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# LIVESTOCK & POULTRY

ADDING INCOME & NUTRITION

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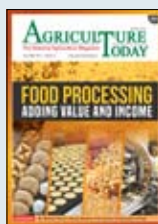
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**From the Editor's Desk**

**LIVESTOCK AND POULTRY – THE INCOME BOOSTERS**

**I**ndia has vast resource of livestock and poultry and India has been ranked number one among the world's milk producing Nations. The sector is thus also an important source of employment.



Dairying has become an important secondary source of income for millions of rural families and has assumed the most important role in providing employment and income generating opportunities particularly for marginal and women farmers. Most of the milk that is produced in India are from animals reared by small, marginal farmers and landless labours. Unlike Dairy, Poultry in India has evolved from being a purely backyard activity to an organized entrepreneur venture. While the backyard poultry served the purpose of meeting the nutritional needs of the house and adding supplementary income, the commercial ventures cashed in on the growing appetite of the flourishing middle income groups. The growth rate of production has increased consistently since 2014-15 mainly due to increasing number of organized poultry players, increasing number of organized retail chains across the country apart from favourable Government policies. India ranks 3rd in terms of egg production, constituting 4% of the total global production of eggs, jumping ahead from the sixth position it occupied, a couple of years before.

However, livestock and poultry sector have its own share of challenges. Presently there is a big shortage of feed and fodder. The shortage of feed and fodder currently in the country is as much as 40 per cent. Diseases are another important factor fiddling with the productivity of animals. Foot and Mouth Disease (FMD) alone leads to economic losses of more than Rs. 20,000 crore per annum. Most of these losses can be prevented through timely immunization. Another major concern in the livestock segment is the increase in the number of unproductive livestock. In the absence of culling of unproductive livestock, mainly due to sentimental reasons and ban on cattle slaughter in many states, the population of unproductive livestock continues to grow, exerting pressure on fodder, feed and forest resources, while contributing significantly to global warming and climate change.

Improving productivity in a huge population of low-producing animals becomes imperative. The focus on genetic improvement should be to enhance milk production, while conserving native breeds, including the draft breeds of cattle. Fodder Development Program along with fodder bank should be designed in every district. Balanced feeding is essential not only to enhance the milk production but also to economise the operation and to maintain good health of the animals. Quality is another area where there is significant neglect and nonchalance. In view of expanding global markets and increasing consumer awareness, it becomes imperative to take a balanced approach in this segment. Livestock insurance in India has not yet become popular. Recurring natural calamities are a good enough reason to pursue schemes which offer succor to the livestock and poultry farmers.

Livestock and Poultry are important sectors that can contribute immensely to the rural economy. However, the sector needs to gear up to the challenges and turn its weaknesses into opportunities.

*Anjana*

**Anjana Nair**

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*Policy Push for Agriculture Reforms*

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*For participation and award nomination*

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## Pulse Revolution

*Indian pulse production have increased reducing our sustenance on imports*

**T**he Pulses which form an integral part of Indian cuisine has compelled India to import a fair share of its consumption from other countries. India's persistent imports have stoked research interest in this genre of grains and we have slowly but consistently been able to increase our production, narrowing the gap between demand and production. The country is slowly witnessing a revolution, that, which is not very radical, but gradual.

India Pulses and Grains Association (IPGA), puts India's import at around 5.7 million tonnes of pulses during FY2017, almost similar to 5.8 million tonnes imported during the previous financial year. India has imported pulses worth \$2.47 billion for the period between April and November 2017 to meet its growing consumer demand. During financial year 2016-17, India had set a record in imported pulses at \$4.24 billion, up from \$3.90 billion the previous year. With a steady growth of 4-5 per cent, India requires around 24 million tonnes of pulses a year to fulfill its demand.

However, data compiled by the Ministry of Agriculture recorded that total acreage under rabi pulses jumped by nearly 5 per cent to hit the highest ever at 16.31 million ha which works out to about 15 per cent more than the average of the past five years. Similarly, many non traditional areas have espoused this crop, For instance, chickpea, a rabi crop of northern India has moved to the warm climates of south and central India. This obviously have entailed research and extension, as the crop in South India had to face dry and hot weather as it matures and faces potential attacks by wilt and pod borers. ICRISAT, headquartered in Andhra Pradesh played pivotal role in evolving varieties that were disease resistant and bypassed the hotter conditions during crop maturity. Average annual production of chickpea has risen from the annual average of 4.88 million tonnes during 1970-80 to 7.38 million tonnes during 2005-15. India has considerably progressed

towards achieving sufficiency in pulses. Chickpea has been the prime contributor, as it accounts for 46 per cent of the country's pulses production.

Adoption of new varieties and good agronomic practices have been the key in this change. But most importantly, it was the resolve by the research community to develop varieties to suit the new growing conditions. India can attain self-sufficiency in pulses if we are able to concentrate on four areas – area, seed, irrigation and market. Increment in area under production is the first and foremost requirement. One good thing about pulse crops is that they can be cultivated in degraded areas. This can convert many waste lands into pulse cropping areas. Integrating pulse crops in crop rotation is another suitable proposition of increasing area under pulses. This will not only increase the income earned from the land but also enriches the land for the next crop owing to its nitrogen fixing abilities and maintains other soil parameters quintessential for the soil integrity of that land. Seed replacement and variety replacement are also equally compelling factors that can affect our production ambition. To make that happen, availability of quality seeds during the sowing season becomes significant. Better irrigation facilities can offset for the deficiency in rain and manage the production.

Beyond the agronomic measures, farmers need regular advisories from the states. Market sensitive production is what we need. Market fluctuations and demands should be communicated in advance to the farmers and this will help them in adjusting their production in accordance with the demand. The usual practise of cultivating crops irrespective of the demands, global and domestic, often result in glut and sharp fall in prices.

India, going at the current pace can very well outlive the dependence on imports. But the real challenge is to maintain and manage the output levels. If we can succeed in gauging the market sentiments and direct the agriculture of the country to deliver accordingly, undoubtedly we can capitalize the global markets and make agriculture a more profitable enterprise.

## Technology – Illegally

*GM crops illegally being cultivated in India*

A decade later, Bt Brinjal is back to haunt India. The inglorious exit of the genetically engineered food crop from Indian soil following a moratorium, had not deterred some farmers in Haryana to sow them in their fields, of course clandestinely. The matter now in public spotlight, raises some uncomfortable questions. How strong and valid is the moratorium on Bt Brinjal? How effective is India's regulatory bodies?

A tip off and further tests have confirmed the presence of Bt Brinjal in a farm belonging to a farmer in Fatehabad district in Haryana. Bt brinjal engineered with a bacterial gene producing Cry1Ac protein and thus endowed with protection against pests that attack plants, is banned in India from being cultivated on a commercial scale. However, the crop was cleared for cultivation in 2009, and a public outcry led to shelving the variety and a moratorium was imposed on it for commercial release. Had it been cleared, Bt Brinjal would have been the first genetically engineered food crop of India. So far, India has only one GM crop to its credit, Bt cotton, the history of which has been good with India. India's cotton production increased dramatically, since its introduction, and today we are a recognizable cotton producer of the world.

Despite the ban, the crop has found its way to the Indian farms. While speculations are rife on the possible smuggling of the GM seeds from neighbouring Bangladesh, where it is completely legal to grow and sell them, interestingly it is not the first instance of illegal cultivation of a genetically engineered crop. In 2017, GM Soyabean – which is herbicide tolerant (HT), has been reported from Aravalli district in Gujarat. Herbicide-tolerant GM cotton known as Roundup Ready Flex (RRF) was also similarly found to be cultivated in three states – Gujarat, Punjab and

Maharashtra, despite the Genetic Engineering Appraisal Committee, not clearing the technology. Even the Bt cotton had followed the illegal route initially, a year before being legally approved to be cultivated. After its formal approval, the area under cotton hybrids rose from 2% in north India and 40% elsewhere to 96% across the country, from 2002 to 2011. Today, India is the world's biggest cotton producer and has the fifth largest area under GM crop cultivation, and Bt cotton seeds account for 40% of the Rs 14,000 crore national seeds market.

But in the case of GM food crops, the environmentalists are concerned about the long-term impact on human health as well as on the environment. The anti-GM activists are worried that the introduction of the transgenic variety may genetically contaminate domesticated as well as wild varieties of the crops. The GM lobbyists, however, are convinced of the good they can offer and the benefit the farmers are to acquire from this brand of technology, considering the advantage that India had with cotton. In the future, when agriculture is pitted against diminishing resources and increasing demand, technologies such as these might come in handy. Some might even argue that farmers are convinced of the efficacy of the technology and hence the rampant illegal cultivation of GM crops.

However, the pertinent question is, how poised is India to take advantage of this technology. This technology of integrating an alien gene into the genetic make up of the crop, comes with its own set of precautions. Hence, we have bodies like Genetic Engineering Appraisal Committee. Unfortunately, the monitoring and regulation has been far from satisfactory. India has not acted responsibly in using this technology and the condition warrants establishing a more responsible and vigilant institution. In the absence of which, it is better for India to steer clear of GM technology.

## Toiling in Turmeric

*Turmeric farmers are contesting against PM in the election to draw attention to their grievances*

**A**griculture in the last few years in India has fairly created an impression that it is non remunerative and its dependents, the farmers, are bearing the brunt of falling prices of commodities. Since the last few years, farmers have been vociferous about their problems and their voice was heard across nation through protest and marches. Dejected over the callousness of the authorities towards their problems, farmers have used this election season to air their grievances in the most innovative way.

This election, some farmers contested against political candidates in huge numbers, so that their problems get a wider audience. About 180 turmeric farmers contested the Nizamabad Lok Sabha election. Taking it a step further and to draw the attention of the entire nation, twenty six turmeric farmers from Telangana filed nominations in Varanasi, taking on Prime Minister Narendra Modi himself. They have taken great pains to achieve this feat considering this time when farmers are busy, as it is the end of rabi season and beginning of Kharif. Filing a nomination is time consuming and capital intensive. The contestants need to make a deposit of Rs. 25000 and will have to get an endorsement by at least 10 local voters. And, definitely a lawyer's expertise to vet the papers. Together with that, they have to navigate the hostility of the constituency.

A task as arduous and expensive as this undertaken by farmers, plainly exposes his helplessness. His woe is same as the rest of the farmers across the nation. Not getting remunerative prices and serially crashing commodity prices. Most of all, he is peeved because no one is listening to him. The price of turmeric which ruled above Rs 10,000 a tonne two years ago, have fallen to just Rs 4,000

now.

Turmeric is no ordinary crop that is cultivated in small swathes of land. India is the largest producer, consumer and exporter of turmeric in the world. Indian turmeric is considered to be the best in the world market because of its high curcumin content. India accounts for about 80 per cent of the world turmeric production and 60 per cent of world exports. Telangana is an important turmeric player with farmers growing it in about 1.50 lakh acres. Farmers toil on field for nine months to produce it. The crop after the harvest undergoes a long process of cleaning, boiling and drying before being brought to market. Approximately between 9 to 10 lakh quintals come to the market here every year.

At present, turmeric is listed as one of the 52 spices in the Spice Board. The farmers, however, are campaigning for a separate Turmeric Board along the lines of Coffee Board, Tea Board and Cotton Board. Their demand is justified considering the revenue earned in terms of foreign exchange by this spice. India gets Rs 22,000 cr foreign exchange every year from exporting turmeric. The cash crop in Nizamabad itself accounts for 30 per cent of country's production which is exported to 130 countries.

With a responsible Board in place, they are hoping to have minimum support price for turmeric. Currently the farmers invest Rs.1.5 lakh per acre and the loss per acre amounts to Rs.30000- Rs. 40000. The exclusive Board will look into the problems and challenges that they are facing and lobby for them at the policy level. Besides remunerative prices and predictability in procurement, a Board would help develop new varieties and improve yields. In fact, their demand for a Turmeric Board is more than two decades old. And it took an election and farmers' extraordinary step of contesting election to draw attention to this demand.

## AgBots – The Next Revolution

*Agriculture tomorrow will be driven by artificial intelligence*

**T**he world is absorbing technology at an alarming pace with the right mix of artificial intelligence, algorithms, robots and of automation. Substituting the human element with technology have in reality guaranteed efficiency in use of resources, minimal errors, precision and better outputs. When the world is embracing self-driving vehicles and robots treating patients, agriculture is also not very far away from such interventions.

The advantage of the technological advancements such as these are their ability to severely restrain loss of resources. They intend to increase the input efficiency. Such an aspect is crucial considering the increasing responsibility of agriculture to produce food for vehemently increasing population. According to the estimate given by the UN, world population is anticipated to grow up to 9.7 billion in 2050. We are left with the option of producing more food from the same piece of land, if not smaller, owing to the increased use of land for other purposes. Besides the population factor, future will see lesser number of people engaged in agriculture as a profession. The fact is quite true for India. The number of farmers have dipped by over 8.6 million in the past decade. The statistics show that only 54.6 per cent of total workers in India are now part of the agriculture sector with a decline of 3.6 per cent as compared to 2001. In such a scenario, AgBots, an autonomous robot used in farming to help improve efficiency and reduce reliance on manual labor, emerges as an apt alternate proposition.

Robots' application in agriculture spans from sowing to harvesting stage. They find active applications in weed control, cloud seeding, planting seeds, harvesting, environmental monitoring, pest management and soil analysis. Some sources even put the market of agricultural

robots to reach \$11.58 billion by 2025. Robots or drones can precisely remove weeds or spray them with targeted weedicides, using 90% less chemicals than conventional blanket sprayer. Most importantly they are programmed to differentiate between weeds and crops, minimizing losses to a great extent. Similarly they can identify disease, pests, alert the farmers and direct the appropriate management strategy at the precise location. Harvesting and picking is one of the most prevalent robotic applications in agriculture. This is because of the precision and speed that robots can achieve to improve yield size and reduce wastage.

Although the opportunities are alluring, they come at a cost, a great cost apparently. The investment is very high and this limits the advantage offered by this technology to just a few. Besides, the technology is still not out in the open. Awareness regarding the existence of such a technology in agriculture is very low. The skill set required to operate and manage is also a pre requisite to popularize the technology. However, these challenges in years to come will be addressed as the scope of this technology is too wide to be dismissed casually.

AgBots has the potential to offer broader and better variety of foods, wider availability of food and feed at a lesser cost economically and environmentally from lesser resources. Agriculture has come a long way from being dependent on humans and animals to now being controlled and regulated by artificial intelligence. The change is reflective of the world that we live in. Our demands have changed, our requirements have evolved and our expectations have grown. Self sustenance have given way to profit and optimization of the yields have become a priority. Agbots offers just that. A few years of research and we will enter this new world.



## As cotton saturates, Kaveri Seed sees richer harvest in other crops

▶ Telangana-based Kaveri Seed Company Limited expects its business mix to change going forward. Against the present 55:45 mix of cotton versus other seeds, over the next couple of years, rice and vegetable seeds will account for about 60 per cent and cotton 40 per cent. In the 15,000-crore organised hybrid seed market, the company commands 8-10 per cent of the business. Interacting with media here, GV Bhaskar Rao, Chairman and Managing Director, said, "We believe that the cotton seed market has reached some sort of a saturation point where we have a major market share. In order to further consolidate our business, we expect to expand our business in non-cotton areas. These include rice and vegetables, which provide huge opportunities to grow and expand." Set up nearly a decade ago, the company has been growing at a compounded annual growth rate of over 20 per cent. Given the growing focus on improving yields, the company believes that the rice, maize and vegetables seeds business will get bigger. The company's focus is on growing hot pepper (chillies), tomato, brinjal, among a host of others.



