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## FARM MECHANIZATION A MANDATORY CHANGE



KAZAKHSTAN: UNEXPLORED INVESTMENT DESTINATION FOR INDIAN BUSINESSES

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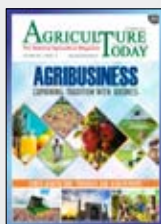
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## From the Editor's Desk

# FARM MECHANIZATION FOR SUSTAINABLE AGRICULTURE

**F**arm mechanization makes optimal utilization of resources and helps farmers save valuable time and to reduce drudgery. This judicious use of time, labour and resources facilitates sustainable intensification (multicropping) and timely planting of crops, leading to an increase in productivity. Farm mechanisation has the potential to raise farmers' income and hence can play a significant role in realising the government's vision of doubling farmers' income.



However, India's current level of farm mechanization stands merely at about 40-45%. The level of mechanization is skewed across the country with states like UP, Haryana and Punjab leading with very high level and north-eastern states having negligible mechanization. India's strength in agriculture has been due to the large area under cultivation and due to cheap and easily available farm labour; the availability of both of which will be constrained in the future.

Farm mechanization has demonstrated successfully that it can increase agriculture yields. However, there are some inherent challenges that interfere with large scale adoption of farm mechanization across India. More than eighty per cent of the landholdings in India is less than 2 hectares, making not only the farms smaller in size for successful operation of farm machines but also reducing the investment potential of such farmers. Considering the preponderance of small & marginal holdings in the country, R & D should aim at developing and designing scale-neutral machinery. Further, machinery that can suit different terrain of the geography deserves priority attention.

Finance must be made easier. Ease of financing like KCC and procedures to avail term loan may be simplified with minimum documentation. Agriculture Machineries can become part of 'Farming as a Service' (FaaS) as recommended by Committee on Doubling Farmers' Income, which means, that farmers should have easy access to mechanization and related services on rent in preference to owning the same. The youth can be specifically trained and financially supported (credit linked back-end subsidy) to set up CHCs. In order to make such enterprises viable, other agricultural services can also be integrated to offer 'One Stop Shop'.

Aggregation platforms can be tried in farm mechanization. Uberization is feasible in agricultural mechanization. This can be made possible by networking of individual owners, CHCs, AMBs and Regional/State Service Centres by onboarding a common platform and meeting the demand in real time, cost effectively. It is also important to ensure availability of repair and service facilities in close proximity, so that operation & maintenance issues are addressed. Mobile service centres can also be promoted to cater to minor repair demands.

Farm mechanization has also been found to impart many social benefits. They can help in the conversion of uncultivable land to agricultural land through advanced tilling techniques. Besides reduced drudgery and shortening times of farm operation can attract more youth to join farming and attract more people to work and live in rural areas.

*Anjana*  
**Anjana Nair**



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## Cash Incentives – The New Farm Loan waiver

*Direct cash transfers are becoming the new fad*

**A**ndhra Pradesh becomes yet another state in implementing a cash incentive scheme for the farmers. Named, YSR Rythu Bharosa-PM Kisaan, the farmers in the state will be entitled to an annual benefit of Rs 13,500. This is so far the highest financial support offered to farmers by any state in India. This is part of the Chief Minister, Jagan Mohan Reddy's Navaratnalu, a basket of nine welfare schemes, that was part of his election campaign.

The YSR Rythu Bharosa replaces the previous TDP government's 'Annadata Sukhibhava' scheme, introduced in February this year. Under Rythu Bharosa, land holder farmers owning up to five acres will be provided with an annual benefit of Rs 13,500. Landless cultivators or tenant farmers from SC, ST, BC and minority groups are also eligible for the incentive. The amount includes the annual benefit of Rs 6,000 per family provided by the Centre under the PM KISAN Yojana. While the previous government's beneficiary list included 43 lakh farmers, Rythu Bharosa is expected to cover around 51 lakh farmers, apart from nearly 3 lakh tenant farmers. The scheme also assures drilling of borewells free of cost, a calamity relief fund of Rs 4,000 crore, 9 hours of free electricity during the day, and setting up of cold storage units and food processing centres. The total budgeted outlay for YSR Rythu Bharosa in 2019-20 is Rs 8,750 crore, of which Rs 3,240 crore is coming from the Centre and the balance from the AP government.

Andhra Pradesh becomes the latest state to join the bandwagon of states reposing faith in cash incentive schemes. K Chandrashekar Rao headed Telangana government's Rythu Bandhu scheme heralded all other cash based scheme. Launched ahead of PM Kisan, the scheme extended support of Rs 4,000 per acre for each season. The Naveen Patnaik-led government in Odisha came out with the famed, Krushak Assistance for Livelihood and

Income Augmentation or KALIA scheme in 2019-20, allocating Rs 10,000-per-year payment for two crops (kharif and rabi). The Trinamool Congress government in West Bengal and the BJP-ruled governments in Jharkhand and Haryana, have also implemented the cash incentive schemes for the farmers.

Most of the governments are fast switching to direct cash transfers to woo the farmers. With economists slamming the farm loan waiver schemes, direct cash transfers seem to be the next popular option. According to the RBI report, 2018-19 marked a "watershed", with some states opting for income support schemes over "conventional" policies such as farm loan waivers to alleviate agricultural distress. While welcoming this move to cash transfers, it has, however, noted that they can succeed only with digitisation of land records and their linking with Aadhaar-seeded bank accounts "for ensuring timely payments to farmers, while minimizing inclusion and exclusion errors".

One of the key deterrants for increasing the profitability of agriculture and realizing income for farmers, is the rising cost of inputs. By directly transferring the required amount to farmers' account, to some extent this issue can be addressed. Mechanization, better inputs, irrigation are some other avenues that the farmer can expand. It will ease out the imminent agriculture distress. But will it cure the pervasive agrarian distress. The answer is a definite no.

But most importantly the immediate concern is whether this is going to shift the focus away from developmental policies in agriculture. Agriculture in years ahead would demand more investments in technology, inputs and research as the twin challenge of maintaining food security, sustainably, in changing climates becomes more and more pronounced. Hopefully, the authorities would also allocate sufficient funds to bring about holistic improvement in agriculture, infrastructure and life of farmers.

## Beckoning Nutritional Revolution

*Oct 16 is celebrated as World Food Day*

**W**orld Food Day is celebrated every year on 16th October in honour of the date of the founding of the Food and Agriculture Organization. This day every year people from around the globe tighten their resolve to tackle hunger. Celebrating the creation of the Food and Agriculture Organization (FAO), events are organized in over 150 countries across the world, making it one of the most celebrated days of the UN calendar. These events promote worldwide awareness and action for those who suffer from hunger and for the need to ensure food security and nutritious diets for all. The focus of the day is that food is a basic and fundamental human right. Yet, in a world of billions, over 820 million people worldwide suffer from chronic undernourishment; 60% women and almost five million children under the age of five die of malnutrition-related causes every day. It's also important to note that while millions go hungry, 672 million people suffer from obesity, and a further 1.3 billion are overweight. This year, World Food Day calls for action across sectors to make healthy and sustainable diets affordable and accessible to everyone. At the same time, it calls on everyone to start thinking about what we eat.

A combination of unhealthy diets and sedentary lifestyles has sent obesity rates soaring, not only in developed countries, but also in low-income countries, where hunger and obesity often coexist. Now over 670 million adults and 120 million girls and boys (5-19 years) are obese, and over 40 million children under 5 are overweight, while over 820 million people suffer from hunger. An unhealthy diet is the leading risk factor for deaths from non-communicable diseases (NCDs), including cardiovascular diseases, diabetes and certain cancers. Linked with one fifth of deaths worldwide, unhealthy eating habits are also taking a toll on national health budgets costing up to USD 2 trillion per year.

Obesity and other forms of malnutrition affect

nearly one in three people. Projections indicate that the number will be one in two by 2025. The good news is that affordable solutions exist to reduce all forms of malnutrition, but they require greater global commitment and action.

Answers can be found in the agriculture systems around the world. Our changing food habits have changed our farming systems. Our food habits have shifted from being local to being global. Our local cuisines have given away to more refined starches, sugar, fats, salt and processed foods, meat and other animal-source products. Mass production of improved varieties have usurped the resilient local varieties. Owing to lack of our interest in local cuisines, biodiversity is eroding away. Today only nine plant species account for 66% of total crop production despite the fact that throughout history, more than 6000 species have been cultivated for food. A diverse variety of crops is crucial for providing healthy diets and safeguarding the environment.

So to bring back affordable and nutritious food to the tables, our agriculture systems need to change and encourage cultivation of wholesome food. This has the potential to not only increase the nutrition in our food menu, but to support the small holders and marginal farmers. Millets and coarse cereals which are rich in many nutritional elements and fiber, can improve the quality of diet and hence health of people. Besides, these region specific crops and varieties are more resilient to climate changes and will be an important tool to fight climate change, poverty and malnutrition.

India has made glorious achievements in the food sector. Our resolve to fight hunger was strongly backed by green revolution technologies. Today our country stands tall in food production front. However, India is yet to address the challenge of nutritional security. Malnutrition is still an infliction that we have to do away with. It is time to switch to healthier and affordable food. It is time for a nutritional revolution.



## AgriMechanization – The New Norm

*Uberization can make farm mechanization accessible and affordable*

**S**mall and marginal farmers dot the agriculture landscape of India. The country which boasts of many agricultural firsts, has 126 million farmers who cultivate on lands less than two hectares, owning just 47.3% of the crop area. They together own about 74.4 million hectares of land – or an average holding of just 0.6 hectares each – not enough to produce surpluses which can financially sustain their families. The number of small holdings is also expected to increase over the years.

Economic survey 2019-20 has observed that the area operated by the marginal and small farmers increased from 38.9 per cent in 2000-01 to 47.4 per cent in 2015-16, while large holdings decreased from 37.2 per cent to 20 per cent during this period. The trend is expected to continue in the future and the farmers will be pushed into perennial poverty, if enough solutions do not reach them on time to increase their incomes. The solutions developed need to be customized or packaged according to the needs of the small farmer. Even mechanization commonly perceived as a privilege of large farms or better off farmers, need to be expanded to include the small farms.

Shortage of labour and wage hikes have increased the cost of production. Investing in mechanization becomes an impossible proposition for these farmers. However, a number of solutions are being developed to address this issue. Custom hiring centers have evolved to fill up this space. More recently many start ups have emerged with promising models. Global firms Aeris India and 'Hello Tractors' have collaborated together to provide an Uber-like rental and hiring facility for tractors in the country. Companies like Mahindra and Mahindra's Tringo, Khetibadi.com and EM3 services have been providing platforms for farmers to take tractors on lease or rent for a value.

Mechanization can help improve the general structure of Indian agriculture. Mechanization has the potential to expand the area under cultivation. By

performing operations at the right time, production potential of the land area is maximized and the number of crops on the same land can be increased. Reduction of the drudgery associated with the use of human muscle power for tasks, such as hand hoeing for primary tillage – especially important in tropical areas where high temperatures and humidity (sometimes associated with inadequate nutrition) make manual work extremely arduous. Smallholder farmers can access input supply chains and can get easily integrated into modern food systems and thus provide for more income, renewed business opportunities and further value addition. Moreover agricultural mechanization in its broadest sense can contribute significantly to the development of food systems, as it has the potential to render post-harvest, processing and marketing activities and functions more efficient, effective and environmentally friendly. Mechanization technologies enable smallholders to enhance yields through the adoption of intensification, conservation agriculture, and other climate-resilient, labour- and energy-efficient, and gender-friendly practices. Agricultural mechanization has the potential to produce social opportunities (and outcomes) for small-scale farmers. It can reduce the risk of low yields thanks to increased cropping intensity and timely planting, weed control and harvesting, and can facilitate storage, resulting in better food security and improved nutrition for the farm family.

Considering the fact that small holders dominate the farming scene in India, the advantages of farm mechanization should reach them, especially when there are a plethora of advantages they offer. To universalize mechanization among all farmers in India, uberization can play an important role. The twenty first century and the years ahead will be pinning hope on ideas that can increase the land productivity. Mechanization would become inevitable, as farm labour force dwindles in wake of other opportunities.

## Digital agriculture to double farm incomes

*Digital technologies can reduce farm risks and increase farm incomes*

**D**igital Agriculture is no more a fantasy. A reality that has started to gain traction in Indian soils, digital technologies such as Artificial Intelligence (AI), Cloud Machine Learning, Satellite Imagery and advanced analytics are empowering small-holder farmers to increase their income through higher crop yield and greater price control.

Currently a localized phenomenon, mainly in pilot projects, digital agriculture is sowing hopes and yielding positive results. In some villages in Telangana, Maharashtra and Madhya Pradesh, farmers are receiving automated voice calls that tell them whether their cotton crops are at risk of a pest attack, based on weather conditions and crop stage. In collaboration with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Microsoft has developed an AI-Sowing App powered by Cortana Intelligence Suite including Machine Learning and Power BI. The app sends sowing advisories to participating farmers on the optimal date to sow. Farmers don't need to install any sensors in their fields or incur any capital expenditure. All they need is a feature phone capable of receiving text messages.

Artificial Intelligence and big data are going to be a "game changer" in the agriculture sector, and the government is aiming to collate about 80 per cent of such data by 2020, according to Agriculture Secretary, Sanjay Aggarwal. The data will help in framing the right policy and converge some projects in order to achieve the targeted development of farmers and the overall sector.

United Phosphorous (UPL) in collaboration with Microsoft has created a Pest Risk Prediction API that enables farmers to get predictive insights on the possibility of pest infestation. This empowers them to plan in advance, reducing crop loss due to pests and thereby helping them to double the farm income.

Microsoft has also developed a multivariate agricultural commodity price forecasting model to predict future commodity arrival and the corresponding prices. The model uses remote sensing data from geo-stationary satellite images to predict crop yields through every stage of farming. This data along with other inputs such as historical sowing area, production, yield, weather, among other datasets, are used in an elastic-net framework to predict the timing of arrival of grains in the market as well as their quantum, which would determine their pricing.

Shifting weather patterns such as increase in temperature, changes in precipitation levels, and ground water density, can affect farmers, especially those who are dependent on timely rains for their crops. Leveraging the cloud and AI to predict advisories for sowing, pest control and commodity pricing, is a major initiative towards creating increased income and providing stability for the agricultural community.

AI can be used in multiple domains of agriculture. Indian agriculture has been mostly traditional and the farmers have relied upon their perfectly honed agriculture wisdom in raising crops and protecting them. However, the challenges have broadened. The today and the future can no longer be dictated by individual farmers' cognitive abilities. Unpredictable climates and global markets influence agriculture today. Traditional farming practices and subsistence level of farming have not been able to realise the full potential of the Indian fields. And failure of monsoon in the country has often resulted in failure of farming and suicides of farmers. But the use of cutting edge technologies like Artificial Intelligence may help Indian farmers to choose the right crop and minimise the risks and raise farm incomes to decent levels. Digital agriculture is going to be the next fastest adopted technology in agriculture.



## Mahindra & Mahindra to champion global small farmers at Agritechnica 2019

► Mahindra & Mahindra Ltd. (M&M), part of the USD 20.7 billion Mahindra Group, will be present at the upcoming Agritechnica Trade Fair 2019 in Hanover, Germany. The company is participating in Agritechnica for the second time. Mahindra will introduce products from its global portfolio of farm equipment's, including products from brand Mahindra, Mitsubishi, Armatrac, Sampo Rosenlew & Hisarlar in Hall 7, Stand A23 between 10th and 16th November 2019. Representing M&M's diverse farm equipment's portfolio, the products on display will include a range of tractors and implements, small and medium sized harvesters as well as precision farming solutions including digital platforms and smart machines.

Mahindra's offerings in products. Mahindra 6075, Mahindra 2025, ArmaTrac 804 Fruit Garden, Power Tillers - ELF 20, Power Tillers - MMR 600, MV 170 - vegetable - high clearance tractor, GM501 Tractor

will be displayed. Precision Farming Solutions from Mahindra include Soil mapping and VRA Fertilizer, potato planter, grape solutions. Apart from this Silage press and winder, power harrow, rubber type disc harrow, Alabora 300, deep chisel, square baler will also be exhibited. All these innovations are designed to help farmers evolve to greater levels of efficiencies in farming and mechanization, thereby increasing their productivity and enhancing their prosperity. M&M aims to be a partner of the small landholding farmers, across their full crop cycle, bringing them technologies that are otherwise deployed on larger farms to make a difference to the way farming is done. This happens through mechanization technologies such as planting and baling, as well as digital technologies, like IoT and precision farming. All these methods help farmers to increase yields, reduce costs and improve productivity. M&M has also made

significant strides in its journey towards developing digital farming solutions with investments in global precision farming and digital start ups in Canada, Switzerland and India. This has enabled the company to secure market access and on ground presence in many of the world's leading agricultural markets as well as to leapfrog the technology curve. The Agritechnica Trade Fair offers Mahindra an ideal platform to showcase its products.

Through their entire range of farm equipment and solutions, M&M will realize the company's commitment to transform the lives of small landholders. Consequently, the company has laid significant emphasis on making all such technologies simple, affordable and accessible – this procedure is called democratization of technology. Two digital examples of this will be showcased at Agritechnica: Soil Mapping and Variable Rate Fertilization: Soil data is captured using implement mounted sensors, that enable creation of fertility zones. This is followed by the usage of a smart planter that dispenses fertilizer as per the requirement of fertility zones. Small landholders can benefit from lower costs and improved productivity.

