS) content of about 14%. The un-crystallised, non-recoverable part goes into what is called 'C' molasses. One tonne of cane, yields 115 kg of sugar (at 11.5% recovery) and 45 kg of molasses (18 kg TFS) that gives 10.8 litres of ethanol. The molasses can, instead, be diverted after the earlier 'A'

and 'B' stages of sugar crystal formation. Mills, then, would produce some sugar, as opposed to fermenting the whole sugarcane juice into ethanol. If ethanol is manufactured using 'B' heavy molasses (7.25% of cane and with TFS of 50%) around 21.75 litres can be produced along with 95 kg of sugar from every 1 tonne of cane.

Given the surplus sugar production in the country, the mills are allowed to produce ethanol from 'B' heavy molasses and directly from sugarcane juice. The CCEA has even approved use of sugar and sugar syrup for production of ethanol. However, the added bonanza is that mills would be getting higher rates for ethanol manufactured from the 'B' heavy and sugarcane juice routes. There is a huge incentive to produce ethanol today. This has been additionally facilitated by the government mandating 10% blending of petrol with ethanol. Between 2013-14 and 2018-19 (supply years), ethanol procurement by OMCs has increased from 38 crore litres to an estimated 200 crore-plus litres. Out of the latter, 32 crore litres is expected to be made from 'B' heavy molasses and sugarcane juice.

This would be a win win solution for mills, farmers and Indian consumers. Considering that India has been producing more sugar which often ends up stocked up as buffer, government has realized a more judicious way to convert the excesses into gains. If mills are able to divert more of cane juice for ethanol, it would mean producing less sugar. Since the country is producing too much sugar and is importing oil, the ethanol-blending programme is beneficial both for mills and for the country's balance of payments. Ten-per-cent blending requires 330 crore-odd litres of ethanol, which can now be produced through the 'B'-heavy molasses and sugarcane juice routes as well.

Onion – The perennial Tear Jerker

The price rise in onions has become a regular phenomenon

Onion prices once again attracted national attention as it travels upwards sending jitters across the politicians, authorities and consumers. The government is entrusted now with the responsibility of finding a solution without upsetting the producers as well as the consumers, as the elections in Maharashtra and Haryana being less than a month away. The desperation with which the government is pursuing the issue can be gauged from the controversial tender to import onions from Pakistan.

Since May this year, prices in wholesale markets across the onion-growing districts of Maharashtra have been increasing and the government has been exploring different options. The state-run MMTC had floated contracts for importing 2,000 tonnes of onions from 'Pakistan, Egypt, China, Afghanistan and other countries of origin'. Following sharp criticism, MMTC dropped Pakistan from the list of countries. The Centre also tried to restrict exports by sharply hiking the Minimum Export Price (MEP) to \$850 per tonne. The government had also ended the 10 per cent export subsidy for the bulb. Anticipating a shortage, the central government had created a buffer stock of 57,000 tonnes, of which 18,000 tonnes have already been offloaded. Despite the efforts, government has not been able to rein in the rocketing prices.

The reasons behind price rise are varied. Primarily, the current increase in onion prices is a fallout of last year's drought and the delayed monsoon this year. To add to the woes, some onion-growing areas have reported excessive rain, and harvest period has been delayed by a week or so. Besides with Navarathri season bringing onion consumption to the lowest, price of onions has increased owing to low demand. While the cultivated area under rabi crop has decreased in Maharashtra, neighbouring Karnataka has received heavy rain during the harvest period for kharif crop, which has delayed the arrival of

onion from Karnataka. If government data on onion production from the past five years is analysed, it can be seen that onion production in 2019 nearly halved in comparison to 2018.

Onion prices rise are notorious for the ripples they create in political circles. This innocuous vegetable that forms the base ingredient in Indian cuisine, and hence abundantly used by the Indian household, had in the past decided the electoral victory. Onions ended up as the decisive factor in the 1998 state elections in Delhi and Rajasthan, and were responsible for bringing down the central government in 1980. Hence any sway in the onion prices towards a costlier direction will elicit swift response from the government. The Price Stabilization Fund (PSF) was an important measure that was set up in this direction which was meant to help regulate the price volatility of important agri-horticultural commodities like onion, potatoes and pulses. The scheme provides for maintaining a strategic buffer of aforementioned commodities for subsequent calibrated release to moderate price volatility and discourage hoarding and unscrupulous speculation. For building such stock, the scheme promotes direct purchase from farmers/farmers' association at farm gate/Mandi.

Although Union Minister Ram Vilas Paswan has asserted that rise in onion price was a "temporary phase", and assured that there is enough supplies in buffer stock to check price of the onion. It is believable that the supply disruption had risen because of floods in main-growing states like Maharashtra and Karnataka and the Center is sitting on a buffer stock of 56,000 tonnes to address any shortages. Despite the assurances, the country is wary of price rise and the panic is evident. Despite all the efforts Onion has remained a tear jerker. Price stabilization fund, buffer stock, hiking MEP, import decisions, have still not been able to solve onion price rise that happens every year. May be we need a different approach.

Continental Presenting Latest Technologies in Agritechnica 2019

Continental continues to expand its activities in the agricultural industry, and the technology company will be showcasing its latest innovations for the agricultural sector at Agritechnica, the world's leading trade fair for agricultural technology, in Hanover from November 10 to 16, 2019. With its intelligent future technologies, the industrial supplier is providing key momentum for advancements in smart farming. For example, Continental is developing platform concepts for robots that can be used in fields, among other places, for instance as part of a larger fleet. The second generation of the intelligent ProViu 360 surround view system is a solution that already demonstrates the future potential of smart agricultural machines today. Scheduled to be released in 2020, the digital camera system will provide the driver with a panoramic bird's eye view of the machine in HD resolution on a touch display. In addition to these kinds of assistance systems, Continental is also responding to the trend toward fully automated vehicles and machines with solutions for component monitoring – unveiling its VF TractorMaster Hybrid at Agritechnica. The intelligent tire is equipped with VF technology and sensors and continuously measures and monitors the tire pressure and temperature. This increases productivity, yield, and operator comfort while reducing fuel consumption, tire wear, and downtime and maintenance costs. In addition to tires, rubber tracks with integrated sensor technology will also be on display at Agritechnica. Continental is testing the digital belt concept together with agricultural machinery manufacturer CLAAS. Continental offers a wide-ranging portfolio for off-highway applications which makes construction, agricultural and transport machinery and vehicles safer, more efficient, more comfortable and more connected. The corporation supplies interdivisional solutions for monitoring the condition of components and systems as well as technologies for information management, exhaust-gas aftertreatment, rubber and plastic products, and tires – all tailor-made and from a single source.



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trustea partners with TRA Tocklai and AFPRO

trustea, the sustainability Code and Indian tea industry verification system for plantations, bought leaf factories (BLFs) and associated small tea growers (STGs), announced that it has appointed Tea Research Association (TRA Tocklai) and Action for Food Production (AFPRO) as an implementation partner (IP). With 627 million kg tea verified (47% of total production) till August 2019, this partnership will provide a fillip to the adoption and implementation of the Code across tea plantations in India. In its endeavor to sustainably transform the Indian tea industry, trustea will work with TRA Tocklai and AFPRO, to appoint a qualified trustea project manager who will oversee the Program, engage with entities in the tea sector for verification under the Code, provide knowledge and skill support to these entities and facilitate Program-level impact assessment activities with third party evaluators. Announcing the partnership, Mr. Rajesh Bhuyan, Director, trustea, said, “We are proud and excited to watch the coming together of TRA, AFPRO and trustea. TRA Tocklai's tea legacy with trustea's vision for tea, and the possibilities that it holds for the tea industry in India.



Their century long involvement in the industry and 55+ years of dedicated research with the Tea Board underscores their credibility to effectively implement the trustea Code in key tea growing regions in India. AFPRO has been an active partner in sustainable development initiatives and their focus areas; Food security and livelihoods, Watershed Management, Water and sanitation, Climate Change has good synergy with the trustea Program. An active trustea implementation Program means a successful, sustainable and organized tea community – for the sector and consumers.” trustea will provide trainings to TRA Tocklai and AFPRO on the trustea Code, to ensure effective implementation of the Program. The trustea Code enables producers, buyers and others involved in Indian tea businesses to obtain tea that has been produced according to agreed, credible, transparent and measurable criteria.

INI in pact with Munger Farms to grow blueberries

➤ Horticulture company INI Farms and US-based Munger Farms plan to form a Joint Venture to cultivate blueberries in India and export pomegranates. The two companies have shortlisted Marathwada, Ahmednagar, Pune and Western Maharashtra to grow the fruit. Blueberries are currently available at Rs4,000 a kilogram in the retail market. The venture capitalist-backed INI Farms, which is currently into Pomegranate, Banana and Coconut farming, plans to introduce the product in the retail market

in the next 2-3 years. Speaking about the joint venture, Pankaj Khandelwal, Chairman of INI Farms said: "Our relationships with Indian farmers, and their expertise in cultivating blueberries will be a great opportunity for us. The Mungers will invest in research in India, and we will focus on the distribution." David Munger, Owner, and Director, Munger Farms said that currently, they have been successful in cultivating and marketing blueberries across the world. According to Munger, India is a difficult

market to ship fresh blueberries to while maintaining quality upon arrival. "That is why we need to be closer to the market," he added. From the perspective of the joint venture, the two companies are looking at starting with the research first to determine what varieties will fit best here. "Within 2-3 years, we will be able to be thorough with the research and be in a position to expand to the retail market," said Munger. Gradually the company wants to have a full berry portfolio in India, moving to strawberry next.



Tirth Agro Tech in JV with German firm to develop root crop machines

➤ Agriculture implements manufacturer Tirth Agro Technology Pvt Ltd, which owns the Shaktiman brand, and German farm machinery and technology provider Grimme on Friday announced a joint venture to develop and market root crop machines in India. The 50:50 joint venture will use the German technology from Grimme and state-of-the-art manufacturing capabilities of Shaktiman to design and develop full-line solutions for potato and other root crops, including turmeric and garlic. The joint venture looks to capitalise on the Indian market, the world's second largest potato producer. It will enable both the partners to optimise their current and future capabilities in the sub-75 HP



category. Dinesh Vashishtha, Chief Sales & Marketing officer, Tirth Agro Technology, said, "The JV will be able to bridge the big gaps in farm mechanisation for potato cultivation in India with availability of technically advanced, indigenised and affordable machines. The JV aims to provide a complete farm machinery solution starting from seed bed preparation to post harvest solutions for root crops such as potato, onion, garlic and turmeric. . "We aim to sell 1,000 machines every year in three to five years," said Vashishtha.

Edible oil industry shaken on report of 2-way Indonesia deal

India's edible oil industry said it was shaken at reports that the government had agreed to lower the import duty on refined, bleached and deodorised (RBD) palmolein oil from Indonesia, in return for export of raw sugar from here. Publications in Indonesia had quoted their Trade Minister Enggartiasto Lukota in this regard. When asked, India's commerce ministry declined to comment. The sugar industry, however, is glad at the news. Sugar's price and sale is controlled by the government and India is struggling to manage surplus. With the next season's start only weeks away, there is a record-high opening stock of over 14 million tonnes (mt), enough to feed six months of domestic consumption. And, amidst high arrears of cane payment to farmers. The industry has been looking for ways to ship out the surplus. In fact, the government has asked it to send out 6 mt in the next season. As for RBD, there was a tariff of 45 per cent on its import from Malaysia and of 50 per cent on what is brought in from Indonesia; these are the two primary producers. Last week, to support Indian farmers ahead of the harvesting season, an extra 5 per cent 'safeguard duty' was added to import from Malaysia. Atul Chaturvedi, president of the Solvent Extractors' Association (SEA), said they would ask the commerce ministry to clarify on the Indonesian news. SEA represents edible oil crushing and refining units and is opposed to any direct import of refined oil, saying the refining capacity here is sufficient.



Modi launches pension scheme for farmers, shopkeepers



Prime Minister Narendra Modi, who was in the Jharkhand capital, launched ambitious pension schemes for farmers, shopkeepers and self-employed persons. Mr. Modi also inaugurated a new building of the Assembly and a multi-modal cargo terminal, which is expected to ease transportation in the region. The 'Pradhan Mantri Kisan Maan Dhan Yojana' will help small and marginal farmers by providing a minimum pension of Rs3,000 per month, on attaining the age of 60. Farmers who are currently between 18 and 40 years of age can apply for the scheme. The 'Pradhan Mantri Laghu Vyapari Maan Dhan Yojana', a pension scheme for shopkeepers and retail traders was also launched. Another 'Swarojgar' pension scheme was also rolled out for self-employed persons. Under both the schemes, beneficiaries between 18 and 40 years will get Rs3,000 per month after completing 60 years of age.

Cabinet approves higher procurement price for ethanol

The Union Cabinet approved a higher procurement price for ethanol purchased by oil marketing companies for the ethanol blended petrol (EBP) programme, which will come into effect from December 1 for a period of one year. According to the new decision, the price of ethanol from C-heavy molasses will be increased from Rs43.46 per litre to Rs43.75 per litre. The price of ethanol from B-heavy molasses will be increased from Rs52.43 per litre to Rs54.27 per litre. The price of ethanol from sugarcane juice, sugar, and sugar syrup has been set at Rs59.48 per litre. The oil marketing companies will also pay the Goods and Services Tax and transportation tax associated with the ethanol supply — a provision that existed in the previous plan as well. "OMCs have been advised to fix realistic transportation charges so that long distance transportation of ethanol is not disincentivised," the government said. "OMCs are advised to continue according priority of ethanol from 1) sugarcane juice/sugar/sugar syrup, 2) B-heavy molasses 3) C-heavy molasses and 4) damaged food grains/other sources, in that order." "Ethanol availability for EBP programme is expected to increase significantly due to higher price being offered for procurement of ethanol from all the sugarcane based routes, subsuming 'partial sugarcane juice route' and '100% sugarcane juice route' under 'sugarcane juice route' and for the first time allowing sugar and sugar syrup for ethanol production," the government added. Increased ethanol blending in petrol has many benefits including reduction in import dependency, support to agricultural sector, more environmental friendly fuel, lesser pollution and additional income to farmers.

Cabinet Okays Rs 6K-cr sugar export subsidy

▶ The government today announced Rs 6,268-crore subsidy for export of 6 million tonnes of sugar during the 2019-20 marketing year starting October to liquidate surplus domestic stock and help mills in clearing huge sugarcane arrears to farmers. The decision taken at a meeting of the Cabinet Committee on Economic Affairs (CCEA) headed by Prime Minister Narendra Modi has been welcomed by the industry. Information and Broadcasting Minister Prakash Javadekar said the move would benefit millions of farmers in sugarcane growing states. A lump sum export subsidy of Rs 10,448 per tonne would be given to sugar mills in the 2019-20 marketing year (October-September), costing the exchequer Rs 6,268 crore, he said. The government is providing subsidy for export of 5 MT of sugar for the current marketing year (2018-19). The subsidy would be directly credited into farmers' accounts on behalf of mills against cane price dues and the balance, if any, would be credited to the mill's account. In wake of surplus sugar production during 2017-18 (October-September) and 2018-19 seasons, notwithstanding various measures taken by the government, the ensuing sugar season (2019-20) is expected to commence with an opening stock of about 14.2 MT and the season end-stock is expected to be about 16.2 MT. According to the Indian Sugar Mills Association (ISMA), 6 MT of exports will not only reduce the surplus sugar inventory next season, but it will also give additional cash flows to the tune of around Rs.18,000 crore, including the subsidy. This will help the mills reduce carrying costs and interest burden as also help them to pay cane price to farmers on time. "With an expected global deficit of around 4 MT next year, the timely announcement of India's export programme with a WTO-compliant export subsidy of Rs 10,448 per tonne will enable Indian millers to ensure 6 MT exports," said AbinashVerma, ISMA director general.

Special Market Intervention Price Scheme for apples

▶ For procuring nearly 12 lakh MTs of apples on remunerative price, a Special Market Intervention Price Scheme (MIPS) of Government of India has been introduced in Jammu and Kashmir. The move, for the first time in the history of Jammu and Kashmir would benefit apple growers and merchants in a satisfactory way. What makes it special is that the procurement would be made at the door steps of the fruit growers who now would stand relieved of the anxiety about the timely availability of transporting facilities. The move deserves all the appreciation as it exhibits the deep concern of the Government especially at Centre to ensure that apple growers encountered no difficulties or would feel concerned in any way about sale and proceeds thereof. What makes it more interesting is that 60 percent of the apple production as at last year would be procured under the S M I P S . It is for the apple growers, now, to reap the benefits of the scheme . However, concerned district authorities must make a wide awareness about the scheme to help apple growers get the benefits thereunder.

Centre to procure apples from J&K farmers directly

▶ As part of its long-term strategy to win over different sections of people from the Valley and normalise the situation there, the Centre has decided to procure apples cultivated in Jammu & Kashmir directly from farmers by the Government-run National Agricultural Cooperative Marketing Federation of India Ltd (NAFED). The payment will be delivered to bank accounts of farmers through Direct Benefit Transfer (DBT) scheme. Officials said on Tuesday that NAFED has been directed to finish the entire procurement process by December 15 through State's agencies. The announcement came in the wake of reports that terrorists were threatening apple growers not to sell their produce in the market following abrogation of the special status given to J&K under Article 370 and bifurcation of the State into two Union Territories. "The Government of India has announced procurement of apples produced in J&K during the current season 2019. The NAFED will complete the entire process of procurement through designated State Government agencies by December 15," said officials. The objective of the NAFED is to promote co-operative marketing of agricultural produce to benefit farmers. The procurement will be made directly from genuine apple growers and the State administration will ensure direct payment in bank accounts of apple growers through DBT. All categories of apples i.e. A, B and C will be procured from all the apple producing districts in J&K as well as designated mandis (wholesale markets) in Sopore, Shopian and Srinagar, the official said. Fair prices for various categories will be fixed by the price committee that includes a member from the National Horticulture Board. Quality Committee will ensure proper grading of varieties of apples.