## Mahindra rated as India's Most Attractive Tractor brand

▶ In a study covering 5,000 brands across 16 Indian cities, 'Mahindra' tractors, part of the USD 20.7 billion Mahindra Group, have been recognized as India's Most Attractive Tractor brand by Trust Research Advisory (TRA) in the fifth edition of its report, titled 'India's Most Attractive Brands' – India Study 2018. The study is based on TRA's proprietary 'Brand Attractiveness Matrix' which comprises 36 attributes of Brand Attractiveness. On being conferred the TRA award, Rajesh Jejurkar, President, Farm Equipment Sector, M&M Ltd. said, "The TRA award is a recognition of our work in building a global customer focused brand, with the widest range of tractors for every kind of farming application. At Mahindra, we constantly strive to work with the customer and connect with their needs to drive success. While thanking TRA for this award, we will continue to work toward the development of newer products both in tractors, as well as the farm machinery space driven by our focus on innovation and technology". Sachin Bhosle, Research Director, TRA Research, said, "Mahindra Tractors communication plays a dual role in building Brand Appeal. Firstly, it enhances the inherent attractiveness of the brand, & secondly, it also helps to communicate this attractiveness to customers across the Indian farming sector. Mahindra is synonymous with tractors, and as a brand it resonates highly on recall among all Indian tractor brands. We congratulate Mahindra on this achievement." TRA's 'Buying Propensity' index is a scientific methodology that gets to the root of the consumer's buying process to understand and measure their buying keenness. It attempts to understand this through the overt, covert and contextual buying drivers of consumer influences. Creating Buying Propensity is to create a natural pull for the consumer toward the brand that is manifested on the basis of the consumer's Trust (the transactional drivers to buy) and Attractiveness (the psycho-socio-cultural drives to buy).



## SanLucar makes its first shipment of blueberries from Spain to Middle East with latest controlled atmosphere technology

▶ SanLucar made the first shipment of blueberries from Spain to the Middle East, using Carrier XtendFRESH™, the most advanced technology on the market in a controlled atmosphere. This innovative system regulates the levels of carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) inside the transport container, reducing and eliminating the ethylene released by the fruit. Thanks to this technology, it is possible to slow the natural ripening process of the fruit down, to extend its shelf life while preserving all its freshness and quality. All these benefits are especially important for a product as delicate as blueberries, and essential to maintain the premium quality of the fruit and vegetables that SanLucar produces and sells worldwide. "Logistics are for SanLucar a key factor in the development of our internationalization strategy, always acting as a springboard and never as a limitation. From this point of view, we are strongly committed to the new means at our disposal to preserve the high quality standards of our products on their long trip to the overseas markets", explains Christian Quintela, Logistics Director at SanLucar. "In this sense -he adds- it is crucial to collaborate with leading shipping and logistics companies such as MSC Mediterranean Shipping Company to find the most innovative preservation technologies in refrigerated containers, as well as the most optimal services and routes for each of the destination markets." In the coming days, SanLucar blueberries will be distributed in the Middle East supermarkets.

## DhanukaAgritech launches new products for paddy, cotton and chilli crops

➤ DhanukaAgritech limited, one of India's leading Agrochemical Formulations Company has launched new products for paddy, cotton and chilli crops. With addition of these new products, DhanukaAgritech would be able to provide a complete solution to the farmers and help improving overall health of cotton and chilli crops. CHEMPA is an effective, pre and post-emergence herbicide controls broad leaf weeds, sedges and grassy weeds in paddy. APPLY is a new technology based systemic insecticide to control brown plant hopper whereas the most awaited insecticide. LARGO, is a solution to the cotton and chilli farmers is useful in controlling major insects in these crops. CHEMPA is based on Japanese technology. It is mainly absorbed through plants root, translocate in plants and inhibit root and shoot growth of weeds. CHEMPA is highly effective and requires low doses. It will help paddy farmers to reduce cost for weed control in their fields. APPLY is one of the best technology available in the world to control BPH which is a serious pest that can cause significant harm in later stages of paddy crops. It has potential to cause losses upto 50% and in past has caused serious damage in some of the major rice growing states. APPLY's 3 way action gives complete control on BPH. Just after spray, BPH stops feeding, thus checks losses immediately. APPLY also stops egg-laying by BPH, thus helps reducing resurgence of BPH. It also requires less no. of sprays than other products available in the market, so it even helps in reducing cost of paddy farmers. The "Green Chemistry Challenge" award winner- LARGO is the world's best thripicide and offers excellent control of important insects on the Cotton and Chilli crop such as Thrips (Thripstabaci), Spotted boll worm (EariasVittella) Leaf eating caterpillar (Spodopteralitura), Thrips (Scirtothripsdorsalis), Pod borer (Helicoverpaarmigera) & Leaf eating caterpillar (Spodopteralitura/ Spodopteraexigua). LARGO acts on the target pest either by ingestion of treated leaf or through cuticular contact.



## PepsiCo India withdraws cases against Gujarat potato farmers

➤ The battle of a multinational-versus-farmers over potato seeds came to an end with PepsiCo India Holdings Pvt Ltd withdrawing cases against nine farmers filed in two Gujarat courts. PepsiCo sought an early hearing in the cases of Intellectual Property Rights (IPR) infringement and applied to withdraw the law suits. It had filed cases against four potato farmers in the Commercial Court in Ahmedabad and against five farmers in the district court of Modasa (Sabarkantha). The development comes after the American food multinational faced public anger and global embarrassment for slapping a Rs 1 crore lawsuit against the farmers for allegedly growing the FL2027 or FC5 variety of potato. PepsiCo claimed exclusive rights to the variety under the PPV&FR Act, 2001. The variety is used to make its popular Lay's chips. Farmers' rights groups and civil society representatives retaliated with a call for a boycott of PepsiCo products. AnandYagnik, counsel appearing for the farmers, said that rarely do multinationals withdraw suits that too having litigated against 'marginalised and downtrodden farmers.' "This is the first instance where PepsiCo has withdrawn suits not only against the farmers of Sabarkantha but also against Aravalli and Banaskantha and with this withdrawal the ill-conceived initiative of PepsiCo to threaten farmers with litigation has come to an end," Yagnik said in a statement. Farmers' rights groups hailed the development as a "victory of farmers" and stated that while PepsiCo India was taught a lesson in law by alert citizens, it is now the responsibility of the Government of India to pro-actively take up measures to uphold farmers' rights.

## UPL announces 26.75% stake buy in Allfresh



➤ Agrochemical firm UPL said it has acquired 26.75% stake in Allfresh Supply Management for Rs 9.24 crore in an all-cash deal. The deal will be completed by May 20, 2019 and will be subject to compliance of certain conditions, UPL said in a filing to the BSE. "UPL Ltd has invested Rs 9,24,99,283 in Allfresh Supply Management Pvt Ltd constituting 26.75% (on fully diluted basis) in the paid-up share capital of Allfresh," the filing said. According to UPL, the acquisition of Allfresh will help the company in growing the post-harvest market in the country. It would also help in leveraging the association of Allfresh with farmers and strengthen the relationship, the company said.

## India not obliged to be compliant with UPOV: Experts to Minister

➤ A section of agricultural scientists, activists and farmer leaders has alleged that there is an undesirable attempt to align India's Protection of Plant Varieties and Farmers' Rights (PPVFRA) 2001 with the International Union for the Protection of Plant Varieties (UPOV), even though the country has no legal obligation to do so. In a letter written to Union Agriculture Minister Radhamohan Singh



and PPVFR Authority Chairperson KV Prabhu, they strongly opposed the move and said: "We note with deep concern the idea to align PPVFR Act, 2001, with the international law on the subject, implying compliance with UPOV. We emphasise that India is not a member of UPOV and is under no legal obligation to be compliant with UPOV." The amendment was to increase the period of protection available to registered varieties to 20 years for trees and 25 years for vines from the existing 15 and 18 years, respectively. "(The PPVFRA) members were informed that the period of protection has to be made on a par with the period of protection under UPOV in alignment with international law on the subject," said the letter quoting the minutes of the meeting of the authority members on November 13, 2017. The existing protection period itself is long and any further extension to 20 and 25 respectively, will interfere with the farmers' freedoms and researchers' privileges that are guaranteed in the law. The Authority is legally bound to maintain the balance between the rights of farmers versus breeders, they argued.

## Govt fixes high OMS price for wheat to force private traders to buy from farmers

➤ The food ministry has fixed the reserve price of wheat under open market sale from official stock at Rs. 2,080/quintal, much higher than MSP, during the procurement period April-June and announced Rs.55/quintal increase in each of the subsequent quarters. This is seen as a move to force private traders to buy from the mandis now instead of entirely depending on the government sale in off season as the bulging stocks put pressure on the Food Corporation of India (FCI) to cut purchase. The reserve price of wheat is Rs. 240 more than its minimum support price of Rs. 1,840/quintal. If traders know that they will have to pay such high price later, they may be tempted to buy at MSP and keep the grains with them, officials said. The reserve price is valid for Madhya Pradesh, Punjab and Haryana. For other states, FCI will add railway freight (ex-Ludhiana) and road transport costs to nearest depot in the reserve price. A total quantity of 10 million tonne has been approved for the open market sale scheme (OMSS) during 2019-20, but the government is ready to release more if demand is there, the officials said. Last year, the OMSS wheat sale was about 7 million tonne out of 10 million tonne approved.

## India signs protocol for export of chilli meal to China; discusses market access for farm products

➤ India and China signed a protocol for the export of Indian chilli meal to China. This is the fourth protocol signed between the two nations over the past year allowing the export of farm commodities from India. Commerce Secretary Anup Wadhawan and General Administration of Customs of China (GACC) Vice-Minister Li Guo, who signed the protocol also discussed issues related to India's pending request for the clearance of more farm products for the Chinese market, said an official release. India raised the issues over market access for items such as bovine meat and soyabean meal. China said it would look into the matter, as it wanted exports to be approved by the global standards agency OIE. India also pointed out that a large number of agricultural items for exports were awaiting China's nod, including soyabean meal, pomegranate, okra, sapota, banana, papaya, pineapple, maize and sorghum. The draft protocol for okra is ready and is expected to be finalised soon for soyabean meal.



## High Court lifts Centre's curbs on GI tag for basmati rice

➤ The Delhi High Court has struck down the decision of the Central government restricting basmati rice production to only seven States in the Indo-Gangetic plains. The verdict came on Madhya Pradesh (MP) government's plea seeking to make 13 districts in the State to be included in the Geographical Indications (GI) for basmati rice. GI certification gives recognition and several protections to a basmati rice producer and helps in maintaining the specific qualities of the rice grown in that particular region. The Ministry of Agriculture had through two Office Memorandums (OM) — on May 2008 and February 2014 — confined the description of basmati rice grown in the Indo-Gangetic plains in the States of Punjab, Haryana, Delhi, Himachal Pradesh, Uttarakhand and parts of Uttar Pradesh and Jammu and Kashmir. The MP government contended that the two OMs were outside the scope of the Seeds Act, 1966. It also stated that the OMs encroach upon its power to pass laws in relation to agriculture, which is a State subject. The 2008 OM of the Ministry set forth the standards of the 'basmati' variety of rice. It specified that only basmati varieties with prescribed characteristics grown in the Indo-Gangetic region would qualify for such a description.



## New procedures for import of pulses

➤ The commerce ministry has laid down a procedure for import of a few varieties of pulses for the current fiscal and has invited applications from millers. According to the ministry's foreign trade arm DGFT, millers and refiners of these pulses need licence for imports. "Procedure for import of 2 lakh tonne (T) pigeon peas/toor dal, 1.5 lakh T urad dal, 1.5 lakh T moong dal and 1.5 lakh T peas (including yellow peas, green peas, dun peas, and kaspera peas) is laid down," directorate general of foreign trade (DGFT) has said in a notice. As per the procedure, for each refining/processing unit, applicants will have to provide self-certified copy of a document indicating its refining/ processing capacity. This document should be issued by a central, state or district authority. The absence of the document will render the application liable for rejection, it said.

## Cabinet committee extends duration of new urea policy

➤ The Cabinet Committee on Economic Affairs decided to extend the duration of the New Urea Policy from April 1 till further orders to ensure smooth supply of nutrients to farmers. The extension of the policy will facilitate continuation of operations of urea plants and ensure regular supply of urea to the farmers. In 2015, the Union Cabinet approved a comprehensive New Urea Policy-2015 for the next four financial years. The policy is aimed at maximising indigenous urea production and promoting energy efficiency in urea units to reduce the subsidy burden on the government.



## 86% farm households in state under debt: Study

► The agrarian crisis seems to be rising as four-fifths of farm and agricultural labour households are under debt in Punjab, reveals a study. The study, published in the Journal of Rural Development, says a total of 85.9 per cent of agricultural dependent households in Punjab are under debt. The study, called 'Levels of Living Farmers and Agricultural labourers', was published by the National Institute of Rural Development and Panchayati Raj, Ministry of Rural Development. It shows that the amount of debt per indebted household increases as the farm size goes up but the amount of debt per owned acre decreases as the farm size increases, which implies that the burden of debt is greater on the lower farm size categories as compared to the upper farm size categories. As many as 89.06 per cent of the semi-medium farm households are under debt while in case of marginal, small, medium and large farm size categories, these percentages are 83.33, 88.64, 84.09 and 82.61, respectively. Similarly, 80.7 per cent of agricultural labour households are under debt according to the study conducted by a group of professors of Punjabi University, Patiala. According to the study, the average debt per indebted farm household in rural Punjab is Rs 5.52 lakh while the average amount of debt per indebted agricultural labourer household is Rs 68, 329.88. Gian Singh, economics professor, Punjabi University, Patiala, said, "It is an utmost necessity to revisit the land reforms in favour of marginal and small farmers. Moreover, agricultural labourers are an important section of the farming community and they need to be looked after." Gian Singh said apart from large-scale farmers, all the other categories of farmers were facing a huge crisis. "Due to high diesel and fertilizer prices along with other expenses, there has been a sharp decline in profitability in the agriculture sector. The cost of input has been increasing faster than the output. For labourers, everything is at stake just to make the two ends meet," he added.

## NABARD announces Rs 700-crore VC fund for agri, rural startups

► The National Bank for Agriculture and Rural Development (NABARD) announced a Rs 700-crore venture capital fund for equity investments in agriculture and rural-focused startups. NABARD has been contributing to other funds till now and this is the first time that the rural development bank has launched a fund of its own. The fund has been launched by Nabventures, a subsidiary of NABARD, and has a proposed corpus of Rs 500 crore with an option to retain over-subscriptions of Rs 200 crore, called as the green shoe option, an official statement said. NABARD has given an anchor commitment for the fund, which will be investing across startups engaged in agriculture, food and rural development, it said. The statement said the fund had its first close but details of the investments done by NABARD and other limited partners, if any, were not immediately available. The fund will have a high impact as it will provide a boost to the investment ecosystem in the core areas of agriculture, food and improvement of rural livelihoods, NABARD chairman Harsh Kumar Bhanwala said. Till now, NABARD has contributed Rs 273 crore to 16 alternate investment funds, the statement said. NABARD is now 100 per cent owned by the government.