- Disease Detection: Crop images are captured through tractor mounted high tech cameras. Captured images are processed through disease algorithms trained to detect or predict crop infestation. This is followed by the usage of a smart sprayer that carries out targeted spraying. Small landholders can benefit from lower pesticide usage and more sustainable practices. Mahindra & Mahindra will be present at the Agritechnica, 12-18 November 2019, Hannover Fair in the Main booth: Hall 7, Stand A23



## Big Relief for Farmers as IFFCO Reduces Retail Prices of Non-urea Fertilisers; Check New Rates

➤ Giving some relief to farmers ahead of Rabi season, leading Fertilizer Cooperative, IFFCO slashed the retail prices of its non-urea fertilisers that includes Di-Ammonium Phosphate (DAP), by up to Rs 50/bag. The price cut comes amid easing cost of raw materials & manufactured fertilisers worldwide. IFFCO Managing Director, Mr. U S Awasthi said, “We have reduced the retail prices of DAP along with all complexes fertilisers taking into consideration the softening trend in global prices of raw materials & manufactured fertilisers”. IFFCO has slashed the maximum retail price of DAP to Rs 1,200 / 50 kg bag from the previous Rs 1,250 / bag, Awasthi said. Meanwhile, the rate of NPK-I complex has been cut to Rs 1,175 / bag from Rs 1,200 and the cost of NPK-II complex has been reduced to Rs 1,185 / bag from Rs 1,210 / bag. In addition, the price of NP complex has been cut by Rs 25 to Rs 975 / bag. Awasthi said the revised retail prices including the GST of these fertilisers, is effective from 11 October 2019. But, the retail price of neem coated urea that is controlled by the Government remains unchanged at Rs 266.50 / 45 kg bag. It must be noted that IFFCO in the month of July had reduced the retail prices of DAP & complex fertilisers. While announcing the new price reduction at the India International Cooperatives Trade Fair Awasthi said this will cut the agri-input cost and also help in realising PM Narendra Modi’s plan of doubling farmers income by 2022. Rabi (Winter) season begins next month (November). One of the largest processed fertiliser cooperatives in the world, IFFCO serves over 5.5 crore farmers in India. It also contributes to about 36% of phosphatic & 21% of nitrogenous fertilisers produced in the country. In 2018-19 fiscal, IFFCO’s turnover stood at Rs 27,852 crore.



## Visakha Container Terminal set to become regional trans-shipment hub on east coast

➤ Container lines Hapag Lloyd, ONE, YML, COSCO and OOCL will jointly run a new direct service from Visakha Container Terminal (VCT), the privately-run facility at State-owned Visakhapatnam Port Trust, to the Mediterranean and Europe, which will also bring connectivity with Africa and the America. The announcement strengthens Visakha Container Terminal’s rising stature as a regional container transshipment hub on the east coast, said shipping industry sources. The commercial benefits offered by Visakhapatnam Port Trust makes the terminal even more attractive in the long run by being the gateway to the East for both northern and southern regions extending right up to Bangladesh and even Myanmar, the terminal operator said. The terminal, majority owned by International Cargo Terminals & Infrastructure Pvt Ltd, is located centrally and strategically on the East Coast



of India between Kolkata and Chennai. The facility handled over 0.45 million TEUs during FY19 and is on the verge of crossing the 0.5-million TEUs in FY20, aided by a 16 per cent growth in traffic, complemented rail movement and also transshipment. The transshipment volumes at VCT grew by a whopping 148 per cent in FY19 over FY18. With the continuous growth in transshipment volumes and with the patronage from various lines such as RCL, WHL, Evergreen Shipping, Samudera, Global Feeders and Non-vessel operating common carriers (NVOCCs), the growth rate between April and August in FY20, compared to FY 19, was 188 per cent and is expected to rise further — with increased participation from other lines which are actively exploring VCT as a port of call.



## India sets quality standards for global potato trade



▶ Quality standards proposed by India will apply to global trade in potatoes. The Codex Alimentarius Commission, an international food standards body established jointly by the Food and Agriculture organization and the World Health Organization, has approved these standards at a session in Mexico. India's Agriculture commissioner, SK Malhotra, who chaired the global working group for development of standards for potato, over the phone from Mexico that standard and quality guidelines for potato would contribute to the safety, quality and fairness of this international food trade. Apart from protecting health of consumers from substandard food products, these standards are recognised as the reference food standards in any WTO dispute settlement under various agreements, he said. The standard guidelines cover all the commercial varieties of potatoes, considering shape, skin colour and flesh colour. The shape varies from spherical to ovoid and oblong, elongated; the skin colour from white through yellow to tan and the flesh colour from white to yellow to blue. The provisions concerning quality, sizing, minimum requirements and tolerances allowed in each class have been elaborated in standards, Malhotra said.

### India firm about protecting farmers' interest in RCEP

▶ India will ensure protecting the farmers' interest in the proposed Regional Comprehensive Economic Partnership (RCEP) trade agreement whose negotiations are in the final stages. According to sources, Union Agriculture Minister Narendra Singh Tomar has communicated to Commerce Minister Piyush Goyal on the same. The negotiations for the RCEP deal has reached a final phase and a final draft may be prepared by November, sources said. The RCEP heads of states will meet in November to announce a formal announcement. Sources also said Prime Minister Narendra Modi has held meeting on this while Union Home Minister Amit Shah held a separate meeting last week with Finance Minister Nirmala Sitharaman and External Affairs Dr S Jaishankar besides Mr Goyal on the matter. The RCEP is a proposed free-trade agreement (FTA) between the 10-member states of the Association of Southeast Asian Nations (Asean) and its six FTA partners China, India, Japan, South Korea, Australia and New Zealand. Commerce Minister Piyush Goyal will be going to Bangkok for the RCEP ministerial meet.



### Govt to now launch Rs 100 crore scheme for cooperatives

▶ In line with schemes like Start-up India and Stand-up India aimed at young entrepreneurs, Agriculture Minister Narendra Singh Tomar will launch the Yuva Sahakar-Cooperative Enterprise Support and Innovation Scheme 2019 with an annual outlay of Rs 100 crore. The scheme is aimed at cooperatives in the northeastern region, cooperatives registered and operating in aspirational districts as identified by NITI Aayog, and cooperatives with 100 per cent women/SC/ST/ persons with disability members. The scheme was launched at the first-ever India International Cooperatives Trade Fair (IICTF) to be held here from October 11-13. As 94 per cent of total farmers in India are members of at least one cooperative institution, the IICTF is aimed at furthering the government's goal of doubling farmers' income by promoting cooperative-to-cooperative trade within India & abroad and promoting exports of key agriculture commodities and products. More than 120 Indian cooperatives and 35 countries from six continents having purchased exhibition booths for participating in IICTF.





## AI, big data to be game changer in India's farm sector

➤ Artificial Intelligence and big data are going to be a game changer in the agriculture sector, and the government is aiming to collate about 80 per cent of such data by 2020, Agriculture Secretary Sanjay Aggarwal said. The government realised to leverage the data of farmers while rolling out the PM-KISAN scheme under which Rs 6,000 is paid annually directly to the farmers as income support, he said. We run different agri-schemes and have huge data under each scheme. We can leverage that data for better targeting of the scheme. By 2020, we should be having 80 per cent of farmers data collated and it will be a game changer, Aggarwal said addressing the 3rd India Agriculture Outlook Forum. The data will help in framing the right policy and converge some projects in order to achieve the targeted development of farmers and the overall sector, he said. Already, the government has started collating the data of farmers registered under the major schemes. There is data related to soil health, Kisan Credit Cards, crop insurance and even land holdings that are getting digitised, he added. The secretary further said that a pilot project is being implemented along with help of IT firm IBM in four districts to provide farm and village level weather forecast and soil moisture. On the PM-KISAN scheme, he said the scheme is not only providing income support but also boosting the confidence level of farmers. About 85 million farmers have registered under the scheme and the government has disbursed first installment amounting USD 3.5 billion so far, he said. The secretary also talked about the progress in the crop insurance scheme and how technology is being used to assess the crop damage. On the problem of scarcity of some crops especially oilseeds, he said that the government has achieved self-sufficiency in pulses, and steps are being taken to achieve the same in oilseeds and reduce the country's dependence on edible oil imports.

## Govt proposes up to 7% increase in MSP for Rabi crops

➤ The agriculture ministry has proposed a 5-7% increase in minimum support price (MSP) of rabi, or winter-sown, crops to improve the lot of farmers, a development that comes ahead of the assembly election in the food bowl state of Haryana. Punjab and Haryana together contribute around 70% wheat to the central pool, which is used to run public distribution and other welfare schemes. The ministry has proposed raising of wheat procurement price by 4.6% to Rs 1,925 per quintal from last year's Rs 1,840. This is likely to put an additional burden of around Rs 3,000 crore on the government's Rs 1.84 lakh crore food subsidy bill. The cabinet is likely to take a decision soon as the winter sowing begins from November. The ministry has proposed a 5.3% increase in the mustard MSP, which will take the existing floor price of Rs 4,200 a quintal to Rs 4,425, and a higher increase of 5.9% in the MSP of barley. It has proposed the highest increase of 7.26% in the MSP of masur, to Rs 4,800 a quintal. The Commission for Agricultural Costs and Prices (CACP), which recommends MSP for major crops, takes into consideration the overall cost of production. Prime Minister Narendra Modi has assured farmers MSP at 150% of the input cost.

## YSR 'Rythu Bharosa' scheme launched in Andhra Pradesh



► Andhra Pradesh Chief Minister Jagan Mohan Reddy inaugurated his flagship 'Rythu Bharosa' scheme, which provides a cash incentive for farm inputs, in Sarvepalli in Nellore district. Speaking at the event, Jagan said, "The scheme will change the history of farmers in the state. This is the maximum support offered to farmers out of all 29 states of India," adding that the scheme has been launched 8 months earlier than promised. Inaugurating the scheme, Jagan released an amount of Rs 3,785 crore towards 38 lakh farmers in the state. With enrolments continuing till November 15, the number of beneficiaries are expected to increase. The farmer welfare scheme

was one of the nine key promises among the 'Navaratnalu' made by the YSRCP in its election campaign. Jagan also announced that within this year farm input stores will be opened at the village level, where good quality seeds, fertilisers and pesticides will be made available so that farmers do not suffer losses due to adulterated inputs. The YSR RythuBharosa replaces the previous TDP government's 'Annadata Sukhibhava' scheme, introduced in February this year in the run-up to the elections. Under RythuBharosa, land holder farmers owning up to five acres will be provided with an annual benefit of Rs 13,500. Landless cultivators or tenant farmers from SC, ST, BC and

minority groups are also eligible for the incentive. The amount includes the annual benefit of Rs 6,000 per family provided by the Centre under the PM KISAN Yojana. According to a government order issued, an amount of Rs 5,510 crore has been issued towards RythuBharosa. While the previous government's beneficiary list included 43 lakh farmers, the CM has reportedly said that around 51 lakh farmers will be covered by RythuBharosa, apart from nearly 3 lakh tenant farmers. The scheme also assures drilling of borewells free of cost, a calamity relief fund of Rs 4,000 crore, 9 hours of free electricity during the day, and setting up of cold storage units and food processing centres. Responding to criticism over naming the scheme after YSR while using funds from the Centre, Minister of Agriculture KannaBabu told the media that Jagan had instructed officials to include the name of the Centre's scheme. While the YSRCP government had earlier promised an amount of Rs 50,000 in four annual instalments of Rs 12,500 each, the amount was increased to Rs 13,500 to be paid for five years, bringing the total up to Rs 67,500. The increment was reportedly made following demands from farmers' representative at an Agriculture Mission meeting held one day before the launch.

## MP's focus on food processing units, get more incentives

► Madhya Pradesh is providing one and half times more incentive to food processing units, compared to other sectors in the state. Chief minister Kamal Nath says, large-scale employment will be generated in this sector. Kamal Nath government will showcase the state's prowess in the food processing sector in the Magnificent Madhya Pradesh Investors' Summit. Kamal Nath government will showcase the state's prowess in the food processing sector in the Magnificent Madhya Pradesh Investors' Summit. Investment from many big companies is expected during the summit, sources said. Projected as the food basket of India in the Magnificent MP, the state is among the largest producers of soybean, gram, garlic, pulses, wheat, maize and onions. MP's durum variety of wheat is considered as the best for the production of pasta, noodles and other has been in great demand, sources point out. Additionally, state accounts for approximately 40% of all organic food cultivated in the country, sources said. The state is already a silent exporter of agro-commodities like soya, rice and pulses, they added. The agrarian strengths of the state make it an ideal place for the development and expansion of export-oriented agro-based industries, said Rajesh Rajora principal secretary Industry who had held for long the charge of agriculture department also. The potential is particularly strong in oranges, mango, guava, banana, onion, tomato, potato, green peas, garlic, chilli, coriander and also in foodgrains, mainly wheat, rice and pulses, he said. The government is striving to ensure ease of doing business in the agro-processing sector with an overhauled version of policies, he said.

## UP Government to Give Subsidy for Mango, Guava and Amla Cultivation to Promote Horticulture

► The Uttar Pradesh Traders Welfare Board Vice-Chairman, Mr. Manish Gupta informed that in order to promote horticulture, the State Government has decided to offer a huge subsidy for cultivation of mango, guava and amla crops. Gupta explained that if 80 percent of the crop remains for at least three years and the farmer is able to prepare the garden, then he will be given 105 percent subsidy (financial support) in 5 years. He added that 50 percent subsidy will be given in the first year of the plantation. Gupta said that there has been a provision of 25 percent subsidy on setting up a paddy industry or rice mill, 70 percent subsidy on setting up a food processing industry and 70 percent subsidy for setting up an industrial unit in the field of solar energy.



## Punjab targets paddy procurement of 170 lakh tonnes

► Punjab Chief Minister Captain Amarinder Singh has directed the Food Department to obtain all receivables from Gol and FCI at the earliest, to ensure that the Cash Credit Limit (CCL) is availed in time for the smooth procurement of Paddy. The Chief Minister was reviewing the arrangements for the procurement season, beginning from October 1, according to an official spokesperson. With 29.20 Lakh hectares of area under paddy cultivation, Punjab is targetting procurement of 170 Lakh Metric Tonnes, requiring CCL to the tune of Rs. 34,500 Crores in Kharif Season 2019-20, said the spokesperson. Directing the Principal Secretary Food & Supplies to liaison with the Central authorities, Captain Amarinder also asked the Food Department, the nodal agency for the procurement operations, to ensure all necessary arrangements for storage of paddy stocks, especially in view of the inclement weather forecast. The Chief Minister reiterated his Government's firm commitment to lift every single grain of the farmers' produce from the market, in a smooth, prompt and hassle-free manner, while strictly adhering to the prescribed norms of timely payment. Referring to the Paddy Purchase Policy for KMS 2019-20, the meeting was informed that the Food, Civil Supplies & Consumer Affairs Department had already issued 'The Punjab Custom Milling Policy for Paddy (Kharif 2019-20)' for paddy processing, after approval from the Council of Ministers.



## Farmers in Flood-Affected Regions to Get Free High-Quality Wheat Seed

► Flood-hit farmers in Jalandhar, Moga, Kapurthala, Fazilka, Ferozepur and other flood-affected districts will be provided high-quality wheat crop seeds for the upcoming rabi season. Secretary of Agriculture Department, Dr KS Pannu & Director Swattantar Kumar Airy told that the seeds would be distributed through the Punjab State Seeds Corporation. Captain Amarinder Singh, Chief Minister of Punjab had already asked the State Seeds Corporation to arrange good quality wheat seed for the flood-affected cultivators. According to available details, around 30,000 hectares land was affected due to floods. Thus 30,000 quintals of wheat seed will be given by the Punjab State Seeds Corporation in the next few weeks. Dr Pannu said, "The total cost of seed requirement in Punjab has been estimated at Rs 9-crore". The quality seed of wheat crop costs around Rs 3,000 / quintal. In the meantime, Chief Agriculture Officer of Moga, DrBalwinder Singh & Plant Protection Officer, DrJaswinder Singh Brar told that 7,000 hectares was affected by the floods in the district. On the orders of District Magistrate Sandeep Hans, officers of the Agriculture Department in a recent survey of flood-affected crops had assured growers that the State government will provide quality wheat seed free of cost to them in the next few weeks. The state government said that the main motive of this gesture is to extend a helping hand to the flood-affected farmers. Captain Amarinder has also issued required directions to the Agriculture Department to ensure timely distribution of wheat seed to the flood-affected cultivators so that they do not suffer any further losses.



## India to expand cotton assistance programme to 5 more African nations in 2nd phase

► India will cover five more African countries in the second phase of its cotton technical assistance programme (TAP) for the region, Union minister Smritilrani said. India implemented a technical assistance programme (TAP) for cotton in six African countries, namely Benin, Burkina Faso, Chad, Malawi, Nigeria and Uganda, from 2012 to 2018. "In the five year long second phase, the programme will be scaled up in size and coverage and will be introduced in five additional countries namely Mali, Ghana, Togo, Zambia and Tanzania. The Cotton TAP programme will now cover 11 African countries including the C4 (Benin, Burkina Faso, Chad and Mali)," an official statement said. India remains committed to building on its longstanding development partnership with Africa, especially in the field of cotton, Union Textiles Minister Smritilrani said at the opening session of World Cotton Day in Geneva. As one of the world's largest producers and consumers of



cotton, India supports the World Cotton Day as an opportunity to recognise the significance of cotton as a global commodity, and, more importantly, as a source of livelihood for millions of small and marginal farmers in developing countries, said Irani. Irani further said that India is also engaging meaningfully in providing assistance to strengthen both the agriculture and textile part of the cotton value chain in Africa through training and capacity-building of farmers, scientists, government officials and industry representatives and through the creation of cotton-related infrastructure. She said that it is fitting that Mahatma Gandhi has been chosen as the icon for the World Cotton Day and to mark the celebration of the first World Cotton Day, India will gift a replica of Mahatma Gandhi's Charkha to the WTO. The Textiles Minister also informed that cotton farming and the domestic cotton textile industry continue to be important pillars of India's economy. As a country of 8 million small and marginal cotton farmers, India is sensitive to the challenges faced by the cotton sector in developing countries and India has been a proponent for the elimination of asymmetries and imbalances in the WTO agreements that lead to a distortion of global cotton markets, the Minister added.

## India aims to export 50,000 tonnes of sugar to China

► INDIAN SUGAR mills aim to export around 50,000 tonnes of sugar to China. This follows extensive discussions between high-level trade delegates from China, who had visited India recently. On an average, China imports around 50 lakh tonnes (lt) of sugar annually. Sanjay Khatal, managing director of Maharashtra State Cooperative Sugar Factories Federation, said this will be the first time that the quota was fixed so early in the season. Guided by this, mills can take a conscious decision on whether to go for production of export-friendly raw sugar or convert the same into white sugar, he said. Given the cost advantage the mills from Uttar Pradesh enjoy in domestic markets, the export quota is expected to be fulfilled mostly by mills in Maharashtra and Karnataka. For the upcoming season, the central government has given a 60 LT quota for exports. Last year, of the 50 LT quota given, mills had reported exports of around 35 LT. Back in August, the central government had announced a Rs 6,268 crore package as subsidies for pushing exports. The subsidy will be directly paid to the bank accounts of the farmers to help mills clear the mandatory fair and remunerative price (FRP) for sugarcane procured. Also, given the back-to-back bumper crop the country had reported for the last two seasons, the sugar glut has posed a great challenge before the industry. Millers said the decision of the government to release the export subsidy after fulfilling 50 per cent of the export quota will help them in accelerating exports. Earlier, mills had to wait for around 30 to 40 days after exports for the government to release their subsidy. Also, most of the subsidies have been de-linked from each other, which millers said will help them in the long run to clear the FRP at the earliest. India's export subsidies come at a time when Brazil, the largest producer of sugar, has decided to downgrade its sugar production figures. In lieu of higher oil prices, Brazil is expected to deliver around 35.9 per cent of its total cane towards production of ethanol as against the 35 per cent of the previous season. Mills in India have been pushed towards exports to reduce the glut in the sweetener in the country. It is expected that the country will be starting the season with 142 lt of sugar and, thus, the drought and floods in Maharashtra and Karnataka are not expected to have much effect on sugar prices.