Farmhand take loans for petty expenses: Study

► A study “Levels, Patterns and Distribution of Consumption Expenditure of Farmers and Agricultural Labourers in Rural Punjab” has established that farm labourers have to take loans to meet small exigencies and therefore are caught in a vicious debt trap. The findings of the study make a strong case for land reforms in favour of the marginal and small farmers and labourers in view of the unabated suicides. Sponsored by the ICSSR, the study was recently published in *Social Change*, a research journal of the Council of Social Development. It was conducted by Dr Gian Singh, former professor in the economics department of Punjabi University, and economics faculty in various Punjabi University-affiliated colleges, including Dr Anupama, Dr Gurinder Kaur, Dr Rupinder Kaur and Dr Sukhveer Kaur. Based on a sample of 1,007 farm households and 301 labour households, the study concludes that there are variations in the consumption expenditure of different farm size categories. “Average annual consumption expenditure of a labour household belonging to the general category is hardly Rs 82,515, as compared to Rs 90,435 for Schedule Castes and Rs 98,366 for Other Backward Classes. It seems that it is only the poorest of general category households who opt to earn their living as agricultural labourers,” the study stated. The expenditure of the general category is less as their income is also less as compared to SC and OBC category,” elaborates Gian Singh. An average sampled farm household spends 40.29 per cent on non-durable items. The marginal farm size category spends the maximum, that is 50.38 per cent of total consumption expenditure, on non-durables. Among non-durables, milk and milk products is the important item of consumption, with 13.08 per cent spent on it. This proportion is the highest for the small farm size category, followed by the marginal, semi-medium, medium and large farm size categories. The field survey has revealed that different agricultural production activities require hard labour. As a result, the farmers rear some milch animals and the proportion of this item of consumption is the highest among non-durable items. This is followed by food grain consumption at 6.86 per cent. An average sampled farm household spends 4.45 per cent on fuel and electricity. This proportional share decreases as the farm size increases.

Haryana waives penalty, interest on crop loans

► In a move to mobilise farm community ahead of assembly elections, Haryana chief minister Manohar Lal Khattar announced a package of Rs4,750 crore for farmers. He waived off penalty and interest on crop loans taken from cooperative banks. Addressing media in Bhiwani, Khattar said his government has decided to give a package of around Rs5,000 crore to farmers. “About 10 lakh farmers – who had taken loan from primary agriculture cooperative societies, district cooperative central banks and Land Mortgage Bank would be benefited... In case of a failure, a 5% penalty is also imposed but we are waiving off penalty also.”



Agri families borrow more, eat less to cope with kin's suicide: study

► Agricultural households are trying to cope with the suicide of an earning member of the family by borrowing more, skimping on food and even taking recourse to bonded labour, a new study has found. Commissioned by the National Human Rights Commission (NHRC) the report *Agrarian Crisis and Farmers' Suicides An Empirical Study of Endemic State* is based on a 2017-18 primary survey of 200 families affected by farm suicides. Spread across four states—Maharashtra, Madhya Pradesh, Karnataka and Telangana—that accounted for the maximum number of suicides, the study was conducted by the National Institute of Rural Development and Panchayati Raj (NIRDPR), Hyderabad, and submitted to the NHRC in March. Major coping strategies adopted by such families were informal borrowing (27% households), formal loans (21%), reducing consumption of food items like milk and eggs (13%), sale of assets (8%) and bonded labour (5.4%). A sordid observation was “the traditional way of bonded labour observed in Rewa district (Madhya Pradesh), where creditors have been taking the children of the debtor families mostly by paying 4 to 5 bags of wheat or rice to the family”. Against the ambitious central target of doubling farm income by 2022, the survey shows the average income of farm suicide families was just Rs3,523 per month in 2016-17, even below the Rs4,561 estimated by the National Sample Survey Office (NSSO) in 2012-13 for the smallest category of land holders. The study found that 92% of farm suicide families were not enrolled under the centre's flagship crop insurance scheme, and faced multiple economic shocks during a three-year period preceding the survey. On an average, they faced more than three shocks ranging from the death of an earning member to output price fluctuations and crop damage due to drought, floods and pest attacks. Most were heavily indebted with informal loans—Rs4.28 lakh in Karnataka to Rs3 lakh in Telangana. Most families took loans to meet agricultural costs (32%) and consumption needs (18%), expenses for social and religious purposes (15%), and towards house construction and marriage (13%).

Farm loan waiver, new houses, rent for flood victims: CM Fadnavis



➤ Loan waiver for farmers, new houses for those who lost their dwellings built under the PM Awas Yojana in deluge and free foodgrains are among the slew of relief measures announced by the Maharashtra government for the people affected by the recent floods. Heavy rains and floods battered several areas of western Maharashtra and the Konkan region earlier this month, with Kolhapur and Sangli districts bearing the maximum brunt. At a press conference in Mumbai, CM Devendra Fadnavis said a committee will ascertain causes for the unprecedented floods and suggest measures to avoid their recurrence.

“The farmers who have lost crops on up to one hectare will get complete loan waiver,” he said. The government has also decided to pay annual rent of Rs24,000 (rural) and Rs 36,000 (urban localities) in the flood-hit areas, where people have been forced to live in rented accommodation, the chief minister said. The rent will be paid to the flood victims till their houses are rebuilt, he said. A committee is being set up under the chairmanship of a retired state government officer, Nandkumar Wadhere, to study the reasons for the deluge and suggest steps to avoid its recurrence in the future, Fadnavis said. Wadhere is a retired principal secretary of the water resources department. “The state government will also pursue (with the Centre) its demand of offering relaxation in terms of filing Income Tax and GST returns in the flood-affected areas. We will take up this matter with the Centre,” Fadnavis said. He was speaking to reporters at his residence in south Mumbai after holding a meeting with senior bureaucrats. The beneficiaries of Prime Minister Awas Yojana, who lost their houses due to the floods, will get a new house as well as Rs 1 lakh as cash assistance, Fadnavis said.

Govt. hoping to bring 25 lakh under crop insurance this year

➤ The State Agriculture Department hopes to bring 25 lakh farmers under the Prime Minister’s Crop Insurance Scheme — Pradhan Mantri Fasal Bima Yojana (PMFBY) — this year. Compared to the previous year, the targeted figure of the current year is only marginally higher. However, officials point to the general tendency of farmers to go for insurance cover only when they anticipate distress. With the Cauvery in spate and several important irrigation reservoirs in a comfortable position, the urge for the insurance cover this year may not be as high as in a year of anticipated poor monsoon. Yet, the officials feel the target is achievable. The first year (2016-17) of the implementation of PMFBY was one of drought, whereas the subsequent year (2017-18) was a “normal year”. Last year, the northeast monsoon (October-December) had deficit rainfall but the damage due to Cyclone Gaja was far greater than that of the monsoon. With the authorities’ drive for enrolment of farmers in the insurance scheme, the total figure for 2018-19 exceeded that of 2016-17. A striking feature of the profile of the farmers who were covered under the insurance scheme was that the insured farmers were predominantly non-loanee agriculturists. In 2018-19, about four-fifths of the insured farmers belonged to this category, given the fact that ordinarily, those taking crop loans would automatically come under the insurance cover. This had captured the attention of the Central government, and the Principal Secretary of the State Agriculture Department, Gagandeep Singh Bedi, explained, at a national conference in Guwahati recently, how the State had accomplished the coverage of non-loanee farmers.



Uttar Pradesh raises paddy MSP by Rs 65 a quintal

► The state cabinet approved the procurement rate of Rs 1,815 per quintal for the common variety and Rs 1,835 per quintal for grade A variety. Paddy procurement will start in some districts from October 1 and will run till January 31, 2020. The Uttar Pradesh government has announced the paddy procurement policy for 2019-20 under which it has set a target of procuring 50 lakh metric tonne of the crop. The state cabinet approved the procurement rate of Rs 1,815 per quintal for the common variety and Rs 1,835 per quintal for grade A variety. This is against last year's price of Rs 1,750 per quintal for common variety and Rs 1,770 for A variety. The price for both is Rs 65 per quintal higher than last year's price. Apart from this, the state would also provide Rs 20 per quintal extra to farmers as transport and other support. The policy was approved at a cabinet meeting chaired by CM Yogi Adityanath.

Hot August hit tea production in Assam

► While World Meteorological Organisation (WMO) declared July last as the hottest month in its latest ENSO update, for the tea industry of the State last August was the hottest August. The hot weather condition in August this year caused significant production loss to the State's tea estates (TEs). The detailed report of August, 2019 production loss of the State's tea industry is under preparation. According to the scientists of the Tea Research Association's Tocklai Tea Research Institute (TTRI), the maximum temperature during August last was found to be 1.9 degree Celsius, 1.5 degree Celsius and 0.8 degree Celsius more when compared with the August long term normal and 2017 and 2018 August temperatures respectively. In 2019 August, the minimum temperature was also found to be 0.6 degree Celsius more compared to the long term normal and 2017 minimum temperatures for the month. Again, the number of days with the maximum temperature of 36 degree Celsius or above was found to be nine in August, 2019, while maximum temperature never touched 36 degree Celsius in August 2017 and 2018 recorded only two days with such a high maximum temperature in August. During August this year, rainfall activities were found to be less, compared to the long term normal and those of 2018 for the month. The decrease was found to be 94.9 mm and 96.7 mm compared to the long term normal August rainfall and the 2018 August rainfall. Similarly, August 2019, with 12 rainy days, recorded around 50 per cent less number of rainy days, compared to the 23 rainy days of the long term normal for the month. Moreover, the 2019 August relative humidity tally with 87 per cent in the morning and 68 per cent in the afternoon, were also found to be less than the long term normal for the month. The long term normal for August morning humidity is 93 per cent and the afternoon long term August humidity is 74 per cent.

Kashmiri apples brave all odds, supply doubles

► Despite terrorists' threat to apple growers and the partial lockdown after the abrogation of special status to Jammu & Kashmir under Article 370, the supply of apples and peaches from the Valley to other parts of the country has nearly doubled. According to Jammu & Kashmir's horticulture department, the total dispatch of fruits this year has been 1.60 lakh metric tonnes so far as against 89,000 metric tonnes during the corresponding period last year. Top sources said the elaborate security bandobast kept terrorists at bay and helped the apple traders transport their produce. The shutdown hit normal life in Kashmir but the Modi Government ensured that the trade of fruits and vegetables was not affected at any cost, source said, adding the Government actually facilitated smooth transportation from the Valley. With Government's efforts,



as many as 750 trucks carrying apples leave the Valley every day for trade in other parts of the country. This has helped reduction in apple prices as it is being sold between Rs 40 and Rs 80 a kg depending on the quality of the apple and localities where they are sold. "The divisional and district administrations have been directed to coordinate with the producers for all facilitation in harvesting and smooth transportation in hassle free manner," officials said, adding that the number of apple trucks is expected to increase in the coming days. According to officials, over 14,000 truck apples have been transported since the Centre's Article 370 move exactly a month ago. Jammu & Kashmir grows 19 lakh metric tonnes of apples each year which is 80 per cent of all apples produced in the country. Due to this, India is the world's fifth-largest apple producing country.

Heavy rainfall leads to spread of fruit-rot on arecanut farms in Karnataka

▶ Farmers in arecanut-growing regions are concerned about the impact of heavy rainfall this year. Many expect a crop loss to the tune of 30 per cent because of the incidence of fruit-rot in many plantations. However, the disease is limited to a few locations at the moment. Some farmers have, however, suffered a crop-loss of around 45 per cent so far. Incessant rainfall in August and September has led to the aggravation of the disease on his plantation. Fruit rot is characterised by rotting and heavy shedding of immature nuts. Continuous heavy rainfall with intermittent sunshine, low temperatures and high humidity are the factors behind the spread of disease. Referring to his interactions with farmers, Shankaranarayana Bhat K, vice-president of the Central Arecanut and Cocoa Marketing and Processing Cooperative (Campco), said growers have been expecting at least a 30 per cent crop loss till now, and the disease is limited to a few locations. Apart from heavy rainfall, the quality of fungicide (copper sulphate solution) sprayed in the plantations is also one of the reasons for the spread of the disease, he said. Estimating the crop loss on arecanut plantations at around 30 per cent, Ravish Hegde, General Manager of the Sirsi-based Totagars' Cooperative Sale Society (TSS) Ltd in Uttara Kannada district, said the major impact of the disease was visible in the traditional arecanut-growing belts of Dakshina Kannada and Uttara Kannada, Karnataka's coastal districts. Cultivation of the crop has been extended to non-traditional areas in the dry regions of Karnataka in recent years. These regions had been witnessing a rain deficit all these years. However, they received rainfall this year. Interestingly, fruit rot has not had much of an impact in these regions, he said.



Mizoram to focus on organic farming

▶ Mizoram Agriculture Minister, C Lalrinsanga said that the state government would focus on organic farming keeping aside "chemical fertilizers". Addressing a meeting at Mizo National Front (MNF) office here, Lalrinsanga said that the state government will collaborate with Central Scientific Industrial Research (CSIR) and Mizoram University to produce vegetables and other crops through organic farming. According to the Minister, the MNF had, in its previous term, passed Organic Act "but the Congress government headed by LalThanhawla failed to implement the Act". "We will implement the Organic Act and make massive efforts to focus on organic farming to produce healthy and cost effective vegetables and other crops," he said. Organic farming is one of the top priorities of the government, he further said. Lalrinsanga also said that the government would set up a biological control laboratory at Lengpui near Aizawl. The government is taking effort to check crop damaging pest with the help of other pests through biological control, he added.

HP leads in production of wild marigold essential oil

▶ In these tough times for agriculture in Northern belt on account of non-remunerative returns and increasing incidences of crop loss owing to wild animals, Himachal Pradesh is flexing its flower power. It has become the largest producer of high quality wild marigold essential oil (4 tonnes per annum) in the country to meet the demand of perfume, flavouring, and condiment industries. The CSIR-Institute of Himalayan Bioresource Technology (IHBT), Palampur in the Himalayan State is doing its bit in this regard by helping and training farmers introduce high value aromatic crops such as wild marigold, damask rose, lavender, rosemary, lemongrass and mushkbala under CSIR Aroma mission. Dr Sanjay Kumar, Director, CSIR-IHBT said to promote cultivation of these aromatic crops among the farmers, a complete package of agro and processing technologies has been developed and executed in the farmers' fields to help them realize the profits. In fact, in the last two years, CSIR-IHBT has brought more than 500 hectares area under these crops. Cultivation of wild marigold has resulted in the production of 7.6 tonnes of essential oil in Himachal Pradesh alone with revenue generation of Rs. 5.56 crores benefitting 861 farmers. Different small societies of progressive farmers have been formed in different states by CSIR-IHBT. Nineteen processing units have been set up for these societies to empower the farmers for production of essential oils, said Dr Kumar. Aromatic crops are widely cultivated around the world due to its high-revenue earning essential oil which is utilized in agrochemical, food, flavoring, perfumery and pharmaceutical industry like wound healing and treatment of eczema, diaper rash, psoriasis and for skin ointment. Increasing demand of natural personal care products and aromatic cleansing agents is also favouring the essential oil market. "The global essential oils market demand was 226.9 thousand tons in 2018 and projected to expand at a CAGR of 8.6% from 2019 to 2025. To promote cultivation of these aromatic crops among the farmers, a complete package of agro and processing technologies has been developed and executed in the farmers' fields to help them realize the profits.

Fortum India signs a MoU with CCS Haryana Agricultural University to make fiber from paddy straw

Fortum India, a Finnish clean energy company signed a Memorandum of Understanding (MoU) with Chaudhary Charan Singh Haryana Agricultural University, Hisar, with the objective to establish collaboration in research about paddy and paddy straw. The MoU was signed in the presence of Prof. K.P. Singh, Vice Chancellor, CCS Haryana Agricultural University by Mr. Sanjay Aggarwal, Managing Director, Fortum India Pvt Ltd. And Dr. S.K. Sehrawat, Director of Research, CCS Haryana Agriculture University, Hisar. Chaudhary Charan Singh Haryana Agricultural University has been constantly working towards the management of paddy straw and as a first step, Fortum's partnership with HAU will include to deepen understanding of the theoretical and practical knowledge and expertise in the areas of studying the properties of rice straw and other agri-biomass, its availability, socio economic impact, probable supply chain and other possible area of support, in the State of Haryana. Prof. K.P. Singh, Vice Chancellor, HAU, while expressing his thoughts over the MoU, said, "This will give more thrust to the university's crop residue management program. The university is striving not only for the proper management of crop residues but also for the fair value of everything coming out of the farm." Commenting on the same, Mr. Sanjay Aggarwal, Managing Director of Fortum India Private Limited said, "We are proud to collaborate with Haryana Agricultural University, one of the leading universities of the country to solve the problem of paddy straw in Haryana. Burning of crop residues on a large scale in the fields emits greenhouse gas which has huge side effects on the environment. In three states in the Delhi region, 50 million tonnes of agrobiomass is burned every year. We intend to convert this agricultural waste into valuable products, provide solutions to reduce pollution, which will help local communities to become self-sufficient and raise their standard of living." Fortum is a leading clean-energy company that provides its customers with electricity, heating and cooling as well as smart solutions to improve resource efficiency.



Iran sanctions hit Basmati rice farmers

Premium Basmati farmers and traders of Punjab and Haryana are facing a lot of hardship. They have been struggling for long to get payments of the rice consignments after the imposition of trade sanctions on Iran. Now with the Basmati crop reaching the markets, the growers and traders are looking at bleak future as Iran is the biggest importer of high-quality Indian Basmati. Earlier this year, there was some cheer among the growers due to increase in the export of Basmati. However, the



euphoria was short-lived as payments from Iran got delayed. According to some estimates, payment for 1 lakh tonne of Basmati worth Rs 1,000 crore has been delayed. Perturbed over the issue, the exporters have sought intervention of the Central government into the issue. According to Agricultural and Processed Foods Exports Development Authority, total Basmati exports from the country touched 8.64 lakh tonnes during April-May 2019 as compared to 7.45 lakh tonnes during the corresponding period previous fiscal. Out of this, Basmati exports to Iran were 3.33 lakh tonnes as compared to 2.41 lakh tonnes in 2018-19 during the same period. Iran has been a major market for Indian Basmati and accounted for around 34% of the country's overall basmati exports during 2018-19.

"The payment against Indian basmati shipments to Iran has got stuck at Iranian ports as the Government of Iran has stopped issuing Indian currency (at concessional rate) to Iranian rice importers without any prior notice. According to estimates, around 1 lakh tonne of basmati valued at around Rs 1,000 crore is lying at Iranian ports," said Vinod Kumar Kaul, executive director, All India Rice Exporters Association. If the issue of delayed payment persists for a longer time, it might hit the earnings of farmers from the region as Punjab and Haryana account for over 70-75% of the total volume-wise exports. According to Mr Kaul, in the current scenario, the market has shown a price slump of around 15%, which will affect the remuneration to farmers once the new crop flows in. However, the woes of Basmati rice exporters of Punjab and Haryana aggravated.