## More farmers to come under crop insurance scheme in Orissa

► In the wake of cyclone Fani that damaged crops in more than 1.4 lakh hectares, Chief Secretary Aditya Prasad Padhi has directed officials concerned to enroll more farmers under crop insurance scheme. This decision was taken at the state-level coordination meeting on crop insurance. Minutes of the meeting showed that during the last Kharif season around 15 lakh farmers were registered under crop insurance with a total premium of Rs 1,102 crore. Target was set to insure at least 22 lakh farmers during the coming Kharif season. With this target, the total premium to be paid by the government is estimated around

Rs 1,380 crore, of which 98 per cent is shared equally by the state and Central government and the remaining 2 per cent by the concerned farmer, sources said. In 2017, the government had paid Rs 940 crore as premium to the insurance companies for Kharif crop, against which the total claim payout to the farmers was Rs 1,726 crore. During the Rabi season of 2017, the total premium paid was Rs 19.14 crore against which the claim payout was Rs 43 crore. In 2018, a total amount of Rs 1,102 crore was paid to the insurance companies towards premium. The yield rate report for 2018 has already been given to the companies after the crop cutting experiments. Senior officers of the Agriculture department are expecting that this year the claim payout may cross Rs 1,200 crore for Kharif crop. The assessment of Rabi crop loss is going on. An amount of Rs 8.23 crore has been paid towards premium to the companies.



## No Bank of Maharashtra loans for drought-hit farmers

➤ In an unusual move, a state-run lender, Bank of Maharashtra, has decided not to extend loans in eight zones in Maharashtra and Madhya Pradesh that include Aurangabad, Latur, Akola, and Amravati, which are hit by drought. The bank cited high bad loans from agricultural advances in the branches of these zones for the decision. The other zones are Solapur and Jalgaon in Maharashtra and Bhopal and Jabalpur in Madhya Pradesh. "The present condition of agriculture is pathetic, wherein gross NPAs under agriculture stood at 18.36%," the bank said in a circular to the branches. The bank had seen fresh slippages of 1,300 crore during 2018-19 from agriculture loans. "It is observed that eight zones/its branches are having high % [percentage] of agri NPAs which are identified for curative action on NPA management," the circular said. The remedial action, as suggested by the 'top management', says, "Branches having NPAs > 15% shall not sanction new/enhancement proposals under agriculture." The bank has said genuine cases of existing borrowers with good track record or new clients should be tapped by these branches and recommended to the next authority for sanctioning. Furthermore, zonal managers of these eight zones have been asked to identify 'chronic/stagnant' branches, and should report the same to the planning department in the head office for merger or closure. The bank has asked all the zones to carry out a detailed analysis of NPA accounts and ascertain various measures for default. Among the eight zones, Aurangabad has the highest percentage of NPAs — almost 25% of advances — followed by Bhopal (21.4%), Solapur (19.1%), and Akola (16.5%). Advances to the agricultural sector come under priority sector lending.



## RBI tells finance panel that income support schemes, farm loan waivers will cause fiscal slippages



➤ The Reserve Bank of India said that income support schemes and farm loan waivers will cause fiscal slippages in the states. The observations were made during a meeting between RBI Governor Shaktikanta Das, deputy governors and members of the 15th Finance Commission, a government press release said. "Fiscal deficit of states is budgeted to be lower in 2019-'20 budget estimates, but revised estimates and actuals deviate significantly," it said. It added that outstanding debt as a percentage of Gross Domestic Product has been rising. BJP-ruled states have and the Centre have announced sops for farmers to relieve agrarian distress. On the other hand, Congress governments which came to power in Rajasthan, Madhya Pradesh and Chhattisgarh have partially waived off farm loans. In its February 1 budget, the Centre had promised that

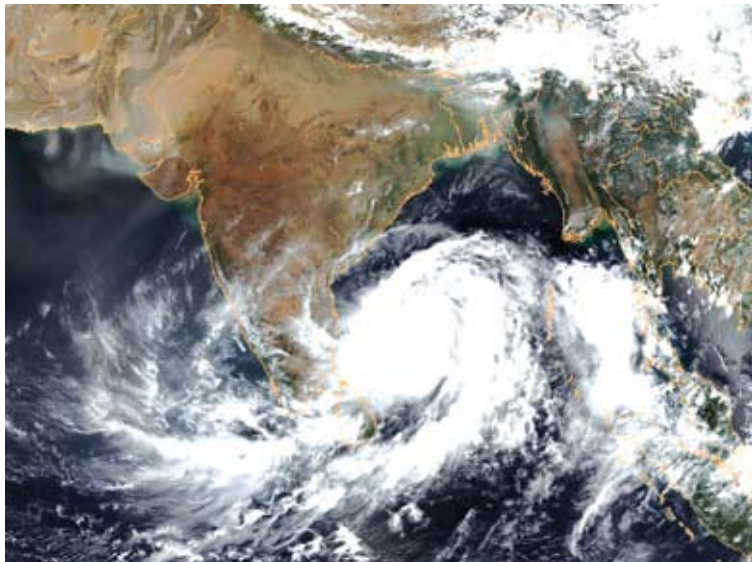
small farmers would get Rs 6,000 per year in their bank accounts in three equal instalments. Beneficiaries will get the amount from December 1, 2018, retrospectively. The Congress, on the other hand, has announced that it will launch the Nyuntam Aay Yojana if it comes to power following the Lok Sabha elections. According to the scheme, the poorest 20% of families will get Rs 72,000 per year deposited in their bank accounts.

## Micro finance sector to grow up to 22% in FY20: ICRA

➤ The micro finance industry is on the path of recovery and is likely to see a growth of 20-22 per cent in 2019-20 despite last year's liquidity squeeze, according to rating agency ICRA. "The domestic microfinance sector registered a robust 28 per cent growth during the 12 months ended December 2018 against 26 per cent in 2017-18, and has emerged unscathed even as the liquidity squeeze after September 2018 severely curtailed growth of NBFCs in India," ICRA said in its report on the performance review and outlook for the MFI sector. As of December 31, 2018, the overall micro loan market size (including SHG Bank linkage programme) was Rs. 2.37-lakh crore, it further said. However, micro finance institutions and small finance banks, would together require external capital of close to Rs. 3,500-Rs. 4,700 crore in the next three years, given their growth targets of 25 per cent to 30 per cent annually, it said.

## Initial estimate pegs Fani crop damage at Rs 150 crore

► The initial estimate of Cyclone Fani's damage to standing crops in Odisha has been pegged at Rs150 crore, but the State Agriculture Department warns that the destruction of storage facilities and harvested crops stored in the open could further spike the losses. Low insurance penetration could also exacerbate farmers' losses, especially in the poultry sector. "Because of the advance warning, it was possible to evacuate larger livestock, but it was impossible to move poultry. A large number of birds, mostly broilers, were killed," said Saurabh Garg, Principal Secretary, Odisha's Department of Agriculture. According to the latest situation report, poultry casualties had hit 34.52 lakh, and more than 53 lakh birds were affected. Livestock casualties included 2,082 larger animals, mostly cows and buffaloes, and 2,202 smaller animals, mostly goats. Initial calculations of compensation to be paid for



poultry and livestock losses are about Rs10 crore, according to Vishal Gagan, Secretary of the State's Fisheries and Animal Resources Development Department. Another concern is the safe disposal of the carcasses. "There has been some concern about contamination of waterbodies, although we are ensuring that burial is done away from homes," said Mr. Gagan, adding that health and sanitation teams had been called in to ensure safe disposal.

## Punjab gears up to produce pesticide-free basmati

► Betting big on basmati exports, Punjab's Agriculture Department is gearing up to assist farmers to produce pesticide-free yield. From educating farmers regarding the judicious use of pesticides to registering them on a web-based application to check traceability, the department, in collaboration with all stakeholders, is working on various modalities to minimise the use of pesticides ahead of kharif season. In 2017-18, basmati exporters faced a major problem with regard to higher maximum residue level (MRL) of pesticides in grains exported to the US, Europe and Saudi Arabia. The importing countries have tightened the norms for MRL values for pesticides. Last year, it was five pesticides and this year there are nine pesticides whose MRL is fixed at 0.01 PPM (parts per million), with major being buprofezin and propiconazole. "We will start a campaign for pesticide-free basmati this kharif season. During the four-month (June to September) campaign, farmers and pesticide dealers would be made aware about the ill-effects of nine agrochemicals on basmati crop and to curtail their use," Punjab Agriculture Secretary KS Pannu informed. Also, under the campaign, every district will collect the fortnightly sale report of these nine pesticides from the dealers and will keep a vigil to restrict their sale.



## Drought intensifies in Maharashtra

► Drought has intensified in Maharashtra with just 18.51 per cent live storage left in dams, 8.5 lakh livestock in fodder camps and 12,000 villages and hamlets depending on water tankers. An estimated 82 lakh farmers are affected by the drought. The situation is likely to worsen in the Marathwada and Vidarbha (Nagpur) regions, where storage levels have depleted to 5 and 10 per cent, respectively. The State Water Resources Department data on May 3 showed that 3,267 major, medium and minor dams in the State have just 18.51 per cent live storage compared to 29.95 per cent on the same date last year. 18 major projects in the State don't have live storage.

## Many sugar mills in TN face insolvency

➤ Cash-strapped sugar mills in Tamil Nadu, facing a cumulative bank debt of over Rs 4,500-5,000 crore, mostly concentrated in listed companies, are hoping for a reprieve from banks from insolvency proceedings. The mills also owe sugarcane farmers Rs 500 crore in terms of statutory Fair and Remunerative Price and the upset farmers are beginning to agitate. Drought has affected sugarcane output, resulting in mills operating at about 30 per cent of capacity. This is contrary to the glut in other regions. "At least 14 factories of the 25 private sector sugar mills are in serious trouble," said a leading sugar mill's representative. Due to the cane shortage and financial crunch, one listed company has not operated any of its mills. Most companies with multiple mills have not been able to operate all their mills, according to farmers' representatives. The sugar companies have approached banks seeking to reschedule loans, arrange working capital and stay out of insolvency proceedings. Being declared non-performing is not in the interest of banks, sugar mills or the three lakh farmers, industry representatives said. Tamil Nadu's sugar production has dropped steadily from nearly 24 lakh tonnes in the 2011-12 (October-September) sugar season to about 6.5 lakh tonnes in the current season. At just about 30 per cent production capacity, the cost per kilogramme of sugar is at least Rs 10 higher than for its counterparts elsewhere, said an industry representative.

## Karnataka's Ishad mango is becoming rare

➤ A local mango variety called Ishad, the pulp of which has been extracted for over a century for making value-added products, is facing the threat of becoming rare in its homeland, Ankola in the Uttara Kannada district, thanks to competition from hybrid varieties. But hopes for its revival are not completely lost as a cooperative society, Hichkad Group Vividhoddeshagala Sahakari Sangha Niyamita, in this coastal town, continues to extract and market its pulp under the brand name 'Oriental (Ishad Mango Pulp)', although in small quantities. Extraction and marketing of Ishad mango pulp has an interesting background, Shivananda Kalave, a Sirsi-based environmentalist, writer and green activist, told The Hindu. Oriental Canneries and Industries set up a unit in Ankola in 1908 to extract pulp from Ishad for making value-added products. The then Bombay government supported it by supplying wood. The pulp, which was also being exported, was being marketed by the then Bombay-based Veerachand Panachand Company. An old marketing brochure printed at the Basel Mission, Mangaluru, says that the pulp was used for making juice, syrup, salad and ice cream. According to the brochure, the pulp could be an ingredient in preparing 48 recipes, and was being used in the United States, Australia and Sri Lanka. According to the brochure, the Hichkad Group purchased the processing unit in 1970 for Rs 95, Mr. Kalave said.



## T-state's irrigation plan for 40L acres takes off

➤ The inauguration of the first pump of the Telangana government's flagship irrigation project Kaleshwaram Lift Irrigation Scheme (KLIS) took place successfully on Wednesday morning. With the officials switching on the first 124.5MW-pump of the project, water from Yellampalli reservoir gushed out of the delivery cistern. In all seven pumping units were installed under package six of the project, out of which two more pumps will be switched on. These pumps can lift water vertically to 110 meters with a 45-degree gradient to the delivery cistern. Package six which costs around Rs 4,961 crore connects the lift irrigation scheme to Nandimedaram project, the halfway point to the mid-Manair project. Chief Minister K Chandrasekhara Reddy in a statement expressed happiness over the accomplishment.

## Maize cultivation affected in Mizoram

➤ At least 1,409 hectare of maize cultivation in Mizoram have been affected by insect attack. The outbreak of Fall Army Worm (FAW) 'Spodoptera frugiperda' an insect has spread to all the eight districts of the state and has caused an estimated loss to the tune of Rs 18.05 crore of maize cultivation. A state level Fall Army Worm Rapid Response Team (RRT) was constituted to combat the FAW outbreak while district agriculture officials were activated to take measures for mitigating the loss of crops and also to launch operation to contain the outbreak.



## Global black tea output up 7.60% in Q1

▶ Global black tea production in the first quarter of the current calendar has risen by 7.60 per cent over the same period of 2018. "According to our compilation of the official data received from various producing countries, the global black tea production till March this year has risen to 310.44 million kg (mkg) from 288.52 mkg," Rajesh Gupta, compiler of the annual Global Tea Digest informed. The 21.92 mkg increase marking a growth of 7.60 per cent is the result of all producing countries reporting higher black tea production during the period, Rajesh Gupta said. As of now, Kenya tops the production table with an output of 106.29 mkg against 99.76 mkg in January-March 2018. This increase of 6.53 mkg marked a gain of 6.55 per cent. India follows closely with 103.61 mkg (92.20 mkg), marking a gain of 11.41 mkg or 12.38 per cent. March was the first month in 2019 when India's overall production rose above the corresponding month of 2018. Until February end, India's production was trailing last year's.



Weather was conducive in both north and south India in March. Till March, north India produced 64.13 mkg, up from 53.86 mkg, or 19.07 per cent, over last year. South India's output rose to 39.48 mkg from 38.34 mkg, up a marginal 2.97 per cent. Sri Lanka came a distant third with a production of 76.81 mkg up 4.04 per cent over last year's 73.83 mkg.

## Despite Tensions, Tea Exports to Pak May Rise in 2019

▶ India's tea exports to Pakistan are expected to increase to 20-25 million kg in 2019 from 15.83 million kg in the previous year, the tensions between the two countries over the Pulwama terrorist attack and the subsequent air strike in Balakot notwithstanding. Industry executives said that since Kenya's tea crop had declined owing to a severe drought, prices shot up 15-20% at the Mombasa auction. "This has prompted Pakistan to import more teas from India," said DP Maheshwari, MD, Jay Shree Tea & Industries. Nearly 80% of the tea exported to Pakistan is from southern India while the rest is from Assam. Last year, Kenya had produced a record crop of 492.9 million kg, leading to a fall in tea prices in the global markets and impacting Indian teas as well. But this year, the crop in Kenya will be much less. Sujit Patra, secretary, Indian Tea Association (ITA) said: "Payments from Pakistan are regular and Indian tea exporters have not faced any problem over payment. The country is buying good volumes of Indian tea, and if this trend continues, we hope to achieve 20-25 million kg of tea exports this year." Pakistan had recorded a massive 35.8% increase in per capita consumption of tea between 2007 and 2016, according to the Food and Agriculture Organisation (FAO) of the United Nations. Currently, Pakistanis consume 172,911 tonnes of black tea, and the figure is expected to rise to 250,755 tonnes by 2027, as per FAO estimates.