## India very important for Netherlands, can collaborate in agriculture, water management: Dutch King Willem Alexander

➤ Dutch King Willem-Alexander has said that India is very important for the Netherlands and said that both countries can collaborate in various sectors including agriculture, water management and climate change. The Dutch King, who is set to visit India later this month along with his wife Queen Maxima, also described the country as an amazing place to do business. India is a very important country for the Netherlands. I am very glad that in the long tradition, my wife and I are visiting India in October. India is amazing, its hustle-bustle, they have vibrant technology, innovations and it is an amazing place to do business, Willem Alexander. He also said that India can help the European country in its efforts to tackle climate change.



## APEDA showcases NE's export potential

➤ The Agricultural and Processed Food Products Export Development Authority (APEDA), in cooperation with government of Tripura organised an International Conference-cum-Buyer Seller Meet in Agartala to showcase the export potential of agricultural products from North East Region (NER) and Tripura in particular. Twenty international buyers from 8 countries - Bangladesh, Bhutan, Nepal, Indonesia, UAE, Bahrain, Kuwait and Greece participated in it. More than 30 exporters and representatives of FPC/FPO from Tripura, Assam and Arunachal Pradesh also participated. APEDA has taken various initiatives to facilitate exports from the region, which has been identified as a major thrust area for increasing agri exports. The event was inaugurated by U. Venkateswarlu, Chief Secretary, Government of Tripura. Venkateswarlu emphasised that Tripura has some very specific commodities like pineapple, ginger, turmeric among horticultural produce and aromatic rice, corn and some oilseeds among the agricultural produce and the State Government is trying its best to create infrastructure and logistics facilities. Further, he informed



that with improved connectivity by rail and road and cross border connectivity being planned through Bangladesh which will open many trade points and provide cost effective transportation. Agriculture Secretary of Tripura, M.L. Dey, elaborated on the strength of Tripura and facilities being created to provide end-to-end value chain. Representatives from NFR and AAI informed about specific initiatives their organisation has taken up to create facilities for cargo handling. Importers and buyers also spoke about their business, commodities of interest and promised to explore import of commodities especially perishable items from the North East region.

## Indonesia to prioritize imports of meat, rice, raw sugar from India in exchange for lower CPO tariff

➤ Indonesia will prioritize imports of buffalo meat, rice and raw sugar from India after the South Asian country adjusted crude palm oil (CPO) tariffs for its top two importers, Malaysia and Indonesia, earlier this month. India has given us an opportunity to increase our CPO exports, it is only fair to give India access to our market as well," Trade Minister Enggartiasto Lukita said during the India-Indonesia Multi Product Roadshow opening ceremony in Jakarta. Previously, India had imposed a 50 percent import tariff on palm oil products coming from Indonesia, while Malaysia enjoyed a lower tariff of 45 percent as it has a Comprehensive Economic Cooperation Agreement (CECA) with the country. India is the largest palm oil market for Indonesia with an export share of about 20 percent, equivalent to 6.71 million tons last year. The EU, China and Pakistan follow India with exports of 4.78 million, 4.41 million and 2.48 million tons, respectively.



## This Satellite-based Advisory Service Will Notify Deep Sea Fishermen of Disasters

▶ To ensure flawless and effective dissemination of alerts & other important disaster-related information to fishermen who venture deeper into the seas, the Indian National Centre for Ocean Information Services (INCOIS) together with Airport Authority of India (AAI) launched a new system. The government in a release said this new system that consists of a specially designed device & a mobile app would expand the scope of sending out warnings and other messages to the fishermen who are out in the seas for several days for fishing & other related activities. Currently, the fishermen get advisories, forecasts & early warnings from a broad range of mechanisms like Potential Fishing Zone advisories, ocean state forecasts, high wave alerts, tsunami & storm surge early warning services. But, all these messages can only get transmitted up to 10 - 12 km from the coast. The new system has been named GEMINI (GAGAN Enabled Mariner's Instrument for Navigation and Information) and it is based on GAGAN (GPS-Aided Geo Augmented Navigation) satellite system made by the Indian Space Research Organization (ISRO) & AAI. The GAGAN satellite system has 3 geosynchronous satellites - GSAT-8, GSAT-10 & GSAT-15 and these cover the whole Indian Ocean region all the time. With the help of this new system, all the important alerts & messages will be sent via GAGAN and the designated device will receive & transfer it to a mobile phone with the help of Bluetooth communication. The related mobile application will then decode & display the information to the user. It can be decoded into 9 languages. The Government release said that the technology for this new device has been assigned to Acord, a company based in Bengaluru. Minister for Science and Technology and Earth Sciences, Dr. Harsh Vardhan had launched GEMINI system. He also launched an enhanced version of PFZ forecasts made by the INCOIS. This new version will give the advisories 3 days in advance. The predictions are generated with the help of modern tools of numerical models & are likely to help in providing the advisories even when there are cloudy skies. The introduction of this new satellite-based advisory service system has come after the gap in communication that was felt during Ockhi cyclone in 2017. At that time, fishermen who were out in the sea for fishing could not be informed of the storm that led to the loss of lives and property of the fishermen.



## A new wheat seed that holds much promise

▶ A new variety of wheat seed developed by the country's premier Indian Agricultural Research Institute (IARI) comes at a critical time when farmers, mostly across northern India, have to deal with increasing incidents of pest attacks which threaten to impact yield. Two of the key wheat varieties — HD2967 and HD3086 — also developed by IARI a few years back and grown widely by farmers mostly in the north-western plains, have become susceptible to yellow and brown rust along with Karnal bunt (a fungal disease) in recent years. IARI has released a new wheat seed, HD3226, which has shown resistance to these pests and is reported to have higher protein content than the existing varieties.

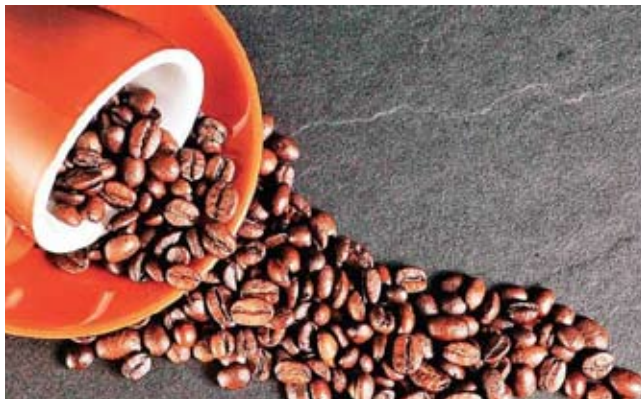
## Food grain output seen at 140.57 million tonne in FY20 on monsoon boost

▶ With the best monsoons in 25 years, the overall food grain production is expected to increase marginally by 8.4 million tonne from the average output in the past five years at 140.57 million tonne in 2019 -20, says a report. The monsoons have been normal or excess in 84 percent of the regions, while the rest of the regions getting insufficient rainfalls, the National Bulk Handling Corporation (NBHC) said. Production of monsoon-sown food grain is expected to be 140.57 mt in 2019-20, up by 8.4 mt from average output in the past five years, it added. The report said total rice is expected to show marginal improvement in sown area by 2.80 percent as farmers have shifted 20-25 percent of their crop areas from non- basmati rice to basmati in Punjab due to the higher export demand last year. Receding waters in the flood-affected regions of Bihar, Odisha and Karnataka have helped recover the areas under paddy but delayed in sowing, which is likely to lower the yield by 2.58 percent, NBHC head for research & development Hanish Kumar Sinha said in a statement. Maize acreage is expected to go up, but output may fall by 5.75 percent due to the massive armyworm infestation.



## Coffee Board to expand krishitaranga service to more farmers

☛ Coffee Board plans to expand the krishitaranga service it launched a year ago in collaboration with the team of precision agriculture department (PAD), co-founded by 2019 economics Nobel prize winner Michael Kremer, to cover 50,000 farmers. Under Kremer's guidance and leadership, PAD has been working with Coffee Board of India to address the needs of the coffee farmers through coffee krishitaranga service. We have been able to have a positive impact on the lives of 15,000 coffee farmers using a simple missed call service, free of cost to them, said Srivatsa Krishna, CEO and secretary of Coffee Board. The service launched about a year ago, involves a weekly advisory on critical farm operations, updated daily market information through an automated push call via a simple missed call by registered coffee farmers to the call centre. Through this platform expert agronomists of Central Coffee Research Institute (CCRI), call back the farmer and give detailed expert advice on various specific farmer issues. The board has decided to expand it to cover more farmers seeing its success.



## Farmers can now register themselves for PM-Kisan

☛ The government has opened the Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) portal for self-registration by farmers this week, but farmers from West Bengal, the State that has refused to implement the scheme, will still not benefit from the move as the task of vetting the registrations lies with State authorities, sources in the Agriculture Ministry said. Participating in a conference last week, PM-Kisan CEO and Joint Secretary in the Agriculture Ministry, Vivek Aggarwal said the PM-Kisan portal would be made public this week. Farmers who have not been enrolled can use the opportunity to register themselves. Besides, the enrolled farmers can access the portal to check by themselves about disbursements made to their accounts while others whose names were registered but haven't started getting the instalments can carry out minor corrections that are holding back the disbursement. But this will not help farmers from West Bengal, whose numbers are estimated to be around 68 lakh. Farmers from the State may be able to register on the portal, but their names need to be cleared by the State administration to make them eligible for the PM-Kisan scheme, said the sources. Unless, of course, a decision is taken at the highest political level to give West Bengal farmers their due.



## Groundnut output likely to be 40% more than last year

☛ Due to bumper production in Gujarat in this Kharif season, the groundnut output in the country is expected to be around 40% more than last year. According to industry body Solvent Extractors Association (SEA), which keeps track on oilseeds production in the country, the groundnut production is likely to be around 5.1 million tonnes as against 3.73 million tonnes last year. Out of this, Gujarat contribution is likely to be 3.21 million tonnes - more than double by last year's output of 1.59 million tonnes. This year due to timely and sufficient rainfall in major groundnut growing areas of Gujarat, the production has doubled. The yield has improved from 1095 kg per ha to 2071 kg per ha. The area under cultivation has increased from 1.46 million ha to 1.55 million ha, said B V Mehta, executive director, SEA. The government has estimated even more output at 6.1 million tonnes. According to the first advance estimate released last month, the agriculture ministry is estimating an output of 6.1 million tonnes. The price of groundnut is likely to remain range bound due to bumper production this year. The export of groundnut oil is likely to be more due to better availability, said a senior agriculture department official.

# FARM MECHANIZATION

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## A MANDATORY CHANGE

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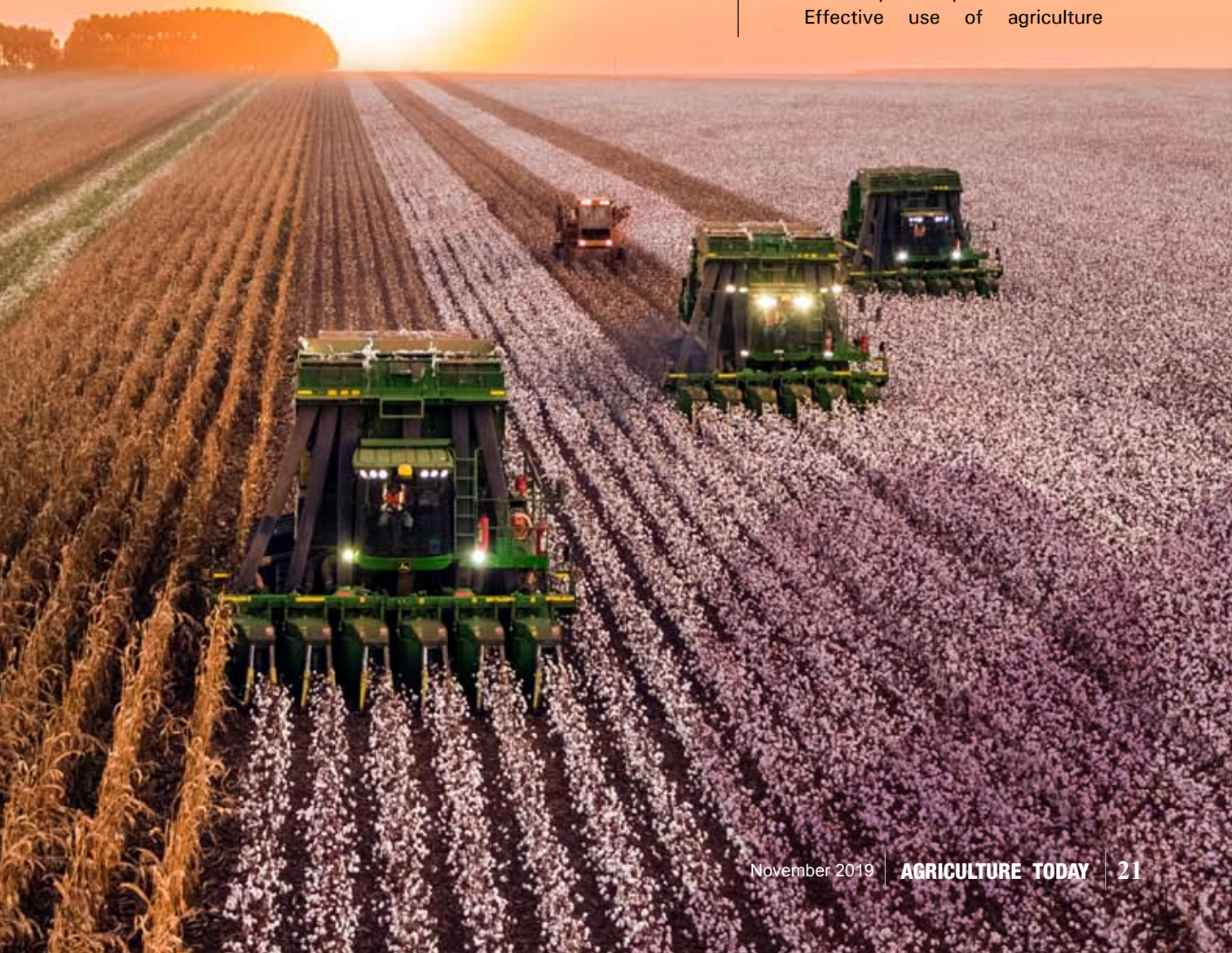


**The scene of agriculture is changing rapidly. Technological innovations that have remained at bay in the initial years of Indian agriculture is gradually making its way into every stage of farming. Mechanization has been an important beneficiary of technology invasion in Indian agriculture. The changing rural landscape has warranted bigger changes in agriculture. Eroding labour resources and hike in the wages have necessitated a shift from manual agriculture to machine based agriculture. Accordingly, Indian agriculture has witnessed many positive changes making the use of farm machines more affordable and universal.**

**T**he future entails bigger challenges and hence would require better changes in the way agriculture is practised.

India will host a larger population and will encounter a reduced share of resources for agriculture. Consistent with the current trend, the share of practicing farmers and agri labourers will decline. According to Economic Survey, Farm mechanization and crop productivity has a direct correlation. Farm mechanization saves time and labor, reduces drudgery, cut down production cost in the long run, reduces postharvest losses and boosts crop output and farm income. Use of improved implements has potential to increase productivity up to 30 per cent and reduce the cost of cultivation up to 20 per cent.

Effective use of agriculture







machinery helps to increase productivity & production of output, undertake timely farm operations and enable the farmers to quickly rotate crops on the same land. By raising a second crop or multi-crops from the same land, there is improvement in the cropping intensity and making agricultural land commercially more viable.

Farm mechanization makes optimal utilization of resources and helps farmers save valuable time and also reduces drudgery. This judicious use of time, labour and resources facilitates sustainable intensification (multicropping) and timely planting of crops, leading to an increase in productivity. India's current level of farm mechanization stands merely at about 40-45%. The level of mechanization is skewed across the country with states like UP, Haryana and Punjab leading with very high level and north-eastern states having negligible mechanization. On a global level, despite India's abundantly strong position in agriculture, this level of farm mechanization is low especially in comparison to other

**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**

agriculturally strong countries such as the U. S. (95 %), Brazil (75%) and China (57%). India's strength in agriculture has been the size of the farm area and the size of cheap and easily available farm labour, the

availability of both of which will be constrained in the future.

According to Economic Survey, Farm mechanization and crop productivity has a direct correlation as farm mechanization saves time and labor, reduces drudgery, cut down production cost in the long run, reduces postharvest losses and boosts crop output and farm income. Use of improved implements has the potential to increase productivity up to 30 per cent and reduce the cost of cultivation up to 20 per cent.

Besides enhancing crop productivity, the new resolve of the government is directed towards increasing farm incomes. One way of approaching this ideal is by reducing the cost of cultivation. Farm mechanization is said to provide a number of advantages including input saving on Seeds (approximately 15-20 percent) and Fertilizers (approximately 15-20 percent). They have also had a profound impact on Increasing cropping intensity (approximately 5-20 percent). Farm machinery also helps in increasing the efficiency of farm labour and

reducing drudgery and workloads. It is estimated that farm mechanization can help reduce time by approximately 15-20 percent. Additionally, it helps in improving the harvest and reducing the post-harvest losses and improving the quality of cultivation. These benefits and the savings in inputs help in the reduction of production costs and allow farmers to earn more income.

Farm mechanization has also been found to impart many social benefits. They can help in the conversion of uncultivable land to agricultural land through advanced tilling techniques. Besides, reduced drudgery and shortening times of farm operation can attract more youth to join farming and attract more people to work and live in rural areas.