India has exported 3.7 mt of sugar so far in 2018-19

India is estimated to have exported 3.68 million tonnes (mt) of sugar so far in the ongoing 2018-19 marketing year, industry data showed. The government has allowed an export surplus of 5 mt of sugar in 2018-19 (October-September), for which subsidy is also being provided. Last year, the exports had stood at just 500,000 tonnes. According to the All India Sugar Trade Association (AISTA), the country has shipped 3.14 mt of sugar and the rest 544,635 tonnes was in transit till September 9. Of the total sugar exported, raw sugar was 1.49 mt and white, 1.53 mt.

To cut imports, Centre plans to boost oilseed cultivation

After achieving self sufficiency by incentivising production of pulses, the Centre is keen on giving a push to oilseeds cultivation, a move that could help reduce the country's dependence on edible oil imports. "The government is fully interested in promoting oilseeds now and various options are being explored," Parshottam Rupala, Union Minister of State for Agriculture and Farmers Welfare, told BusinessLine on the sidelines of the World Seed Congress 2019. Rupala said the government wants to cut down on the huge edible oil import bill, which exceeds 60,000 crore per year. Besides focussing on improving the productivity, output and expanding the cultivation in the irrigated areas, the government also proposes to incentivise farmers to take up oilseeds, Rupala said. The success achieved in pulses production by incentivising the farmers could be replicated in the area of oilseeds, Rupala said.



India's edible oil consumption is estimated at around 22 million tonnes a year. Over two-thirds of the edible oil requirement is met through imports, entailing a huge foreign exchange outgo. The domestic production of edible oils is estimated to be between 6-7 million tonnes. Oilseeds production has gone up from 25.1 million tonnes during 2003-04 to around 32.26 million tonnes during 2018-19. However, the production has been stagnant over the past three years, hovering around 31-32 million tonnes.

Indian tea exports to Iran double to 17.7 million kg, but concerns remain

Amid tensions in West Asia, India has managed to raise tea exports to Iran, doubling its shipment volume to 17.7 million kg between April and July 2019, from a year earlier. This has happened when overall tea exports have remained flat at 73.2 million kg between April and July 2019 against 73.4 million kg between April and July 2018, with exports changing marginally to most destinations. Unit prices of Indian teas, too, rose to Rs282.9 against Rs197.6 and \$4.1 against \$3.5 for the period under review. Tea exports were valued at Rs1,676.7 crore against Rs1,491.2 crore with improved prices. Tea Board of India deputy chairman Arun Kumar Ray said export prices rose on the back of improved tea quality, which came after last year's curtailment of production during the winter months. "This and increased exports of orthodox teas led to the improved show at Iran," he said. Over the years, several measures have been taken to woo the over 100 million kg Iranian tea market. While Iran grows sizeable volume of tea, it also imports from many countries, including Sri Lanka and India, to meet its requirements and for blending. In recent times, the Commerce Ministry and tea industry have jointly taken several initiatives, including participating in buyer-seller meets in Tehran to expand the network. India also has seller-meets with visits to tea estates to build trust on issues such as good manufacturing practices (GMP). Issues such as online viewing of phytosanitary certificates have also been addressed. "These [initiatives] have led to increased exports," said Sujit Patra, secretary, Indian Tea Association. Merchant exporters are wary about raising a toast to Iran exports. Their concerns arise out of the existing rupee-rial export mechanism pursued for exports to Iran, and stem from the U.S. economic sanctions on Iran and its restrictions on dollar trade with the country. In 2019, methods like advance payment and forward contracts were made to ease exports of certain commodities, including tea. Reserves built up through prior oil imports were converted to rupee to help exports. These reserves were now running out and if tensions continued, they would cast a shadow on India's most promising orthodox export market by next year, merchant exporters said.

Sirsi farm cooperative to launch digital wallet for members

➤ In an effort to popularise digital transactions among its members, a farm cooperative from Uttara Kannada district of Karnataka is set to launch its own digital wallet. The 96-year-old TSS (Totagars' Cooperative Sale Society) Ltd in Sirsi will launch the digital wallet for its members on September 11. The cooperative primarily deals in procurement and marketing of arecanut and pepper in the district. Ravish Hegde, General Manager of TSS Ltd told that the cooperative has taken various transaction-related activities of its members into consideration while planning its 'TSS Wallet'. The mobile wallet will enable TSS members to pay digitally for purchases at the TSS



supermarket in the town, and to pay to their workforce in the farm. Apart from viewing their account details maintained with TSS Ltd, members will get the daily market report of the agriculture produces sold through TSS Ltd. There will be options to transfer money to other bank accounts, and book tickets, recharge mobile phones and DTH, among others. The wallet also helps members to store important documents such as Aadhaar, voter ID, driving licence, land records, etc, digitally, he said. There are also plans to popularise this wallet among other traders and service providers in the region. In this regard, the cooperative is planning to encourage QR code-based payments among the traders and service providers in the town. Hegde said TSS Ltd is partnering with the mobile wallet service provider 'TA Wallet' for launching the wallet. TSS Ltd, which has around 30,000 members, also introduced 'face-recognition' system for its members for payments at its supermarket in Sirsi a few months ago. Hegde said the 'face-recognition' system enables members and persons authorised by them to buy the product they want at the supermarket, and pay digitally. The 'face-recognition' system helps deduct money from the account of the member concerned at TSS Ltd. Terming it as a secure and safe system, Hegde said members need not pay cash or swipe cards for their purchases at the supermarket. This system prevents any kind of malpractices in transactions, he added.

High technology transforming farming

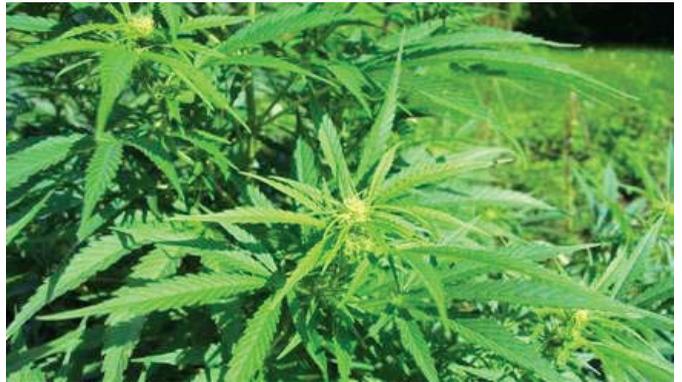
➤ Of all the out-of-the-box products a Silicon Valley tech start-up could offer, Bear Flag Robotics may be delivering the most unexpected: ploughed fields. The company is developing autonomous tractors, a goal that equipment companies like Case IH, John Deere and Kubota are chasing as well. But the business model of Bear Flag, based in Sunnyvale, California, has a twist — it does not build the tractors. Instead, it adapts the sensors and actuators needed for driver-less ploughing to existing tractors produced by major manufacturers. That step is not as sci-fi as it might seem. From equipment automation to data collection and analysis, the digital evolution of agriculture is already a fact of life on farms across the United States. Auto-steer systems, which use GPS receivers to keep rows straight and avoid gaps or overlap, are available for equipment ranging from tractors to harvest combines to sprayers with 100-foot-wide booms. Precision seeders and fertiliser systems can be satellite-guided to accuracy of an inch or less. The difference: For the most part, those operations still depend on an operator at the controls. Tractors equipped with Bear Flag technology are able to work fields around the clock, without



a driver, using sensors similar to those in autonomous road vehicles under development: lidar, radar and digital video. The sensory devices provide more than situational awareness, vital for safe operation where workers and livestock may be nearby, also collecting data on the land to improve efficiency. While Bear Flag pursues expanding capabilities to tasks like planting and spraying that have long demanded human supervision, it also plans to expand to the labour-intensive harvest duties of crops including tree nuts and row crops.

HP may allow cannabis cultivation

▶ With several countries like Canada, Israel and Malaysia approaching Himachal Pradesh to provide high quality cannabis extract for use in pharma and hemp industry, the demand for allowing its controlled cultivation may gain ground. Although successive governments have chosen to tread cautiously on the issue, there have been demands even in the past to allow its controlled cultivation with there being a huge demand from the pharma sector. The issue has come alive once again with ambassadors and high commissioners of many countries evincing interest in high quality cannabis extract, which grows in abundance in



Kullu, Mandi and other parts of the state. The diplomats have conveyed that the quality of hemp from cannabis in HP is of a far higher quality than that from Uttarakhand, for which there is a huge international market. It is with an eye on attracting big investments that the state government held interaction with representatives of almost 100 countries in Delhi ahead of the Global Investors Meet, scheduled to be held at Dharamsala on November 8-9.

In the age of seed companies, free distribution aims to preserve native paddy

▶ A home-grown initiative is making waves in an age where private players have the upper hand in terms of logistics and pricing. The Pudukkottai Organic Farmer Producers Company Ltd (POFPCL), an initiative of farmers, has been distributing seeds free of cost as parts of its efforts to revive and preserve native paddy varieties. Unlike other inputs for which farmers pay in cash, POFPCL distributes seeds with a rider - farmers have to return double the quantity at the end of harvest. Fearing that increasing use of chemicals and fertilizers could make agriculture difficult to sustain in future, POFPCL with support from Tamil Nadu Agri-marketing department, has been distributing free seeds for the past four years. The company has customer base of 1000 farmers in the district. "Whenever we issue seeds, the only advice we give farmers is tell them not to use pesticides or fertilizers. Extensive use of hybrid seeds and chemicals have reduced the quality of grains. Growing crop without chemical use would help retain nutrient value of the rice", said AAdhappan, Managing Director of POFPCL. "If a farmer collects 2 kg of Seeraga samba variety of paddy, he must repay with 4 kg of seeds after harvest. In this way we can sustain the business model and also can reach out to more farmers," said Adhappan. The company currently provides 46 varieties of native paddy seeds including Mappala Samba, Seraga Samba, Mysore Malli, ThuiyaMalli and Kichidi Samba. The low investment needed for using native variety is encouraging many farmers approach the company. Besides issuing seeds, the company operates procurement centres to buy harvested crop.

MSP: Delhi to soon implement Swaminathan recommendations

▶ A proposal to implement the recommendations by the M S Swaminathan Committee report on farmers will soon be placed before the Delhi cabinet, Delhi Development Minister Gopal Rai said. Rai said that the proposal note was ready and would be presented by mid-September. The recommendations would be launched under the "Mukhya Mantri Kisan Mitra Yojna". Under the proposed scheme, the Minimum Support Price (MSP) with 50 per cent margin at the cost of production is likely to be Rs 2,616 per quintal for wheat and Rs 2,667 quintal for paddy in the national capital, an official said. The proposed MSP structure is higher than the MSP provided by the Central government by Rs 776 per quintal for wheat and Rs 897 per quintal for paddy," the official said. The Delhi government has calculated that the government will have to incur an additional liability of Rs 96.38 crore at this MSP. To implement the recommendations, Rs 100 crore was kept aside in the 2019-20 Budget. Speaking about the plight of farmers, Finance Minister Manish Sisodia said in his Budget speech: "When the country was ruled by the British, the farmers did not commit suicides. But when the county is heading towards development, they are committing suicide in the 21st century." Despite being presented in 2006, no government in the county had implemented the Swaminathan report, Rai pointed out. Around 20,000 families of farmers in Delhi will benefit from this scheme. In February, Rai had organised an Agriculture Conference to discuss the implementation of the recommendations. He had also sought suggestions from farmers and general public on the same. In 2006 report, the National Commission on farmers' chairman M S Swaminathan suggested the Commission for Agricultural Costs and Prices (CACPC) to fix MSP at least 50% more than the weighted average cost of production. This recommendation was not incorporated in the National policy for farmers 2007.

AGRIBUSINESS

COMBINING TRADITION WITH BUSINESS



Agriculture is today India's critical offering to the world. Producing record levels of food grains and other farm produce, India has emerged as a significant player in the food front. The amplified agriculture production has converted this proletarian activity into a high impact commercial enterprise necessitating an influx of corporate intelligence and infrastructural

support. The agri-business generation of farmers have now the added responsibility of maintaining uniform levels of production with precision in quality and services.

AGRIBUSINESS—AN EMERGING BUSINESS OPPORTUNITY

The \$5 trillion agribusiness industry represents 10 percent of global consumer spending and 40 percent of employment. By 2050, caloric

demand worldwide will increase by 70 percent, and crop demand for human consumption and animal feed will increase by at least 100 percent. Excellent opportunities therefore exists in agribusiness sector. Since 2004, global investments in the food-and-agribusiness sector have grown threefold, to more than \$100 billion in 2013, according to McKinsey analysis. Not only is demand for food in emerging markets expected to rise



dramatically because of population and income growth, but also demand for rich diet is bound to increase.

The food-and-agribusiness value chain covers a wide range of components each representing a significant investment opportunity. Input industries- seeds, fertilizers, crop protection, agriculture machinery, from suppliers of agricultural machinery, seeds, chemicals, animal-health tests and vaccines, and packaged foods to data providers for precision agriculture etc.

In addition to greater demand for protein, a trend toward healthier diets is anticipated. Consumers are increasingly health conscious and place greater importance on environmental sustainability, most visibly in developed countries but more and more in emerging markets. In response, governments are tightening standards for food production. As a result, demand is rising for healthier functional foods (those that offer benefits beyond basic nutrition, such as lowering cholesterol) and for traceable and certified foods that are guaranteed to meet a certain level of safety and environmental or corporate social responsibility. Producers and food companies that embrace more

stringent environmental and social standards, organic-certification requirements, and traceability

The cold-storage-and-transportation market generates \$12 billion to \$18 billion in revenues and is expected to grow 10 to 15 percent annually to meet the country's expanding meat, dairy, and vegetable demand

standards would eventually benefit in the face of evolving regulation and continue to grow to take advantage of this trend Food-and-beverage companies can also profit from products with specific fortifications and nutrients to appeal to the health-conscious segment (for example, omega-3-fortified milk).

Besides the richness of the diet, the companies may also be expected to utilize the resources efficiently as it is a proven fact that years forward would see a decline in the available resources for the production of food. This in turn warrants for the development and deployment of technologies across geographies to be able to cater to the increasing demands sustainably and judiciously. To take advantage of the need for higher productivity, input companies, distributors, and logistics enterprises can expand into new geographies as well as provide a wider range of products and services (for example, high-yield seeds, fertilizer, and resource-optimization techniques) to help farmers increase crop yields. Offering innovative technologies (for example, seeds requiring less water for similar yields) is important, but so is their distribution in emerging markets.

Post harvest losses create a major source of loss. An estimated 30 percent of agricultural production in Africa and Asia is lost postharvest. Reducing food waste in emerging markets is a big value-creating investment opportunity, particularly in logistics and distribution. In China



alone, the cold-storage-and-transportation market generates \$12 billion to \$18 billion in revenues and is expected to grow 10 to 15 percent annually to meet the country's expanding meat, dairy, and vegetable demand.

Data is going to be another big market opportunity for agribusiness. Considering the relevance and increased acceptance of precision agriculture, there is exciting potential to use more granular data (for example, data for every ten-meter-by-ten-meter square of a field) and analytical capability to integrate various sources of information (such as weather, soil, and market prices) with the goal of increasing crop yield and optimizing resource usage, thus lowering cost.

However, there are still investment opportunities for low-cost producers in countries such as Brazil, where agricultural exports continue to grow. In addition, investments in infrastructure that enables the movement of commodities, such as ports, storage, and the cold chain, can help to promote and capture more value from agricultural trade. Major agricultural traders such as Archer Daniels Midland, Bunge, Cargill, and Louis Dreyfus

have committed capital to relieving some important bottlenecks such as movement of product from Brazil's interior, and additional investment is expected.

Another important segment is creation of infrastructure for agricultural trade. Infrastructural facilities required for storage, processing and transport decides the profitability and access of agricultural commodities. Developed countries are advanced in this area, whereas other countries including India lag behind in this aspect. Considerable investment opportunities therefore exists in this segment.

INDIA'S AGRIBUSINESS OPPORTUNITIES

Agriculture has always remained an important activity in India. Once it was for subsistence, thence it meant business. The incredible achievement that India made in the food front opened the gates of agriculture towards a bigger market. The surpluses created trade, and today India successfully exports many agricultural commodities to different parts of the world.

Agriculture is the primary source of livelihood for about 58 per cent of India's population. Gross Value Added by agriculture, forestry and fishing is estimated to be Rs 18.55 trillion (US\$ 265.51 billion) in FY19. Agriculture and allied

sector's GVA at constant 2011-12 prices grew at a CAGR of 3.07 per cent between FY12-19. As per Union Budget 2019-20, allocation of Rs 140,763.97 crore (US\$ 1.95 trillion) was made for the Ministry of Agriculture.

Post green revolution, India has consistently cloaked higher levels of food grains production. As per Third Advance Estimates for 2018-19, total Foodgrain production in the country is estimated at 283.37 million tonnes which is higher by 17.62 million tonnes than the previous five years' (2013-14 to 2017-18) average production of foodgrains. Total production of Rice during 2018-19 is estimated at record 115.63 million tonnes. Production of rice has increased by 2.87 million tonnes than the production of 112.76 million tonnes during 2017-18. It is also higher by 7.83 million tonnes than the five years' average production of 107.80 million tonnes. Production of Wheat, estimated at record 101.20 million tonnes, is higher by 1.33 million tonnes as compared to wheat production of 99.87 million tonnes achieved during 2017-18. Moreover, the production of wheat during 2018-19 is higher by 6.59 million tonnes than the average wheat production of 94.61 million tonnes.

Production of Nutri / Coarse Cereals estimated at 43.33 million tonnes is marginally higher by 0.24 million tonnes than the average production. Total Pulses production during 2018-19 is estimated at 23.22 million tonnes which is higher by 2.96 million tonnes than the Five years' average production of 20.26 million tonnes. Total Oilseeds production in the country during 2018-19 is

estimated at 31.42 million tonnes. The production of oilseeds during 2018-19 is higher by 1.77 million tonnes than the Five years' average oilseeds production. With an increase by 20.46 million tonnes over 2017-18, total production of Sugarcane in the country during 2018-19 is estimated at record 400.37 million tonnes. Moreover, the production of sugarcane during 2018-19 is higher by 50.59 million tonnes than the average sugarcane production of 349.78 million tonnes. Production of Cotton is estimated at 27.59 million bales (of 170 kg each) and Production of Jute & Mesta estimated at 9.79 million bales (of 180 kg each).