## Oilmeal exports fall 25% in April, castor seeds gain

▶ The overall export of oilmeals during April 2019 has been provisionally declined 25% to 1,68,809 tonne, against 2,24,351 tonne in April 2018. The export of castor seed meal, however, has increased to 53,591 tonne against 17,257 tonne, according to the Solvent Extractors' Association of India (SEA). It is mainly exported to South Korea. According to data compiled by SEA, the overall export of oilmeals during 2018-19 has revived and reported at 33,24,693 tonne, against 30,26,628 tonne during the same period of 2017-18. In terms of value, the total earning has increased 34% to Rs 6,410 crore against Rs 4,762 crore due to the higher export of rapeseed meal, BV Mehta, executive director, SEA, said. Export of rapeseed meal rose 65% to 1,094,015 tonne from 663,988 tonne and the export of soyabean meal rose 14% to 13,58,083 tonne from 11,87,818 tonne, he said. During April 2019, Vietnam imported 17,575 tonne of oilmeals as compared to 43,368 tonne in the previous year. This consists of 380 tonne of soyabean meal, 8,795 tonne of rapeseed meal and 8,400 tonne of de-oiled rice bran extraction. South Korea imported 94,847 tonne of oilmeals which consist 43,935 tonne of rapeseed meal and 50,912 tonne of castor seed meal, against 49,649 tonne. Thailand imported 32,337 tonne of soyabean meal, against 19,224 tonne.

## Illegal cashew kernel imports a big worry

▶ The Cashew Export Promotion Council of India (CEPCI) has raised serious concerns over rising illegal import of cashew kernels, saying this has hit the crisis-ridden domestic industry. CEPCI pointed out that large scale imports of low-quality, plain cashew kernels from competing countries such as Vietnam, Mozambique and Ivory Coast have led to closure of several cashew factories that provides gainful employment to more than 10 lakh workers, majority of them are women. According to R.K.Bhodes, Chairman, CEPCI, plain cashew kernels that falls under chapter 8 of the customs tariff is levied a basic customs duty of 45 per cent. Also, the minimum import prices of Rs 288/kg for broken grades and Rs 400/kg for whole cashew are fixed and 45 per cent of the same is levied as the basic customs duty for imports. However, roasted cashew kernels and further value-added cashew products which comes under chapter 20 of the customs tariff under various Free Trade Agreements have been fully exempted from payment of basic customs duty. Misusing these provisions, he pointed out, several importers ship large volumes of plain cashew kernels (mostly broken), which are inferior in quality vis-a-vis Indian products. Since these countries do not have a domestic market, they sell it in the Indian market at throw-away prices. As such low-quality and low-priced broken kernels are dumped in the domestic market evading customs duty, genuine processors are finding difficulties in selling their products. This has not only impacted prices in the domestic market but making domestic processing unviable as well. Further, re-exporting of low-quality whole kernels of other countries with Indian label has tarnished the brand of Indian kernels. Exports of imported unpeeled cashew kernels can also avail of 5 per cent export incentive as applicable to fully processed cashew in India. "This is a big blow to the efforts of the CEPCI to promote Indian cashew as a brand," Bhodes said.

## China planning an overhaul of state-owned agriculture giants

▶ China is said to be planning a shake-up of its massive state-run food companies in a move that's set to reverberate around global agricultural markets. The government plans to transfer the trading assets of stockpiler Sinograin to food giant Cofco Corp., according to people with knowledge of the plan. The restructuring would be implemented in several stages and also includes Cofco taking over oilseed crushing capacity from Sinograin, said the people, who asked not to be identified because they're not authorised to speak publicly. The revamp of the biggest state companies in China, the top consumer and importer of farm products, will take Cofco closer to its goal of rivalling the storied 'ABCD' group of international commodity powerhouses that dominate flows of agricultural products, while extending its ability to secure food supplies for the world's most populous country. The overhaul would also dovetail with President Xi Jinping's drive to reform China's sprawling and inefficient state-owned enterprises, which account for almost half of the nation's industrial assets. Steel, power and chemicals companies are among those already targeted in the restructuring programme, with a long-mooted megamerger of China National Chemical Corp. and Sinochem Group now said to be close.

## Area under cane falls in Brazil, but higher sugar output expected

▶ Brazil is expected to produce a smaller cane crop in 2019/20 than in the previous season, but sugar output is set to rise, government agency Conab said in its first report for the new crop that started in April. Conab projected the main centre-south cane crop at 566 million tonnes, versus 572 million tonnes in 2018/19, saying planted area had fallen in the region and country in general, with many farmers switching to other crops such as soybeans. It projected total cane area to drop by 2.4 per cent in 2019/20 to 8.38 million hectares. Conab sees a reduction of 181,500 hectares of cane fields in the main sugar state of Sao Paulo. The agency expects sugar production to reach 31.43 mt in centre-south versus 26.5 mt in the previous crop.

## Crude palm oil import price up

▶ India raised the base import price of crude palm oil by \$5 to \$545 per tonne, the government said in a statement on Wednesday. The government usually revises the base import price of edible oils, gold and silver every fortnight and the price is used to calculate the amount of tax an importer needs to pay. The world's biggest edible oil importer has levied 40 per cent duty on crude palm oil.



## Balvinder Singh Nakai elected Iffco Chairman

▶ Cooperative major Iffco on Friday elected Balvinder Singh Nakai as its Chairman and Dileep Sanghani as Vice-Chairman. After the 48th Annual General Body meeting of the Indian farmers fertiliser Cooperative (Iffco) here, 21 directors were elected. They, in turn, voted for the positions of Chairman and Vice-Chairman, a statement said. Balvinder Singh Nakai is a farmer - co-operator who has been deeply involved in providing strength to the cooperative movement for the last three decades. He is currently Chairman of Malwa Fruit and Vegetable Cooperative Marketing-cum-Procurement Society Limited. He has earlier served as Vice-Chairman of Iffco for two terms. Dileep Sanghani is Chairman of Gujarat State Cooperative Marketing Federation Limited. Iffco has five fertiliser plants and its turnover was Rs 27,852 crore last fiscal.



## Genetic code cracked for resilient chickpea

▶ In a significant breakthrough, scientists from 21 research institutes globally have successfully completed sequencing 429 chickpea lines from 45 countries, to identify genes for tolerance to drought and heat. The team, led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in close collaboration with BGI-Shenzhen, China, involved 39 scientists from leading research institutes world over. The major implications of the research to the agricultural community are the potential development of newer varieties of chickpea with higher yields, which are disease-and-pest-resistant, and better able to withstand the vagaries of weather, says the paper published in Nature Genetics Online. The results of the three-year-long study showed that more than 90 per cent of the chickpea cultivation area is in South Asia. Drought and increasing temperatures are said to cause more than 70 per cent yield loss in chickpea globally. Chickpea being a cool season crop, is likely to suffer further reduction in productivity due to rising temperatures. The study was done in close collaboration with partners from National Agricultural Research Systems. India, for instance, as the biggest consumer of pulses in the world, faces an increasing production gap. The new research could take India closer to attaining self-sufficiency in pulse production.

## Know Your Peas: Food Co to Trace Supplies Back to Farm

▶ Roquette, a food and nutrition company, is currently building a pea protein plant near Portage la Prairie, Manitoba. While the plant won't be running until the second half of 2020, the company has already started working on tracing the crops that will get processed there. Consumers have been showing more interest in knowing where their food comes from. Supply tracing helps give insight to consumers that want to know that they're eating products that were grown sustainably. Demand for peas has increased amid the craze for alternative sources of protein.

## IIT-Roorkee sets up agro-met field unit

▶ The Indian Institute of Technology (IIT)-Roorkee now hosts an agro-met field unit set up under the Gramin Krishi MausamSewa Project (GKMS), one of 130 such units in the country. This is part of a flagship scheme of NITI-Aayog and works closely with the India Met Department (IMD), responsible for agromet advisory services, providing tailor-made management information to farmers in a real-time format. A new website [www.gkms.iitr.ac.in](http://www.gkms.iitr.ac.in) was launched on Wednesday to provide online real-time weather information to stakeholders, including farmers, said Ajay K Chaturvedi, Director, IIT-Roorkee. The website will feature links from relevant Agro-Met Field Units and institutions as well as IMD, Pune, to provide more comprehensive information about weather conditions in and around Roorkee. The unit at IIT provides information to farmers of Dehradun, Haridwar and PauriGarhwal districts. The IMD has identified IIT-Kharagpur also as part of the project. The unit will record daily surface agromet data such as daily rainfall, evaporation, sunshine hours, relative humidity, wind velocity and direction, air and soil temperature, dry and wet bulb temperature, dew quantity, and grass minimum temperature. This data is transmitted to IMD, Pune, online, Chaturvedi added.



## 14 products from different States accorded GI tags so far this year

➤ Himachali Kala Zeera, Jeeraphool from Chhattisgarh and KandhamalHaldi from Odisha are among the 14 products that have received a Geographical Indication (GI) tag from the government so far this year. According to the data with the Department for Promotion of Industry and Internal Trade (DPIIT), the other products that received this tag include Coorg Arabica coffee from Karnataka, Wayanad Robusta coffee from Kerala, Araku Valley Arabica from Andhra Pradesh, SirsiSupari from Karnataka and HimachaliChulli oil. The tag helps growers of these products get a premium price as no other producer can misuse the name to market similar goods. A geographical indication tag is used for an agricultural, natural or a manufactured product (handicraft and industrial goods) originating from a definite geographical territory. Typically, such a name conveys an assurance of quality and distinctiveness, which is essentially attributable to the place of its origin. Darjeeling Tea, TirupatiLaddu, Kangra Paintings, Nagpur Orange and Kashmir Pashmina are among the registered GIs in India. According to experts, the tag gives protection to the producer of genuine products that command premium pricing in domestic as well as international markets.

## Highest-ever wheat yield expected

➤ The granary of India, Punjab, is expected to have the highest-ever wheat production this year. Production of this staple foodgrain is expected to touch 180 lakh metric tonnes, in spite of the fall in area under the crop. This is mainly because of the highest-ever yield in wheat produced in Punjab. The yield is expected to be 52 quintals per hectare, up from the previous high of 50.09 quintals per hectare, achieved in the last rabi marketing season (2018). Agriculture experts say that the favourable weather conditions all through the winter and the prolonged cool weather through the ripening stage of the crop have helped in the state getting the highest yield ever. The previous high of wheat production was in 2011-12, when Punjab had produced 179.7 lakh metric tonnes (lmt) of wheat — mainly because of increase in area under cultivation as well as favourable weather. Last year, wheat production was 178 lakh metric tonnes.



## 'Rising CO2 levels leading to zinc deficiency in diet'

➤ Rising carbon dioxide levels in the air is causing zinc deficiency in Indian crops thus impacting nutritional value of food consumed by humans. The national rates of inadequate zinc intake has increased from 17% to 25% between 1983 and 2012 increasing risk of diseases like malaria, diarrhoeal afflictions and pneumonia, particularly in children, a new study by the Harvard T H Chan School of Public Health says. Apart from rising CO2 emissions, changing diets and an ageing population are also seen as factors responsible for increasing zinc deficiency. The study shows highest rates of inadequate intake are concentrated mainly in southern and north-eastern states like Kerala, Tamil Nadu, Andhra Pradesh, Manipur and Meghalaya where diets are more rice-dominated. Rice is relatively poor in zinc, aggravating zinc inadequacy in diets of people who rely heavily upon it.

# LIVESTOCK & POULTRY

## Adding Income and Nutrition



India's livestock wealth has contributed immensely to the success of agriculture and economy. Livestock and poultry being the bastion of the small and marginal farmers, their relevance in securing dependable income is undisputed in India. The reliability of these sectors for providing a stable income to the Indian farmers have made them an integral component of the rural households. The sector's profitability and the increasing demand for their products have led to the establishment of many large scale ventures in India. Their success have further corroborated the scope and possibilities that these sectors can offer.

### LIVESTOCK LEVERAGE

India has vast resource of livestock and poultry. India ranks first among the world's milk producing Nations since 1998 and has the largest bovine population in the World. There are about 300 million bovines, 65.07 million sheep, 135.2 million goats, 10.3 million pigs and 729.2 million numbers of poultry as per 19th Livestock



There are about 300 million bovines, 65.07 million sheep, 135.2 million goats, 10.3 million pigs and 729.2 million numbers of poultry as per 19th Livestock Census in the country

Census in the country. The massive livestock population necessitated a strong set of workforce. The sector thus turned into a formidable employment provider. As per the estimate of NSS 68th Round (July 2011-June 2012) survey on Employment and Unemployment, 16.44 million workers as per usual status (Principal status plus subsidiaries status) were engaged in the activities of farming of

animals, mixed farming, fishing and aquaculture. The 70th round survey showed that more than one-fifth (23 per cent) of agricultural households with very small parcels of land (less than 0.01 hectare) reported livestock as their principal source of income. Farming households with some cattle head are better able to withstand distress due to extreme weather conditions.

The value generated from the





sector has also been impressive. According to estimates of the Central Statistics Office (CSO), the value of output livestock sector at current prices was about Rs. 5,91,691 crore during 2015-16 which is about 28.5% of the value of output from agricultural and allied sector. At constant prices, the value of output from livestock is about 29% of the value of the output from total agriculture and allied sector.

India continues to be the largest producer of milk in world. Milk production in India during the period 1950-51 to 2017-18, has increased from 17 million tonnes to 176.4 million tonnes as compared to 165.4 million tonnes during 2016-17 recording a growth of 6.65%. The per capita availability of milk in the country which was 130 gram per day during 1950-51 has increased to 374 gram per day in 2017-18 as against the world estimated average consumption of 294 grams per day during 2017. This represents sustained growth in the availability of milk and milk products for our growing population. The country's milk production is expected to surpass the 180-million tonne mark in the current financial year mainly on account of various export-linked benefits by



the government. The government has increased export subsidies to 20 per cent to ship surplus SMP and in addition, State-sponsored export-linked benefits by Gujarat and Maharashtra, and a minimum support price for raw milk to farmers in Maharashtra are also expected to spur the milk production.

Dairying has become an important secondary source of income for millions of rural families and has assumed the most important role in providing employment and income generating opportunities particularly for marginal and women farmers. Most of the milk is produced by animals reared by small, marginal farmers and landless labours. Of the total milk production in India, about 48 % milk is either consumed at the producer level or

sold to non-producers in the rural area. The balance 52 % of the milk is marketable surplus available for sale to consumers in urban areas. Out of marketable surplus it is estimated that about 40 % of the milk sold is handled by the organized sector ( i.e. 20% each by Co-operative & Private Dairies) and the remaining 60 % by the unorganized sector.

About 16.6 million farmers have been brought under the ambit of about 1,85,903 village level Dairy Cooperative Societies (DCS) up to March 2018. Despite the slump in world market, better procurement prices by dairy cooperatives along with decrease in procurement volume by major private players led to increase in milk collection by the dairy cooperatives by about 11%. The dairy cooperatives have procured daily average of milk about 475.6 Lakh Kg per day (LKgPD) during 2017-18 as compared to 428.7 lakh kg procured during 2016-17. The sale of liquid milk reached to 349.6 Lakh Liter per day (LLPD) during 2017-18 recording a growth of 6% as compared to 331 LLPD marketed during 2016-17. Women members of the DCS are also being encouraged to assume leadership roles. As on 31.03.2018, the total number of women in dairy cooperatives across the country was 4.9 million in 32,092 women DCS which is 29.5% of total farmers.

## POULTRY POWER

Poultry in India evolved from a purely backyard activity to an organized entrepreneur venture. While the backyard poultry served the purpose of meeting the nutritional needs of the house and adding supplementary income, the commercial ventures cashed in on the growing appetite of the flourishing middle income groups.

The egg production segment of Indian poultry industry has been on the rise since 2014-15. After an unprecedented growth of 75 billion eggs in 2013-14 from the preceding year's total egg production of 70



billion, the current egg production in India hovers around 88 billion. Approximately, 75 percent of egg production is contributed by commercial poultry farms, remaining comes from household/backyard poultry. The growth rate of production has increased consistently since 2014-15 mainly due to increasing number of organized poultry players, increasing number of organized retail chains across the country apart from favourable Government policies. The current growth rate of the industry hovers around 6% and is expected to grow at a faster rate in the coming years. Total broiler meat production in the Country is about 4.2 million tonnes currently with a total market size of Rs. 730 billion. This segment is registering an annual growth rate of almost 7%.