### FARM MECHANIZATION – TILL NOW...

Currently Indian level of farm mechanization is below fifty percent. Availability of farm power has been a crucial determinant for the acceptability of mechanization as an integral component of agriculture. Average farm power availability for the cultivated areas of the country has been increased from 0.295 kW/ha in 1971-72 to 2.02 kW/ha in 2016-17. It is pertinent to note that the share of power from tractor and that of electric motor in the total farm power is increasing. However, share of animate power and draught animal power is decreasing. A linear relationship between availability of farm power and farm yield has also been established. Therefore, there is a need to increase the availability of farm power from 2.02 kW per ha (2016-17) to 4.0 kW per ha by the end of 2030.

In accordance with the changing times, tractors and power tillers were sold more over the last ten years. Tractor numbers have increased at CAGR at 6% over the period of 12 years from 2005-06 to 2016-17, while power tillers have also increased with 6% CAGR during the same period. Though the per capita land holding size is decreasing, demand for tractors is still more than power tillers.

The extent the various farm operations are



mechanized varies between 40 to 45 per cent. The harvest and processing segment of wheat and rice are the most mechanized. Mechanization in India has still not looked beyond the conventional farm machines. Tractors constitute the huge bulk of farm machines in India. Tractors constitute the largest segment in the agricultural equipment market in India

Type of Operation	Percentage of operations mechanized
Soil working & seed bed preparation	40
Seeding and planting	29
Plant protection	34
Irrigation	37
Harvesting and Threshing	60-70% for wheat and rice and <5% for others

Source: IndiaAgristat

Year	Agricultural Worker	Draught Animal	Tractor	Power Tiller	Diesel Engine	Electric Motor	Total Power, kW/ha
1971-72	15.11	45.26	7.49	0.26	18.11	13.77	0.295
1981-82	10.92	27.23	19.95	0.33	23.79	17.78	0.471
1991-92	8.62	16.55	30.21	0.4	23.32	20.9	0.759
2001-02	6.49	9.89	41.96	0.54	19.86	21.26	1.231
2005-06	5.77	8.02	46.7	0.6	18.17	20.73	1.502
2012-13	5	5.1	45.8	0.8	16.3	26.8	1.94

Source: IndiaAgristat





and account for over 80 per cent of the total number of agricultural equipment sold in India. In addition, India is the largest manufacturer of tractors and accounts for nearly one-third of the total tractor production in the world. The sale of tractor has been growing due to the increasing rate of mechanisation. Tractors and tractor-driven equipment are the key products of the organised market. The tractor market in India is expected to grow at a CAGR of 7 per cent during 2015-2022. Currently, the total sales for tractors in FY 2017 was 691,631 units with exports accounting for 12 per cent, i.e. 84,650 units. A good monsoon for the current year combined with continued efforts by the government to move towards mechanisation and an increase in construction activity will likely result in significant growth in demand for tractors in FY2018.

Combine harvesters, another key category, is used to harvest grain crops. The three harvesting activities are reaping, winnowing, and threshing. Crops such as oats, rye, barley, sorghum, soybeans, corn, flax, sunflowers, canola, and wheat can be harvested using combine harvesters. The harvester market in India is expected to grow at a CAGR of 14 per cent during the forecast

period of 2015-2022.

Power tillers are widely used in India as they are used in smaller farm sizes and can reduce field-leveling time considerably. By adding different attachments, power tillers can be used for various other processes such as land levelling, seed bed preparation, puddling, ridging, sowing and inter-culture. The increased government focus on farm mechanisation in India has led to the growth of the power tiller market which is expected to grow at a CAGR of 9.5 per cent during 2015-2022. The penetration of power tillers in India is higher in southern and eastern India as compared to the others parts of the country on account of the small size of land holdings per farmer in these respective regions. In fact, small land sizes and high cost of labor, coupled with rising income levels in rural areas, provide a huge untapped opportunity.

While tractors and power tillers still outsell other farm equipment like paddy transplanters and combine harvesters, the gap has closed in recent years. Rural youth population is migrating to cities in search of better paying jobs in services and factories. This is creating a big market for specialized machineries, such as threshers, rotavator, transplanters,

reapers, zero till drills, laser levellers and power weeders.

India is a strong exporter in agricultural machinery with a CAGR of 6.2 per cent over the last four years. India is a leading export market for agricultural machinery and on an average, exports 79,000 tractors annually. India's tractor export markets primarily include African countries and ASEAN countries where soil and agro-climatic conditions are similar to India.

In contrast, the import for agricultural machinery has seen a CAGR of around 6.8 per cent. China continues to be India's leading partner for imports with 10.2 per cent of total imports for agricultural machinery. India's export market is dominated by tractors, with approximately 60,000 units exported per annum. India is the global market leader today for tractor exports accounting for approximately one-third of the total exports. India's largest share of tractor export was to the United States of America in the year 2017. It exported 84,650 units to USA which was approximately 12 per cent of its total exports in 2017.

### **GOVERNMENT BACKED FARM MECHANIZATION**

Farm mechanisation has the potential to raise farmers' income and hence



can play a significant role in realising the government's vision of doubling farmers' income. Several schemes has hence been developed and implemented by the government to aid in the expansion of farm mechanization.

The Government of India through several schemes and policies have tried to further enhance the spread of farm mechanization. Rashtriya Krishi Vikas Yojna (RKVY), Mission for Integrated Development of Horticulture (MIDH), National Mission on Oilseeds and Oil Palm (NMOOP) and National Food Security Mission (NFSM) are the schemes that are intended to expand country's agricultural productivity. Provisions have been made under this scheme to adopt farm mechanization and hence the government has accorded an important status to the sector.

Under the National Food Security Mission (NFSM) launched in October, 2007, provisions for assistance (up to 50 percent the cost of machinery) have been provided for adoption of farm machinery such as pump sets, tractor mounted sprayers, seed drills, zero till seed drill etc. to varying degrees. Similarly, under the Mission for Integrated Development of Horticulture (MIDH), an important intervention is

'Horticulture Mechanisation' which aims to improve farm efficiency and reduce drudgery of the workforce. Assistance in this regard is provided for activities such as procurement of power operated machines and tools, besides import of new machines. Assistance is also available to grower associations, farmer groups, self-help groups, and women farmer groups etc. (with more than 10 members) that are engaged in cultivation of horticulture crops. 60 percent of the cost of machines will be borne by such groups. Mission on Agricultural Extension and Technology (NMAET) also includes a Sub-Mission on Agricultural Mechanisation (SMAM) which is implemented in all the states to promote the usage of farm equipment and to increase the ratio of farm power to cultivable unit area up to 2kW/ha.

Sub-Mission on Agricultural Mechanisation (SMAM) under the Ministry of Agriculture was started in 2014-15. This scheme is implemented in all the states to promote the usage of farm mechanisation and increase the ratio of farm power to cultivable unit area up to 2.8 kW/hectares by 2022 under its new 7-year plan. SMAM is a sub-mission under National Mission on Agricultural Extension and Technology and

enlists 8 components under it which ranges from promoting agricultural mechanisation through training, testing and demonstration to providing financial assistance to farmers to help them procure agricultural machinery and equipment.

Capacity building and training are essential parts of the sub mission because they aim at sustainability and ensure proper utilisation of the technology to maximise productivity, thereby increasing returns for farmers. States with low mechanisation like the north-eastern states and others need special attention and had been neglected before the implication of the sub mission. SMAM aims to promote farm machinery and equipment in these states and has incorporated it as a component of the sub-mission.

The 7-year plan which ranges from 2016-17 to 2021-22 implemented from August, 2017 has defined new targets for the sub-mission

- Farm Power availability of 2.8 kW/hectares to be achieved by 2022 from the existing level of 2.02 kW/hectares in 2016-17.
- 1,48,000 trainees to be trained to develop skilled manpower in farm mechanisation sector.
- 10,270 agricultural machineries to be tested.
- 2,80,000 CHCs to be established



- at the village level.
- 19,000 demonstrations to be organised on farmer fields.
- 19,00,000 numbers of farm machinery to be distributed under SMAM.
- 8 new Farm Machinery Training and Testing Institutes (FMTTIs) to be established in addition to the existing 4.
- 2,00,000 beneficiaries to be benefitted from distribution of farm machinery for individual ownership in north-eastern and Himalayan region.

National Portal on Mechanisation and Technology is an active online portal developed and launched by Department of Agriculture to help farmers across the country to get acquainted with and apply for all types of schemes and subsidies they are eligible for. Online booking for farm equipment testing, financial assistance application and other numerous facilities can be directly accessed by farmers even in remote villages. Portals are also separately available and functional for state level schemes and policies under SMAM and other missions like RKVY, MIDH, NMOOP and NFSM which allow aid and subsidies for farm mechanisation across all crop types, ranging from cereals, horticulture crops to oilseeds as per their functional guidelines and regulations.

### THE RIDE OF FARM MACHINES IS NOT SMOOTH IN INDIAN TERRAIN

Indian agriculture is desperately looking for ways to enhance farm productivity. Farm mechanization has demonstrated successfully that it can increase agriculture yields. However, there are some inherent challenges for the adoption of farm mechanization. More than eighty per cent of the landholdings in India is less than 2 hectares, making not only the farms smaller in size for successful operation of farm machines but also reducing the investment potential

of such farmers. This explains the rather slow expansion of farm mechanization in India.

To ensure return on investment and make investment profitable in farm mechanization, farm machines need to be engaged continuously. The area under operation should be ready to take more crop per year. Unfortunately, assured irrigation facility is still non-existent in most of the farms.

India has until the recent past not looked beyond the conventional tractors. In fact whatever mechanization that have happened in India can be attribute as tractorisation and not mechanization in the true sense. Tractors have an annual market of 600,000-700,000 units in India whereas, threshers, the next largest segment, has an annual market of just 100,000 units. The penetration of tractors has grown from one per 150 hectares to one per 30 hectares on agricultural land. However, such a growth in penetration has not been seen in other agricultural implements. It is to be noted that for a sustainable agricultural future, other farm implements, and not just tractors, need to be advanced to farmers in the country.

The huge financial requirement that comes with the purchase of farm equipment are an important deterrent to farmers. The availability of institutional credit does not make matters easier either. The procedure to avail agriculture term loan is more cumbersome than production credit. Availability of suitable officer with required technical appraisal skill is also key issue for the banks, which is also creating hindrance for smooth disbursement of term loan for various activities helping farm mechanization. The rate of interest for farm mechanization activities is higher.

Subsidy is based on the budget allocation, not on requirement basis. Farm mechanization requires substantial investment. To assist farmers, to withstand the burden of

principal and interest, Central Govt. and various State Govts. have been providing subsidy for Individual/ Group of farmers/ Cooperative to invest. These subsidies are available based on the budget allocation made by Central/ State Govt. there is need to change the approach from allocation based to requirement based.

Farm mechanization has to some extent altered some of the agricultural operations. However, many Indian farms rely heavily on manual labour. The level of farm mechanization behaves inversely with population engaged in agriculture. Unless and until, there is lucrative alternate option for livelihood, promotion of farm mechanization will not be successful.

A wide variety of equipment, machines meant to mechanize several stages of agricultural operations have still not been able to take away the focus from tractors, power tillers, combine harvesters and threshers. There are many other self-propelled machineries and equipment, which are suitable for small land holdings and can be used by even individual farmers. Farmers are not aware about these kind of machineries and implements and methods of using them.

### THE WAY TO CHANGE

Farm mechanization has become an unavoidable change. But transplanting the idea of farm mechanization practiced elsewhere in the world need not hold well under Indian conditions. The per-capita land holding of Indian Farmers is decreasing which necessitates popularization of small farm machineries / implements (individually operated) keeping in view of the versatility of various crops, cropping pattern and agriculture operations. We should look at other countries for ideas and models and look inwards at innovators. The 'Make in India' initiative launched by the Government can be used to support the manufacture of inputs and farm implements. Considering



the preponderance of small & marginal holdings in the country, R and D should aim at developing and designing scale-neutral machinery. Further, machinery that can suit different terrain of the geography deserves priority attention.

Finance must be made easier. Ease of financing like KCC, procedures to avail term loan may be simplified with minimum documentation. Capacity building of bank staff dealing with agriculture term loan products may be ensured. To motivate banks for financing farm mechanization, it is pertinent to devise framework that would strengthen the credit policy for farm machinery in India. Credit guarantee fund currently facilitates loans for micro, small and medium enterprises (MSMEs) and producers organization. Similar models should be devised for farm machinery sector as well.

Agriculture Machineries can become part of 'Farming as a Service' (FaaS) as recommended by Committee on Doubling Farmers' Income, which means, that farmers should have easy access to mechanization and related services on rent in preference to owning the same. This can be facilitated by promoting 'Custom Hiring Centres' (CHCs) at the rate of a minimum of

1 (one) per village (when large) and 1 (one) per Gram Panchayat comprising in cluster of small villages. These should be able to meet the demand for all basic services, and would therefore be expected to possess low duty machinery. 'Agriculture Machinery Banks' (AMBs) at the district/sub district level, possessing heavy duty machinery like combine harvester, laser land leveller etc., is another recommendation. 'State/Regional Services' possessing more sophisticated and heavier machineries can service larger areas to meet certain specific demands; and also possess ICT/GIS/ Space technology based services. These centres at different levels, should be supported to broaden their technologies to include modern systems like drones, sensor based applications, etc.

The youth can be specifically trained and financially supported (credit linked back-end subsidy) to set up CHCs. In order to make such enterprises viable, other agricultural services can also be integrated to offer 'One Stop Shop'.

Aggregation platforms can be tried in farm mechanization. Uberization is feasible in agricultural mechanization. This can be made possible by networking of individual owners, CHCs, AMBs and Regional/

State Service Centres by onboarding a common platform and meeting the demand in real time and cost effectively. Professional Service Providers with large investments and capable of establishing a brand name can opt to promote franchise model for quick scale up across the region/state. The youth can grow up professionally as franchise based entrepreneurs. Since agricultural operations are seasonal and time bound, the farmer in need of a service cannot afford to wait and would benefit only if response to his call is positive with nil/least time lag. Further, transaction cost will need to be rational, and therefore, the machinery will need to be sent to the farmer's work site from the nearest location. Uberization is the most optimal solution to such demands.

It is also important to ensure availability of repair and service facilities in close proximity, so that operation & maintenance issues are addressed. Mobile service centres can also be promoted to cater to minor repair demands.

The future necessitates judicious use of resources and wise decisions. Farm mechanization has demonstrated yield increments. Our resolve should be to facilitate transition to machine based farming.



# ENHANCING THE FARM PRODUCTIVITY & REDUCING WATER USAGE THROUGH NEXT GEN TECHNOLOGY

**Sonalika International Tractors Ltd., the 3rd largest tractor manufacturing company in the country with the bestselling tractors ranging from 20HP-120 HP, is well recognized in both Domestic and International market as a formidable player & has earned the trust of over 9 lakh patrons in more than 100 countries across the globe. The proud recipient of various awards like Global Innovation Award'19, Global Agriculture Leadership Award'18, Best Brand Award'18 by The Economic Times of India and many more, Sonalika has been providing superior technology to farmers globally and was chosen by Govt. of India to be a part of NITI Aayog for doubling farmer's income by 2022. In an interview with Agriculture Today, Mr. Raman Mittal, the Executive Director of Sonalika Group converses about the changes that has happened in Indian farming scenario. With him at the helm, the company has doubled its volume and grown its market share over the last four years by achieving a significant milestone of 1 lakh tractors in one year FY18. Following the growth trajectory, the company in FY19 registered Highest Ever sales of more than 1,14,000 tractors. He spearheaded the layout, set-up and inauguration of the World's No. 1 largest integrated tractor manufacturing plant which stands as a testimony to the strong belief of 'Make in India'. He has invested the company's energies in the state-of-the-art innovation (R&D) centre, incorporating the best global practices offering customized solutions for the farmers. Today, the plant is fully equipped to manufacture from sheet metal to everything which goes under manufacturing a tractor, to meet the ever-increasing demand from more than 120 countries across Asia, America, Europe, Africa and Oceania.**



**What changes have you witnessed in the way farming is practised in India? How has Sonalika contributed to the same?**

Farming in India has undergone a spectacular transformation from the basic farming to mechanised way of farming. The transformation is resultant of years of research and development and trials that eventually has made an impact on our food production front. But still year after year, farmers are dependent on the vagaries of rainfall and weather patterns. Instead of rhetorical promises and reactive concessions, they require a long-term sustainable solutions. This includes the intervention of mechanization solutions, which can provide

**SONALIKA**  
HEAVY DUTY. JAISE AAP.

customized crop centric solution to ensure their prosperity through saving time and efforts. We at Sonalika, feel customized crop centric solutions play an important role in bringing an effective farming through various technological innovations leading to more income.

We, with an endeavour to provide product which are best suited for farmers to increase their productivity and which can reduce or optimize the use of water, we have clearly demarcated our focus towards being farmer centric brand. Following this approach we have understood the fact

that farmers across the globe growing different crops have different needs & we take it as our responsibility to offer them the products which are customized according to their diverse needs.

In alignment of the same, we have developed more than 1000 technologically superior variants in the widest product range of 20-120 HP. Believing not only in the concept of Make in India but also to make quality products in India, we have established the World's No.1 Largest Integrated Tractor Manufacturing Plant in Hoshiarpur, Punjab ensuring the high quality standards. Considering the product quality at the first and foremost requirement of farmers has led us to gain the



farming solutions to farmers globally with a more satisfying experience. We have developed extensive range of implements which help farmers to increase their productivity and can reduce the usage of water.

### **Beyond providing best agri solution to farmers, Howis Sonalika helping the society?**

Believing in the concept of growing together, we have set up 54+ skill development centers across India to provide training to farmers/technicians on different topics. This year we

trust of over 10 lakh farmers & be a dedicated farmer centric brand offering complete farming solutions to farmers globally.

### **What according to you is the scope of farm mechanization in Indian agriculture?**

Indian farmers have a remarkably lower earning per capita compared to the world average because of the low yield per hectare of their farmland. However, this can be addressed by encouraging mechanization of farming process which would, in turn reduce the cost of input and improve productivity, thereby increasing the overall profitability of the farmers. Although there is a wide scope for process mechanization in the country, the unwavering focus on tractorisation has led to tractors being the most common machine on Indian farms, at the expense of specialist machines such as combine harvesters etc. These machines play a significant role in the sector as the use of tractors are not diversified and not just limited to farming. Tractors today are also used for non-farming purpose which is helping the user to earn more in the toughest farming situation.