The total horticulture production of the country is estimated to be at 314.87 million tonnes which is 1.01 per cent higher than horticulture production in 2017-18, according to the Second Advanced Estimate (2018-19) of area and production of various horticulture crops. India ranks second in global production of fruits and vegetables and is a leading exporter of mangoes and bananas. Under the horticulture crops, production of fruits is estimated to be around 97.38 million tonnes in 2018-19 compared to 97.36 million tonnes in the previous year. Vegetables production is estimated to rise by 1.6

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per cent to around 187.36 million tonnes. As per the data, spices production is estimated to be around 8.61 million tonnes, which is 6.01 per cent higher than 2017-18.

Agri Exports have perennially increased echoing the burgeoning production front. India was the ninth largest exporter of agricultural products in 2017. Total agricultural exports from India grew at a CAGR of 16.45 per cent over FY10-18 to reach US\$ 38.21 billion in FY18. In FY19 agriculture exports were US\$ 38.54 billion. The Agriculture Export Policy, 2018 was approved by Government of India in December 2018 with the aim to increase India's agricultural exports to US\$ 60 billion by 2022 and US\$ 100 billion in the next few years with a stable trade policy regime. The Government of India has come out with the Transport and Marketing Assistance (TMA) scheme to provide financial assistance for transport and marketing of agriculture products in order to boost agriculture exports. Marine Products, Buffalo Meat and rice are largest agricultural export items in terms of value. Other major export items are spices, cotton, oil products and sugar. Marine product exports reached US\$ 7.39 billion in FY18, followed by Basmati rice at US\$ 4.16 billion and buffalo meat at US\$ 4.03 million. Tea exports from India reached 270.27 million kgs in FY19 while coffee exports stood at 282.87 million kgs in FY19. By early 2019, India will also start exporting sugar to China, while exports of Indian grapes to China is expected to increase 200 per cent by 2020. In November 2018, an agreement to export fish meal and fish oil from India to China was also signed.

The food and grocery market in India is the sixth largest in the world. The food processing industry contributes 32 per cent of this food market and is also one of the largest industries in the country, contributing 13 per cent of total exports and six per cent of industrial investment. Dairy sector's revenue in



India were estimated⁴ at Rs 5.7 lakh crore (US\$ 88.44 billion) in FY18 and are expected to reach Rs 7.5 lakh crore (US\$ 116.37 billion) by FY21. There are more than 37,175 food processing units in India, as per 2016-17 as per Annual Survey of Industries. Foreign direct investments (FDI) in India's food processing sector is expected to cross US\$ 28 billion in 2019. Processed fruits & juices exports in FY18 reached US\$ 646 million, followed by miscellaneous processed items at US\$ 574 million and processed vegetable exports at US\$ 283 million. Exports of ready to eat items from India reached US\$ 689.80 million in FY18 and have reached US\$ 681.95 million in FY19 (up to February 2019). Main export destinations for processed food products from India in FY18 were USA, EU and Middle East.

On the input side, several sectors contribute actively to sustain the momentum of Indian agriculture. Indian seeds market is expected to grow at a CAGR of 14.3% during 2018-2023, reaching a value of more than US\$ 8 Billion by 2023. The Indian seed market has witnessed a

major restructuring as a result of the implementation of some progressive policies by the government. Seed Development, 1988 and National Seed Policy, 2002 have helped in strengthening the Indian seed industry in the areas of R&D, product development, supply chain management and quality assurance. Owing to this, India has emerged as the fifth largest seed market across the globe.

Agrochemicals are indispensable components aiding plant growth. Their market has grown considerably over the years. Currently, India is the world's 4th largest producer of agrochemicals after United States, Japan and China and has emerged as the 13th largest exporter of pesticides globally. This segment generated a value of USD 4.4 billion in FY15 and is expected to grow at 7.5% per annum to reach USD 6.3 billion by FY20. Approximately 50% of the demand comes from domestic consumers while the rest goes towards exports. However, the usage of agrochemicals in India is one of the lowest in the world at just 0.58 kg per hectare against 4.5 kg

per hectare in the US and 10.8 kg per hectare in Japan. It is no where near the world's average consumption of 3 kg per hectare. This shows there is clearly a large scope of growth in usage and demand. With limited availability of fertile land to cultivate food and feed an ever growing population, the only alternative we have is to increase productivity per hectare. Besides, it is proven that protection chemicals can increase crop productivity by 25-50%, by mitigating crop loss due to pest attacks. Crop protection chemicals are therefore very crucial to ensure food and nutritional security.

With a marked reduction in the availability of labour for agricultural operations, India is experiencing a shift towards agricultural mechanization. The Government has introduced several schemes and policies that support greater mechanization of Indian Agriculture. The focus on farm mechanization is driven by the need for enhancing agriculture productivity and availability of food grains; increasing agriculture exports; mitigating labour shortage; and facilitating judicious use of scarce

natural resources and farm inputs. Keeping this in view, an ambitious target of increasing the availability of farm power from 2.02 kW per ha (2016-17) to 4.0 kW per ha by the end of 2030 has been set. By 2022, the size of the farm equipment market is expected to reach Rs. 9 Lakh Crore. Though, the level of farm mechanization in India stands at about 40-45% with states such as UP, Haryana and Punjab having very high mechanization levels, north-eastern states have negligible mechanization. This level of farm mechanization is still low as compared to the countries such as the U. S. (95 %), Brazil (75%) and China (57%). There is a need to innovate custom hiring service or a rental model by institutionalization for high cost farm machinery such as combine harvester, Sugarcane harvester, potato combine, paddy transplanter, laser guided land leveler, rotavator etc. to reduce the cost of operation which can be adopted by private players as an agribusiness venture.

When it comes to judicious use of resources, micro irrigation becomes an enterprising opportunity in India. The Economic Survey 2018-19 suggests that "focus should shift from 'land productivity' to 'irrigation water productivity'. The current domestic industry is estimated at around Rs. 4,500-5,000 crores and is considered to be highly competitive. There are more than 100 large and small scale drip and sprinkler irrigation systems producers and marketers across different states. Major players include Jain Irrigation, Netafim India, Finolex and EPC Industries Ltd. Jain Irrigation commands a market share of more than 30% and Netafim India has a market share of about 18%. The industry has been growing at a CAGR of 5-7%. However, given the increasing requirement of water management, according to some estimates, the total market in India is expected to be more than Rs. 8,000 crores by 2020.

AGRICULTURE INFRASTRUCTURE – THE WEAKEST LINK

Despite the advances in production front, India is yet to create infrastructure that can support the augmented food production scene. The record food grain production that has become an yearly affair seldom translate into higher earnings for the farmer. Lack of appropriate storage facilities, warehouses, godowns, cold storages have led to wastage of agricultural commodities incurring heavy losses. If doubling farmers' income has to become a reality, agri infrastructure must be developed at accessible location and price.

Warehousing is crucial to Indian agriculture. They serve as transit places for the agriculture produce between harvest and market. The duration of the transit varies depending upon a host of factors. Warehousing helps to maintain food security in the country through uninterrupted supply of agricultural commodities throughout the year irrespective of harvest season. The issues of glut and scarcity are thereby kept at bay. Beyond the traditional functions of warehousing, today warehouses have become financial instruments as well which help the food producers access credit from financial institutions. Warehouse receipt financing has been primarily developed to provide liquidity for depositors while allowing them to hold on to their goods till they receive a better price. It also allows farmers to use this system to avoid a distress sale and obtain working capital. WR finance is estimated to be \$3.0- \$3.5 billion in India, quite far from its potential of \$60 billion.

The total agri warehousing capacity in India is about 109 million tonnes as against the total demand of about 180 million tonnes. Agricultural warehousing accounts for fifteen percent of the warehousing market in India and is estimated to be worth Rs. 8,500 crore. However, there exists a gap between the

demand and existing capacity. As on May, 2015, the cumulative storage capacity of various agencies such as Food Corporation of India, Central Warehousing Corporation, state warehousing corporations, cooperatives and private parties stood at just 121.11 million metric tonnes (mt), while the marketable surplus of food grains in 2013-14 alone was approximately 159 million metric tonnes.

To tackle the situation, the central government is implementing a host of schemes to augment India's storage capabilities. The government is implementing the Integrated Scheme for Agricultural Marketing (ISAM) — a sub-scheme of which, the Agricultural Marketing Infrastructure (AMI) facilitates construction and renovation of warehouses in rural areas of various states. Between April 2001 and June 2015, 35,226 godowns with a capacity of 555.13 lakh mt have been sanctioned for construction and renovation, for which a subsidy of Rs 1908.50 crore was released. Of this, a total of 28,694 godowns with a capacity of 480.59 lakh mt have been constructed and 1,743 godowns with a capacity of 22.13 lakh mt have been renovated.

The widening gap has attracted many private players to invest in this space. Agri-commodity warehousing firms have witnessed strong growth in their businesses adding just more than warehousing services. Apart from stocking a range of commodities and issuing receipts against them, modern commodity warehouses provide allied services such as procurement, maintenance, collateral management and financing. These new services have provided firms with more revenue lines and higher margins, attracting private equity investors to the space. Canadian investment firm Fairfax bought a majority stake in National Collateral Management Services Ltd for Rs.800 crore. In 2014, Temasek invested Rs.250 crore in Star Agri



warehousing. Agri-warehousing firm SohanLal Commodity Management Pvt. Ltd had raised Rs.100 crore in private equity funding led by Chicago-based Creation Investments Capital Management Llc and existing investor Everstone Capital. Additionally, the shortage of agri-warehousing capacity and the low-level of private sector participation in the sector too has been an attraction for investors. Even the existing storage infrastructure has become outdated and would soon be required to be replaced by modern ones.

In addition to dry storage capacity, there is an acute shortage for cold chains in India. This is a severe handicap considering our post harvest losses. Cold Chain, a chain of logistics activities that ensure market connectivity of perishable produce from harvest to consumers, is still in a nascent stage in India despite its immense potential in an agriculturally significant nation like India. India's cold chain sector is a combination of surface storage and refrigerated transport.

Currently, India has 6,300 cold storage facilities unevenly spread across the country, with an installed capacity of 30.11 million metric tonnes. These are mostly used for

storing potatoes. However, the market is gradually getting organised and focussing towards multi-purpose cold storages. More than 50% of the cold storage facilities in India are currently concentrated in Uttar Pradesh and West Bengal, while other states still face a challenge with investments from the government and private operators.

In a bid to expand the cold storage capacity of the country, the Centre sanctioned 101 new integrated cold chain projects that will leverage a total investment of Rs.3,100 crore. The projects, which will be developed by companies including BalmerLawrie, Sterling Agro and Haldiram Snacks, are aimed at doubling farmers' income, reducing wastage in the agri-supply chain and creating huge employment opportunities. In May 2015, the Ministry announced the sanctioning of 30 cold chain projects. The total expected grant-in-aid to be released to these projects is Rs.838 crore. The balance funds is expected to be raised from the private sector. The 101 new projects – which are for fruits and vegetables (53 projects), dairy (33), fish, meat, marine, poultry, ready-to-eat/ready-to-cook sectors – will create additional capacity of 2.76 lakh MT of cold storage/

controlled atmosphere/frozen storage. Maharashtra cornered the maximum number (21) of the projects followed by Uttar Pradesh (14), Gujarat (12), Andhra Pradesh (eight) and Punjab and Madhya Pradesh (six each).

India needs more investments in cold storage considering the heavy losses the country incurs by way of wastage of fruits and vegetables which was pegged at Rs. 92,000 crore on the basis of the wholesale prices of 2014. The government has also plans for building National Cold Chain Grid in the country so that all food producing hubs are connected to cold storage and processing industries.

Thus agriculture has transformed from an activity limited to fields and has encompassed many industries that are catering to the needs and demands of the farmers and fields. This tie up has raised the status and output from the industry towards the nation's income. With the objective of increasing agriculture production, due attention should also be laid on filling the infrastructural gaps existing in the agricultural space. This will not only help in extending the life of otherwise perishable produce, but also help in fulfilling the objective of doubling farmers' income.

FACTORING IN WEATHER

Watson Decision Platform for Agriculture based on IBM PAIRS Geoscope from IBM Research swiftly practices colossal, intricate geospatial and time-based datasets gathered by satellites, drones, aerial flights, millions of IoT sensors and weather models to help farmers make faster, more informed and profitable decisions about their crops. With the launch of IBM Watson Decision Platform for Agriculture; farmers, growers and enterprises across the country can earn the benefits of technology and innovation. Speaking to Agriculture Today Mr. Himanshu Goyal, India Business Leader of the Weather Company shared an overview on how Watson Decision Platform aims to work together with the businesses across India towards the use of technology to provide insights to the farmers for enhancing the crop productivity and soil yield along with the supreme goal of improving farmers' incomes.

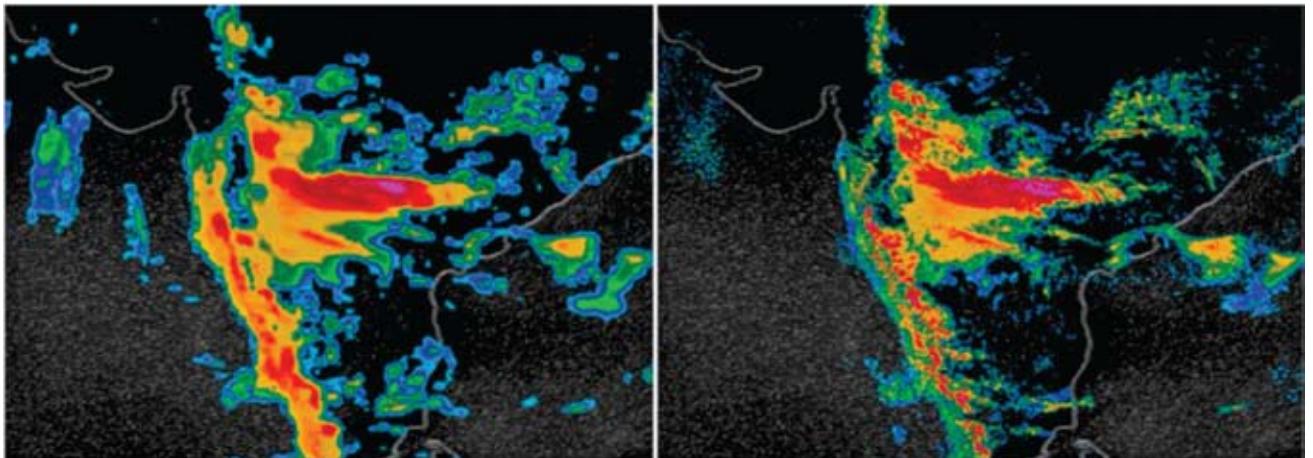


How can Modern Agriculture Technology and IoT data improve harvests, sustainability and quality of crop produce?

Farming has always been a complex undertaking that requires growers to manage an interconnected web of pre-season and in-season decisions with dependence on ever changing weather conditions. With the explosion of data from farm equipment, environmental sensors, and remote input, it's impractical to rely only on intuition or traditional technology to understand what drives variation in yield or provide guidance to growers. Combining artificial intelligence (AI), Internet of Things (IoT), and predictive analytics can aid stakeholders across the agriculture

ecosystem in gaining insights into projected yields and potential problems, helping to enable better decisions.

With one of the objectives to help farmers to better anticipate and prepare for dramatic shifts in weather and more, IBM unveiled the new IBM Global High-Resolution Atmospheric Forecasting System (GRAF), the first hourly-updating commercial weather system that can predict something as small as a thunderstorm, virtually anywhere on the planet. Compared to existing models, IBM GRAF can provide a nearly 200 percent improvement in forecasting resolution for much of the globe (12 - 3 km; 7.5 - 1.2 mi.). GRAF is expected to be available later in 2019.



Picture caption: An August 2018 monsoon in India, shown at left by the best current weather model that operates at 13-kilometer resolution. At right, the new IBM Global High-Resolution Atmospheric Forecasting System (GRAF) operates at 3-km resolution and updates 6 to 12 times more often. Credit: IBM

How is precision agriculture system helping to predict the crop diseases earlier and sooner and could it also help in accessing more precise predictions with data analytics?

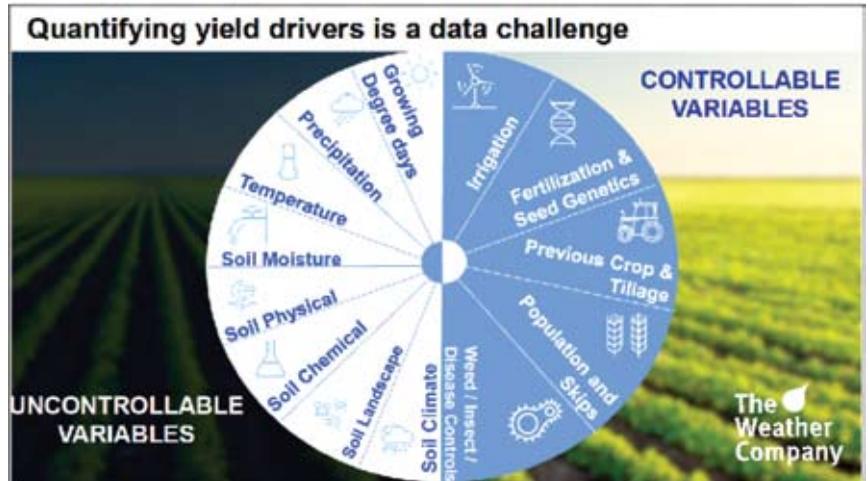
In India, crop damages due to pest attacks causes billions of dollars of loss annually. With the help of Precision Agriculture techniques, growers can identify certain types and severity levels of pest and disease damage. With this field-specific insight, growers can more effectively assess current risk levels of crops. For example - look at environmental-friendly ways of detecting blight. This saves time and money while reducing the impact on the field by enabling decisions such as how and when to spray fungicides.

IBM's Watson Decision Platform for Agriculture applies AI, machine learning, and advanced analytics to extract valuable insights. For example, a grower can take a photograph of a plant up-close and with the help of Watson identify what type of pest is affecting the plant. This solution also uses satellite imagery to help producers understand which parts of their field are under stress.

Is the current state of application services the 'new normal' for agriculture sector and farmers?