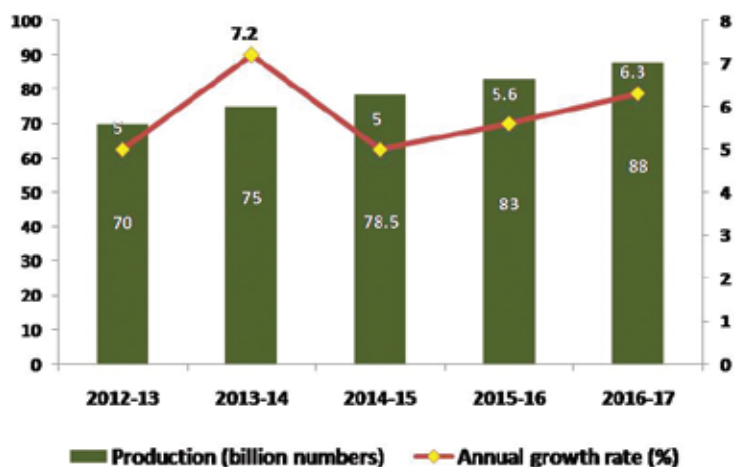
Among the States, Andhra Pradesh and Tamil Nadu rules the roost. Andhra Pradesh is currently the leading State in terms of poultry population with 161 million birds, ahead of Tamil Nadu with about 117 million bird population. Maharashtra is the third largest State in terms of poultry population with 78 million birds followed by Karnataka (53.4 million) and West Bengal (52.8 million).

Share of the world's egg consumption in developing countries has witnessed a significant increase in the last decade. In the Asia Pacific region, countries like

China, Japan and India have been contributing significantly to the global egg production scenario and India ranks 3rd in term of egg production constituting 4% of the total global production of egg, jumping ahead from the sixth position it occupied couple of years before. China contributes 29% of the total global production. As a matter of fact, China has been the world's largest producer of eggs

The egg production segment of Indian poultry industry has been on the rise since 2014-15. After an unprecedented growth of 75 billion eggs in 2013-14 from the preceding year's total egg production of 70 billion, the current egg production in India hovers around 88 billion

**Production of Egg and Its Annual Growth Rate**



Source: Ministry of Agri & Farmers Welfare



The present shortage of feed and fodder in the country is as much as 40 per cent. According to IGFRI's estimates, by 2020, India will require 850 million tonnes of green fodder, 520 million tonnes of dry fodder (edible crop residue) and 90 million tonnes concentrates

### Broiler Poultry Meat Production and Its Growth Rate in India



\*: High growth due to abnormally low production in the preceding year  
 \*\*: Estimated production figures

Source: Ministry of Agri & Farmers Welfare

for the last 30 years. In terms of broiler meat production, India ranks fourth with a total global market share of 5% behind U.S.A. (21%), Brazil (14%), China (14%) and EU (13%). The enthusiasm in the production numbers are still to reflect in the processing segment. The live market sales of broiler meat still constitute more than 90 percent of total volume of sales, whereas the processed chicken meat segment comprises only about 5% of total production. This has more to do with consumer preference for fresh meat rather than processed one.

### CHALLENGE CHECK

Despite the enormity in numbers and production, Livestock and Poultry haven't explored their full potential yet. Our paramount position in milk production is the courtesy of the numbers of livestock and not because of its efficiency. In 2014, India had 50 million dairy cows and 40 million water buffalo, a total of 90 million animals producing 140 million tonnes of milk. Dairy cattle produce an average of 1.4 tonnes per animal and buffalo produce 1.9 tonnes per animal. By contrast, in 2014 the U.S., the world's second largest milk producer had just 9.2 million dairy cows and produced more than 93 million tons of milk, an average of 10.1 tonnes per animal. India has 10 times as many dairy-producing bovines as the U.S., but produces only 50 percent more milk. This is a cause of concern as more animals means more constraint on the resources.

Presently there is a big shortage of





feed and fodder for this sector. The present shortage of feed and fodder in the country is as much as 40 per cent. According to IGFRI's estimates, by 2020, India will require 850 million tonnes of green fodder, 520 million tonnes of dry fodder (edible crop residue) and 90 million tonnes concentrates. The area dedicated to fodder cultivation has remained constant at 4.7 per cent of the total cultivable land since independence. Climate variations like increasing temperature and decreasing rainfall are reducing the yield of pastures and changing land use patterns, especially that of common and traditional pasture lands, and it is diverting a significant amount of the grazing pressure to forests. Besides, the quantity the quality if the feed is also less. A review of the climate impacts of dairy production in South Asia by FAO revealed that the region is responsible for 23 percent of the global methane emissions from dairy production. The report identified poor feed quality as the major cause of methane emission from dairy-producing cows and buffaloes. Most of India's milk production takes place at small-scales in mixed farming systems (farms producing crops and livestock.) The quality of the feed stocks used by small farmers is often poor. Poor quality feed is difficult for animals to digest and this can increase the amount of methane produced during the digestive process. If milk productivity is not improved, farmers will use more animals to meet rapidly growing demand, with profound consequences for the environmental sustainability of milk production in India.

Diseases are another important factor fiddling with the productivity of animals.

*Professor (Dr.) P. K. Shukla,  
Dean, PGS and Registrar,  
DUVASU, Mathura*



"Animal husbandry is pivotal to the rural Indian farmer families' livelihood and food security. Livestock and Poultry production are primarily technology-driven with a rapid adaptability record through appropriate technology transfer in the field. This has made us global leaders in milk and egg production. To cope up with many challenges for sustainable production, cutting-edge end-to-end farming and precision technologies are adopted in areas of breeding, genetics, nutrition, management, food safety, traceability and welfare. Artificial Intelligence, neural networks, blockchain, IoT, robotics, augmented and virtual reality are now the smart farming tools, to name a few. The main game-changer in delivering these in leapfrogging technologies to the livestock farmer is the Veterinarian. As per OIE (World Organisation for Animal Health) the day-one veterinarian's specific competencies include epidemiology, transboundary animal diseases, zoonoses including food-borne diseases, emerging and re-emerging diseases, disease prevention and control program, food hygiene and veterinary products. Therefore, a great responsibility lies with the pedagogues to ensure that the curriculum is covered with adequate hands-on training and exposure through illustrations from real world. The technology is advancing with quantum leaps and bounds and the Veterinarian has to ensure adaptability at a rapid rate through multi-faceted capabilities".





Foot and Mouth Disease (FMD) alone leads to economic losses of more than Rs. 20,000 crore per annum. Most of these losses can be prevented through timely immunization. India has a total of 8,732 veterinary hospitals and polyclinics and 18,830 veterinary dispensaries against the requirement of about 67,000 institutions. Most of these have poor infrastructure and equipment. One of the major threats to poultry meat market in the country is Bird Flu. Ministry of Agriculture and Farmers Welfare has so far reported 25 episodes of AI A (H5N1) in poultry birds in 15 states/ union territory (Maharashtra, Gujarat, Madhya Pradesh, Chhattisgarh, West Bengal, Bihar, Assam, Meghalaya, Manipur, Tripura, Sikkim, Odisha, Karnataka, Kerala, Chandigarh) till January 2015. Perhaps it is because of this reason that 2013-14 witnessed a huge dip in broiler meat production in the country which picked up in the subsequent year registering a year on year growth of 53%.

Another major concern in the livestock segment is the increase in number of unproductive livestock. In the absence of culling of unproductive livestock, mainly due

to sentimental reasons and ban on cattle slaughter in many states, the population of unproductive livestock continues to grow, exerting pressure on fodder, feed and forest resources, while contributing significantly to global warming and climate change.

The milk processing industry is small compared to the huge amount of milk produced every year. Only 10% of all the milk is delivered to some 400 dairy plants.

A specific Indian phenomenon is the unorganised sector of milkmen, vendors who collect the milk from local producers and sell the milk in both, urban and non-urban areas, which handles around 65-70% of the national milk production. In the organised dairy industry, the cooperative milk processors have a 60% market share. The cooperative dairies process 90% of the collected milk as liquid milk, whereas the private dairies process and sell



only 20% of the milk collected as liquid milk and 80% for other dairy products with a focus on value-added products. Similarly, in poultry segment the level of processing is very low. The live market sales of broiler meat still constitute more than 90 percent of total volume of sales whereas the processed chicken meat segment comprises only about 5% of total production. This has more to do with consumer preference for fresh meat rather than processed one.

One of the critical limiting factors for profitability in the poultry sector is the prohibitive prices of important feed ingredients like maize and soymeal. Availability of adequate feed at reasonable price is a crucial factor. For future growth of the poultry industry as a whole, it is essential that the current availability of about 4 million metric tonnes of maize based poultry feed is increased to at least 5 million metric tonnes by the end of 2022. Similarly, there will be a requirement of more than 5 million metric tonnes of soymeal for the Indian poultry industry by 2022 than the current availability of about 1.7 million metric tonnes. This is also evident from the fact that a sharp decline in soymeal prices in 2017 followed by a stable

price of the same in 2018 resulted in an increase in the operating margin of the poultry industry in these years.

### INCREASING MOMENTUM

Livestock and Poultry have emerged as an important source of revenue and nutrition to rural households. The demand for their products have compelled the sectors to flourish and capitalize on the emerging markets. However, to fully take charge of the needs of the country, the sectors need a push.

Improving productivity in a huge population of low-producing animals is paramount in raising the production. Crossbreeding, Upgrading and Selective breeding are the most effective ways for improving productivity. Crossbreeding of indigenous species with exotic stocks to enhance genetic potential of different species has been successful only to a limited extent. Distribution of improved bulls can be practiced in remote areas where A.I. facility is not available.

The focus on genetic improvement should be to enhance milk production, while conserving native breeds, including the draft breeds of cattle. Indigenous breeds adjust productivity to adverse climatic conditions and availability of

The cooperative dairies process 90% of the collected milk as liquid milk, whereas the private dairies process and sell only 20% of the milk collected as liquid milk and 80% for other dairy products with a focus on value-added products





Since Fodder and Feed contribute 60-70% of total recurring expenditure, thus, economic feeding will increase the profitability. Fodder Development Program along with fodder bank should be designed in every district

food. They are resistant to diseases peculiar to the region in which they have evolved. 'Elite' breeds, however, are productive only in ideal, disease-free conditions. In the long run, exotic breeds are economically not viable.

Since Fodder and Feed contribute 60-70% of total recurring expenditure, thus, economic feeding will increase the profitability. Fodder Development Program along with fodder bank should be designed in every district. Balanced feeding is essential not only to enhance the milk production but also to economise the operation and to maintain good health of the animals. As there is a severe shortage of animal feeds and fodder in the country, serious efforts are needed to develop feed and fodder resources, for the expanding dairy industry. High yielding forage varieties must be developed and popularized. Facilities for production and distribution of good quality seeds of outstanding varieties must be established by networking between Agricultural Universities,

National Seed Corporation and farmers. Fodder banks must be established to collect and store surplus crop residues in fodder surplus areas, under public-private partnership for distributing to fodder scarcity areas. Degraded and wastelands and community pasture lands can be notified for raising pastures. Popularisation of complete feed, feed with by-pass protein, microbial protein,

azola, spirulina and non-traditional feed ingredients should also be carried out.

Animal health is very important area and hence special emphasis must be laid to monitor the livestock and maintain facilities to manage and prevent the spread of disease in a pandemic manner. Wider and effective immunization for important economic diseases and compulsory deworming programme should be practised. Creation of disease-free zones and stamping out of major diseases, Facilities for production of vaccines and diagnostics under Public-Private Partnership and establishment of Disease Investigation Labs at the district level and linking them with livestock breeding centres to provide diagnostic and advisory services through Block Veterinary Officers should be promoted.

Establishment of disease investigation units at major livestock market yards to screen animals before selling and purchasing can prevent the spread of diseases, and farmers from being cheated. Periodic livestock health camps for handling problems of infertility, mastitis and other health related issues should be organized. Private veterinary services under the supervision of the AHD or Dairy Federation can also be promoted.

Quality is another area where there is significant neglect and nonchalance. In view of expanding global markets and increasing consumer awareness, it becomes imperative to take a balanced

approach in this segment. Testing of milk for safety and quality parameters at the collection centres should become the norm rather than exception. Establish food testing laboratories duly accredited by the Food Safety and Standards Authority of India (FSSAI) to check adulteration can also ensure safety and sustenance of dairy units.

The success of the livestock development programme is dependent on value addition and better price realisation of the produce. Milk being a perishable commodity, facilities for timely collection nearer their house and payment of remunerative price are essential to encourage the dairy farmers. Preventing wastage of milk due to contamination, unfair trade practices and elimination of unnecessary intermediate agencies in marketing can further enhance the profit margins. Automated bulk milk coolers that can assess the quality of milk and fix the price and total value of the milk on the spot should be installed.

Awareness of clean milk production and methods to keep the bacterial count low from the period of milking till delivery to bulk milk coolers is restricted and hence must be encouraged. Decentralised mini-dairies which can ensure transparency and efficiency, while generating local employment and reducing the cost of processing and marketing of milk and milk products must be promoted.

Livestock insurance in India has not yet become popular. Recurring natural calamities makes it a priority to pursue schemes which offer succor to the livestock and poultry farmers. According to the latest situation report, Odisha's Cyclone Fani had inflicted poultry casualties of 34.52 lakh, and more than 53 lakh birds were affected. Livestock casualties included 2,082 larger animals, mostly cows and buffaloes, and 2,202 smaller animals, mostly goats. Livestock insurance provided



by the public sector insurance companies could cover only about 6% of the animal heads. Innovative and acceptable insurance models may be designed to evolve a suitable scheme for various species.

Dependable income generating enterprises, animal husbandry and poultry have been of immense financial support to women farmers and small and marginal farmers. India being the top producer of milk has only encouraged more farmers into dairying and allied

enterprises. Backyard Poultry is an unavoidable presence in many rural farm households which is religiously meeting the protein and financial requirement of many farm families. While agriculture is becoming risky with changing climates, livestock and poultry have been adding stability to the financial position of the farmers. Considering this, animal husbandry has become even more pertinent in today's situation when doubling the farm incomes has become a priority for the government.

# 'RURAL POULTRY FARMING IS OF GREAT IMPORTANCE IN A COUNTRY LIKE INDIA'

**"While agricultural production has been rising at the rate around 2 percent per annum over the past two to three decades, poultry production has been rising at the rate of around 8 percent per annum, with an annual turnover of US\$ 7500 million. Considering the potential of the sector an established organized network of both production and marketing is running side by side. Due to this organized shape and set up this sector means strength for the country," says Dr OP Chaudhary, Joint Secretary Poultry, Ministry of Agriculture in an interaction with Agriculture Today. The Excerpts from the interview:**



## **What are the major interventions of Central Government to double farmer's income?**

The Present Government has set a target of doubling of farmers' income by the year 2022, for which an expert committee has been framed to examine issues relating to doubling of farmers' income and recommend a strategy to achieve the same in real terms by the year 2022. The same committee has identified seven sources of income growth viz, improvement in crop and livestock productivity; resource use efficiency or savings in the cost of production; increase in the cropping intensity; diversification towards high value crops; improvement in real prices received by farmers; and shift from farm to non-farm occupations. Apart from that, Department also converge different schemes to achieve the target. In my view, four things must be focused for escalating the income of Indian Farmer i.e. focus on achieving high productivity, reduced cost of production and remunerative price on the produce and use of local resources for productivity enhancement with a view to earn higher profits from farming.