### **What is the growing concern of agriculture these days?**

Agriculture across Asia extracts nearly 80% of its accessible fresh water for irrigation. Various industries continue to dump disproportionately into the water resources which leads to



polluting them. Hence we desperately need to conserve water. The World Economic Forum calculates that there will be a 40% deficit in the available fresh water which is an indicator for us to solve this growing concern. We are extensively working in order to provide solutions which can help in resolving issues like these.

Our R&D team which is one of the biggest in the tractor industry conducts detailed market surveys to understand the evolving needs of farmers & provide best possible solutions. Our focus has led us to continuously invest in bringing the latest technologies following which we have set-up the new innovation center in Delhi NCR along with the one in Hoshiarpur plant, to provide technologically advanced products to resolve the growing concern of farmers globally.

Our focus on the farming community makes us a dedicated brand with imperishable efforts to offer complete

educated over 2300 technicians/farmers. While touching million of hearts, we have uncompromisingly catered towards the development of the society & inspired farmers to excel in their fields. Sonalika CSR is dedicated towards the upliftment of the society with this very vision we are doing CSR for past 13 years. We focus on Women, Children, Sports, Environment, Rural India and Sanitation. Be it sports or any necessary infrastructure support, Sonalika CSR always tries to help the people in the best possible way. Initiatives like Udaan for women empowerment, Clean & Green for environmental protection, Swachh Dhara for water sanitation etc. are in line with the growth of society. We are extensively working on scalable solutions to curb crop residue burning, air pollution & in line with the same we have adopted 50 villages in Haryana to implement this project.

# DEVELOPING BLOCK AGRI-PRODUCTS CAN BE A BIG EXPORTS SPINNER



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**E**merging economies already injected new dynamics into global trade and the emerging economies are certainly doing a great deal by way of pushing up the global average. The region of Asia, which covers many of the emerging economies, had outperformed all other regions with an increase in terms of export volume.

## **BUT.....**

Current trends indicate that not only India but the developing countries also increased their share in manufacturing exports during the 1990s but saw little expansion in agricultural exports, barely maintaining their share of around 36 per cent after losing market shares during the 1980s. All of their gains in agriculture during the 1990s came from expansion of their exports to other developing countries. Share of India's agri-exports in the global trade in agri-commodities till now hovers around 1 per cent! More than 48 per cent of world agricultural trade is still accounted for by trade between industrial countries — about the same share as in 1980-81.

## **EXPLORING PLENTY OF HIDDEN RESOURCES**

Needless to repeat that the global market for these products is a tremendous one and it goes without saying that if systematically tapped there lies immense scope ahead, especially for the least developing economies as the latter virtually depends on a handful of agri-commodities to earn foreign exchange. Of course the absolute advantages as well as comparative advantages must be fully reaped. For example, India produces grapes twice a year — a rare advantage and gift of nature which other leading producers do not have.

Especially, trade in fruit and vegetable products has been among the most dynamic areas of international agricultural trade, stimulated by rising incomes and growing consumer interest in product variety, freshness, convenience, plus year-round availability. Undoubtedly, advances in production, postharvest handling, processing and logistical technologies — coupled with increased levels of international investment — have played a facilitating role.

Specifically, for developing countries,





trade in these products has been attractive in the face of highly volatile or declining long-term trends in the prices for many traditional export products. This is also a fact simultaneously that, in spite of many developing country suppliers having entered the field (process is on: Venezuela, Bangladesh in mango market), relatively few have achieved significant, sustained success, which, in turn, adequately reflects the fact that the industry is intensely competitive plus rapidly changing.

What is more, these commodity markets de facto exhibit a complex political economy – domestically and internationally. Undoubtedly, the arcane nature of many policy interventions in these commodity markets and the many heterogeneous interests exacerbate this complexity. It must be agreed upon that identifying superior policy options is not difficult, but what is pertinent on this score is the fact that the feasibility of reform depends on the power of vested interests and the ability of governments to identify tradeoffs and possible linkages that will allow them to pursue multiple goals (food security, income transfers, expansion of domestic value addition etc) more efficiently.

### **SYSTEMATICALLY TACKLING THE PROBLEMS**

The steadily marching, forward going preferential and regional agreements often bar low-cost producers from entering the internal markets covered by agreements. Quota allocations are concentrated in a few, often high-cost



countries, which are generally not the poorest. (For instance, Mauritius has 38 per cent of EU quotas. Thailand, a very low-cost producer, is limited to a 15,000 ton quota in the United States, whereas the Philippines has a quota 10 times larger that often goes unfilled.)

But there are a number of major problems which are required to be tackled at a quicker pace so as to ensure that the future prospects are far brighter.

### **LET US HAVE A CLOSE LOOK AT THAT.**

Though the latest trends indicate increasing demand pattern in the agriculture sector, several problems loom large such as lack of a broad raw material base in terms of the kinds and varieties of fruits and vegetables suitable in all respects for processing and their availability in commercial quantities at prices economical to the processing industry. Invariably, the cost of the raw material is high; low productivity and poor quality of the produce as compared to the very

high levels obtained in the advanced countries affect processing and none of the processing units work to full capacity utilization. What is more, the produce that is taken up for processing is devoid of the quality attributes or characteristics required for processing. Lack of a proper marketing strategy to meet the raw material requirement of processing units and ensuring a sustainable export market for the processed products has been keenly experienced.

Due to poor infrastructure in handling, transport, marketing and processing, horticulture as an industry has failed to register commendable growth in economies like India. Infrastructure stands tall to block the prospects—particularly transportation, road networks and freight and cargo facilities (the freight rates in India are reported to be higher than those prevalent in some other countries, the very fact that does very little to improve our competitiveness), cold storage facilities, etc., coupled with inadequate post-harvest management

which affect the produce and products. Poor and inconsistent quality of processed products and inadequate export promotion are also hindering the growth prospects. It is the residual rather than the fresh produce that is often taken up for processing, which has a bearing on quality.

It is a fact that fruits and vegetables are generally constrained by poor price support, credit support and delivery system. Inadequate supply of power, water and research and development support exist as no less constraints. The quality of packaging also leaves much to be desired – simply not market-oriented – as importing countries demand specific packaging for each produce and the use of biodegradable materials resulting in high cost of packaging.

Then the question surfaces from another angle: trade distortions (border protection) and domestic subsidies – the major factors that have been affecting world markets. It has been the experience that large trade distortions impede trade flows, depress world prices, and discourage market entry or delay exit by noncompetitive producers.

Climatic factors must not be lost sight of as well. The high risk for water-related yield loss in rain-fed agriculture makes farmers avert risk, which in turn, influences their perceptions on investments in other production factors such as labour, improved seed and fertilizers. Because of the risk associated with climate variability, smallholder farmers are generally and rationally keen to start by reducing risk of crop failure due to dry spells and drought before they consider making investments in soil fertility, improved crop varieties and other yield enhancing inputs. This, in turn, together with the fluctuations in yields, makes it hard for resource poor men and women in semiarid areas to respond effectively to opportunities made possible by emerging markets, trade and globalization. Rainfall micro-insurance, on this score, can



increase agricultural production.

Simultaneously, this is also a fact that the dramatic commodity price increases seen in 2007 and 2008 triggered a record number of export restrictions, in particular for rice and wheat, which led, in turn, to even greater price hikes, and hindered sufficient and timely procurement of much needed food aid. Export restrictions (bans, quotas or taxes) are often imposed by governments as a means to promote domestic food security. Although they may bring some short-term relief to domestic consumers, still their overall impact on the domestic economy as well as on the rest of the world is assessed to be negative. The expected gains from export restrictions are often not realized in practice.

### TOWARDS A WIN-WIN SITUATION

That is why alternative measures

are required to be taken also by the governments to safeguard food security. A crucial element is supply augmentation, which requires strengthening of the agricultural sector, especially in developing countries for which this should also remain a priority. There are a number of alternative measures, countries could implement to achieve food security without harming their producers and without triggering even higher global prices.

Farmers in developing countries could form agricultural cooperatives, which could then sell their shares to both domestic and foreign citizens and institutions. The generated funds could be used to improve irrigation and storage facilities as well as undertake agronomic research. This should help to increase both country specific and world supply and do away with export restrictions.

The world has to craft improved trade disciplines on agricultural export restrictions since existing agricultural trade rules are primarily focused on the problems of exporters (viz. high border protection, domestic support and export subsidies) and have practically ignored the importers' main problem, which is unreliability of supplies. As the things stand now: given the uncertain fate of the Doha Development Round, it is better not to pin much hope in the short run on the agricultural negotiations. Greater supply assurances could motivate import-sensitive countries to undertake greater market access opening. The idea of a separable "exporters' code" or "food security code" – which could be pursued in case of a long-term suspension of the Doha Round – that include self-restraint on both export subsidies and export restrictions may be welcome.

So a series of practical, relevant steps, implementable in a time-bound manner, is the crying need so as to register a good growth within a shorter period of time.





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# TRUSTEA

## THE CODE TO A PERFECT TEA

*trustea* is an Indian sustainability code and verification system for the tea sector, which addresses some of the sustainability challenges. The 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. *trustea* Code encompasses all aspects of tea manufacturing and supports sustainability across the chain by improving productivity, quality and maintaining safety standards. It supports smallholders and estates in improving the competitiveness of tea gardens by positively influencing the practices and scale of production, farm organization, processing, new technologies and supply chain development. In an interaction with Agriculture Today, Mr. Rajesh Bhuyan, Director, *trustea* discusses the relevance of having a code and verification system for Indian tea and its impact.



### What are *trustea*'s vision and business objectives and its approach to reach those objectives?

The vision of *trustea* is providing safe tea for consumers, good livelihoods for producers, workers and their families, whilst at all times caring for the natural environment. On similar lines, *trustea* aims to sustainably transform the Indian tea industry for the benefit of consumers, workers, farmers and the environment, by verifying tea producers against a



world-class sustainability code of conduct. Further, working with tea industry to address key sustainability challenges such as food safety, stagnating yields, pest and disease control, living wages, worker welfare and equality, preservation of biodiversity and improvement of livelihood of smallholders.

**What are the standards of tea maintained in India? Can it be equated with international standards?**





It is not appropriate to compare standards across regions, as it is important to recognise the Indian context when it comes to the requirements of farmers. trustea program is developed to tailor global sustainability principles to Indian conditions and encompasses compliance with Indian legal requirements. The trustea program has been developed in line with international certification bodies and it incorporates elements from these programmes, such as management system, soil conservation, water management, fertiliser, Plant Protection Formulations (PPFs), occupational health & safety, biodiversity, working conditions and labour rights, and waste management.

### **What are the measures used to ensure safe and sustainable tea cultivation in India?**

trustea is driving a multi-faceted effort for continuous improvement of tea-producing farms and plantations. trustea program is a multi-stakeholder initiative to establish sustainable practices and to strengthen the ecosystem for tea

cultivation in India based on ground realities with globally-accepted sustainability principles. trustea Code encompasses all aspects of tea manufacturing and supports sustainability across the value chain by improving productivity, quality and maintaining safety standards. It supports smallholders and estates in improving the competitiveness of tea gardens by positively influencing the practices and scale of production, processing, new technologies and supply chain development.

### **How can the standards of Indian tea be trusted by the customers?**

The Code ensures the long-term sustainability of the industry, by improving the prevalent practices of the fast-growing smallholder segment and mainstreaming the bought leaf factories and small estates into the sustainability fold. The compliance to the code is validated by reputed third-party audit agencies and there is monitoring of compliance through fixed internal and external audits. The certification validates that the tea is being produced in a sustainable manner under the three pillars of

trustea – Environment, Safety and Livelihoods. The communities associated with trustea have started feeling the changes. We encourage you to read the stories pertaining to smallholders and estates taking part in the program, through the following web link: <https://trustea.org/wp-content/uploads/2019/05/trustea-stories-from-the-field.pdf>

### **Can you explain how trustea is helping in the sustainable development of tea plantation, plantation workers and consumers?**

trustea follows an approach that focuses on continuous improvement, wherein mandatory criteria to be adopted in the first year are aligned with the laws of the land. Compliance with the Code helps improve competitiveness for tea estates and makes it possible for them to comply with national regulations and in future, with international sustainability standards. The verification under the Code provides consumers with the assurance of responsible production and provides producers with the opportunity to credibly demonstrate it to their customers.

## 5TH EDITION OF WORLD COFFEE CONFERENCE & EXHIBITION COMES TO INDIA FOR THE FIRST TIME

International Coffee Organization (ICO) under the aegis of the United Nations is organizing its 5th Edition of World Coffee Conference to be held at Bengaluru from September 7th to 9th 2020. The Ministry of Commerce & Industry, Government of India will host the 3-day event themed, 'Sustainability Through Consumption' that will observe diverse characteristics and varieties of coffee in an immersive experience with conferences addressed by international speakers, coffee exhibition, buyer sellers meets, competitions and awards, skill-building workshops, amongst many others.

Coffee is the world's most favourite beverage with 2.5 billion cups consumed every single day and produced in about 70 countries most of them belonging to the developing countries like Africa, Latin America and Asia. India is the sixth-largest producer of coffee in the world, accounting for about 5% of world coffee production. With countries like India, Vietnam, Indonesia, Nepal accounting for almost 33% of the world coffee production and consumption growing anywhere between 6% to 15% as against the world average of about 2% growth YoY, Asia has become a region of high importance in coffee business.

WCC 2020 will witness the participation of 78 member countries of the International Coffee Organization of which India is one of the founding members. WCC 2020 will address the challenges that farmers across the world are battling such as climate change, increasing cost of production and falling prices. World Coffee Conference will focus on economic, agricultural, commercial, environmental, social & cultural impact of Coffee.



The curtain raiser conference of WCC was attended by the diplomats of various countries like Bulgaria, Guatemala, Czech Republic, Yemen, Angola, Liberia, Tunisia, Costa Rica, Colombia, Korea, Russia, Hungary, Papua New Guinea, Gabonese, Mexico Sweden, Taiwan, Zimbabwe, Netherlands and Nepal.

Shri Piyush Goyal, Hon'ble Minister for Commerce & Industry and for Railways, Government of India while welcoming the event's maiden venture into India, urged, "an out of the box approach to make it an outstanding event in the global coffee landscape and become a catalyst for innovations and attracting investment to the sector in India. I commit the full support of the Ministry of Commerce and all its agencies like Coffee Board of India to the organizers to make this event a resounding success. He emphasized that efforts should be made to make sure that the farmers can become stakeholders in the value chain and benefit from the technologies which will connect farmers to the end consumers resulting in getting better value to their produce. The initiatives

like the use of Blockchain technology are significant in this direction. WCC should focus on addressing some of the concerns related to Health and convey the benefits of Coffee."

Shri. Jagadish Shettar, Hon'ble Minister for Large and Medium Scale Industries, Government of Karnataka said, "I would like to welcome ICO and all participating delegates to India for The World Coffee Conference. Karnataka is the coffee capital of India and we are ecstatic at the opportunity to host the 5th edition of the mega event that will see participation from all key stakeholders globally. This is going to be a significant step in making India emerge as a major hub for coffee industry from farm to cup. Karnataka accounts for 68.7% of India's coffee output. WCC offers an excellent opportunity to showcase India as a major coffee destination and particularly Karnataka as the most preferred state for global coffee industry to invest in."

Commenting on bringing this event to India, Mr Jose Dauster Sette, Executive Director, International Coffee Organization said, "I am



delighted to be here for the curtain raiser event to announce our 5th edition of World Coffee Conference. This is the most important event on our calendar which marks the time when the ICO gathers all leading experts from across the world to discuss the most important challenges the world coffee sector is facing today. Asia is extremely important when it comes to coffee as coffee has been produced in the region for many centuries. In the past three decades, the Asian share of world coffee production has grown from 16% to 32%." Commenting further on why India is hosting this prestigious event, he said, "India is the world's seventh-largest coffee producer and is the fastest growing consumer market, known for growing both the important varieties of coffee – Arabica and Robusta."

While addressing the audience, Shri Anil Kumar Bhandari, President, India Coffee Trust said, "India is poised for a great leap forward in the growth of this vital sector. Coffee consumption is showing accelerated growth in India and with a little added investment we are positive it could result in a thriving vertical in our economy. Today 3.50 lakh coffee farmers in India are suffering immense hardship brought

on by huge global surpluses. This is even though India itself has no unsold coffee. What we produce is either exported or consumed domestically. We are grateful to ICO for organizing this prestigious conference that would bring together all the major coffee manufacturers and retailers. At the WCC 2020, we are hoping that one of the cornerstones of this strategy is to rapidly increase coffee consumption in Asia, especially in India."

After four successful coffee conferences held in London, Brazil, Guatemala and Ethiopia, India will be the first-ever Asian country to host the 5th edition of World Coffee Conference.

WCC Conference will focus on global best practices in Coffee production, new technologies, Coffee and Health. Global CEO's meet will be a major highlight of the event wherein it is expected that best of global coffee companies' leaders will discuss ways to promote coffee consumption and address the issues pertaining to price crises. The participants will attend a host of Workshops on coffee Roasting, Grinding, Brewing of Coffee, Cooking with Coffee and soon. There will be special focus on small farmers and special workshops will be conducted for them.

WCC Exhibition will attract several country pavilions from Latin America, Africa and Asia where in world's best and unique coffees will be on offer. Coffee technologies and equipment from plantations to Coffee Roasting, Coffee dispensing for in-home and out of home consumption will be on display. World's leading coffee brands and café chains will be participating in the exhibition. The unique shade-grown coffees of India will be showcased to buyers from across the world who will be participating. With the assistance of scheme under Ministry of commerce Govt of India Buyer seller meets will be conducted which will bring Indian coffee growers face to face with global coffee buyers, coffee brands and café chains for them to source their coffees from India,

Coffee planters, industry captains, foreign delegates and coffee enthusiast golfers of the Golf Championship will also be invited to participate. The event will also feature exclusive visits to coffee estates in India located in Coorg, Chikamagalur, Sakleshpura as well as other regions for the serious coffee buyers as well as curious coffee enthusiasts and connoisseurs of fine taste.

## EUROPEAN UNION SEMINAR ON FOOD STANDARDS, FARMING POLICY AND TRADE -DELIBERATION ON WAYS TO BOOST EU-INDIA TRADE IN AGRI-FOOD PRODUCTS



**F**ood 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 European Union (EU) share similar values when it comes to 'food culture'. It is integral to the rich array of food production, tightly bound up with the unique farming practices resulting in distinct products.

In the EU, as in India, consumer protection comes first. A high level

of health protection is the paramount objective of all EU laws in the food and farming sectors. The EU has, therefore, harmonised its food safety and quality regulations throughout the Union under the concept 'from farm to fork'.