There is a shift in the way farmers are accessing data and technology to be more productive and profitable. A number of apps are available in India providing farm advisory that range from crop specific advisory for sowing and harvesting, government schemes available for farmers, weather forecasts, latest mandi prices to organic farming practices and so much more.

Sustainable agricultural practices today use technology and other resources to provide insights on



optimum weather conditions for cultivation, market fluctuations, supply chain, assessing farmer credit worthiness for loans and insurance, thus paving the way for digitally equipping the agricultural ecosystem including farmers.

How is IBM working with AI and farmers to protect crops from further damage and increasing yields?

IBM has brought Data and AI together to create Watson Decision Platform for Agriculture -the platform is an innovation that draws upon IBM's most advanced capabilities in AI, analytics, IoT, Cloud, and weather to create a suite of solutions that span the farm-to-fork ecosystem. It is a global agriculture solution that combines predictive technology from The Weather Company, an IBM Business, with IoT data into a single electronic record of truth so that farmers, food companies, grain processors and product distributors around the world can leverage insights to drive more profitable decisions resulting in:

- Higher grower and food company profitability
- Better crop output quality and value
- Greater sustainability and efficiency

Let me give you an instance to explain this further. With Karnataka being a

key producer of tomatoes and maize, IBM is developing an advanced price forecasting system for the Karnataka Agricultural Prices Commission (KAPC) which is a dashboard that predicts the market price trends for at least a fortnight and the production pattern of tomatoes. The dashboard, leveraging IBM's Watson Decision Platform for Agriculture as well as big data, AI and ML, uses satellite imagery and weather data to assess the acreage and monitor crop health on a real time basis. It can detect pest and disease infestations, estimate the tomato output and yield, and also forecast prices. Previously, the output estimates were based mainly on acreage data. Other key input such as the prices in major markets of neighbouring States are also factored into the price forecast. The price forecasting mechanism developed for Karnataka was the first of its kind in the country. It was initially launched for the three major tomato-growing districts of Kolar, Chikkaballapur and Belgavi and two key maize-producing districts of Davangere and Haveri.

Considering the Global challenges faced by farmers and farming sector today, how can Watson platform improve agricultural efficiency on a global basis?

Watson Decision Platform for Agriculture aims to help growers and enterprises make better decisions



based on weather data so we can continue building towards the goal of sustainable agriculture:

- Adopting sustainable practices and optimizing use of resources such as water and keeping the land healthy can go a long way in meeting the increasing demand for food and agricultural commodities and minimizing environmental impact.

- Farming smarter and moving food from farm-to-fork in a more efficient manner will be beneficial for anyone involved with the agriculture industry limiting the necessary operating costs.

How does AI and modern technologies help in crop insurance schemes?

Multiple stakeholders are impacted by crop loss as it leads to defaulting on loan further leading to non-performing assets. The Government, insurance companies and financial stakeholders try to perform estimation exercises on small areas of land to assess soil moisture, fertility and impact of weather in order to predict yield. Accurate yield prediction is largely dependent on hyper-local weather inputs and precision to location helps the entire ecosystem to not just

manage risk but also plan for failure for bad seasonal output or plan for demand for a bountiful season thus impacting the entire value chain.

Weather data and insights can be used by insurance companies to plan crop insurance schemes for farmers by providing smarter rates to improve risk insight and claims processing. This is extremely helpful in allowing insurance companies plan for the monsoon with its impact on crops and crop insurance.

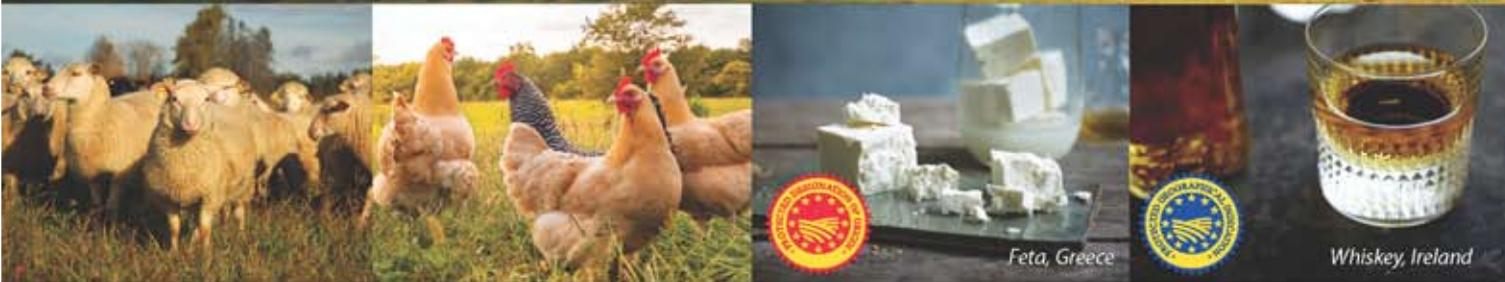
What are the challenges and opportunities confronted by the farmers while using modern techniques. How can we overcome those challenges?

The business of agriculture is undergoing massive disruptions including: Increasingly volatile weather, Growing environmental and regulatory pressures and Greater demand for food quality and sustainability. Rapid technological advancements, inundation of data without a streamlined way to unlock insights and expensive farming equipment have made it hard for farmers to keep up. Relying on traditional knowledge and methods may no longer be enough to meet the

challenges facing modern agriculture. By shifting towards a tech-driven, sustainable approach to agriculture, farmers can gain an advantage by taking full control of their available data. The Government of India is now taking steps to deploy AI, IoT and data analytics in agriculture. The Ministry of Agriculture and Farmers Welfare and IBM recently signed a Statement of Intent to deploy IBM's precision agriculture solution which combines AI and weather technology to obtain and analyse farm level insights. As part of the partnership, IBM Watson Decision Platform for Agriculture will be implemented in three districts in Central & Western India as a pilot study to obtain farm level weather forecast and village level soil moisture. This will currently be for the Kharif crop season 2019 to be conducted in Nanded district in Maharashtra, Bhopal district in Madhya Pradesh and Rajkot district in Gujarat. The government's think tank NITI Aayog is bringing AI to farmers by using IBM's smart technology solutions for the sector. The project aims to develop specific monitoring systems to help improve crop yields and savings with the objective of improving the livelihood of farmers.



The European Union's 'From Farm to Fork' Food Safety Model: a Guarantee of Safety and Quality for Indian Consumers



Food production and gastronomy in Europe are based on the combination of knowledge, skills, practices and traditions bringing together farming and methods of conserving, processing, cooking, sharing and eating food. India and the EU share similar values when it comes to cultural heritage. It is integral to the rich array of food production, tightly bound up with the unique farming practices in different European regions and with their local products while including concepts like respect for animals, nature and biodiversity. The development of global export markets is enabling also consumers in India to benefit and share the EU's rich cultural food heritage.

In the EU, not less than in India, **Consumer protection comes first**. A high level of health protection is the paramount objective of all EU laws in food and farming sectors. The EU has harmonised its sanitary and phytosanitary legislation throughout the Union under the concept **'from farm to fork'**. The EU is a single entity when it comes to food safety which means that **food exported from the EU to non-EU countries must comply with all the relevant requirements of EU food law regardless whether the product is intended for the EU single market or to be exported**.

The European Commission verifies that the food control systems are effective. It is in charge of auditing of the controls and inspections of food production systems in EU Member States from farm to consumers. This ensures that food produced in the EU follows similar standards all over Europe and is subject to serious controls.

The EU ensures high standards of animal and plant disease control and effectively tackles outbreaks. In the event of an outbreak of a serious animal disease on a farm, immediate movement restrictions are applied to the affected holding and all farms in the so-called "surveillance

zone". This EU system for **"Regionalisation"** of animal diseases is a trade-facilitating tool, ensuring the best possible disease control and allowing safe trade from non-affected areas. Regionalisation minimises the negative impact of disease outbreaks, without lowering the level of safety of traded commodities. It has demonstrated its efficiency for many years and has proven to stop disease spread and eradicate them. **EU exports from disease-free regions have never been a source of transmission for any importing country or trade partner.**

In the EU, plant health is similarly a key factor for sustainable and competitive agriculture, horticulture and forestry. Healthy seeds and propagating material are required for the preservation of the Union's forests, for profitable crops in agriculture and for food security.

The EU has the world's most rigorous monitoring system to keep contaminants away from our environment, our food and our animal feed. Maximum acceptable limits for those **contaminants and residues** apply to food and feed products. Food materials that come in contact with food are also strictly regulated to exclude any contamination. Member State authorities maintain extensive programmes of sampling and analysis from farm to fork to ensure that potential sources of contamination are identified and safe levels maintained in all stages of food production and processing.

The European Food Safety Authority (EFSA) provides independent risk assessments that underpin regulatory decisions taken by the EU. The assessments provide the **scientific basis** for the sanitary and phytosanitary standards of the Union that are applicable to domestic production and imports.

From farm to fork, EU food and beverage products provide a guarantee of safety and quality that consumers in India can truly enjoy.

Geographical Indications: helping you to discover authentic food

The European Union protects European food heritage by highlighting its diversity and emphasizing the qualities associated with the origin of its products. The European quality schemes for geographical indications are open also to non-EU countries wishing to protect their products' names.



Protected Designation of Origin (PDO)



Protected Geographical Indication (PGI)

REINING IN LOSSES

DHL SmarTrucking ColdChain, FSSAI-compliant and following the latest ISO standards in the cold chain industry, provides temperature-control capabilities that are comparable to international standards. They offer some of the fastest transit times with 95 percent reliability and up to 50 percent reduction in transit time compared to traditional trucking. As their goods reach markets in a shorter time and are in better condition than if they were subject to traditional truck transport, businesses are able to increase their transactions and also fetch a better price for their goods. “Our solutions are designed with a view to ease of use, and we facilitate end-to-end consignment visibility and 24x7 real-time tracking to provide our customers peace of mind and confidence in the integrity of their products. For example, businesses in the agricultural sector often need to transport goods like fresh fruits and vegetables which need to be transported promptly, with temperatures maintained at a consistent level to prevent spoilage,” says Vikash Mohan, CEO, DHL, SmarTrucking India. In conversation with Agriculture Today, Mr. Mohan discusses the post harvest losses and the benefits of having smarTrucking solutions.



What is the significance of SmarTrucking network and how is it going to benefit farmers and the farming sector in the long-run?

Globally, the agriculture sector is facing many challenges, both from natural and human causes. On one hand, factors like climate change are driving a decrease in farming output and a consequent increase in hunger, while on the other hand, burgeoning use of water and inadequate sustainable farming practices are compounding the issue further. Low mechanization among small-holders in many countries has also contributed to low farming yields and health issues among farmers. It is vital, therefore, to infuse greater efficiency in the sector, for optimum utilization of these products and to minimize waste. To cite an example, it is believed that around 30-40 percent of agricultural produce in India is wasted annually due to inadequate cold chain infrastructure which is

needed to preserve its shelf life. In such a milieu, logistics providers like DHL SmarTrucking have a significant contribution to make, in terms of bringing technology and reliability to the transport of agricultural goods, to increase their shelf life and reach. A smart cold chain distribution system will go a long way towards this aim.

DHL SmarTrucking ColdChain has helped our customers reduce wastage, by ensuring that the produce reaches its destination faster, and is maintained at the required temperature throughout its transit. As a case in point, we have helped JVS, a 27-year-old Chandigarh-based family-owned apple trading company, reduce their transit time by about 28 percent, from 7 days to 4-5 days. The reduction in spoilage during transit has also helped the company reduce its dependence on imports.

How DHL's SmarTrucking initiative would accelerate in the development of technology-

enabled logistics solutions in India?

As a pioneer in TechLog, DHL SmarTrucking is committed to bringing efficiency to the Indian logistics sector. We apply technology to logistics, including IoT, data analytics and on-board diagnostic tools, to add value for our customers through on-time delivery; faster transit times and complete visibility into the location and condition of consignments. Our advanced analytics help businesses plan their supply chain by helping to inform their business strategy; IoT-enabled sensors monitor the location and temperature of the shipment and send data to the centralized control tower, facilitating more effective decision-making. Offline data loggers ensure complete security and integrity of the cargo while dynamic route optimization helps reduce the turnaround time of deliveries. We also provide temperature control reports at the end of each trip, so that our cold chain customers have

a full view of the condition of their goods throughout the journey. Just as the direct application of technology to agricultural processes can help make them more efficient and productive, use of technology in logistics processes can help make the journey of agricultural products fast, secure and reliable while also ensuring minimum waste. Organized providers such as DHL SmarTrucking offer agri-businesses great value by delivering their shipments faster, while also preserving the freshness and wholesome benefits of the products. Farmers can get the best price for their goods when they are delivered in pristine condition, and can sell more when their produce is delivered to markets quickly. In light of the evolving circumstances, such as changes in climate conditions and the increasing demand for global natural resources, making food distribution efficient and all-encompassing has become more critical than ever. Going forward, technology use will be the standard in this sector, to make agriculture sustainable, prolong the life of harvested produce and to ensure food for all.

What were the challenges faced while testing the pilot project and how were they resolved by the company?

One of our first challenges was sourcing skilled drivers. While India has many commercial truck drivers, it often proves tricky for them to transition from the unorganized to the organized part of this sector. Organized logistics providers have more stringent requirements in terms of driving behavior, decorum and grooming, and this poses a challenge for some of the truck drivers who are not accustomed to such exacting standards. Given that they are an essential cog in the logistics process, we strove to inculcate DHL's values in our drivers, and help them assimilate into their new environment while also focusing on their wellbeing, through trainings, gamified learning and wellness workshops. DHL

SmarTrucks are equipped with sensors to monitor driver behavior, which allows us to identify areas of improvement and target our training modules to better address the needs of our SmarTruckers. We also had to contend with network complexities in our quest to provide world-class transport solutions to our customers. In the trucking industry, it is important that vehicles be optimally utilized and continuously on the move, and balancing demand and supply can be complicated since some parts of the country are more of consumption centres and cannot always be relied upon for a productive and cost-effective return journey for our SmarTrucks. We use data analytics to predict demand and plan our vehicle deployments accordingly. In addition, our customers can place their indents as much in advance as they desire, which makes it easy for them to plan their supply chain in an efficient manner.

Another challenge was presented by the road transport infrastructure. The quality of roads, traffic conditions and wait times at toll plazas impacted the speed of our deliveries and our overall turnaround time. The introduction of the goods and services tax, ongoing road infrastructure development and upgrade under Bharatmala has greatly eased traffic congestion. Ironing out the wrinkles in the e-way bill system has vastly improved state border-crossing procedures. The introduction of FASTags is also going to reduce, or perhaps even eliminate, wait times at toll plazas.

How safeguarding the products integrity through SmarTrucking would transform the traditional methods of delivery?

Even though India is one of the largest producers of agricultural goods, about 30-40 percent of fresh produce gets wasted each year due to lack of cold chain storage and transportation. Most farmers in India currently transport their produce either using trucks, which are open and covered only with tarpaulin,

or container trucks which do not have any provision for temperature control. Either way, since the goods are not being maintained at proper temperatures, there is quite a bit of wastage of food during the transit process due to spoilage. To preserve fresh agricultural produce, they must be stored or transported in a cold environment at prescribed temperatures. This is especially important in India where the outside environment often differs from region to region. Unfortunately, India's cold supply chain is still nascent and unorganized. This makes it difficult to monitor and regulate the conditions under which the products are stored or moved, thereby contributing to inefficiency and wastage. An efficient cold chain is essential to ensuring that the quality and freshness of the produce is maintained throughout its transport. At the same time, it is also important to provide businesses visibility into the whereabouts of their shipments and give them complete confidence in the integrity of their consignments. A smart, connected cold supply chain gives companies the ability to respond to evolving market demands decisively and in a timely manner. It also ensures that the condition of the products is consistently maintained, and the appropriate teams are promptly alerted in case any intervention is necessary. DHL SmarTrucking ColdChain vehicles are equipped to maintain temperatures in the range of -25°C to 25°C to preserve the freshness and quality of a wide range of agricultural products. Our fully-owned fleet of refrigerated SmarTrucks is equipped with IoT-enabled sensors that continuously send data to a centralized control tower, facilitating 24x7 consignment visibilities for our customers, and allowing for real-time tracking. We also provide a complete record of the shipment's temperature conditions throughout transit to our customers, so they can have complete confidence in the integrity of their consignment.

PERILS OF UNPLANNED PRODUCTION- CARS OR CARROTS, IT'S THE SAME

There are lessons to be learnt by farmers from auto industry



A recent social media forwarded message brings out the apathy of farmers in dealing with the market forces. The message asks the car manufacturers why is it they want to shut production instead of dropping prices like the farmers who sell at any price unmindful of their cost and continue producing. Presume this message must have originated from a set of farmers, which is a good sign that the farmers are looking around and hopefully would learn

from automobile industry responses. Situation of excess inventory over market demand could be new for the automobile industry, but our farmers are used to such situations resulting in market control pass over to the buyers who dictate prices, given other issues of perishability of the product, the bargaining power of farmers only gets lower by the day, continuing to silently suffer their plight. Carrots or Onions or Pulses or Automobiles, anything in excess over demand means disaster for the producer is lesson number 1 for the farmers.

Farmers now have a chance to learn from how the automobile industry manages the situation arising out of excess production over demand. Unlike the farmers, obviously no one dares ask them to sell their cars at less than half their cost of production, while it is accepted as

a market determined price based on supply demand equations which our economists are happy to see their theory working, however they fail to see the raw deal meted out to the farmers in a process where the producer has no say on pricing their product.

Response from automobile industry would at best be to offer some freebies, hence the lesson number 2 for the farmers on managing without steep price cuts, and not let the market take control of the price for their products. Possible response of the industry would be to moderate production in line with demand, hoping the companies would tide over the situation. Industry, through its market studies, would take up suitable changes in the mix of vehicle models to maximise its financial strength in a shrunken market. However, farmers in millions and

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करत नाही

acting individually do not have such an option of collectively responding with changes in production mix based on market studies to align their production with the market demand, therefore they end up doing the same again and again.

Current market information services that broadcast price information through various channels are of limited actionable value for the farmers in protecting their interest. The need is for a market intelligence system that is capable of forecasting production ahead of actual planting, based on the farmers' inclination, affording an opportunity to correct any potential imbalance in the crop product mix at harvest, by diverting acreage of likely excess seeding of any specific crop to some other crops likely to be in short production. High prices of pulses in 2017 and the higher MSP announcement for 2018 led to every single farmer going for it in 2018 resulting in excess production leading to price crash. This could have been averted by an intelligence system designed to forecast the area likely to be seeded, which would have forewarned the excessive area expansion and preventing them of

following the same direction.