## **What is the vision of your Department towards Poultry sector and how it will be strengthened with respect to processing of products/ value addition?**

Presently, the wet market dominates, and processed products account for only about 5 -6 percent of total production. In case of eggs, the processing is even lesser. No doubt the processing/ value addition of poultry produce is still at a very nascent stage, but both the quantity and

value of the exported processed poultry products have increased during the last few years. Ministry of Food Processing Industries being the nodal agency, has a clear goal for facilitating and acting as a catalyst to attract quality investments from within India and abroad into this sector, and for this job MoFPI is also functioning in consultative manner with our department. Besides that, rapid urbanization, industrialization and proliferating fast food parlours, etc., over the last decade have given some impetus to the growth of poultry processing sector. In future days we will plan for establishment of FPOs in this sector and also to channelize these FPOs for strengthening the rural production system as well as the marketing network in a wholesome manner.

## **Although we have experienced phenomenal growth in poultry sector, the growth has not reached the farmers. They are still economically backward. Do you think that extension services need to be strengthened particularly in this sector ?**

Definitely. You know extension and skill development have a key role in intensification of this sector. But the major bottleneck is that the specialized extension worker and facilitator working at grass root level is engaged in different activities and hence individual attention is not possible. However the services with proper guidance and mechanism can boost the production potential of rural poultry sector by transforming the traditional poultry sector to commercial production set up. As you aware that, rural

poultry farming is of great importance in a country like India as it not only generates income and employment opportunities to small farmers including women, but also brings about desired socio-economic change in rural areas which are vital for rural development and rural prosperity.

**The government has approved the proposal for Animal Husbandry Infrastructure Development Fund. Can you share the details of the projects envisaged under these funds?**

Animal husbandry Infrastructure Development Fund (AHIDF) to the tune of Rs. 2,477.52 crore has been announced during 2017-18 Budget. Infrastructure components for Entrepreneur activities like different farming system and core Infrastructure activities like Breeding farms, establishment or strengthening of semen stations for goat, sheep

and pig, Skill Training Institutes (with residential facility), feed mixing units, by-pass protein units, fodder block making unit, veterinary healthcare centers, dispensaries, biological units for healthcare, livestock and livestock product market, retail outlets for livestock products, cold-chain infrastructure have been proposed for this scheme. Need based infrastructure projects especially those innovative and improvised projects like rendering plant etc. which are crucial for meeting biosecurity, zoonotic pressure reduction, food safety, welfare, environmental pollution abatement objectives also be addressed through this AHIDF scheme.

**Your department has recently prepared National Action plan for different sectors like, Feed and Fodder, Poultry, Sheep and Goat, Dairy Production etc. What is the target and vision**

**of department to achieve the goal ?**

Livestock and poultry sector in India have almost shifted from the traditional family holdings to the commercial economical venture. Still the individual sector has its own strength and weakness for prospective development. To analyze the strength of the sector and converging the present strength for future opportunities, a National Action Plan for feed and fodder, poultry and small ruminants has been finalized. A detailed road map to address the issues for mass production and production by masses across the Country has been designed in this action plan. No doubt these action plans are imperative for increasing the farmers' income aligning with the vision of Hon'ble Prime Minister for doubling farmers income by 2022.

**Animal welfare issue has become a big debate in the**





**recent past. How is your Ministry going to deal with this issue further? What are your plans?**

See, it is a new responsibility assigned to our Ministry to look after the different issues related to animal welfare which was earlier dealt by Ministry of Environment Forest and Climate Change. Animal welfare is indeed an issue of concern of today's society for holistic development of humanity. Different organizations and institutions are directly or indirectly involved in animal welfare activities. Stakeholder consultation, strengthening of networking, awareness programme as well as scientific and ethical handling are issues that pertain to welfare and wellness of livestock that will be planned and executed through different State Government and UTs. After all, I wish to emphasize that animal welfare is a right of a living animal which can only be facilitated by benevolence, compassion and kindness.

**Poultry cage ban issue is presently a hot topic. What is the stand of the Department to address the welfare issue as well ?**

It is pertinent to mention that the issue of cage ban is sub judice and the Hon'ble Supreme Court of India has directed (on a Transfer Petition of various such cases going on various Courts of the country) that this will be dealt with at Hon'ble High Court of Delhi, New Delhi. Recently as per the direction of the Hon'ble Court, our department has published a draft of the Space allowance for conventional colony enclosures of egg-laying hens for commercial egg production. At the same time, we are also inviting the suggestions and objections on the published draft rule within a period of 30 days from the date of publication for future consideration/amendment.

**Both poultry as well as livestock are competing with human food resources. Because of which the feed price is escalating day by day. So at this juncture do you think India should take new and aggressive reforms in agri food sector?**

Indian feed industry is nearly worth Rs. 400 billion and is projected to reach Rs. 900 billion

in near future at a CAGR more than 12%. There is an increase in demand of animal feed ingredients. The sector is also facing different challenges to overcome the old traditional feeding practices and to move towards modern scientific practices with technological intervention. India, being a price sensitive market has its own challenges in getting quality raw material by achieving the focused feeding strategy for livestock with regard to amino acid profile, mineral bio-availability, pro and pre biotic feeding. I am of the opinion that India Agri Food Sector needs up-scaling in regard to utilization of non conventional feed resources, low cost animal feed formulation, precision feeding and rationalization of diet which can be addressed by proper policy support, awareness among the livestock keeper and control on procurement price like MSP based grain price for feed inputs etc.

**What are the pro people oriented schemes presently Animal Husbandry Department is continuing for the poultry farmers/entrepreneurs across the Country?**

Department of Animal Husbandry and Dairying (DAHD) is implementing National Livestock Mission (NLM) since 2014-15. The various poultry components under this mission are Poultry Venture Capital Fund under Entrepreneurship Development and Employment Generation component (wherein back-ended subsidy is available to the beneficiary), and other components are Rural Backyard Poultry Development, Innovative Poultry Productivity Project, Modernization and Development of Breeding Infrastructure (State and University Poultry farms) and Central farms Central Poultry Development Organisations (CPDOs). The 'Rural Backyard Poultry Development' component is envisaged to cover beneficiaries from BPL families to enable them to gain supplementary income and nutritional support. Similarly IPPP (Broiler & LIT) has been formulated to encourage poultry entrepreneurship in rural educated and unemployed youth. The model is introduced under Innovative Project of 'Productivity Enhancement' component of Sub-Mission on Livestock Development under NLM.

# NOTHING IS MORE IMPORTANT THAN ANIMAL HEALTH'



**Ayurved Limited is one of India's leading animal care companies specializing in 100% natural and safe herbal products. The company's portfolio includes herbal healthcare and nutritional products catering to a wide range of animal species. Recognising the importance of nutrition in maintaining health, Ayurved has also entered the promising area of animal nutrition with the launch of a range of value-added, herbs-enriched quality Feed products. Ayurved is the only company in India with a portfolio of both health-care and nutrition / feed products. "We have around 10% of market share in domestic market. We are leaders**

**in certain segments like Mastitis Control, Reproductive Health management, Digestive health care etc.," says Dr. Anup Kalra, Director Sales & Marketing, Ayurved. In an interview with Agriculture Today, Dr. Kalra elaborates on the importance of animal health care management for better returns.**

## **How important is animal health for better production?**

There can be nothing more important than the animal health. It is the health and management which can make animals more productive. The use of herbals through the knowledge of Ayurveda has played significant role in improving animal health. At Ayurved, we have used Science and Technology to validate herbal solution for their benefits in health and production improvement, in domestic and international sectors, alike.

## **Are you satisfied with the current animal care management practiced in India?**

The awareness amongst farmers and practicing vets with respect to management and animal health care has improved, for sure. Stakeholders have started discussing that prevention is better than cure. But, still a long way to go. The use of nutrient and herbal health solutions has shown positive growth.

## **What are the challenges encountered by the farmers in livestock health management?**

The farmers are always keen to improve health and their profits. Since India is a vast country, reaching all the farmers has always been a great challenge. The other areas are the limited availability and use of diagnostic tools/kits and the limited awareness.

## **How far does feeds influence the animal**

## **output?**

Quality and Nutritious feed always has an important role to play on animal output and health. The challenge is the low awareness amongst farmers about the benefits of compound feed. Also the value which the farmer receives per liter of milk is low. He therefore tries to manage on low feed resources.

## **What are the recent trends in animal health care products globally? How far has India been able to catch up with this trend?**

The trend is towards health improvement and supporting management and production. One such area is Antimicrobial Resistance. The trend has begun and the farmers and feed millers have started looking for best possible options to replace antibiotics in feed.

## **How effective is Ayurveda in treating animal health problems?**

The herbs using the knowledge of Ayurveda has been very effective. There are scientific reports to prove their role in improving health and production, in India and globally as well. What is important to note is that use of quality herbs, right processing and packing plays most important role, which needs to be looked into very closely.

# “KISAN KALYAN”

## AN APP INTEGRATING ALL THE NEEDS OF THE FARMER

**K**isan Kalyan’ stands for the welfare of farmers. The android app, ‘Kisan Kalyan has been designed for the betterment of lives of farmers and farming. It is an app which provides an online platform for the Indian farmers for availing the facilities required for agriculture and also for minimizing the cost of production in agriculture. In addition to that, the services are made available at a cost affordable by the farmers. There are times when a farmer is not able to get the desired supply for farming which may sometimes have disastrous output. This app will help them to rent the tools at a minimal cost and acquaint with agriculture news to have the desired production.

### SERVICES

Currently, there are five types of services available on ‘Kisan Kalyan’ app.

- Rent & Borrow
- Labour Booking
- Kisan Yojna
- Agricultural News
- Agricultural Insurance Facility (Coming Soon)

A few more services are expected to be added in to the app.

### RENT AND BORROW

This service is mainly for providing agricultural tools to farmers or renting it from the other farmers who can supply. This service helps farmers who are not financially capable of



buying agricultural tools. Hence, they can rent it from here. Ultimately, it will enhance the possibility of availability and fulfil the urgent requirements of tools.

### LABOUR BOOKING

This service mainly deals with the human resource requirement. It helps in booking workers and thereby reduces the hassle of finding workers by the farmers during the unavailable seasons.

### KISHAN YOJNA

This service helps in educating and updating the farmers regarding various government schemes and initiatives. The app provides the links and direct the users to the concerned websites and provides important information and the procedures that would be needful.

### AGRICULTURE NEWS

This service helps the farmers to be updated with the news and the events happening in their field. It gives a wider perspective of their occupation and ideas to improve.

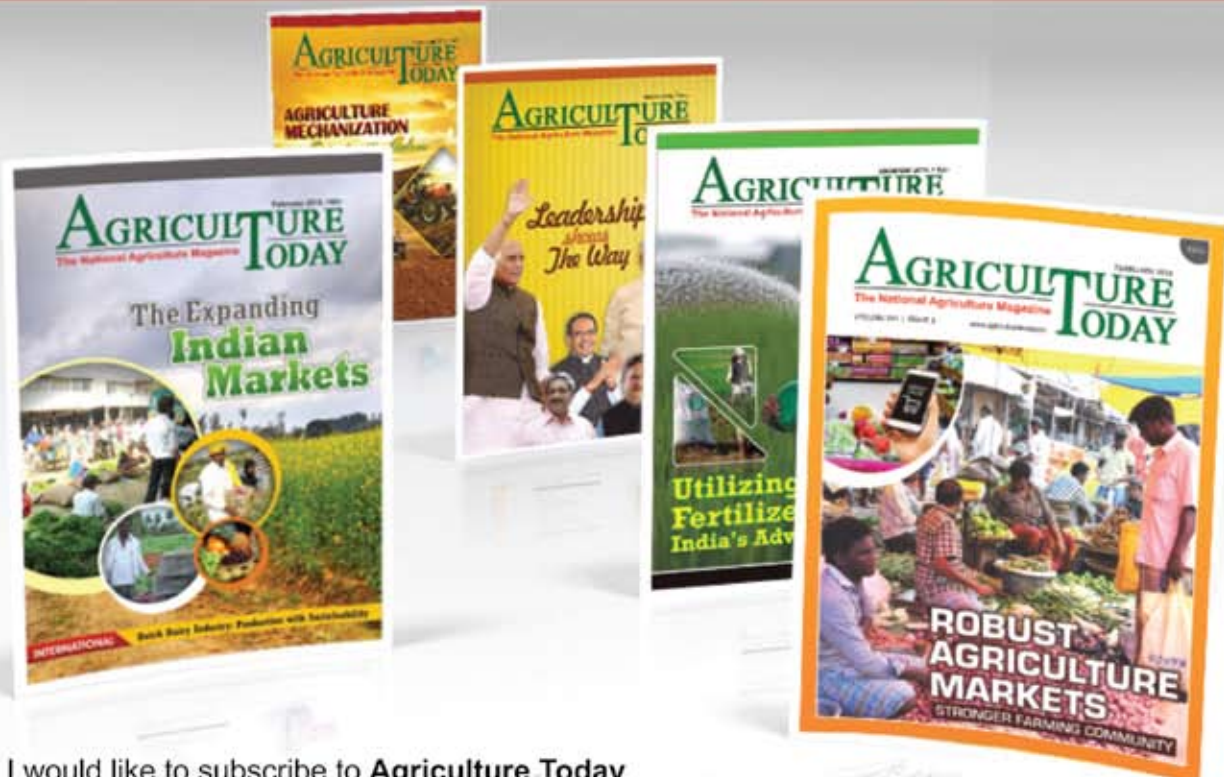
### INSURANCE FACILITY

This service provides the insurance of the work and protects the livelihood of the farmers and the workers in case of any unlikely events.

This app is committed to helping Indian farmers in everywalk of their lives. It will provide all the schemes, features, news and day to day needs of the farmers on one platform-Kisan Kalyan.

**Santosh Ram**  
AP Goyal Shimla University

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**AGRICULTURE TODAY**

# BUMPER PRODUCTION WITHOUT NECESSARY MOVEMENT OF CROPS WILL NOT SOLVE FARMERS' DISTRESS



India is one of the foremost countries that can bask in the glory of 'bumper production' year after year. The advance estimates released by the agriculture ministry depict that total production of horticultural produce including fruits, vegetables, spice, and flowers until July this year will be 314.67 metric tonnes, against the 311.71 metric tonnes in the previous year. And yet, we hear a lot of news on subsidised irrigation water, power, seeds, and fertiliser to grow crops that often give surplus yield. Consequently, it will not be unfair to wonder why our farmers still need subsidy whereas their counterparts abroad, despite producing only a part of the 'bumper production', are more self-reliant. Despite the rosy



future, we are circumspect whether it will augur well for the farmers or will be yet another year of struggle for prices. In my interactions with the farmers, few issues, and aspects of mobilising their crops have come up year after year.

## NEED MORE AND BETTER WAREHOUSES

Typically, the demand-supply dynamics that rule the market ensures that prices plummet during harvest and surge during lean period. This means that the farmer effectively gets less for the produce despite more than usual harvest. One of the most effective ways to address this irony is to create an ecosystem of well-positioned and well-equipped warehouses across the country. This will help farmers to save the crops for a time when there will be no harvest in spite of enough demand. In fact, one of the reasons why farmers abroad have a better earning despite lesser yield is that they have been able to monetize their limited harvest in the best possible manner. Apart from

enabling profitable access to the market, these storages can play an important role in facilitating the access of crops to the food processing and packaging units. Reaching these units will be a more commercially-viable option for the farmers and a good way to utilise the surplus crop.