The European Union guarantees that its food and beverage products are safe, authentic and of high quality, and in order to explain it better and have a dialogue, the EU Seminar on Food Standards, Farming Policy and Trade in Andaz Hotel, New Delhi was held on 10-11 October 2019. The seminar brought together food and farming policy experts from the European Union, representatives of major EU food sectors (including dairy, meats, fruit and vegetables as well as wines and spirits), Indian government, research and academia and business representatives. The EU and India had the opportunity to share views and exchange best practices on policy and regulatory perspectives on harmonised food safety and quality model and sanitary and phytosanitary standards in the world that can ultimately benefit both farmers and consumers.

On the EU side, the seminar was attended by H.E. Mr.Ugo Astuto, Ambassador of the European Union to India along with other EU experts and officials. Agriculture and Commercial representatives from different EU Member States were also equally present. From the Indian side, there was Pawanexh Kohli, Advisor, National Center for Cold Chain Development, while government officials and State agriculture departments



representatives participated as well.

In the inaugural session, H.E. Mr.Ugo Astuto stated that "The high-level forum will deepen our mutual understanding. It shall create a positive environment for further enhancing EU-India's trade relations & boosting bilateral trade in agri-food." Pawanexh Kohli commented that "The question we should be asking is - How to make sense of our food? It is possible only when we have the right standards." According to him the standards cannot be one-sided, but of mutual construct and designed to provide a win-win for all in the ecosystem.

Among the topics discussed, this seminar deliberated on EU food and farming policy and food safety regime, consumer protection, geographical indications and other key issues. This was followed by dedicated, business-led sessions on dairy, meat, fruit and vegetables, wines and spirit drinks and olive oil.

The seminar deliberated on

"How to boost EU-India trade in agri-food products". Chaired by Mr John Clarke, International Affairs Director from Directorate General for Agriculture and Rural Development of the European Commission, the debate included distinguished Indian panelists including representatives of the Forum of Indian Food Importers and the Food Safety and Standards Authority of India. This Open House provided an opportunity for both sides to discuss key EU policies in the agri-food sector, benefits and challenges of the Indian market, especially to the European businesses.

An intensive discussion on EU-India Agri-Food Trade concluded that while there are challenges to be tackled, there are immense opportunities for both sides to boost their two-way trade on agri-food products.

The EU is India's largest trading partner. However, two-way agri-food trade can be greatly improved. The EU has a negative trade balance with India and sees opportunities for increasing exports to this vibrant and growing market. Overall, the value of EU imports in the agri-food sector from India amounted to € 3153 million in 2018 and continues to increase, creating a great opportunity to the Indian producers. In the same year, the EU exported to India agri-food products of the total value of just € 849 million.





## Massmerize 2019 - Retail, FMCG & E-commerce Conference



**F**ederation of Indian Chambers of Commerce and Industry, the largest, oldest & the apex business chamber of India, had taken the initiative to organize 'Massmerize 2019 - Retail, FMCG & E-commerce Conference' in Delhi on the 16th of October. Speaking at the conference, Dr Krishnamurthy Subramanian, Chief Economic Advisor, Ministry of Finance, Government of India urged the Industry to capitalise on the measures announced by the government and RBI and start making the investments required to boost growth. He further stated that industry must play the leadership role in making investments.

"Investment has to be long-term and corporates should focus on the long-run. The fundamentals of the economy are fundamentally as strong as before. This gives an immense opportunity for corporates to be able to benefit from consumption by doing the investments that is required to be able to put economy back on the 7% plus growth path to make the country a \$5 trillion economy by 2024-25 and \$10 trillion by 2032," the CEA said.

He further reiterated that in order to achieve the target of USD 5 trillion economy by 2024-25 and USD 10 trillion by 2032 it is imperative that the corporates should also set-up benchmark with regards to honouring contracts of MSMEs and by making timely payments. In order to increase

consumption, Dr Surbramanian emphasised that the corporates should also focus on the technology and big data. He said that consumer data can be used to find the preference as well as predict timing of consumption thereby getting a holistic view for making investments much sharper.

In the conference, Mr.Sanjiv Mehta, Chair, FICCI FMCG Committee and Chairman and Managing Director, Hindustan Unilever Limited said, "Those who can re-imagine and impact the entire value chain are going to be the real gainers."

While highlighting that the Indian retail is one of the fastest growing industries across the globe and is expected to cross USD 1 trillion by 2021, Mr.Krish Iyer, Chair-FICCI Retail & Internal Trade Committee and CEO & President, Walmart India Pvt. Ltd said, "It is heartening to know that RBI and the government are working in tandem to address the challenges faced by the industry."

Mr.Herjit S Bhalla, Co-Chair FICCI FMCG Committee and Managing Director, Hershey India welcomed the recent steps taken by the government to improve the retail sector. He also highlighted the importance of using vernacular communications to engage with consumers. "It is important for companies to speak a language that consumers desire and understand," he said. He further emphasised on investment as a long term vision.

Mr.Raghav Rao, Co-Chair FICCI E-Commerce Committee and Vice President- Finance and CFO -Amazon Seller Services P. Ltd said that in order to achieve overall economic growth, it is important to partner with local or kirana stores as they have now become both adoptive and adaptive to new technology.

FICCI-Deloitte report 'EVOLVE for consumer' was also released during the event according to which Indian Retail market is to reach USD 1200 billion by 2021 and USD 1750 billion by 2026 and Indian E-Commerce market to USD 84 billion by 2021 and USD 200 billion by 2026. The report also highlighted that growth is expected not only from large cities and metro but also from Tier 2 and Tier 3 cities. The report also stated that the organised food and grocery sector are expected to reach USD 75.1 billion by 2025 and an increase in online shoppers from current 15 percent of the online population to 50 percent by 2026.

MASSMERIZE provided an exclusive platform that commenced a dialogue between Government and Retail, FMCG, and E-Commerce sectors to discuss regulatory issues, Macro-Economics, and consumer trends. The platform was a unique ground to explore opportunities for innovative growth strategies and further accelerate the growth of these sectors.

# FOOD FRONT FOR INDIA

## Grassroots Awareness on Some Disruptive Agro-Technological Advances



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**W**orld agriculture over the past three decades has been transforming fast in a moving world trade order. There have been several disruptive technological advances, and a more complex technological regulatory regime. Further, amidst a growing management complexity in agrobusiness today, one needs to focus on holistic compliance management approach. This may include; (i) systematic knowledge on applicable regulations in a value-chain cycle, including their specifications, timing and procedures; (ii) automation of regulatory compliances at user-end, and (iii) vying for traceability of actions taken amidst actions contemplated.

Some of the prominent, disruptive technologies emerged since mid-1990s, when agriculture was brought to the world trade regime folds, are listed in tabular form.

However, further commentary is limited to innovations and regulatory regimes in nano-biotech and drones in agriculture.

### INNOVATIONS IN NANO-BIOTECH

Nano-fertilizers, nutrients and pesticides clearly dominate in this category. Nano-cellulose for impregnating biodegradable polymer composites is also vital as it could potentially be a long term technological replacement of single use plastics. Broadly, nano-biotech has enormous potential to help increase agricultural productivity, mitigate climate change and pollution challenges, and attain sustainable food security.

Specific microbial strains are identified or invented and used to break down salts into nano-nutrient particles that would be readily absorbed by plants. The nutrient use efficiency of nano materials is up by three folds, and corresponding requirement of chemical fertilizer reduces by 80-100 folds.

#### Some noteworthy disruptive technologies (Processes and Products) emerged in agriculture

<b>Agri-biotechnology</b>	Products of Genetic Modification and Gene Editing; Genome Sequences in Crops and Agriculturally Important Microbes; Genes, Promoters and Primers; Novel Microbes as Insecticides or Biodegradation Agents; Virus Detection in Horticultural Crops; Stem Cell Lines in Farm Animals; Parentage Verification Kits and Paternal Traceability Tools in Farm Animals; Prediction Tools to predict distribution of Nucleotide constituents from Genome Sequence Data.
<b>Nano-biotechnology</b>	Nano-Products/Processes for Fertilizers and Nutrients, and Pesticides, Agrochemical Delivery Tools, Anti-Transpiration Agents, Plant Growth Regulators, Bio-Stimulants for higher crop output; Nano-Gel/Efficient Polysaccharide Producing Microbes to stimulate moisture retention in desert soils; Nano-Cellulose for impregnating biodegradable polymer composites to use in Mulching and/or Packaging; Chemical Biology Diagnostics supplemented with Nano Sensors; Nano Delivery Vehicle for Therapeutic Genes in Veterinary Applications.
<b>Sensors</b>	Various Products for Application in Precision Agriculture and Farm Management.
<b>Decisions Support Systems (DSS)</b>	For Various Digital or On Line Applications to assist in Precision Agriculture.
<b>Drones in Agriculture</b>	Various Categories of low flying loaded machines for assistance in Crop Husbandry, Diagnostics and Protection

Source: Many disruptive technologies emerged under NAIP-ICAR; others compiled from public search.



It increases nutrient mobilization in the soil in root zone by 30 per cent and the crop yield could improve by 20-50 per cent. It is cost effective by 150-200 per cent as compared to chemical fertilizer.

Such technology was identified, standardized, validated, patents applied for, licensed, and know-how shared with Industry by the Indian Council of Agricultural Research (ICAR) under the National Agricultural Innovation Project (2007-2014). This disruptive innovation has high potential for 'Make In India' realm. Few limiting factors requiring industrial R&D to upscale include; low shelf-life (~3 months), long supply chain, high cost of technology at low scale, and challenges in the maintenance of identified microbial strains on industrial scale. A difficulty in the commercial release of licensed nano-fertilizer/nutrient product developed under NAIP, in the absence of any prescribed regulation, was overcome by making voluntary declaration on the deemed regulatory aspects, including fertilizer/nutrient use efficiency, and the efficacy and biosafety of nano-fertilizer/nutrients intended to be commercially released. Relevant information, data and analysis was submitted to Union Ministry of Environment and Forests [and Climate Change] being the Nodal Ministry administering EPA. An awareness booklet was also released by ICAR-IARI before the licensee launched test marketing of its commercial product.



**Specific microbial strains are identified or invented and used to break down salts into nano-nutrient particles that would be readily absorbed by plants. The nutrient use efficiency of nano materials is up by three folds, and corresponding requirement of chemical fertilizer reduces by 80-100 folds.**

The Environmental Protection Agency (EPA) of USA requires no special regulatory review for pesticides that contain nano-scale active ingredients. In India, the environment protection issues facing the promotion of nano-biotech R&D and the commercial release of their products are deemed to be governed

under the Environment Protection Act, 1986 (EPA), and related biodiversity access and benefit sharing issues regulated under the Biological Diversity Act, 2002.

Further, Government of India, Department of Biotechnology (DBT) has recently brought out draft "Guidelines for Evaluation of Nano-Agri Input and Nano-Agri Products in India" and invited stakeholder' comments by August 31, 2019 (<http://dbtindia.gov.in/regulations-guidelines/guidelines-evaluation-nano-agri-input-and-nano-agri-products>). These guidelines aim at regulating Nano Agri Input Products (NAIP) and Nano Agri Products (NAP) in the country; ensuring quality, safety and efficacy of nano-products as well as encourage commercial release of nano-biotech based innovations in agriculture, food and feed sub-sectors, with 'high benefit :

## REGULATORY CONCERNS FOR NANO-BIOTECH

The genetic engineering domain has been clearly administered under GOI Rules 1989, under Environment Protection Act, 1986 (EPA). However, corresponding rules or guidelines to administer the nano realm did not exist until recently, i.e. August, 2019, even in Draft form.

Experience shows that despite successful large scale adoption of few Genetically Modified (GM) crops, policies and efforts to help adopt GM Foods are inconclusive because of tough public debate on environmental and health concerns in regard to these products, and other related issues across the world.

This could be avoidable in the adoption of nano-biotech products. It is, therefore, important that suitable awareness is created, highlighting the potential benefits and shunning the apprehensions on adopting nano-scale agrotechnologies. Also, due policy safeguards be provided to assist in the emergence of a high potential 'Make In India' nano-biotech industry.



**Unauthorized flights are prohibited and public safety ensured. Any registered drone must simply not takeoff without a digital permit to fly. To ensure that drones remain on their approved flight paths, the UTM operates like a traffic regulator in the drone airspace and it closely coordinates with the defense and civil air traffic controllers (ATCs)**

low risk' ratio as compared to their routine, bulk counterparts.

Although not notified as yet, these Draft DBT Guidelines provide a firm step moving towards a new era of regulated nano-biotech sector in India.

### DRONES IN AGRICULTURE

This disruptive innovation is much in limelight and being seen as a multi-purpose, invaluable tool to assist in efficient and more remunerative precision farming. However, its awareness, do-how, and knowledge at the user-end, of regulatory restrictions to operate drones for various categories of farm operations is much lacking.

The GOI Ministry of Civil Aviation has announced a "no permission, no takeoff" (NPNT) policy and provided a Digital Sky Platform for unmanned traffic management (UTM) of drones. Users are required to do one-time registration of their drones, pilots and owners. Unique Identification Number (UIN) is issued for every registered drone, with its complete specifications recorded on line. Operator Permit is also required for all drone operators except for operating nano drones (payload < 250 gram) up to 50 feet high, and micro drones (payload < 2 kilogram) up to 200 feet high.

Except for flying nano category drones,

it is mandatory to get digital permission to fly drones in other (micro, small, medium, large) categories. The process is simple and fully automated on a mobile app. Instant permit or denial is digitally issued.

Unauthorized flights are prohibited and public safety ensured. Any registered drone must simply not takeoff without a digital permit to fly. To ensure that drones remain on their approved flight paths, the UTM operates like a traffic regulator in the drone airspace and it closely coordinates with the defense and civil air traffic controllers (ATCs). These regulations became effective on December 1, 2018. At present, a visual line-of-sight daytime-only and a maximum of 400 ft altitude operations are permitted, which may be sufficient for doing any agricultural or animal farm operations.

Further details/ links for digital sky platform are available at (<http://dgca.gov.in/cars/RPS-FAQs.pdf>). These regulations are enforced by suspension/cancellation and/or penalties in case of any violations. Thus, ignorance of law is no excuse but awareness of law and voluntary and/or mandated compliance would help shape the farmers' prosperity via development in agriculture and food sector.

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# GREEN ECONOMY CRITICAL TO ADDRESS FOOD AND WATER SECURITY

**F**ood security refers to a system with sustainable food production, which provides affordable and nutritious food that can be accessed easily. In a food secure community, all people at all times have economic and physical access to food that is safe and nutritious. Water security is the capacity of a population to ensure sustainable access to adequate quantities of water for human well-being and socio-economic development. In a water secure community, quality water is available for people, industry, and the environment.

Discussions of a green economy or sustainable development often focus on issues of transport, energy, waste management, or ecological conservation. According to the Intergovernmental Panel on Climate Change (IPCC) 2014 report, agriculture produces a quarter of global greenhouse gas emissions, which is more than all of our trucks, cars, and planes combined. Agriculture is also the largest consumer of freshwater resources in the UAE. Agriculture technology (AgTech) such as controlled environment agriculture using hydroponics combined with vertical farming can reduce water consumption by over 90%.

In the GCC, our reliance on imports to meet over 90% of our food demand results in an extremely high carbon footprint. Local agriculture is reliant on traditional methods that are unsustainable due to their intensive use of dwindling fresh water. If we take UAE as an example, the population is predicted to increase by over 60% in the next 30 years, exceeding 15 million by 2050 and feeding them is a collaborative effort

between governments and the private sector.

## GOVERNMENT SUPPORTS GREEN ECONOMY

2019 has been a big year for AgTech in the UAE as food security is on the country's national agenda. Acknowledging the strategic importance of this industry, under the guidance of H.H Sheikh Mohamed bin Zayed bin Sultan Al Nahyan, the Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE's Armed Forces, the Abu Dhabi Investment Office (ADIO) conceptualized a Dh1 billion incentive scheme to help AgTech companies cover R&D costs. The initiative recognizes that agricultural innovation is expensive and challenging even when conditions are ideal. Our desert climate adds complexity to an already herculean task. This support is crucial and timely, given that there is no clear dominant company or city that is home to the AgTech revolution. There is an opportunity to establish the UAE as a global leader as the industry is still in its infancy.

Government funding alone does not ensure success. Regulations need to keep pace with technological and commercial innovation. The Abu Dhabi government consolidated regulation of the agriculture sector through the establishment of the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA). This new organization has taken on the roles of the Abu Dhabi Food Control Authority, the Abu Dhabi Farmers' Services Centre, and the Food Security Centre – Abu Dhabi. It is responsible for overseeing agriculture, food safety, food security, and biosecurity.

Like any new industry, businesses

in the AgTech industry will inevitably discover that some aspects of the existing regulatory framework do not meet their commercial needs. This is natural as regulators cannot predict future industry requirements with 100% accuracy. However, it is encouraging to see that the government is proactive about increasing their understanding and are taking decisive actions.

## ADOPTION OF GREEN INNOVATIVE SOLUTIONS

Research & Development (R&D) is vital for the successful adoption of global sustainable technology. The AgTech products being deployed around the world cannot simply be copied and pasted here in the region. Products developed in Asia, Europe or North America were created to be successful in their local environments. Differences in local environmental conditions, such as dust, humidity and heat, and overall weather patterns can take their toll, which means that effective localization is key to success. Localization also means that the industry caters for the local consumption needs identified by The UAE National Food Security Strategy which mentions 18 main food items that are integral to the diet of UAE residents.

It is an exciting time for the UAE, the local green economy is generating interest and support from all sectors of society. A sustainable AgTech revolution will help reach sustainability goals by reducing dependence on imports and conserve precious water resources.

**By Abdulaziz Al Mulla**  
Co-founder and CEO  
Madar Farms

# ENTREPRENEURIAL MODELS FOR SUSTAINABLE DEVELOPMENT

In India, around 833.1 million people (68.84%) live in 640,867 different villages with diversified culture, values and social cohesiveness. But, the Indian economy is transforming from village based agrarian economy (GDP share of 16.7% in 2018) to urban based industrial (GDP share of 26% in 2018) and service sector oriented (GDP share of 60% in 2018) Digital and smart economy. At the same time, India has not utilized the full potential opportunities of the decentralized agricultural based

eco-friendly rural village settlement pattern for effective sustainable development process. Hence, the agro based entrepreneurship development is one of the effective strategies to empower the rural economy and retain the population in villages with improved standard of living status and conserving the natural resources for sustainable development process. Under this background, this article discusses about the appropriate low investment oriented sustainable enterprise development process, various development stake holders

involvements in the promotion of enterprise under farmers field condition for sustainable economic development process.