A statistically valid, digitally enabled farmer survey of crop area allocation plans of farmers just ahead of the sowing season in the country could throw up forecast of area cover expected under various major crops, just as the exit poll conducted during general elections in the country. Based on the area allocation, the likely production could be forecast, also factoring in the rainfall spatial distribution forecast in each of the areas. Any significant departures in

area expansion/reduction of specific crops over a normal year planting pattern, which can potentially result in excess/short production of specific commodities beyond/under 10% of the market demand, could be fed back to the farming community to consider reallocation by a specific % so as to prevent a demand supply imbalance resulting in market price distortions. Natural calamities of drought, floods and other reasons which are not part of a normal year could impact the output levels, such situations can





be managed with buffer stocks or mopping up excess, such volumes are unlikely to be in proportions of big surprise as the area planted is moderated.

In many states, Farmer Producer Companies (FPC) and various community-based farmer organisations (CBO) are active, awaiting a meaningful evolution of their purpose and role, and could be part of the response collection and dissemination system. Suitable digital system of response gathering and dissemination of analysed reports both routed through the CBOs could achieve the desired result of reallocation of crop area. Such surveys could be taken up prior to planting seasons of kharif, rabi and summer initially, and the methodology perfected before taking up crops involving multiple planting windows such as vegetable crops. Thereby, frequent excess and shortfalls often witnessed in vegetables could be put to rest to a large extent, if not entirely.

As the Government through its various actions is responsible for ensuring farmers receive remunerative compensation for their produce, the suggested system of planting

poll could be part of some arm of the Government. Alternatively, as a step towards getting the farmers into managing their own affairs, just as every manufacturer does for their products, lesson number 3 from automobile industry would be to learn to work through their own association, like Society of Indian Automobile Manufacturers. Government could facilitate establishment of an independent body with representations from various CBOs, FPCs, Farmer bodies. During the initial phase, inclusion of observer representatives from Marketing department of GOI and some states can be considered. The body could be designed based on the organisation structure of National Egg Coordination Committee, mandated to work on all such annual crops, excluding commodities which already have a Board. The farmer body could be mandated to handle all such matters of agricultural development primarily focussed on the marketing issues of its farmer members, in assisting farmers in realising a fair price for their produce through a dialogue process with the trade and a bargaining council format to be devised, to be responsible for

coordination with various farmer bodies, CBOs on dissemination of market intelligence based actionable direction for the farmers and any other commercial matters for improvement of farmer incomes. The farmer body is best managed by an independent professional team with defined set of objectives and goals, to ensure that it stays apolitical with the vision of emerging as the NDDB for annual crop farmers. A good starting point could be a consultative round table of key stakeholders to decide on the broad contours of the proposed Body. This body in its final shape and form will succeed in farmers managing their own marketing as profitably as any industry would, otherwise stop production if not profitable, which is the last lesson from the present automobile industry crisis.

By the way, it is hoped that the automobile industry is not picking a leaf from the farmers' handbook and seeking government procurement like under MSP.

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AGRITECHNICA 2019

MARKETPLACE OF SOLUTIONS FOR GLOBAL AND LOCAL CHALLENGES IN AGRICULTURE

From 10 to 16 November 2019 (exclusive days on 10 and 11 November), approximately 2,750 exhibitors from 51 countries will present their innovations, concepts and visions for the agriculture of today and tomorrow at the Agritechnica, the world's leading trade fair for agricultural machines, in Hanover Germany. In trade fair grounds with an exhibition area of approximately 40 hectares, all leading companies of the industry will be represented with a comprehensive range of products and services and many innovations and new products. The organiser, DLG e.V. (Deutsche Landwirtschafts-Gesellschaft - German Agricultural Association) expects more than 400,000 visitors, including over 100,000 from abroad, this year.

Trade visitors from the host nation of Germany and agricultural nations worldwide can expect a range of attractive

services, topical features and premieres at Agritechnica 2019. These include the new "DLG-AgrifutureLab" exhibition area for start-ups, as well as "International Farmers' Day", which premieres this year by focusing on the agricultural nations France and the United Kingdom. The extensive programme of conferences and forums this year will take place under the event's guiding theme, "Global Farming - Local Responsibility".

"Innovations, information, networking and business – this is what the world's leading trade fair for agricultural technology stands for," says Marie Servais, Project Manager at Agritechnica, who is pleased with the high level of interest ahead of the event. "Agritechnica is fully booked out to the very last stand, and the event is once again the global platform for national and international agriculture".

"With new services for visitors, such as our innovative Agritechnica app, but

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also new event formats such as International Farmers' Day and the DLG-AgrifutureLab, we are offering new platforms for the growing dynamics in agriculture and agricultural engineering," adds Servais. "And under 2019's guiding theme, "Global Farming - Local Responsibility", we are discussing solutions for the sustainable future of agriculture in numerous forums, special features and conferences, together with the agricultural machinery industry."

The Agritechnica is the leading international marketplace for agricultural solutions and innovations: The number of national pavilions at Agritechnica 2019 has increased to a record 37, representing an increase of 60 percent compared to two years ago. The popularity of the pavilions, which allow smaller companies to get together to exhibit under the banner of their home nation, has resulted in 19 different countries taking part at this year's event, six more than at Agritechnica 2017.

Over 1,700 (60 percent) of the exhibitors come from abroad. Most are from Italy (366 companies), China (158), Turkey (113), the Netherlands (110), France (98), Austria (77), Poland (64), Great Britain (60), Denmark (58), India (58), Spain (51), USA (50), Finland (47) and Canada (37). Over 20 countries have registered joint participations, including for the first time from France, the United Kingdom (UK), India, Belarus and the Altai region (Russia). In addition, the German state of Lower Saxony and the UN organisation UNIDO (United Nations Industrial Development Organization) are represented for the first time with a joint stand.

291 registrations for the Innovation Award from 148 exhibitors from 24 countries illustrate

the high spirit of innovation of the global agricultural engineering sector. From this, an impartial commission of experts set up by the DLG will present new products with the Innovation Award in Gold or Silver. For the first time this year, the DLG will honour innovations in the field of components and systems with a separate innovation competition, the "Systems & Components Trophy – Engineers' Choice". The prize winners will be selected by a jury composed of development engineers of the agricultural machine manufacturers exhibiting at the Agritechnica.

Visitors to Agritechnica in November will have a new tool at their disposal to help optimise their time at Hanover's Exhibition Grounds. The Agritechnica app, an interactive guide to the world's leading farm machinery trade fair, will allow them to easily and professionally prepare their visit between November 10th and 16th this year. This functional and user-friendly app, which is available for both iOS and Android, and is available in the respective app stores, will not only assist visitors in advance of arriving at Agritechnica 2019, but will also support them once they arrive at the exhibition grounds.

HIGHLIGHTS

As a meeting place for decision-makers and a leading business marketplace, Agritechnica is the perfect breeding ground for innovation. With the DLG-AgrifutureLab (Pavilion 11, Hall 11), Agritechnica 2019 will be offering start-ups and other recently established innovative companies the opportunity to provide answers to the big questions about the future of agriculture by providing them with attractive ways to present their visions and products to the international agricultural sector. These may include sensor technology, cloud data storage and the introduction of smartphone apps that make use of "big data" and clever algorithms have the potential to revolutionise the way farmers manage their crops.

International Farmers' Day will take place for the first time at Agritechnica 2019 on 14th November, with the launch event featuring France and the United Kingdom. The world's leading trade fair will focus on the interests of farmers from these two nations, with a comprehensive forum programme featuring expert presentations taking place in Hall 15. This will present the challenges faced by French and UK farmers and the solutions that the agricultural machinery industry



has developed to overcome them. Meanwhile, a key session at the 2019 AgMachinery Conference on International Farmers' Day will discuss the topic "The European Union in the Post-Brexit Era – Challenges for Farmers in Europe". With the launch of this new feature, it is appropriate that both France and the United Kingdom will host International Pavilions for the first time at Agritechnica 2019.

In cooperation with the VDMA (Germany's Mechanical Engineering Industry Association), the international conference series "Ag Machinery International" will continue at Agritechnica 2019. In addition to the International Farmers' Day events, the opening day of this important conference on 13th November will provide an opportunity to discuss the topic "Chances and challenges of large-scale agriculture worldwide".

The international "LAND. TECHNIK AgEng 2019" conference, organised by the Association of German Engineers (VDI), will give an overview of the latest developments in agricultural engineering and provide information about the latest research results when it takes place on the eve of Agritechnica 2019, on 8th/9th November at the Hanover Exhibition Grounds' Convention Centre.

Under its guiding theme "Global Farming – Local Responsibility", Agritechnica will present the latest technologies and trends that can enable a sustainable productivity increase in agriculture and provide answers on safeguarding yields and protecting the environment. These include, in particular, the latest developments in the fields of soil-conservation technology, technology for low-loss fertilisation, innovative systems for decision support, resource-saving crop protection methods and innovative irrigation systems. Two Special Features at Agritechnica 2019 will provide a particular focus on these issues:

- Protecting Yield & Nature in Hall 15, which focuses on these topics, will include 15 manufacturers, institutions and specialist partners exhibiting the latest technologies and systems.
- The Acre of Knowledge in Hall 21

will show how farms on different continents around the world can benefit from innovative technology. This Special Feature offers international visitors in particular the opportunity to participate in a unique information platform that will allow them to compare different systems and offers in one place, to engage in an intensive exchange of opinions and experiences with experts, and to make new contacts.

This year marks the fourth time that Systems & Components has featured as part of Agritechnica. Its role as a technical spotlight, industry get-together and B2B platform for OEM suppliers perfectly complements the world's leading trade fair for agricultural technology. Systems & Components will provide information on the latest developments and innovations from manufacturers supplying the parts used to build machinery for the agricultural and related sectors.

Agritechnica has always recognised the importance of introducing young people to the agricultural sector, both to better inform those who are interested in a career in the industry, and to encourage anyone who might want to develop a business serving the agricultural community. Agritechnica's organiser, the DLG – which also runs the Young DLG for young members – therefore provides a range of reasons for younger visitors to attend Agritechnica. 14th November, is "Young Farmers 'Day" at Agritechnica 2019, which features a tailored technical programme during the day, and ends with the "Young Farmers' Party" running long into the evening. In the "Campus & Career" exhibition area at Agritechnica 2019 the DLG and its partners will present a comprehensive information and consulting programme centred on professional agricultural careers.

Comprising a technical spotlight, an industry get-together and a B2B platform, Systems & Components will be held for the fourth time at Agritechnica 2019 and will perfectly complement the trade fair's farming focus by providing the latest developments and innovations in

the field of agricultural machinery components and related sectors. The 700-plus exhibitors in Halls 15, 16, 17 and 18 will offer a comprehensive overview of current trends and will take a look into the future of agricultural engineering. Industry leaders, medium-sized companies and start-ups from more than 40 countries will leverage their know-how to present innovations in the areas of engines, electronics, drive technology, hydraulics, cabs, as well as spare and wearing parts.

With the guiding theme Assisted Farming – Engineering Agriculture through Smart Solutions, Systems & Components focuses on assistance systems for agricultural machinery as well as upstream and downstream data interaction. The innovative combination of hydraulic, mechanical and electronic engineering solutions creates new applications and methods that provide manufacturers, farmers and the off-highway sector with optimal solutions to meet the challenges of the future.

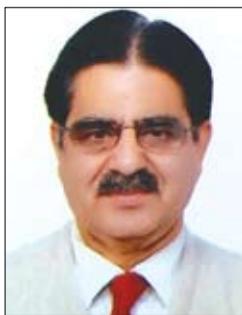
The Future Lounge is home to Systems & Components' specialist technical programme, and this promises to provide insights into current topics of interest to the supplier industry. In addition to technical presentations, the winners of the new Systems & Components Engineers' Choice Trophy will be highlighted there.

The announcement of the inaugural competition winners will be made on 10th November 2019, on the first day of Agritechnica 2019 in Hanover. On 11th November, the three manufacturers winning awards will present their new products in the Systems & Components Future Lounge.

Agritechnica 2019 takes place at Hanover Exhibition Grounds, Germany, from 10th to 16th November (with special preview days on 10th and 11th November). Two years ago, this prestigious event attracted a record attendance of 458,000, including 110,000 international visitors from 128 countries. Information for international visitors considering a visit to the event can be found online at: www.agritechnica.com.

FOOD FRONT FOR INDIA

Farmers' welfare friendly holistic and sustainable development in agriculture and food front: A rudimentary perspective



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A Rudimentary Perspective

There is wide diversity in Indian agricultural ecosystems and patterns. Planned development in the agriculture and food sector has to be holistic, sustainable, farmer friendly, open and transparent. Beside the government's new welfare initiatives, judicious, farmer-friendly lockstep by the corporate agro-business world could bring revolutionary effect. Therefore, a basic awareness and understanding needs to be developed first so as to articulate a long-term perspective in larger interest.

Recent well-considered policy decisions, welfare schemes and programmes of Union Government have potential to bring in agrarian prosperity and also sustainably safeguard farmers' welfare in the country. Yet, there are many if's and but's staring at the farmers. The impact of perceptible, welfare interventions may be most fruitful if various stakeholders engaged in business with farmers could also responsibly come forward.

Agriculture production in all forms is input dependent. Farmers' welfare most of the times is vulnerable to fluctuating incomes. Without security and safeguards, agriculture cannot develop; irrespective of whether this insecurity is climatic or resource or income related or due to farmers' inability to manage on their own, various socio-economic or

other managerial problems affecting their farm production and income or attributable to any other, unknown cause.

Over the past millennia, insecurity attributable to rulers and invaders has been the bane of Indian agriculture. In independent India, despite few successful transformations (hydro-electricity and canal irrigation, major fertilizers, rural road connectivity, procurement and public distribution of major foodgrains, agricultural cooperatives, etc.) and a green revolution, insecurity continued to grip agriculture in many regions and pockets across the country.

The recent de novo policy initiatives have sown seeds of new hope. But, any effective progress in reaping their benefits would rely upon the level of awareness and procedural clarity to farmers and small entrepreneurs. Government's prerogative, next to new

AGRO INDUSTRY'S CSR EXPENDITURE COULD BE A BOON FOR AGRICULTURE AND FARMERS' WELFARE

Seed industry alone among the vast agro-industry in India is currently valued at INR 16,124 crore (US\$ 2.27 billion) and is projected to grow at 6.4 per cent CAGR over the next 5 years. The Companies Act, 2013 requires Indian companies above a certain threshold to spend at least 2 per cent of their net profit each year on social expenditure. Its amendment 2019 further provides for strict implementation of CSR in real time including physical verification of the company if doubt arises. Reports indicate that in 2018-19 Indian corporates across the sectors spent INR 15,010 crore towards social expenditure, which is a substantial investment no doubt.

The point home is that such huge, mandated corporate social responsibility (CSR) expenditure, if properly organized, could be a potent tool for improving farmers' welfare and bringing agricultural development in the country. This may also help in the success of government's new welfare initiatives without assuming any additional subsidy burden on the public exchequer.

IS ZERO BUDGET NATURAL FARMING A BANKABLE MODEL OR CONVENTIONAL WISDOM

In another, recent news Hon'ble Prime Minister of India mentioned at the 14th Conference of Parties to the UN Convention to Combat Desertification about zero budget natural farming (ZBNF) as another point of focus in Indian agriculture. Union Finance Minister in her Budget speech had also talked of replicating this innovative model to help in doubling the farmers' income. However, a controversy arose when an agricultural think-tank arguably recommended to the government not to needlessly invest capital and human resources towards promoting ZBNF, terming it to be an "unproven" technology with no incremental value gain.

The point here is whether public investment should be made, and, if yes, in which form.

policy announcements, pavement of implementing institutions, and simplification of procedures, is to spread mass awareness on the new schemes, which are already being vigorously done.

The much needed primary push to break age old barriers to farm insecurity would, however, simultaneously require conducive human environment to scout the potential beneficiaries, and also sociological synergies. It remains to be seen how different stakeholders and interest groups in business with farmers come forward to perform their social duty towards farmers, claiming the welfare rights subsisting in the new government



pronouncements.

The present scenario is highly hopeful despite wait and watch. Economic empowerment of farmers is

sure to happen through their mindset change in favour of augmenting their own managerial capabilities for banking (jan dhan), insurance (fasal bima); soil (health card), water (more crop per drop) and crop health (bio-agents friendly agriculture), and timely and apt remunerative disposal of farm produce (pre-determined minimal support price in a larger array of crops) for assured higher incomes, among others. It is implicit that the new government schemes confer 'positive rights' upon farmers, which if properly claimed could surely help them uplift their own socio-economic status sooner or later.

It may be difficult for farmers





to reap the benefits of such 'claim rights' on their own. They may feel insecure and even suspect the danger of being misled. Law provides that in cases where 'claim rights' are conferred upon someone, 'others' have correlative or symbiotic duties to fulfill. Therefore 'others', for example, input provider companies, corporate or cooperative procurement agencies, etc., are expected to hand hold the farmers in their early steps towards claiming their socio-economic empowerment rights under new government schemes.

Farmers also need to be rightfully positioned, duly informed, and correctly remunerated on a pre-assured price in the production to consumption value chains by agro-input industry or corporate/cooperative procurement agencies as the case may be. The bottom-line is that it would be meaningless to subsidize activities in the value chains. Rather, the financial commitments towards corporate social responsibility (CSR) by seed and other agribusiness companies could be utilized as a buffer resource to help mainstream the beneficial effects of new socio-economic

empowerment schemes thereby also building long term business trust with farmer producers, farmer conservers and young entrepreneurs.

Further, agriculture production realm in India is characterized by huge diversity of situations and practices in contrast with the uniform, standards-specific industrial manufacturing realm. The 'one shoe does not fit all' situation clearly prevails in Indian agriculture, and therefore, fault-finding must be avoided in order to help simultaneously maintain many typical verticals of agro-eco-systems in the country.

The current status on popularizing zero budget natural farming (ZBNF) is slippery but it does not warrant persisting with any controversy. The ZBNF option could be clearly attributed to the 'conservative farming' vertical. Therefore, 'compare the comparable' principle requires that its validation and popularization should be limited to conventional farming areas or pockets and by the concerned practitioners in participatory mode.