### ACCESS TO ROADS AND VEHICLES FALL SHORT

This brings to the next pertinent question, where to build these storages. The highways, one of the main routes to transport agri produce from one part to the other, can be a rather opportune site. Most of the farmers choose roadways over any other means of transport. However, few can afford an air-conditioned transport that would save the produce from heat, moisture or cold. As a result, a part of the harvest is lost in transit. Locating warehouses on the highway will ensure that the farmers are able to save their crops until a more favourable time to sell them. However, access to these will be dependent on the condition of roads and availability of vehicles. While most of the roads in the interiors of India have potholes and ditches, getting the vehicle can be challenge for the farmers who often overcharge. Such poor connectivity issue is one of the major reasons that agri produces struggle to find a way to the markets. India's road network too is far from adequate – according to the figures available in 'Statistical Year Book India 2017'. Out of a total highway (state and national) length of 265,100 kms, 263,263 kms is surfaced while out of a total of Panchayati Raj and Rural Roads of 1,831,043 kms and 2,437,255 kms, respectively, only 986,075 kms and 1,486,069 kms, respectively, have been surfaced or concretised. These roads are key to ensure that farmers growing crops in the interiors of the country can sell their produce, either through physical access to the markets or through e-NAM (electronic National Agriculture Market).

### DIGITAL LITERACY TO LEVERAGE E-NAMS IS LACKING

In a country where general literacy covers a sizeable population and access to the Internet has enabled an enviable Smartphone



penetration, the digital coverage among farmers remain questionable. These people still depend on age-old practices which are often unproductive, if not counter productive. As a result, the government's move to e-NAMs (National Agricultural Markets) bore limited fruit. The physical access to mandis is a task for many farmers, especially the small and marginal ones. Though only around 600 mandis are enrolled in the e-NAM system, there is an urgent need to improve their performance to encourage sponsors to raise their bids and compete to enrol farmers to secure input supplies, farmers are yet to take advantage as many of them are not digitally adept.

Historically, such bumper productions are good news to statisticians who can play around with the figures to show how increase in production pushed down the wholesale price index (WPI) and consumer price index (CPI), and thereby keeping the dreaded inflation under check, and retail customers, who are flooded with choice, though we may doubt how useful that ultimately proves to be. Farmers are the last ones to reap the benefit. The time to change it is here.

**Mr. Rajesh Aggarwal, Managing Director, Insecticides (India) Limited**

Out of a total highway (state and national) length of 265,100 kms, 263,263 kms is surfaced while out of a total of Panchayati Raj and Rural Roads of 1,831,043 kms and 2,437,255 kms, respectively, only 986,075 kms and 1,486,069 kms, respectively, have been surfaced or concretised



## **UN's 'Decade of Family Farming' calls for a progressive and sustainable approach towards farmers**

**Against the backdrop of the success of the 2014's International Year of Family Farming, United Nations has declared the years 2019 - 2028 as the UN Decade of Family Farming, aiming to reduce hunger, strengthening food security and empowering family farmers. The decade is being measured as an extraordinary opportunity to gain momentum on the part of public policies that allow the development of family farming and make considerable progress towards the Sustainable Development Goals as defined by the United Nations. Speaking with Fariha Ahmed, Managing Editor of Agriculture Today, the Ambassador and permanent representative of the Dominican Republic to the Rome-based United Nations agencies, H.E. Mr. Mario Arvelo, highlighted certain key points regarding the significance of family farming.**

**There is a role to play for family farmers as they dwell on the front-line in veritable battles for the eradication of poverty, hunger and malnutrition; for protecting the environment, its natural resources and the biodiversity therein; for adapting, mitigating and, crucially, reversing the impacts of climate change**

### **What is the importance of family farming today?**

Family farmers constitute a large and extremely diverse group of workers that produce about 80% of the world's food. As much as we talk about issues relating to industrial farming, family farming is the predominant form of agriculture in both rich and developing countries. Notwithstanding their considerable output, a paradox arises: about four in five persons in extreme poverty, suffering from chronic hunger and malnutrition, are family farmers and their children. Looking at family farmers from the perspective of the Committee on World Food Security, it becomes painfully obvious that the road to a world where every single individual is food secure —Sustainable Development Goal #2 calls for zero hunger— necessarily depends upon lifting all family farmers to a place where they can produce food, in a sustainable manner, for themselves their communities, and the world. The importance of family farms is therefore crucial not just for reaching this and other vital milestones, but also for the survival of humankind itself. Clearly, there can be no peace within or amongst nations as long as hunger and malnutrition prevail.

### **What role can family farmers play in sustainable development?**

Although many family farmers in developed countries struggle to make a living, they do enjoy structural advantages that their counterparts in other places can only dream of: access to credit at low —often subsidized rates, extensive plots protected by enforceable property rights, and modern machines and corresponding technology, readily available inputs (such as high quality seeds, fertilizers, pesticides and tools),

accessible infrastructure for irrigation and for connecting to markets, as well as first-rate extension services, including scientific and technical advice, among many other benefits that originate from development itself. Speaking, then, about small holding family farmers across the so-called Global South, we see enormous challenges, as they —on one hand— lack comprehensive support from established arrangements and, on the other hand, developing-country family farmers present extraordinary diversity in terms of size, access to markets and household characteristics. Their livelihoods are often complex, combining multiple natural-resource-based activities, such as raising crops and animals, fishing, or collecting forest products, as well as off-farm activities, including non-agricultural enterprises. Also, there is a role to play for family farmers as they dwell on the front-line in veritable battles for the eradication of poverty, hunger and malnutrition; for protecting the environment, its natural resources and the biodiversity therein; for adapting, mitigating and, crucially, reversing the impacts of climate change. Sustainable agriculture, which is also a building block of SDG-2, must be given particular attention from policy makers, in order to tackle the triple challenge of producing more food, creating more rural jobs of better quality, and preserving the natural resource base. We can say that, in all these endeavors, small family farmers reside —and toil— at the heart of all solutions.

### **How will climate change influence family farmers?**

Small-scale farmers' livelihoods are at an alarming risk due to their direct dependence on natural resources. In addressing the World



Rural Forum earlier this year, I put to the assembly the rhetorical question of who can know better than an actual farmer about the impact of climate change upon food production. Climate change is projected to increase temperatures and extreme weather events in all parts of the world, while augmenting and reducing precipitation to levels of floods and droughts not seen in millennia. Weather predictability, which is essential to farming, presents in ever more disparate patterns, making forecasts increasingly useless to farmers. To be sure, the scientific consensus has clearly established that there will be variations resulting in a general reduction of the production and productivity of both crops and livestock, with ruinous effects throughout farming systems worldwide. Some areas will likely be shifted out of productive zones, a slow-building devastation that will have an impact on agricultural investments and agricultural transformations; it does not take a community of experts to discern that increasing uncertainty deriving from climate change will pile on existing pressures for migration within countries as well as internationally, and will fuel conflict.

### **How can we institutionalize family farming? What kind of public policies are necessary to promote this agricultural model?**

To anyone discussing what policies work —given the tremendously complex issues surrounding this debate— several truths become self-evident. Firstly, political will is an indispensable precondition for any type of solution, as efforts must be brought together in order to produce action that is concerted, coherent and effective. Policies must take into account that women family farmers remain the weakest link in the structure; for a variety of reasons, including the persistence of conceptual barriers stemming from what are understood to be ‘traditional’ gender roles for women and girls, and others that are unique to specific cultures, countries and localities therein, women remain the largest latent —squandered— force in the fight against hunger and malnutrition. This is not advocating for pregnant or lactating women and girls to be subjected to field work; to the contrary, all members of the family farming unit, regardless of gender, must be placed at the center of education and capacity-building policies that can reduce the amount of hard work in food production in less intensive ways, taking full advantage of knowledge and technology, as well as expanding job opportunities in areas such as planning, supervision, accounting, research, partnering, quality control,

standards compliance, labeling, marketing, and other low-impact tasks that add enormous value along the production and distribution chains. Sound policies are also needed in a wide range of fronts, including motivators for not only persuading the youth not to leave the countryside, but to attract urban dwellers to food production; the only possible way to accomplish this is through an enabling environment where actual, future and prospective farmers can see a clear way forward —and upward— in agriculture, livestock, fisheries and related occupations. The economic incentive is critical. For these and other policy initiatives to succeed, both in design and implementation, national governments must be in sync with local authorities, target populations in the field, civil society —with emphasis on action-oriented entities and not just social movements— and the private sector. International organizations have a lot to offer because of their wide-ranging work and wealth of good practices, including in resource mobilization and knowledge dissemination. Financial institutions have an important role to play, as well as research centers, academia, philanthropies, legislators, social protection nets, influencers and other opinion shapers, as well as citizens from all walks of life: everyone has to eat, and the ethical choices we make as individuals going about our daily life —especially as taxpayers and as voters— must also be a part of the equation: the more and better everyone knows about the difficulties of family farmers, the closer we will be to enacting comprehensive and useful policies for their benefit.

### **How can we improve the accessibility of markets for the family farmers?**

Smallholders engage in many interrelated markets, but also face challenges in securing market access and eliciting benefits to support healthy livelihoods. Again, governments at all levels have an essential role to play in addressing specific constraints and maximizing potential for beneficial access to reliable and remunerative markets. The Committee on World Food Security has developed policy recommendations aimed at boosting access of small-scale family farmers to markets. These recommendations include improving data collection for better evidence-based policies; providing fair and transparent prices that adequately remunerate smallholders’ work and investments; supporting affordable mechanisms for smallholders’ access to useful, timely and transparent market and price information; promoting and expanding institutional procurement programs for public institutions,

food assistance and school feeding; integrating family farmers into the food value chains and participating in local food systems; improving access to inclusive financial systems and insurance; investing in infrastructure, including irrigation, small-scale centers for processing and packaging, and roads; recognizing the environmental, social, and economic value of food produced by family farmers, and their sustainable use and management of natural resources; preserving traditional practices and knowledge; increasing resilience to climate change, natural disasters and price shocks; capacity building, including adoption of innovative technologies; promoting food safety standards; boosting production, managerial, and entrepreneurial capacities; and facilitating smallholders' capacity to increase their bargaining power and control over their economic environment, among many others accessible at [www.fao.org/cfs](http://www.fao.org/cfs)

### How can family farming hold up to the pressure of urbanization?

Urbanization and rural transformation present both challenges and opportunities for family farming. The transformation of rural areas stimulated by interactions with urban centers can deliver positive impacts in terms of sustainability, as well as in terms of access to services and higher incomes. Such transformation, however, can also result in certain areas being left behind and in creating pockets of poverty, where people are forced by circumstances to escape from their localities of origin in search of better living conditions. This exodus should also be studied in light of the need for policies to facilitate socio-economic development in the rural areas. At the same time, an interesting phenomenon of peri-urban agricultural production is taking place without regulatory approaches catching up with the trend at the speed needed to enable proper development of these emerging opportunities. Policy makers need to move beyond the outdated dichotomy between urban and rural areas, moving towards a new social pact that is based on rural-urban inter-linkages. Both the countryside and the cities need each other, and they must be connected, not least in the realm of food production, in order to thrive. Family farming can and must provide a bridge in the context of fast urbanization and changing food systems.

### What are your expectations from this

**This is not advocating for pregnant or lactating women and girls to be subjected to field work; to the contrary, all members of the family farming unit, regardless of gender, must be placed at the center of education and capacity-building policies that can reduce the amount of hard work in food production in less intensive ways, taking full advantage of knowledge and technology**

### Decade of Family Farming?

The UN General Assembly adopted the Decade of Family Farming on 20 December 2017; it covers the years from 2019 until 2028 to serve as a framework for countries to develop public policies and target investments in support of family farmers. The Decade is our collective opportunity to craft more and better actions, boosting the implementation of existing structures, making sure family farming is understood and recognized for its enormous worth, and putting rural people at the center of the global debate on how to eradicate hunger and malnutrition. The International Steering Committee of the UN Decade is proposing an Action Plan based upon seven pillars, (i) Developing an enabling social, economic and political environment as a prerequisite for family farmers to lead the transformation towards zero hunger and poverty, sustainable and healthy food systems, and an inclusive and resilient society; (ii) Supporting youth to ensure the generational sustainability of family farming; (iii) Promoting gender equality in family farming and rural women's leadership role; (iv) Strengthening family farmers' organizations and capacities to generate knowledge, represent farmers and provide inclusive services in the urban-rural continuum; (v) Improving socio-economic inclusion, resilience and wellbeing of family farmers, rural household and communities; (vi) Promoting sustainability of family farming for climate-resilient food systems; and (vii) Strengthening the multi-dimensionality of family farming for social innovations contributing to territorial development and food systems that safeguard biodiversity, environment and culture. Reaching these goals will put the world on a firmer route to zero hunger by 2030!

# FOOD FRONT FOR INDIA

## Towards building agrarian economy and farmers' welfare under *sui generis* rights regime



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I ncreasing farm production and enhancing agrobusiness are two sides of the same coin. Farmers' sweat and toil for perpetual engagement in farm practices is crucial. They deserve fair and just share of benefits accrued.

Agro-entrepreneurs are imaginative, creative, keen and quick; have understanding to deal with risks and opportunities from farm gate to serving plates. They too deserve their piece of the business pie on same principles of equitable rights and the right to dignified life.

However, in India, the concept of elaborate food and agriculture value chains is just at nascent stage. There is hardly any direct engagement of mutual interest among players across the production and agrobusiness realms; both sides heavily rely on government schemes.

Recent brisk announcements and initiatives in the area of public policy, programmes, and schemes aim at helping the farmers achieve higher incomes in the medium term. Simultaneously, incentives regime is also activated to enhance and scale up agri-incubators and start-ups. However, a lack of meaningful or effective engagements across the production and business realms within the food and agriculture ecosystem is a key concern.

The recent court case between PepsiCo India Holdings Pvt. Ltd. and some potato growing farmers of Gujarat provides a real-time example for furthering a meaningful conversation in this regard.

PepsiCo (India) came to limelight last April, second time since the opening of National Waterway-1 at Varanasi on November 12, 2018 where its container of Lay's chips was the first cargo received at the multi-modal terminal. On April 8, 2019, a commercial court in Ahmedabad passed *ex-parte ad-interim* injunction order restraining some farmers from growing potato variety FC5 in an infringement case filed against them by the company.

The PPV&FR Act, 2001 allows farmers to *inter-alia* use their farm saved seeds as a matter of right. This includes the farm saved seed of any variety protected under the Act; provided the farmers do not sell it as branded seed in labelled packages. The Act further protects innocent farmers from alleged acts of infringement as also waives off their litigation fees in tribunals and higher courts.

Despite this, the district level court restrained accused farmers for the time being from using their farm saved seed of FC5. This led to an obvious disquiet among farmers; politics entered, and activists too

PepsiCo (India) was in historic limelight on November 12 last year in Varanasi at the opening of inland waterway on Ganga river for cargo shipment. The first consignment received by the Prime Minister of India to inaugurate the first multi-mode terminal and dedicate it to the nation - a container of Lay's chips - belonged to the MNC. It was transported all the way from Kolkata inland port along the National Waterway-1 for over 1600 kilometres in 13 days in a large container vessel MV Rabindranath Tagore. PepsiCo (India)'s presence in this launch event received a worldwide publicity beside the news of India's real-time progress on development path. It may also be optimistically viewed as a positive intent and gesture by a MNC in contributing to mainstream pragmatic national policies of India while getting simultaneous publicity of its own agrobusiness.



echoed in the noise. As a result, PepsiCo (India) withdrew the case on May 6, 2019, hoping that assurance by government would protect its long-term business interests.

It is, nevertheless, important to build healthy and confident agrobusiness ecosystem by pro-active orientation rather than salvaging operations like withdrawal of court case, administrative order, etc.