## How is it possible?

The Indian socio- cultural system is relatively less in the entrepreneurial characteristics of initiative ability, creativity and innovativeness, economic motivation, risk taking ability, achievement motivation, economic wellbeing, manageability, leadership ability and finally marketability. Meanwhile, promotion







Scientist interacting with Women workers

of entrepreneurial human resource development is very important process to convert the large number of farmers into agripreneurs for sustainable development process. In this context, development of the agro enterprise is possible through identification of innovative idea, development of initiative ability, training and capacity building activities about the particular enterprise, financial support from various public-private partnership initiatives. This article discusses about two different enterprise case's development process and roles and responsibilities of different stake holders for further development of such type of the enterprises.

**They are,**

- Corporate Social Responsibility supported agro food processing enterprise.
- Krishi Vigyan Kendra supported Integrated Farming System based enterprise.

**The Corporate social responsibility supported agro food processing unit**

The Corporate social responsibility is a management concept whereby companies integrate social and environmental concerns in their

**At present, the 2% of the net profit of the corporate should be spent for the benefit of community under the CSR initiatives. In this aspect, every year, around Rs.20,000 crores funds are mobilized for community development initiatives through NGOs or non-profit organizations**

business operations. At present, the 2% of the net profit of the corporate should be spent for the benefit of community under the CSR initiatives. In this aspect, every year, around Rs.20,000 crores funds are mobilized for community development initiatives through NGOs or non-profit organizations. The TVS Corporate Company has initiated a sustainable agro food processing industry based entrepreneurial model in Thandalam village at Kanjipuram District of Tamil Nadu. It was started in the name of Thandalam women's group started in the year 2005 with the aim to uplift the standard of living of women in Thandalam village.

**Initiation:**

Initially, the SHG members of Thandalam village received training and orientation about the agro processing industries enterprise establishment. After that, they started enterprise on a small scale and processed the foods and sold in the nearby markets.

**Establishment:**

The women farmers were motivated to start this due to their poor wage earnings from agricultural activities. So, the SHG group got livelihood loan under the SGSY Scheme and they registered their processing unit. Further, the TVS Corporate Company created essential infrastructure such as buildings, storage rooms, solar drying yards and important processing machines for pickle preparation, Chilli powder making unit, extruded products preparation unit and cold storage units.

**Management of Human resource:**

The human resource management and system maintenance are very important aspects in any enterprise. The company was managed by one manager and there were 16 women SHG members who were working as employees in that processing unit. This was governed by the director of the TVS Corporate company's corporate social responsibility initiatives.

**Major activities:**

The company produces and processes 39 food processing products consisting of different masalas, extruded products, etc. In addition to masalas, they also prepare Nutriblend (health drink) made up of 15 ingredients. They are branding the products and selling them in distant markets with efficient marketing channel. The average turnover of this food processing unit was around Rs.50 lakhs/year.

**Krishi Vigyan Kendra supported**

**Integrated Farming System based enterprise.**

Size of Indian agricultural land holdings has rapidly reduced in last three decades. Hence, profitability is the biggest issue to operate the farm in a conventional monoculture based farming system approach. In this juncture, the Integrated Farming System based entrepreneurial opportunities can sustain farming with profitability. It also conserves the energy with eco-friendly farming practices. The low investment livelihood activity has diversified farm products with easiest way of marketing possibilities for sustainable livelihood opportunities. In this background, the KVK, Vellore, Tamil Nadu has identified potential farm women for agro-entrepreneurial training and capacity building process. Further, the KVK has supported bank linkage initiatives and marketing linkage support to the Integrated Farming System based enterprise.

**Initiation**

The enterprise was started in the year 2010. The Integrated Farming System farm is located in the village Karugamputhu of Vellore District of Tamil Nadu. In this entrepreneurial model, the women farmer, Mrs Kala is the owner of the enterprise. She got training about IFS practices from KVK, Virunjipuram, Vellore district, Tamil Nadu. She also received training on dairy farming from Madavaram Dairy, Chennai. She became interested to convert her half acre farm land to IFS unit with dairy and Vermicompost unit initially. All of her family members are involved in the activity. It was succeeded with family farming approach.

**Establishment**

The success of the initial IFS model encouraged the woman farmer. And further, she established one Goat rearing unit, Nursery unit, Bee keeping unit, Backyard poultry to enhance the effectiveness of the Integrated



**The Corporate social responsibility supported agro food processing unit is a self-sustainable value added entrepreneurial venture to sustain the livelihood of village women. The KVK, Commercial Banks, SGSY scheme, CSR initiatives join hands on the sustainable development of the entrepreneurial model.**

Farming System activities. This IFS unit was integrated in the half acre of farm land. The enterprise also produces Azolla for fodder to cattle and feed for poultry. The enterprise also prepares panchagavyam and sell it at Rs 16/ltr.

**Impacts:**

The Krishi Vigyan Kendra supported Integrated Farming System based enterprise impacted her life style in different dimensions. Before starting this venture, she cultivated paddy, finger millet and maize with net profit of Rs 10,000/annum and after

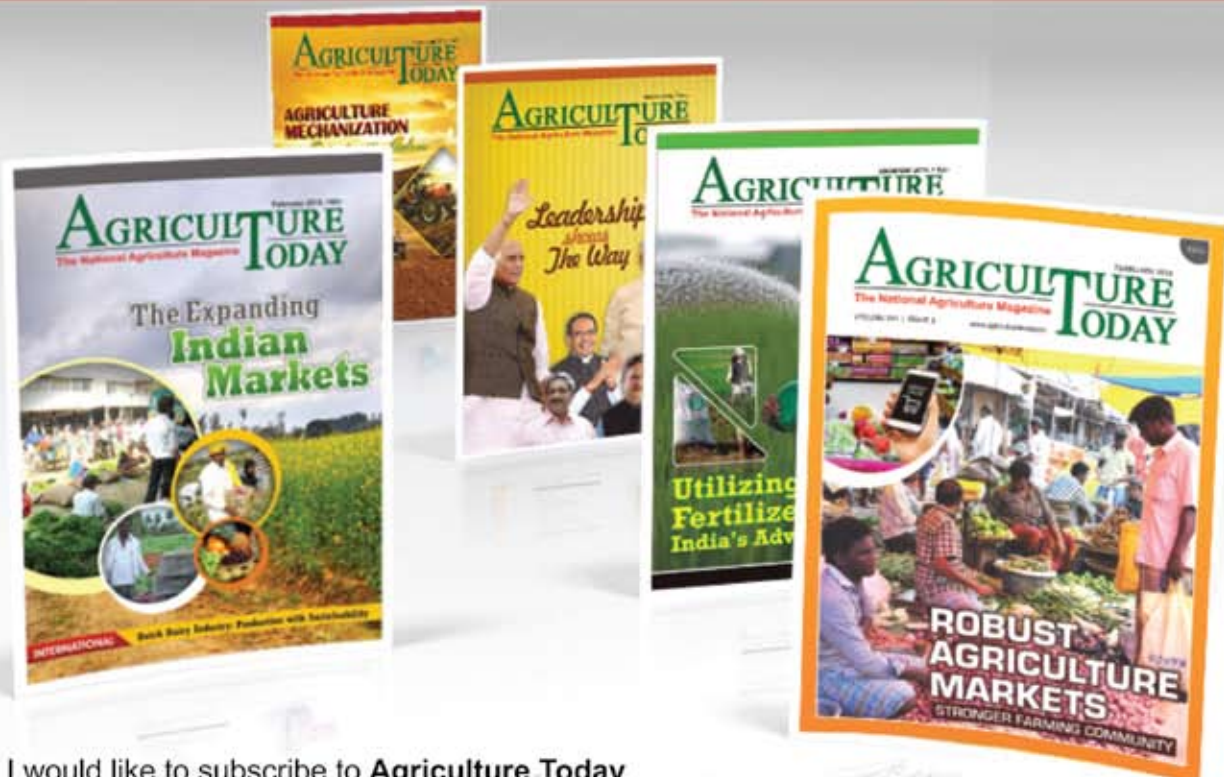
starting the IFS her annual profit increased to more than tenfold.

The Corporate social responsibility supported agro food processing unit is a self-sustainable value added entrepreneurial venture to sustain the livelihood of village women. The KVK, Commercial Banks, SGSY scheme, CSR initiatives join hands on the sustainable development of the entrepreneurial model. The IFS based entrepreneurial venture is the need of the hour to convert the farms into the farm enterprise. The entrepreneurial competency development is very important with appropriate financial linkages and various development stakeholders' support to support the value added economy through the entrepreneurship development process. For the betterment of other farmers in our country, to document and validate the farmer-led innovations and farmer friendly low investment, high profit enterprise model development enhance the adoption process. The networking and convergence are also other important factors for promotion of sustainable the enterprises.

**L. Muralikrishnan, Scientist  
Division of Agricultural Extension,  
ICAR-IARI, New Delhi**



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**AGRICULTURE TODAY**

# KAZAKHSTAN

## UNEXPLORED INVESTMENT DESTINATION FOR INDIAN BUSINESSES

**K**azakhstan, the ninth largest country by area in the world, has two and a half million hectares of unused land. Approximately 272 million hectares, or 74 percent of Kazakhstan's land, is devoted to agriculture. The figure includes 167.7 million hectares of pastures, 30 million of tilled and lea land and more than four million of hay.

Kazakhstan is one of the largest grain producing countries in the world, where agriculture is the major employer for the majority of the population. A high proportion of the population (43%) lives in rural areas. The level of agricultural production development impacts the quality of life of not only those who work here, but also those who have some sort of relationship to this industry.

Agriculture in Kazakhstan remains a small scale sector of Kazakhstan's economy. Agriculture's contribution to the GDP is under 10%, engaging only 20% of labour. At the same time, more than 70% of its land is occupied in crops and animal husbandry. A relatively small percentage of land is used for crops, with the percentage being higher in the north of the country. 70% of the agricultural land is permanent pastureland.

Approximately 75% of the country's territory is suitable for agricultural production, but only about 30% of the land is currently under



agricultural production. Farmers raise sheep and cattle, and livestock products include dairy goods, leather, meat, and wool. The country's major crops are wheat, barley, cotton, and rice, with wheat exports a major source of hard currency.

According to the Ministry of Agriculture, the total area under crops totaled 19 million hectares including 14.5 million hectares of

grain crops, 2.7 million hectares of oilseeds, 458,300 hectares of vegetables, melons and potatoes, 1.2 million hectares of forage crops and 144,000 hectares of industrial crops (sugar beet, cotton, tobacco). Agriculture inputs amounted to roughly 2.5 million tonnes of seeds and 471,400 tonnes of fertilizers.

The primary agricultural regions are the north-central and southern parts of the republic. Grain production is especially important in the north-central region, and cotton and rice predominate in the south. Kazakhstan also is a major producer of meat and milk.

The country is the leading market in Central Asia and has emerged as a major transport and logistics hub





in the region. The country links the large and fast-growing markets of China and South Asia and those of Russia and Western Europe by road, rail, and a port on the Caspian Sea. Kazakhstan has abundant of natural resources, including oil & gas, coal and mineral deposits and its economy continues to be fueled by extractive industries. In addition, Kazakhstan boasts significant agricultural potential for both grain and livestock production. With a growing middle class and economic growth poised to reach 4 percent in 2019, Kazakhstan provides trade and investment prospects for firms seeking new opportunities in one of the most dynamic emerging markets.

Kazakhstan's agricultural sector is one of the most promising sectors of the country's diversification strategy, yet its potential remains largely untapped. The country is already among the top-five producers of wheat and is one of the largest exporters of flour; however, the government is determined to diversify its agricultural production away from wheat toward oilseeds, fruits and vegetables, corn, sugarbeets, livestock, and, in particular, organic production.

### **Agriculture Production**

Kazakhstan's largest crop is wheat,

#### **GRAIN PRODUCTION AND EXPORT**

- Kazakhstan is among the top 5 largest exporters of wheat
- The country exports an average year 7-8 million tons of wheat
- The production and export of grain Kazakhstan is in the top largest exporters of wheat, according to the International grains Council (IGC). In the season 2017/2018 Kazakhstan exported 8.4 million tons wheat.

#### **FLOUR PRODUCTION AND EXPORT**

- Kazakhstan is among the three largest exporters of flour to an average of 2.3 million tons of flour per year.

#### **PRODUCTION AND EXPORT OF OILSEEDS**

- Currently Kazakhstan produces up to 1 million tonnes of oilseeds per year. Flax seeds included into a three of world leaders.

#### **PRODUCTION AND EXPORT OF POULTRY MEAT**

- Currently Kazakhstan produces up to 170 thousand tons of broiler meat. That is 50% of the internal market, while in the case of the opening of the Chinese market, the growth potential will amount to 1 million tons of broiler meat.

#### **MANUFACTURE AND EXPORT OF CATTLE MEAT**

- Currently in Kazakhstan there are about 5 million head of cattle. Whereas, the growth potential is up to 15 million head of cattle.

which it exports. It ranks as the sixth largest wheat producer in the world. Minor crops include barley, cotton, sugar beets, sunflowers, flax, and rice. Kazakh wine is produced in the mountains east of Almaty.

Potatoes, fruits, and vegetables are other significant food crops. Less

than 2% of agricultural land is used to cultivate commercial crops such as cotton, sugar beets, sunflowers, and flax. Kazakhstan is the only former Soviet republic that exports grain.

The country is the birthplace of apples. All trees which produce eating apples are believed to originate from

## ACHIEVEMENTS AND BENEFITS OF KAZAKHSTAN IN THE AGRICULTURAL SECTOR:

### Extensivel land resources

Meadows pastures 180 million hectares  
Arable 20 billion acres

### Geographical proximity of markets and a high-capacity

The EEU 170 million people  
China 1.3 billion people



### Current exports of agricultural products- \$ 2 400 000 000

Government support – Tax incentives by the Ministry for investment and development of Kazakhstan, subsidies by the Ministry of agriculture of the Republic of Kazakhstan



the *Malu sieversii* tree, which grows in the high altitude forests of Kazakhstan. Almaty, the capital of Kazakhstan, means “father of apples.” Apple tree orchards are found in and around Almaty. “Aport” is a famous variety of apple with links to ancient apples.

### Grain Production

Kazakhstan is one of the world’s major wheat and flour exporters. It is among the 10 largest wheat producers. The main grain crop is milling wheat, which is typically high in quality and protein. There is a growing trend for Kazakhstan to export its grain internationally.

Kazakhstan is an important producer and exporter of high-quality wheat. Average annual production is about 13 million tonnes, but output is highly dependent on weather and in

recent years has fluctuated between 10 and 17 million tonnes. Between 2 and 8 million tonnes is exported annually, mainly to destinations in Europe (including Russia and Ukraine), northern Africa, and Central Asia. Kazakhstan also produces around 2 million tonnes of barley, and a small amount of oats, corn, and rice, but wheat is by far the country’s most important commodity. The production of oilseeds (sunflower seed and rapeseed) is increasing but total oilseed output remains well below 1.0 million tonnes. The country also grows a small amount of cotton in southern Kazakhstan, with annual lint output at around 100,000 tonnes.

### Livestock Industry

To increase livestock efficiency and strengthen the country’s export potential, in 2018, Kazakhstan adopted new programs for beef and dairy cattle industries development. The Program is designed to double lamb and beef production within ten years, with the aim of exporting to China, Iran, Saudi Arabia, and Vietnam. The Livestock Program intends to support smaller scale farms of 100-200 head cattle or 600 head sheep, expanding the number of farms from today’s 20 thousand on 58 million hectares to 100 thousand on 100 million hectares in 2027. According to the Ministry of Agriculture Department of Animal







Husbandry, Kazakhstan only utilizes 30 percent of its possible 110 million hectares. Within the dairy industry program, it is planned to increase the number of family farms to 930, large dairy farms to 170, and dairy plants to 174. The programs will focus not only on beef and milk production, but also on technologies and equipment for effective use of pastures, increasing areas of irrigated pastures, meat and milk processing.

Poultry meat is by far Kazakhstan's biggest import from the United States, totaling nearly 106 thousand tonnes in 2018. In 2017 the Union of Poultry Farmers jointly with the Ministry of Agriculture of Kazakhstan, developed the Sectoral Program for the Development of Poultry Farming in Kazakhstan for 2018-2027.



"Kazakh Invest" National Company JSC was established in accordance with the resolution of the Government of the Republic of Kazakhstan in 2017. The mandate of Kazakh Invest is to promote sustainable socio-economic development of the Republic of Kazakhstan by attracting

foreign investment in priority sectors of the economy and comprehensive support of investment projects.

Kazakh Invest is authorized to implement measures of state support for industrial and innovative activities in the area of attracting investments to the economy of the Republic of Kazakhstan. It is a single point of access to the system of public services, including both government support for investors in the form of investment preferences and the issuance of various permits and approvals necessary for the implementation and further operation of investment projects. It provides a

full range of services on the principle of "one window" for the support of investment projects from idea to implementation.

### Kazakhstan - Market Opportunities

Kazakhstan ranks 28 on the World Bank's Ease of Doing Business Report. Of the various indicators used, Kazakhstan ranks higher than its overall score in "Protecting Investors", "Registering Property" and "Enforcing Contracts."

Kazakhstan's strategic aspiration is to become a modern, diversified economy with a high value-added and high-tech component, and the government is cognizant of the need for foreign expertise to accomplish this. To this end, the government continues to develop international partnerships and has agreed to projects with U.S., China and EU countries worth billions of dollars.

### Kazakhstan - Market Overview

- Kazakhstan is ranked 28 among 190 economies in ease of doing business, according to the latest World Bank annual ratings;
- The level of foreign direct investment is among the highest.

### How Kazakhstan Compares

1st in the world for **protecting minority investors**

1st in the world for cost effectiveness in **FDI Manufacturing Locations of the Future report**

9th country in the **world by land area**

28th in the world for **ease of doing business** based on the World Bank's Doing Business report

31st in the world based on the **human capital index**



Dr. MJ Khan, Chairman, Indian Council of Food and Agriculture with Dr. Toleutay Rakhimbekov, CEO, NASEC and Mr. Yessenbay Islamov, Managing Director for Science and Education of NASEC

**FAVOURABLE INVESTMENT CLIMATE**

**Kazakhstan is #28 in the World Bank's Ease of Doing Business ranking 2019:**

- #1 for protecting minority investors
- #4 for enforcing contracts
- #18 for registering property
- #36 for dealing with construction permits
- #37 for starting a business



The United States is one of the largest investors in the market along with the Netherlands and China.