Nonetheless, the conservative farming vertical needs foremost priority in terms of mainstreaming

agrobiodiversity. This ecosystem could be duly harnessed for on-farm conserved crop-biodiversity products in the food value chains, innovative nutraceutical and plant/animal based medicinal products in the health value chains, and discoveries and inventions on plant and soil borne microorganisms of agricultural importance in R&D chains.

Finally, it may be prudent to finance activities under the conventional farming vertical in project and pilot modes, rather than through direct subsidies, to see lasting effects in the long term. Also, substantial support must be ensured to start-ups based on this vertical for encouraging farmers' participatory development and growth in conventional agro-eco-systems. It could also be worthwhile developing a dedicated scheme to support collaborative R&D in farmer-industry partnership mode; for value addition and branding of ethnic niche products, for increasing farmers' income and/or their export potential.

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HOW TECHNOLOGY CAN REALLY REVOLUTIONIZE INDIAN AGRICULTURE?

The agricultural production in a certain piece of land can't increase after a certain limit which warrants the use of technology.

However, almost every agricultural technology has an inherent limitation to express itself in a particular way in a certain geographical condition. For instance, the yield of tomato in India is about 30-35 tonnes/acre but in US it goes beyond 80-90 tonnes/acre. One of the major reasons behind this dividend is the different types and extent of technology usage.

Although technology plays a major role in increasing the farm production, does it really contribute to the well-being of the farmers? We generally think that technology can make a farmer rich and hence his living standard might improve. But, often that's not the case especially in a nation like India where many complex socio-cultural dynamics operate. For example, farmers in Punjab province of India fight among themselves so much over a commonly owned piece of machinery in their farm that a large portion of the expected economic benefits of that machinery is invested in the damage control itself. In many other cases, the increased production due to technology use doesn't even fetch positive results. Day in and day out, farmers in many Indian states are seen dumping their farm-produce in local markets at very minimal prices or no return at all. Under such circumstances we are forced to ponder, 'what is the role of Agricultural Technology?', 'Is it to just increase the Agricultural production or something beyond that?'

To answer these questions, it is first imperative to understand

why and how technology found its way in Indian farms. During 1920s, food production in India was around 50 million tonnes and it remained static at least till next two decades. Between early 1890s to late 1940s, the annual growth rate of farm production was only 0.4% and the production of food-grain remained stagnant. However, the population raised exponentially. In order to feed the growing population, movement from that static phase became necessary. Dire need of new knowledge, technology and ideas emerged. Many Agricultural institutes and research stations were established in the country with the aim of introduction of innovations and technologies in Indian Agricultural system. In those days that worked like wonders. Many new improved and hybrid varieties of crops and farm machineries were introduced and in no time India became self-sufficient in terms of food production.

However, with time, the challenges of Indian Agriculture have changed. Today, more than increasing the food production, focus has been shifted to put the increased production into profitable use. Having said that, the country now needs to adopt measures for guiding its farmers to channelize the benefits of technology to productive usage. In addition to finding ways to increase the farm income for the farmers, government should also scramble for solutions to come up with complementary schemes of sustainable and constructive use of that raised income.

An important aspect of a long-term agriculture policy could be to balance this technology versus welfare tussle through legal interventions. For



instance, Indian governments' recent initiative of permitting the use of unmanned aerial vehicles (UAV) e.g. drones technology in the farms can be put into place with some standard ethical rules and regulations. Also, proper planning regarding the effective use of the data generated from these technologies should be done. The policies should also mandate the implementation of technology with minimum harm to the environment and society.

Since, Agriculture today is getting increasingly automated, the Indian government needs to invest and incentivize the ideas resulting into productive usage of technology for agriculture. A campaign for wide-scale awareness and usage of technology in agriculture needs to be undertaken. An information dissemination network needs to be established to effectively guide farmers. Well informed adoption of the technology in Agriculture will pave the path for sustainable solutions for reducing farmer distress in long run.

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UZBEK AGRICULTURE PROGRESS AND ACHIEVEMENTS



Located in the central part of Central Asia, Uzbekistan is bordered by Kyrgyzstan to the east, Kazakhstan in the north-east, north and north-west, by Turkmenistan on the south-west and south, by Afghanistan to the south and by Tajikistan to the south-east. The most populous nation in central Asia, with over 33.2million citizens, Uzbekistan has a total area of 44.8 million hectares. About 4.5 million hectare is arable, of which 4 million hectares is under irrigation. Agriculture plays a major role in the economy, employing 44% of the population, with 6-7% annual growth rate, contributing 19% to the GDP and providing employment for some 15 million people.

Cotton and grain are the country's principal crops. Exports of agricultural products contributed approximately 9.3 percent to Uzbekistan's external earnings in 2018. The main share in the structure of crop production is occupied by vegetables (36%), cereals (25%), potatoes (10%), and cotton (8%). The government hopes to increase agricultural productivity through the adoption of new technologies, and to further develop processing and packaging capabilities to add value to domestic and export products.

To improve the country's food security, the Government of Uzbekistan has emphasized on wheat production and poultry and animal farming over the past few years. Moreover, the profitability of fresh fruit and vegetables has increased in recent years and local farmers have aggressive plans for developing export markets for these products.



From the first days of Independence, the Government of Uzbekistan has been implementing a coherent and comprehensive policy in agricultural sector aimed at ensuring food security. The approach based on the importance of fruits and vegetables production for the whole system of livelihood, maintaining the health of the population, as well as creation of employment opportunities has become one of the main vectors of economic and social policy in Uzbekistan.

An unprecedented decision of 1989 to allocate more than 400 thousand hectares of irrigated land for garden plots was among initial measures to radically change the approach for achieving food independence in Uzbekistan. Further steps on implementing the market and institutional reforms in agricultural sector included modification of sown areas structure and reduction of cotton cultivation for almost 2

times in favor of crops. As a result, Uzbekistan, previously imported more than 80% of the demand in grain, and has gained “grain” independence, producing more than 7 million tonnes annually.

Other important vectors of the state policy in agricultural sector include liquidation of state and collective farms in favor of private farms to ensure productivity growth based on modern agricultural technologies; diversification of sectors in agriculture, development of potato farming, viticulture, apiculture, poultry and fish production; expansion of preferential crediting system of agricultural production; establishment of an effective system of maintenance for farming enterprises, as well as supplies of necessary materials and technical resources (fuel, chemical fertilizers, biological and chemical pesticides, seeds); formation of logistics system for storage and transportation of agricultural products, as well as its industrial processing.

Currently, there are 67,804 farms in the country. The legal framework is established and being coherently improved. In accordance with the Law “On farms” and Presidential Decree “On measures of further improving the organization of activities and development of farming in Uzbekistan”, the range of activities are undertaken with the aim to transform the farms – major producer of agricultural products, to a powerful social and political force capable to take responsibility for the further development of the agricultural and other sectors, as well as increase the level and quality of life.

Last year, the country developed more than 17,500 farms and more than 250 thousand new jobs. The largest number of farms were established in Tashkent, Jizzakh, Namangan, Samarkand, Kashkadarya, Ferghana, Andijan regions and the Republic of Karakalpakstan.

The farmers of Uzbekistan harvested 6.12 million tonnes of grain and 2.3 million tonnes of cotton,

despite all the difficulties in 2018. 8.66 million tonnes of vegetables and 2.41 million tonnes of potatoes were also grown in the country. The volume of harvesting melons and gourds amounted to 1.6 million tonnes, fruit - 2.1 million tonnes and grapes - 1.31 million tonnes. Farmers produced 18,000 tonnes of cocoons, 1.78 million tonnes of meat, 7.83 million tonnes of milk. Over the year, agricultural products totalled \$7 billion.

AGRICULTURAL PRODUCTION

The main cereals are wheat, barley, corn, and also rice, which are grown in intensively irrigated oases. Minor crops include sesame, onions, flax, and tobacco. Fresh fruits are mainly consumed domestically, while dried fruits are also exported. Uzbek melons, known for their long life and unique taste, are widely sought after in the large cities of the CIS.

Uzbekistan is the world's fourth-largest producer and second-largest exporter of cotton, which in 2005 accounted for approximately 20 percent of the country's exports after reaching 39 percent in the late

1990s. In recent years, Uzbekistan has switched some farmland from cotton to grains, mainly rice and wheat in an effort to reduce food imports.

Since 1997, agriculture demonstrated steady positive growth of 6-7% annually. Starting 1991, the volume of agricultural production has more than doubled, allowing to increase per capita consumption of meat by 1.3 times, milk and dairy products – 1.6 times, potatoes – 7 times, vegetables – more than 2 times, fruits – almost by 4 times.

Over 24 years, the volume of agricultural products increased more than twice. This, in turn, allowed saturating the market and increasing the consumption of basic foodstuffs several times. For example, last year, 12.592 million tonnes of vegetables, including potatoes, 1.85 million tonnes of melons, 1.556 million tonnes of grapes, 2.731 million tonnes of fruits were grown. High yields were provided mainly due to intensification of agricultural production, improvement of selection and implementation of recognized



Chorsu Bazaar in Tashkent selling variety of food and agriculture products.



varieties of cotton and cereal crops, and development of modern agricultural technologies.

The comprehensive measures helped to steadily increase the export potential of the industry. In recent years, Uzbekistan has become a major exporter of high quality and competitive fruit and vegetable products. In order to ensure year-round supply, significant attention is being devoted to processing and storage. Over the past 10 years, the volume of processing of vegetables and grapes has increased by 3.5 times, including the canned fruits and vegetables by 2.5 times, dried fruits – 4 times, natural juices – 7 times. More than 16% of total production of vegetables and grapes are processed. Currently, more than 180 types of fresh and processed fruit and vegetable products are exported. Its share in the structure of exports is 73%.

The geography of horticulture and viticulture exports is also expanding. Previously Uzbekistan supplied Russia, Kazakhstan and other CIS countries, whereas now it exports to the markets of more than 120 countries worldwide, including Indonesia, Norway, Mongolia, Saudi Arabia, Slovakia, the USA, Thailand and Japan.

Other significant agricultural products are silk, fruits and vegetables, cow's milk, and beef. Virtually all agriculture requires intensive irrigation. Cattle, goats, and sheep are the most frequently raised livestock.

FAO in Uzbekistan : Partner for sustainable production intensification and food security



Mr. Alisher Shukurov, Assistant FAO Representative for Uzbekistan

The partnership between Uzbekistan and FAO has been evolving since the country joined the organization in 2001, and it was strengthened with the opening of a representation in 2014 and the signing of a host country agreement. Delivered through national as well as regional projects, technical assistance has covered a wide range of areas, including diversification of cropping systems, livestock production and disease control, locust control activities and increased fisheries production. Sustainable natural resources management and organic agricultural production are features of current cooperation.

FAO's assistance in Uzbekistan is shaped by the Country Programming Framework (CPF), which has several thematic priority areas such as diversification of cropping systems and sustainable production intensification, with a view to support the development of sustainable high-value crop production for domestic and export markets. "Uzbekistan recognizes the need for diversification of agricultural production from cotton

into higher value-added production and processing, including fruits and vegetables and livestock, which will lead to better-paid jobs in rural areas, food security, and exports", said Mr. Alisher Shukurov, Assistant FAO Representative for Uzbekistan.

Promotion of efficient locust control techniques, integrated pest management (IPM), conservation agriculture and other good agricultural practices are the priority areas for FAO in Uzbekistan.

"Uzbekistan and FAO are working together to strengthen the country's legal framework for the development and promotion of sustainable agro-food quality assurance systems in Uzbekistan.

Activities are underway to strengthen national capabilities for organic agriculture, good agricultural practices (GAPs) and quality assurance systems", mentioned Mr. Shukurov.

Sustainable natural resource management, including development of the forestry sector, increased income generating opportunities for rural populations, promoting

sustainable land management, improving water resource use for sustainable irrigated agriculture, and proactive drought risk management are other core work areas of FAO in Uzbekistan.

FAO is also working towards livestock production, disease control, increasing animal production and improving beekeeping, poultry production, aquaculture and inland fisheries development, with a view to supporting sustainable increases in inland fish production. Jointly prepared with the government and other partners, the CPF reflects relevant national policies and strategies while supporting FAO's corporate strategic objectives and regional priorities.

In addition to shifting the focus to diversified yields, there is also a focus on creating labor-intensive agricultural positions, providing regular work for many in rural communities. "With a solid agricultural base, Uzbekistan can both provide for citizens at home in terms of food and work, and with the trend toward export-driven growth, it can leverage that base to grow the new economy. If the country continues this way, there's a lot of room for substantial growth, including into other sectors. Boosting agriculture in Uzbekistan can open doors for improvement in other sectors of the economy", said Mr. Shukurov.



Tashkent State Agrarian University

The formation of Tashkent State Agrarian University was closely linked with name of Mirzo Ulugbek National University, founded in 1918 by local intellectuals, as many other Central Asian universities. In the 1920s, there were 8 faculties among them including agriculture. On May 26, 1930 on the basis of this faculty, the Central Asian Agricultural Institute was established and after some changes, it was renamed the Tashkent Agricultural Institute in 1934. In April 1991, the university received the status of Tashkent State Agrarian University. This status was given to only 8 of the 104 agricultural higher educational institutions in the CIS for its achievements in training, science development, scientific and pedagogical potential, quality improvement, development and strengthening of material and technical base.

Tashkent State Agrarian University has three branches, Termiz branch in the South, the Nukus branch in the northern region, and Andijan branch for the valley, 4 Centers, 6 faculties and 29 departments.

"TSAU plays a key role in Uzbekistan's socio-economic development programme, focusing on the whole complex issues related to agriculture, animal husbandry, forestry and environmental management. The country has huge agricultural potential, but it faces the challenges of a fragile natural environment, with extreme contrasts of climate and soil fertility, ranging from the lush Ferghana Valley to the arid deserts of Karakalpakstan. TSAU covers all main theoretical and applied areas of agriculture, as well as financial management, marketing and communications technology", said Mr. Sohیب Islamov, Vice Rector of Tashkent State Agriculture University.

The university conducts 80 graduates and postgraduates courses and specialities such as 20 directions of bachelors degree; 23 specialities on master degree; 19 specialities on PhD; 4 specialities on Dsc; 1 special correspondence course and 13 correspondence directions.

This university offers various graduate and post graduate courses under the faculty of agrobiolgy; fruit and vegetable growing and viticulture; plant protection and agrochemistry; storage and processing of products based on innovative technologies; silkworm and breeding; and forestry and ornamental gardening. There are 502 professors and teachers at the university; 46 of them are doctors of science, professors, 207 are candidates of science, and associate professors. There are 11 educational buildings, 5 students hostels, 1 Information Resource Center in the University.

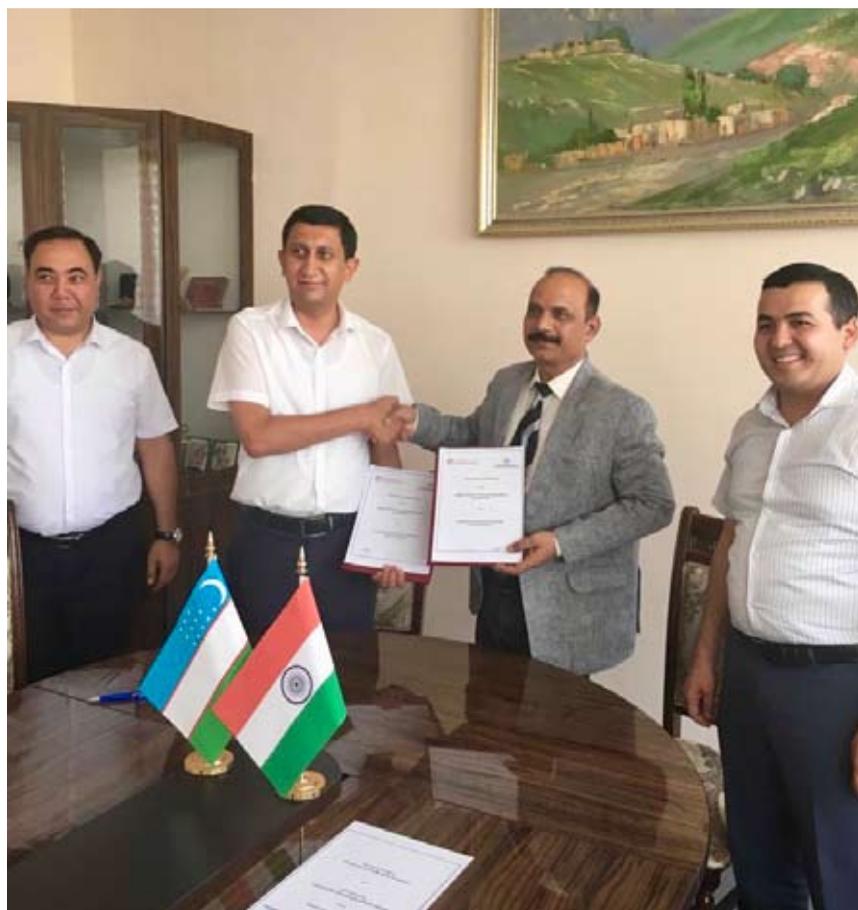
International partner organizations

The university has partnerships with major international institutions and research agencies such as FAO, UNDP, GIZ, JICA, KOICA, and USAID. It also has regional branches and its activities including the provision of non-academic facilities and services to the wider agricultural community.

"The University has been cooperating with advanced higher education institutions and training centres in the US, South Korea, Japan, Germany, Italy and the CIS. Currently, more than 50 contracts and memorandums have been signed with foreign higher education institutions and organisations. University actively cooperates with five foreign higher education institutions to obtain two diplomas and 9 directions. Under the memorandum signed with Michigan State University, Bogor University in Indonesia, and National Agrarian University of Vietnam, partnership relations are established in the fields of fisheries, rice breeding, horticulture growing, plant protection, since 2018", mentioned Mr. Islamov.

Currently, foreign students from the Russian Federation, Kyrgyzstan, Israel, Kazakhstan, Turkmenistan and Tajikistan are studying at the Tashkent State Agrarian University. "We look forward to have collaboration with India and Indian partners in order to establish exchanges, learning and technical cooperation in the field of agriculture. We also believe that our recent collaboration with the Indian Council of Food and Agriculture will be fruitful and will help in facilitation and increased exchanges of students and activities between the two countries", said Mr. Islamov.

The activity of higher education is closely connected with the history of the country, its agriculture, economy, culture and development of higher education. The University has become a major educational and scientific center in Central Asia for agriculture. TSAU is one of the



Dr.MJ Khan, Chairman, Indian Council of Food and Agriculture and Mr. Sohib Islamov, Vice Rector of Tashkent State Agriculture University signed an MOU

leading universities with a high degree of scientific pedagogical potential, a developed network of international relations, and a leading position in the field of training of specialists in the field of agrarian science.

Organization and Structure of Agriculture in Uzbekistan

A dehqan farm is a term for an individual or family farm in Central Asia. Up to 1991, agriculture in Uzbekistan, as in all other Soviet republics, was organized in a dual system, in which large-scale collective and state farms coexisted in a symbiotic relationship with quasi-private individual farming on subsidiary household plots. The process of transition to a market economy that began in independent Uzbekistan after 1992 led to the creation of three types of farms: the traditional household plots were

renamed dehqan farms; the large-scale collective and former state farms were reclassified as shirkats (agricultural production cooperatives); and a new category of mid-sized peasant farms or "farmers" was introduced between the small dehqan farms and the large-scale shirkats.

As of now, "farmers" cultivate 75% of sown area, while dehqan farms cultivate 12.5% and various corporate farms control the remaining 12.5%. The situation is totally different with regard to livestock: 95% of cows are in dehqan farms, 4% in peasant farms, and just 1% in corporate farms. Dehqan farms produce 62% of gross agricultural output, followed by 32% in peasant farms, and a mere 6% in corporate farms.

The Council of Farms, Dehqan Farms and Owners of Homestead



Lands of Uzbekistan is a national organization in charge of all the important tasks and development related to farmers and agriculture in Uzbekistan. The Council monitors land reformations, ensuring effective use of agricultural areas, in particular, homestead lands, the widespread introduction of advanced technologies and scientific achievements, and thereby increasing production to benefit farmers.

“Additional measures to improve the activities of farmers, dekhkan farms and landowners are taken by the government. Starting from 1 July 2018, the membership of all farming and dekhkan farms in the Council is compulsory, and for the owners of homestead lands is voluntary. Councils of farmers, dekhkan farms and landowners carry out monitoring and public control over the fulfillment of contractual obligations in agriculture”, said Dr. Fakhridin Kushanov, Deputy Chairman of Council of Farms, Dehkan Farms and Owners of Homestead Lands of Uzbekistan.

Uzbek President approved the proposals of the Council, the Ministry of Finance and the Ministry of Agriculture of the Republic of Uzbekistan, on establishment of membership fees to the Council. “For farms specializing in the production of raw cotton and grain crops, in

the amount of 0.8 per cent of the purchase price of raw cotton and grain; for other farms in the amount of 0.5 percent of cash received from sales of their products; for dekhkan farms and owners of household land in the amount, indicated in the agreement on membership in the Council”, said Kushanov.

The Council established a fund to support farmers, dekhkan farms and landowners under the Council of Farmers, Dehkan Farms and Owners of Household Land in Uzbekistan with the status of a legal entity. The Fund will provide loans to farmers, other production, processing, procurement, supply, trade organizations in the agricultural production and leasing organizations to strengthen the material and technical base, purchase of agricultural machinery and transport, purchase materials and components for the installation of greenhouses of farmer, dekhkan farms and landowners. The head of Uzbekistan released the fund from all types of taxes and mandatory payments to state trust funds.

The council supports and fund farmers, dekhkan farms and farmers allocation of preferential credit for landowners’ activity. The council assists farmers, dekhkan farms and landowners on the introduction of advanced agro-technologies, alternative energy sources, as well

as innovation and information and communication technologies.

The council has been playing a critical role in the development of farm producers. In accordance with the State Program for Development of Multi-Owned Farms, it is planned to increase the number of farms specialised in animal husbandry, poultry farming, fisheries, beekeeping, and popularize the experience of exemplary farming practices in these areas. The placement of farms into registered multi profile farms will be made free of charge for farmers, dekhkan farms and landowners. The council is also working towards development of farm processing, storage, service delivery, drip irrigation and water saving technologies for farmers.

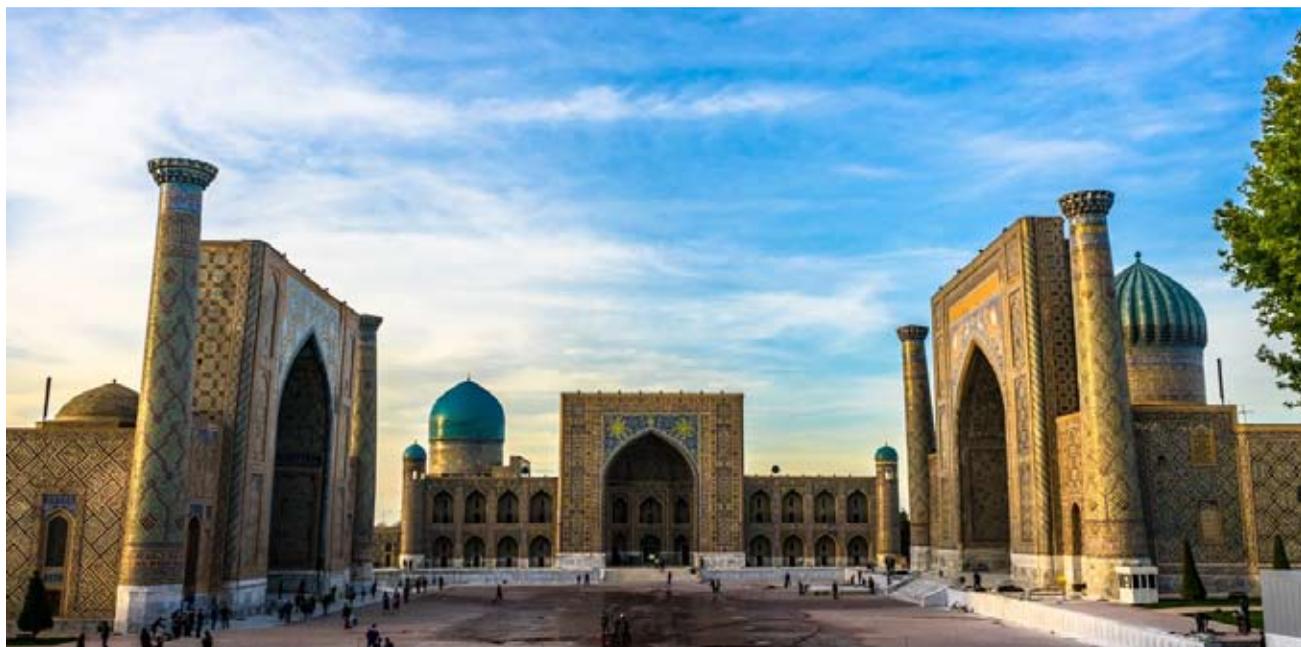
Uzbekistan - Market Opportunities and Investment Potential

Uzbekistan, the largest consumer market in the region, has a favorable geographical position due to its proximity to the largest markets and is the key to Central Asia. There is an agreement on free trade with the CIS countries, which provides duty-free access of Uzbekistan’s products to regional markets with a population of more than 300 million people.



Mr. Rustam Mamadjanov, Head of Department of Attracting Investments of Ministry of Agriculture of the Republic of Uzbekistan

Modern Uzbekistan is the leading industrial state located in the heart of Central Asia, ensuring stability and economic development of the region as a whole. “Among the advantages offered by the modern economy of



Uzbekistan for foreign companies are political and macroeconomic stability, favorable climatic conditions, hospitable and hardworking people and many others. The key factors for the success of doing business in Uzbekistan are a rich resource base, a favorable geographic location in the center of the largest regional markets, a transport and logistics system integrated into a network of land and air communications of international importance, a diversified industrial base and a scientific and intellectual, personnel potential of the republic", said Mr. Rustam Mamadjanov, Head of Department of Attracting Investments of Ministry of Agriculture of the Republic of Uzbekistan.

Access to a wide range of raw materials maximally optimizes the cost of production by significantly reducing the cost of transporting raw materials and materials, provides an opportunity for in-depth processing with the production of products with high added value and a level of localization in excess of 30%.

Uzbekistan is rapidly changing the course for openness to the world and foreign capital. The priority is given to the economy over politics. It has arrangement of most favored nation



treatment with 46 countries including India. The country has developed communications, logistics, and has favorable natural conditions: warm – 8 months a year, 275 sunny days.

Agriculture is considered to be an important supplier of raw materials for industrial production. Due to favorable climatic conditions, Uzbekistan has the richest agricultural potential: the country is the fifth largest producer of cotton fiber in the textile industry; it has the potential to produce more than 10 million tonnes of fruits and

vegetables per year and annually supplies up to 10 thousand tonnes of air-dried silkworm cocoons.

Proximity to extensive sales markets and a developed transport infrastructure of Uzbekistan, integrated into the multimodal communication system of Eurasia, also predetermine the prospects of investment and trade and economic cooperation. "By investing in Uzbekistan, foreign companies will have the opportunity to enter the 5 largest and fastest growing



markets – these are CIS countries with a market of more than 300 million people in Central and Eastern Europe, South and Southeast Asia, and the Middle East. At the same time, a developed multimodal network, significantly reducing the time and costs of delivering goods from Uzbekistan and transit through the territory of the country, as well as agreements on the establishment of the most favored nation treatment with 46 countries, and the Free Trade Area established between 12 CIS countries, significantly increase the competitiveness of Uzbek manufactured products in foreign markets”, said Mr. Mamadjanov.

It is well known that labor resources are also important for foreign investors. Uzbekistan, one of the most densely populated and multinational states of the world located at the crossroads between the West and the East, has historically been a place of



concentration of leading research and educational institutions that have turned the country into a forge of highly qualified, professional personnel.

The need to build up the production and export potential of Uzbekistan is evidenced by the

fact that Uzbekistan is located in the center of the 5 largest and most dynamically growing markets in the world. “First of all, this is a favorable geographical position of the republic at the intersection of all trade routes between the above regions, a developed multimodal

network covering markets that are far beyond the borders of Central Asia, including Eastern Middle East, Northern India and Western China. The unprecedented conditions for the development of dynamically growing and, in many respects, remaining uncovered, markets in Central Asia and the CIS, are also due to the possibilities of duty-free entry of Uzbekistan's producers into the markets of Central Asia with a population of 60 million and the CIS with a population of 300 million", mentioned Mr. Mamadjanov.

Uzbekistan occupies one of the leading places in the world for many positions including non-metallic and metallic minerals, agricultural raw materials. In particular, copper reserves – 11th place, in terms of gold production – 9th, uranium – 8th, cotton fiber – 5th place.

The economy of Uzbekistan is one of the few which is characterized by absolute energy independence in the world. The industry of the republic is fully provided with natural gas, oil and petroleum products, coal and electricity. 188 deposits of oil, gas and condensate, 3 deposits of coal explored here. The total energy reserves of Uzbekistan are sufficient to cover the needs of the economy for at least 100 years. Electricity produced in the country fully covers the growing needs of the republic and at a cost 4.5 times lower than

WHAT ARE THE OPPORTUNITIES?

PROCESSING

- Growing at 10-15% a year
- Many fruit and vegetables currently exported

MACHINERY

Child labor rules require more mechanization

- Government committed to 80% machine harvesting

ONE BELT ONE ROAD

- Uzbekistan borders major markets
- Infrastructure investment

VALUE CHAIN

- Cool-chains, grading, packing
- Market information
- Packaging

Cattle breeding and poultry farming;

Seeds and seedlings (for example, berries, fruits, nuts, vegetables, melons);

Seeds and seedlings of ornamental plants (flowers);

Technical solutions for microclimate control in greenhouses;

Mills for the production of feed and feed additives for poultry;

Packaging of fresh vegetables and fruits.

the average price paid by industrial consumers in developed countries.

Best prospect industry sector of the country

The growing public and private investments resulting from the Uzbek government's export oriented and import substituting industrialization agenda may create more opportunities for businesses.

The food processing and packaging industry has demonstrated relatively slow growth in recent years while the demand in the most populous country of the region is high. The government prioritizes development of this industry to address both rural employment and export facilitation goals of its economic policy. Uzbekistan domestically processes only about 16 percent from over 18 million tonnes of fruits and vegetables produced by local farmers annually. Existing capacities of refrigerated warehouses can store only 5% of the national harvest. Expected accelerated development of this industry creates new opportunities for suppliers of food processing, packaging, and storage technologies as well as transportation and logistics solutions.

The best sector opportunities in production and processing/packaging equipment supply lie in the areas of juice, fruit, vegetable, meat and milk processing. The Uzbek government is encouraging private sector development in these areas. The greatest demand for packaging material is for cardboard, paper, aluminum foil, and stretch films. Small businesses have a great need for small-scale equipment.

Some of the larger companies currently doing business in food processing in Uzbekistan include Nestle, Coca-Cola, PepsiCo, and Carlsberg. Local companies prefer working with a foreign partner and value foreign management, technology, technical expertise, and export market access.

Huge investment opportunities in various sectors of the economy:

- Undervalued real estate (commercial and residential);
- National traditions of hospitality, as a foundation for the development of tourism. The vast expanse of various locations where you can build hotels and resorts, including themed ones;
- The growing demand for consumer goods in a different price range;
- Underdevelopment of retail and packaging of food and beverages;
- A developing banking sector with growing potential;
- Retail needs modern shopping centers.

14TH CONFERENCE OF THE PARTIES (COP 14) TO THE UN CONVENTION TO COMBAT DESERTIFICATION



The 14th meeting of the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP14) took place from 2-13 September 2019 at the India Expo Center & Mart, Greater Noida, in Delhi-NCR. The 12-day event, hosted by the Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India, was attended by 5,000 participants, including 3000 international delegates from 196 countries, as well as environment ministers from 94 countries and Ralph Gonsalves, the Prime Minister of Saint Vincent and the Grenadines. Shri Narendra Modi, the Hon'ble Prime Minister of India, also attended the event. The COP14 is being held alongside the 18th session of the Committee for the Review of the Implementation of the Convention (CRIC) and 14th



meeting of the Committee on Science and Technology (CST), UNCCD.

Policy makers, scientists, researchers, representatives of national and local governments and multilateral agencies, global business leaders, NGOs, gender-based organisations, youth groups,

journalists, faith-based organizations and community groups shared their expertise at the Conference. The agenda of the event was to reverse land degradation and its outcomes while accelerating positive achievements for people and ecosystems with a view to deliver



on Sustainable Development Goals, especially SDG 15.3. As host of the biennial event, India took over the COP presidency from the previous host China for a period of two years until 2021.

The global Conference reviewed the progress made, especially during the last two years, to control and reverse further loss of productive land from desertification, land degradation and drought. Agreement on about 30 decisions to ensure that the Convention's goals for 2018-2030 are achieved. These goals are to improve the lives of the populations affected by desertification and land degradation and to improve the affected ecosystems, to mitigate the effects of drought and to mobilize sufficient resources to achieve these goals. COP14 focused not only on the critical gaps in land management and planning, but also on practical actions at local, national and global level.

Some of the prominent policy and decision makers who participated at the Conference include names such as Sh. Prakash Javadekar, Hon'ble Minister of Environment, Forest & Climate Change, Govt. of India; Sh. Babul Supriyo, Hon'ble Minister of State for Environment, Forest & Climate Change, Govt. of India; Amina Mohammad,

Deputy Secretary General, United Nations; Ibrahim Thiaw, Executive Secretary, UN Convention to Combat Desertification; Inger Andersen, Executive Director, UN Environment Programme; Achim Steiner, Administrator, UN Development Programme; and Cristiana Paşca Palmer, Executive Secretary, UN Convention on Biological Diversity. Other distinguished participants at the event include Sadhguru Jaggi Vasudev, the noted Indian spiritual leader; Ricky Kej, Indian composer, music producer and environmentalist; Baaba Maal, Senegalese singer and guitarist; Inna Modja, Malian-French singer and model; Hindou Oumarou Ibrahim, Civil Society Leader from Chad, Naoko Ishii, Chairperson, Global Environment Facility (GEF); and Yannick Glemarec, Executive Director, Green Climate Fund.

The India Pavilion showcased the country's efforts to tackle the challenge of desertification, land degradation and drought. More than 10 Central Ministries participated along with several states and premier scientific organizations such as ISRO, ICFRE and ICAR. Many organizations showed their latest products, technology and innovations at the Exhibition and Technology fair. There were also forums exclusively

organized by and for business, youth and NGOs as well as art performances and cultural events.

India's Prime Minister, Narendra Modi, reaffirmed his commitment to the goals of the Rio Conventions and the Sustainable Development Goals (SDGs), and announced his government's support for enhanced South-South Cooperation and a "Global Water Action Agenda," to maximize synergies through holistic land and water management.

At the closing of COP14, UNCCD Executive Secretary Mr. Ibrahim Thiaw shared these takeaway messages: "Land restoration is the cheapest solution to climate change and biodiversity loss, Land restoration makes business sense if regulations and incentives to reward investment are in place, Drought preparedness and response are critical in the face of climate change and To put people first is to ensure gender balance, engage youth, secure land rights."

COP 14 ended on a note of optimism that there is a growing alignment of the land, climate and biodiversity agendas, and, with its sharpened focus on land restoration, the UNCCD can offer cost-effective and sustainable solutions to some of the most entrenched global challenges today.

“We believe that India’s farmers have the capability to contribute significantly to achieve the target of doubling their incomes by 2022. Farmers must adopt scientific farming, increase the use of technology and mechanisation in agriculture to achieve this goal.”

NARENDRA SINGH TOMAR
Union Agriculture Minister



“Research and development efforts of the seed sector should also focus on incorporating the high-yielding characteristics in the varietal seeds. Also, there is a need to create a mechanism to estimate the real-time demand and supply of seeds in various States.”

PARSHOTTAM RUPALA
Union Minister of State for Agriculture

“Our farmers should focus on per drop, more crop. It is time our farmers adopt cooperative farming and drip irrigation to achieve more yields.”

VIJAY RUPANI
Gujarat Chief Minister



“Seed producers have big responsibility to provide improved seeds to farmers as it is the most critical input for food production. To feed the rising population from limited land resources, improving the production capacity is crucial. Seed sector, one of the most regulated sectors in the world, is looking for science-based regulatory approach.”

MICHAEL KELLER
Secretary General, International Seed Federation