- Raw mineral extraction continues to dominate Kazakhstan's economy, making it overly dependent on world market prices for natural resources;
- Kazakhstan has a healthy appetite for imported goods and in some, not all, cases is willing to pay more for higher quality and innovative technologies and services.
- The Kazakhstani government aims to have the country join the World Economic Forum's "Global Competitiveness" Top 30 economies by 2050. In the World Bank's 2018 Competitiveness Rankings, Kazakhstan ranked 59 out of 140 countries.

**National Agrarian Science and Educational Centre (NASEC)**

National Agrarian Science Educational Center (NASEC) is a leading regional research and educational center in the agrarian sphere. NASEC was created

to promote innovative development of the agro-industrial complex of Kazakhstan.

The charter capital of NASEC was formed by transferring one hundred percent of the shares of the joint stock company Kazakh Agricultural Technical University, Kazakh National Agrarian University and West Kazakhstan Agricultural Technical University. Also, 23 scientific research institutes, 7 pilot farms, 7 breeding stations, 4 service companies, covering all regions of Kazakhstan, were transferred under the management of NASEC.

The goals of the NASEC are integration of science and education with production; and shifting the emphasis from the current profound academic results to the introduction into the production and commercialization of scientific developments. NASEC is a single operator of sustainable interaction of scientific and educational institutions of the agrarian sphere of Kazakhstan with the state and business.

"NASEC's mission is to



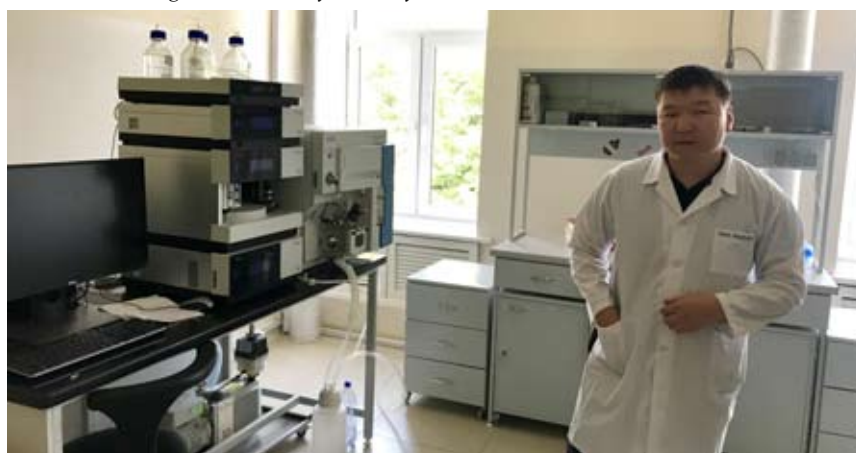
contribute to the innovative development of the agro-industrial complex of Kazakhstan, including the introduction of innovative approaches in agriculture for increasing the yield of breeds, the creation of demonstration sites on the basis of pilot farms for the approbation and the introduction of new technologies, the local and foreign research for the development of the agro-industrial complex of Kazakhstan, the strengthening and further development of the scientific environment in the agrarian sphere.”, said Dr. Toletay Rakhimbekov, CEO, NASEC.

“To implement its mission, NASEC carries out the following activities such as increasing the scientific and personnel potential of the agro-industrial complex; stimulating investment and innovation activity in the agrarian sector; development of international cooperation in the field of experimental design, fundamental and applied research of innovative nature in the agro-industrial complex, their commercialization and implementation in Kazakhstan; Involvement of domestic and foreign investment in the agricultural sector; development of incentive measures for agricultural producers that introduce modern production technologies; raising the level of Kazakhstan’s agricultural science and education to international quality standards, promotion of Kazakh agrarian scientific products (breeds, technologies, etc.) to world and regional markets; creation of an effective system for introducing modern scientific developments and innovative technologies into production; and establishment of a network of regional pilot centers and education centers”, mentioned Mr. Yessenbay Islamov, Managing Director for Science and Education of NASEC.

## Kazakh National Agrarian University



*Kazakh National Agrarian University in Almaty*



The Kazakh National Agrarian University is an elite university for innovation, the leader of the agricultural sector of Kazakhstan and Central Asia. The university is carrying out the science education process at the international standards level in cooperation with the economy sector and ensuring the competitiveness of graduates in the world labor market. It is ranked among the 300 universities of the world rating agency QS. The university provides integration of education, science and production on the basis of innovations in the agro-industrial complex, mobility of students and teaching staff.

The main purpose of research University is integration of science and industry, creation of conceptions for intellectual property and technology products commercialization, training highly qualified scientific - pedagogic staff through participation in basic and applied scientific researches and other scientific technical projects.

University has concentrated its resources and has become the core of educational, scientific and innovative environment of the agrarian-industrial development that has been significantly affecting the country’s competitiveness in that industry.

Currently the University is successfully integrating into the world scientific space, cooperating with leading foreign universities and scientific centers, realizing international programs on such global issues of humanity as climate change, environment protection, food safety, deficiency of drinking water and others.

## The National Chamber of Entrepreneurs of the Republic of Kazakhstan “Atamekeh”

The National Chamber of Entrepreneurs of the Republic of Kazakhstan “Atamekeh” is a non-profit organization designed to enhance the negotiation power of business with the Government and public authorities. The Chamber represents the interests of small, medium and large businesses, covering all business areas, including internal and external trade.

The main task of the National Chamber of Entrepreneurs “Atameken” - is protection of the rights and interests of the business, ensuring wide coverage and involvement of all entrepreneurs in the process of formation of legislative and other regulatory rules for business.

Activities of the National Chamber are aimed at improving the business and investment climate, stability, development of the business environment in the country, both for domestic and foreign investors. The main functions of the chamber are representation and protection of the rights and legitimate interests of entrepreneurs; public monitoring of entrepreneurial activity, business conditions in the regions; participation in government programs of support and development of entrepreneurship; support of the domestic industry and increase of the local content share in the procurements of organizations; promotion of foreign economic activity of business entities; and attraction of investments and diversification of the economy.

“Since 2018, the National Chamber of Entrepreneurs of Kazakhstan “Atameken” has signed agreements to assist exporters in the framework of the state program, which provides for the reimbursement of costs to the subjects of industrial and innovative activities, producing domestic processed goods. Costs associated with advertising products,



participation in international exhibitions, fairs and festivals, as well as the development and distribution of advertising catalogs will be reimbursed. In addition, part of the amount will be compensated for the maintenance of a representative office, outlet or warehouse abroad, conducting procedures for registering trademarks and certifying products.”, said Mr. Yerbol Yesseneyev, Managing Director, Agribusiness and Food Processing industry department of ATAMEKEH

Also, number of seminars with the participation of international experts is planned for business representatives, as well as more than ten webinars on the export of domestic goods and services. These online seminars will allow business to get all the necessary information on exports and many other issues related to international trade without interruption.

*Dr. MJ Khan, Chairman, ICFA with Mr. Yerbol Yesseneyev, Managing Director, Agribusiness and Food Processing industry department of ATAMEKEH*





**Mrs. Isaeva Gulmira Sultanbayevna, Vice-Minister of Agriculture of the Republic of Kazakhstan**

**What are the broad priorities and thrust areas of the Ministry? What are your flagship projects in food and agriculture?**

The mission of the Ministry of Agriculture is to create the conditions for improving the competitiveness of agriculture, steady development of water, fishery, forestry and hunting by the effective formation, coordination and implementation of government policy.

The Ministry of Agriculture has developed a strategy for increasing crop production in Kazakhstan. The plan focuses chiefly on boosting yield rather than expanding area. A proposed measure includes technology-driven increase in yield through continued government subsidies for fertilizer, herbicides and pesticides, and high-quality seed; an increase in the use of reduced tillage; introduction of more oilseed crops into the rotation; and an increase in pulse area to improve soil fertility.

The country's national agriculture development programme envisions measures to create long-term sector

development programmes in farming. In the next ten years, the plan is to create 80,000 family farms in beef cattle and sheep farming that will work with meat processing and feedlots. The programme is designed to boost the export potential of the Kazakh beef and lamb.

In 2018, Kazakhstan exported 19,900 tonnes of beef, 3,000 tonnes of lamb and 400 tonnes of pork. This year, the government plans to double the pork production, particularly targeting the Chinese market. The target also is to facilitate import substitution of dairy products. The ministry seeks to bring milk production to 1 million tonnes.

The construction of industrial dairy farms will facilitate progress. As part of the agriculture development programme, the ministry is implementing long-term sector programmes to develop farming. The ministry is also working to remove restrictions and disagreements in veterinary and sanitary requirements for processed products in the export priority countries for Kazakhstan.

These measures will help increase the volume of beef exports to 37%, lamb to 32% and pork to 43%. Competitive advantages of the Kazakh products, environmental friendliness can help boost agriculture growth. The agriculture sector is also looking for strategic investors and seeks greater involvement of transnational companies.

**Which are the biggest trading partners of Kazakhstan in agriculture segment?**

The main trading partners of Kazakhstan in agriculture segment are Central Asian Countries, China, European Union and US. The State program for development of the Agro-Industrial Complex provides implementation of tasks, and ensuring the availability of sales markets and export development, and the development of rural areas are among it. New Opportunities for Development under the Fourth Industrial Revolution, the country's Agro-Industrial complex was set a goal to radically increase labor productivity

and growth of processed agricultural products exports at least 2.5 times. All this, together, will provide key conditions for the development of the Agro-Industrial sector.

### How significant is India as a market for Kazakhstan?

India is one of Kazakhstan's key political and economic partners in the region and relations between our peoples have ancient roots. In 2009, Kazakhstan and India signed the Declaration on Strategic Partnership. Until 2015, the Indian population wasn't fully aware of Kazakhstan's economic opportunities. Prime Minister Modi's 2015 official visit and top-level negotiations spurred economic cooperation. Additional impetus came during the Indian Prime Minister's 2017 visit to Kazakhstan for the SCO Summit and the opening of EXPO 2017. Today, cooperation is rapidly developing with a focus on economic diplomacy.

Kazakhstan is India's main trading partner in Central Asia. Kazakh-Indian trade exceeds India's combined trade with other countries in our region. I am convinced we can expand trade. To do so, we must improve delivery methods between our countries. According to the Ministry of National Economy of Kazakhstan, approximately 560 entities with Indian capital are registered in Kazakhstan. More than 200 Indian companies registered in the past two-three years.

Work to expand trade and economic cooperation is carried out jointly with the Kazakh-Indian Business Council. Tengri Bank in Almaty, of which Punjab National Bank is the shareholder, assists Indian companies in Kazakhstan.

Regarding attracting investments, the Kazakh Ministry of Foreign Affairs and other government agencies are building a vertically integrated scheme to attract foreign investors, starting with embassies abroad.

Also, in recent years, the numbers of Indian citizens visiting Kazakhstan and Kazakhs traveling to India have

increased. The positive state of Kazakh-Indian relations demonstrates that we have chosen the right path for cooperation.

### Are there opportunities in Kazakhstan where Indian agribusiness sector can invest upon?

The leading sub-sectors where Indian Companies can invest are agricultural chemical products and fertilizer applicators; grain farm machinery, grain storage and processing equipment, yield enhancement technologies; innovative technologies in livestock and poultry industries, and veterinary products and services; feed production and agricultural products processing equipment.

Both the government of Kazakhstan and private entities are looking for international partners to increase existing domestic production of agricultural machinery and equipment and establish new manufacturing and assembly facilities.

There are also growing markets for food related imports, including beef, poultry, almonds, beverages (particularly beer, wine, and spirits), livestock genetics, and planting seeds. Kazakhstan imports in this category consist mostly of cane sugar, black tea, and poultry meat; however, if grouped together fresh fruits and vegetables top all other agricultural imports at over 500 thousand tonnes, and most of those come from Uzbekistan or China.

Nearly 90% of machinery currently in use in the Kazakh agriculture sector is at the end of its life cycle and needs to be replaced, with the rate of machinery renewal expected to grow to between 6% to 8% a year (up from 3% to 4.9% over the past five years) through imports, but also new projects to assemble machines locally. Improved irrigation and machinery can help unlock the potential of the country's crops, as well as improve its pastures. The country produces about 5 million head of cattle per year but with better pastures and genetics, Kazakh authorities estimate that it

could reach as high as 15 million head of cattle per year. This potential has not gone unnoticed to a first wave of foreign investors.

Currently, 45% of the total gross of Agricultural output produced in Kazakhstan is an animal husbandry. As a part of development of the Agro-Industrial complex for 2017-2021, about 30% or 35.9 billion tenge was allocated for subsidizing investment projects in the livestock sector.

Based on analysis and comparison of the foreign markets and domestic production capacities potential, main long-term priority of the agro-industrial complex development is meat cattle breeding.

### What are the motivating factors for investment in Kazakhstan?

Kazakhstan's accession to the World Trade Organization opens up new opportunities for both Kazakhstani exporters and foreign investors, who are provided with a favorable investment climate and liberal regulation. A key advantage of Kazakhstan - its favorable geographical location - predetermines its significant transport potential in the field of transit traffic. Air, rail and road routes pass through Kazakhstan from Europe to Asia, in particular to Western China and from there to Southeast Asia. The wide opportunities provided by integration into international transport corridors are demonstrated by the geography of export of goods from Kazakhstan.

Given its membership in the Eurasian Economic Union, which provides free movement of goods, services, capital and labor, there is great potential for export to the EAEU partner countries. Kazakhstan, as part of the Eurasian Economic Union, is actively expanding the geography of trade: negotiations are underway to conclude agreements on a free trade zone with India, Singapore, Serbia, Israel, Egypt. Such agreements have already been concluded with China and Iran (interim agreement).

The development of its agribusiness sector is one of Kazakhstan's key



priorities, and a first wave of foreign investors from Europe and Asia is looking at the country as a base to supply major markets in the regions.

Kazakhstan has been a well-kept secret over the years. For those who haven't heard much of Kazakhstan in the past, they will hear more about the country because of its proximity to so many large markets in the world. It's next to China, Russia and north of India. Many millions of people in close proximity will be eating products grown and shipped from Kazakhstan in the future.

Kazakh authorities are now preparing for an overhaul of the national agriculture sector by directly engaging with private domestic and foreign agribusiness companies. New opportunities are emerging along the agribusiness value chain, and a first wave of food producers is already setting up local operations to meet the needs of major markets across the whole Eurasia region.

Kazakhstan has a fertile ground for FDI. It is believed that with the export of beef and mutton to the Chinese market, Kazakhstan's agriculture and animal husbandry will be developed rapidly, and Kazakhstan will soon become an international agricultural and animal husbandry country.

Chinese investors have been active in growing crops, as well as producing meat and other food products, for several years in Kazakhstan, as the Belt and Road Initiative opened up new co-operation opportunities at a national and local level while upgrading export routes able to cater to western China. But the sector is increasingly on the radars of investors from other parts of the world.

Husbandry and agriculture have marked the pace of life on the Kazakh steppes for centuries. The knowledge that comes from that tradition, combined with the capital, technology and management skills of foreign investors, is now expected to take the country's agribusiness sector to the next level. Millions of consumers in neighbouring markets, from China and Russia all the way down to India,



could soon be the final judges of Kazakhstan's sweeping agribusiness ambitions.

### How important is organic agriculture in Kazakhstan?

Kazakhstan is tapping growing consumer demand for organic crops to help it better compete in the food-export market. The country wants to use much of its vast uncultivated lands to grow soybeans and other non-genetically modified crops for markets such as China and the European Union. By offering non-GMO and pesticide-free produce, it hopes to carve out a niche in a crops market dominated by giants such as Russia, Australia or the U.S.

As the world's largest landlocked country, moving crops to top importers is pretty costly. So rather than trying to compete with low-cost growers, we aim to grow more organic crops that can be sold at a premium. There's room for growth because about half of its farmland is uncultivated, and the country plans to boost non-GMO soybean output at least 10-fold in the next seven years.

We can use these hectares for starting ecological production. We cannot compete by price with U.S., Australian and Canadian agricultural products, but we can be a competitor in the organic markets. The organic food market is worth more than \$90 billion globally and has grown in Europe and the U.S. in recent years. The organics expansion is also part of a broader strategy which includes developing the livestock sector and improving grain-export routes.

Kazakhstan hopes to export much of its produce to the EU, the second-biggest organic market worth about \$35 billion. China has also shown an interest in buying Kazakh soybeans.

The potential for organic agriculture in Kazakhstan is significant as a large percentage of the country's vast pastures do not require any form of artificial feeding. Kazakhstan currently has over 300,000ha of agricultural land that is certified as organic. Promoting organic products is Kazakhstan's main export strategy for the coming years.

Also, the demand for organic products has risen steadily in Kazakhstan in recent years. Of particular note is the organic meat sector, as neighboring China and booming markets such as Russia and Iran have shown increasing interest in "Made in Kazakhstan" organic beef.

However, meat is not the only promising product for the development of Kazakhstan's organic exports. Organic grain, vodka, and wine as well as organic apples are other highly requested products. In fact, not many outside of Kazakhstan know that the country in particular its former capital Almaty, whose name in Kazakh (Alma-Ata) means "grandfather of apples" is indeed the birthplace of apples, and that all modern domestic apples sold in supermarkets all over the world are most likely descended from a species of wild apple endemic to the Almaty region. Apples are among the most consumed fruit, particularly in Europe and North America, where demand for organic apples now exceeds supply.

“With 60 percent of the population dependent on agriculture, the foremost priority must be accorded to promoting agriculture and making it viable and remunerative”

**M VENKAIAH NAIDU**  
Vice President



“Villages and agriculture were crucial for the economic advancement of India. India is a land of villages where agriculture is the primary source of livelihood”

**NARENDRA SINGH TOMAR**  
Union Agriculture Minister

“Artificial Intelligence and big data are going to be a game changer in the agriculture sector, and the government is aiming to collate about 80 per cent of such data by 2020”

**SANJAY AGGARWAL**  
Agriculture Secretary



“I think that we can really do a lot (in agriculture)... helping not only with business tools and technology, but also creating a potential Innovation Centre here to support agriculture, which I am committed to doing that”

**TERESA CARLSON**  
Vice President – Worldwide Public Sector of Amazon Web Services