For PepsiCo (India), FC5 is not just like any other potato variety available in the market. It is a special

variety suitable for making crispy chips. The company introduced and commercially used it since 2009 to ensure quality potato production, processing, and manufacture of its branded "Lay's" chips for regular supply in the market.

Lay's is a reputed brand in the Indian market. So much so that the company cannot meet the demand only with the potatoes procured from its contracted farmers. A sizeable proportion of the required procurement by PepsiCo (India) is also done from

In an earlier attempt to harness the Ganga waterway for shipment of large stocks of food grains, after the great Bengal famine of 1770, Golghar, a huge dome shaped granary, was built up in Patna in 1786. But due to engineering defect bringing cracks in its thick wall, the storage structure could not be practically used. Here, the bottom-line is that big agrobusinesses or projects need huge investments and determination. If successful, these could immensely benefit both producers and end-users; but the risks involved too could be massive.



open market.

The variety FC5 (Trade Name) is registered under the PPV&FR Act with FL2027 as its registered nomenclature. With such registration and protection, there is scope for other farmers not contracted by the company to also supply their farm saved seed produce of this variety to PepsiCo (India) through open market for bulk manufacture of Lay's chips.

IPR laws allow the right holders to maximize their profits during the term of protection. Both reputation of company and quality of product are important to achieve this. The plant variety industry would be genuinely concerned that the produce of their protected varieties used in processing industry must meet certain specified quality parameters for their use in manufacture of processed foods.

PepsiCo (India) had duly laid down in 2009 the quality specifications for potato produced from variety FC5 (FL2027) to qualify for buyback from its contract farmers. Now, when other farmers are also producing the same protected variety through their farm saved seed, the company would expect that they also ascertain similar quality parameters.

Yet another worry for agrobusinesses is as to how to thwart illegal competitors jumping into the processed food market without any financial commitment or answerability about the quality and

PARTICULARS OF REGISTRATION AND PROTECTION OF FC 5 POTATO	
Registration No.	59 of 2016
Category of Variety	Extant (VCK)
Denomination of Variety	FL 2027
Crop	Potato
Name of Applicant	PepsiCo India Holding Pvt. Ltd.
Applicant Category	Private
Application No.	E18 ST1 11 151
Date of Certificate Issue	01/February/2016
Protection Period up to	31/January/2031
<i>Source: PPV&amp; FR Authority website. Accessed on 30.4.2019.</i>	



goodwill subsisting in the proprietary variety and its products. Ideally, if some new enterprise is interested in making crispy chips from potatoes of this variety, then it should negotiate

a license from the right-holding company. Doing so will create only win-win situations. Otherwise, litigation is the only recourse, but defendant may camouflage in the pretext of an innocent farmer infringer!

The story unfolds possibilities of many unforced errors and conflict of interests, but endorses that reconciliation is a powerful tool. It may also create awareness for farmers using protected plant varieties through farm saved seed. There is scope for getting higher remuneration by using protected varieties having special processing quality attributes. Contract farming with due safeguards could be beneficial. And, use of ethical practices may lead to long-term economic and social benefits.

Farmers have the right to be aware on these counts for preparing themselves to join in participatory activities of agrobusinesses using proprietary plant varieties (contract farming) for-(i) increasing their incomes on sustainable basis, and (ii) simultaneously contributing to the development of food and agriculture sector.

This first step towards mutual confidence building among farmers and private sector, when taken, can also potentially contribute in the long run towards conservation while in-use of on-farm diversity of ethnic crop varieties through contract arrangements.

FC5 potato case brings second major issue under PPV&FR Act in recent times, next only to Bt cotton price fixation of trait value case. It threatens the long-standing market-decides-rule-of-the-business realm. Also keeps at bay the exclusive marketing rights privilege available under the IPR law. As a mid-course correction measure concerning the price fixation issue, the PPV&FR Authority has already come out with an order under sections 7 and 28 of the Act delinking trait value fixation of un-protected varieties, also the varieties whose term of protection has expired, from that of the protected varieties. This January 19, 2019 notice also refers to procedures for sales and sale price fixation u/s 28 for all registered varieties during their term of protection. Whereas, sections 64 (infringement) and 92 (overriding effect) of the Act are invoked in the notice to enforce newly elaborated provisions of plant breeder's rights.



• कारवायनपत्राक • बीटनपत्राक • कर्कुरनपत्राक • उपजसर्वक

**रहिमन पानी राखिये, दिन पानी सब सून । पानी गये न ऊबरे, मोती, मानुष, धून ॥**

वर्ष पहले से हमारे पूर्वज  
पानी के महत्व का वर्णन कर गए हैं ।

पुराने समय में पानी का स्रोत  
नदी, कुएँ, झरने इत्यादी हुआ करते थे  
और पानी का उपयोग  
आवश्यकता अनुरूप होता था ।

आज आधुनिकता के दौर में  
हम जमीन से ज़रूरत से ज्यादा पानी निकाल रहे हैं,  
जो उपयोग कम और बर्बाद ज्यादा होता है ।  
जिससे भू-जल दिन प्रतिदिन कम हो रहा है  
और कुछ सालों बाद शायद पूरा ही खत्म हो जाये!

अब सवाल उठता है  
कि हम हमारी आने वाली  
पीढ़ी के लिए कितना पानी छोड़ना चाहेंगे ?

इस परिस्थिती को भांपते हुए  
धनुका ने 2005 में नारा दिया था,

“खेत का पानी खेत में – गांव का पानी गांव में”  
बचाव पानी की हर बूंद ।

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अपने घर में, स्कूल में, फीकट्री में, संस्थान में, गाँव में....  
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[savewater@dhanuka.com](mailto:savewater@dhanuka.com)



खेत का पानी खेत में



बचाव पानी की हर बूंद

गाँव का पानी गाँव में



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Fax: 0124-3838888, email: [headoffice@dhanuka.com](mailto:headoffice@dhanuka.com), Web: [www.dhanuka.com](http://www.dhanuka.com)

# ESCALATION THROUGH ICT EXTENSION SERVICES WITH INNOVATIVE MEDIA PLATFORMS

**W**orld population is expected to surpass the 9 billion mark by 2050, and agricultural production will need to increase by 70 percent from its 2016 levels to meet this additional food demand. ICT applications can make a significant contribution to meet this future global food needs. Information and Communication Technology can do so by collecting and sharing timely and accurate information on weather, inputs, markets, and prices by feeding information into research and development initiatives by disseminating knowledge to farmers by connecting producers and consumers, and through many other avenues. Millions of smallholder farmers are the foundation of agricultural and food supply chains in most developing countries. So far agricultural practices of smallholder farmers are at times not economically viable and struggle to be sustainable. Small farms produce low yields, adversely affecting farmers' economic conditions. Lack of information about critical inputs and inadequate knowledge about modern and efficient agricultural practices contributes to low farm yields.

Information and communications technology (ICT) extension services involve the dissemination of practical knowledge and exchange of market information through ICT platforms. These solutions relate to agricultural and rural transformation processes, especially for smallholders. ICT extension service imparts range of information services to the



smallholder farmers from pre-harvest stage to post-harvest stage. They help the farmers understand and adopt agricultural best practices on crop selection, input management, land selection and preparation, finance, transportation, packaging processing, and marketing of the agricultural produce. The enterprises provide these services via radio and television shows, mobile applications, Demonstration, Training, digital video disks (DVDs) and interactive voice response (IVR) technology. Enterprises deliver information services which can help improve agricultural yields and guide farmers in procuring and using the right inputs and participating in commercial value chains.

## ICT in developing and developed countries

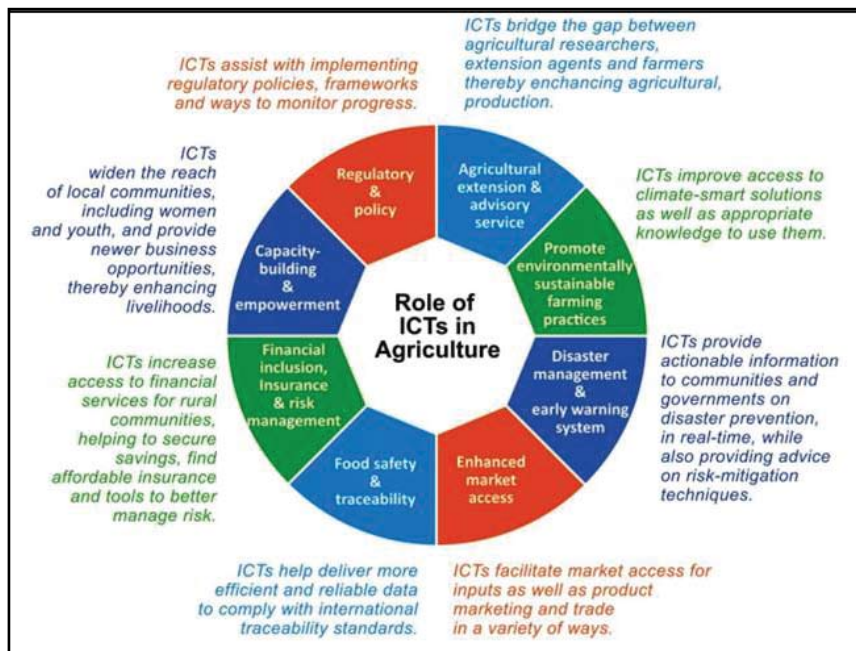
Transaction costs explain why markets are missing or do not function well because smallholders are not well integrated into markets due to high transport costs and their lack of ability to timely deliver consistent, quality and large volumes of produce. Even if well-developed infrastructure

reduced transport costs, small family farmers would face transaction costs to form a cooperative and aggregate their produce in larger volumes. They would also face costs to obtain information about consumer preferences and decide what and how to plant, and incur costs related to searching and screening for a partner with whom to negotiate a deal, bargain, reach and monitor an agreement. Similar transaction costs characterize other markets such as those for labour, credit, and insurance. For example, low population density, isolated communities, and lack of information on collateral, increase the costs of financial services and result in missing credit and insurance markets. For a bank, often the fixed cost to establish a branch in a remote area is very high compared with the quantity of business it will conduct. ICTs have the potential to reduce these costs – digital technology can be transformational. For example, in India financial institutions for smallholder farmers, retailers and agricultural product buyers can function through a cashless

microcredit programme. Farmers can gain access about inputs i.e. seeds, fertilizers, pesticides from local input providers by using a pre-established line of credit. In India, e-Choupal, one of the trading platforms, reduces transaction costs by connecting buyers with farmers, using Internet kiosks. Through its ICT-kiosk platform, e-Choupal also offers farmers additional services, such as sharing of best practices to improve productivity, and price benchmarking to increase sales prices. The increase in the use of digital technologies has created benefits for all through easier communication and information sharing, and improving social connectedness. Inclusion, efficiency, and innovation are the main mechanisms for digital technologies to promote development. Nearly 70 percent of the population in developing countries own a mobile phone. The number of internet users has more than tripled in a decade, from 1 billion in 2005 to an estimated 3.2 billion at the end of 2015.

The digital divide between developing and developed countries is nowhere more evident than in agriculture. Farmers, their cooperatives, large, medium and small input suppliers, traders, processors and retailers use ICTs

### Some of the broad areas where ICT plays a crucial role in agriculture



throughout the food value chain, from testing the soil in the farm to using 3D printers to process food. Over the last twenty years, farmers in developed countries have already been using ICTs in large scale farming for Precision Agriculture (PA) in soil analysis, irrigation, farming equipment, weather forecasting, and more. The fast pace of technological development, which allows for increasing data storage and analytics and progressively

lower costs have helped reach these farming advances.

### Development Challenges:

There are over 500 million smallholder farmers globally. Nearly 80 per cent of the food supply in Asia and Sub-Saharan Africa is carried out by these smallholder farmers. Limited access to technology, lack of productivity enhancement inputs, and low awareness about best farming best practices, and weak links across the agricultural value chain are some of the major challenges that smallholder farmers face. Further, severe climatic conditions lead to crop failure when farmers are not able to take pre-emptive steps due to lack of weather forecast information. Improper planting and harvesting practices result in loss of productivity and lower profit margins for farmers. ICT can facilitate wide dissemination of relevant information at the right time in a cost-effective manner. Its increasing penetration of mobile phones and internet, more specifically budget friendly smartphones can support





a business model that expands information sources and farmers' ability to access the same. Such solutions have significant impact in the rural and remote regions of developing countries with large farmer populations. ICT can be applied to address various aspects of agriculture including identification of farmers' pre-harvest needs, devising solutions to meet those needs, and collection of feedback from farmers regarding a specific service or solution. Popular information dissemination models using ICT include online platforms, mobile applications, training content through videos, personalized call centers, and radio and television programs. Some of these are interactive and help smallholder farmers solve problems in real time. The quality and type of ICT extension services vary based on telecommunication facilities and nature of demand from farmers. A critical factor for adoption of ICT extension services is the ease of use of information. Enterprises offering these services should address issues such as ICT illiteracy, and the need for relevant and localized content.

### Business Model

Many social enterprises (SEs) have introduced ICT applications to enable farmers to access vital pre-harvest information. The diffusion of ICT devices i.e. mobile phones and infrastructure has eased constraints in supply-chain management and farmer aggregation. ICT extension enterprises enable farmers to access information related to agricultural inputs, weather forecast, market prices, and best practices in agriculture being followed by fellow smallholder farmers in general as well as other developing countries or regions. These services connect smallholder farmers at the global level, facilitate cross-learning, and help them increase their agricultural productivity.



### Disseminating pre-harvest related information:

Some enterprises leverage information technology to share and replicate best farming practices from one region or country. The solution includes a digital video database that is produced for farmers by farmers. Participating villages are provided with a TV, DVD player and camcorder operated by local NGO staff and managed by farmers, along with DVDs or flash drives that are shipped to the village. The enterprise organizes shows in different areas of the village for small groups of 10 to 20 farmers. Also, weekly radio program featuring agricultural news and responding to the business and market access needs of rural

farmers in India. The hour-long program covers a wide range of topics, including market prices and trends, farming techniques, weather and seasonal issues, financing opportunities, inputs, land use, and quality standards.

### Imparting advisory and consultancy services:

Online dissemination and sharing of knowledge among experts, farmers, students and research scholars can encourage rapid adoption of efficient and modern farm practices. Some enterprises have developed virtual platforms to disseminate expert advice and technical knowledge, cutting across geographies and time zones to reach a potentially

#### Element used in this Model

Development Challenges	<ul style="list-style-type: none"> <li>Lack of information about weather, pest control, and seeds leads to low productivity for smallholder farmers</li> </ul>	<ul style="list-style-type: none"> <li>Smallholder farmers find it difficult to access expert advice due to issues of reach and cost</li> </ul>	<ul style="list-style-type: none"> <li>Smallholder farmers deploy inputs unproductively and hence, are not able to achieve optimum profit margin</li> </ul>
Components	Information dissemination	Advisory and consultancy services	Tools for pre-harvest efficiency
Key Activities	<ul style="list-style-type: none"> <li>Social enterprises provide weather forecast, price, market demand, and operational information through delivery channels such as mobile apps, voice, SMS, radio, video to farmers from a centralized IT operation</li> </ul>	<ul style="list-style-type: none"> <li>Social enterprises provide technical assistance about farming best practices and assisting in capacity building</li> <li>Some enterprises are also providing bundled analytics and consulting services</li> </ul>	<ul style="list-style-type: none"> <li>ICT tools combined with inputs provision can enhance their productivity</li> <li>Examples include tools for diagnostics, supply chain management, order management, etc.</li> </ul>

large audience. India-based Farmers Helpline operated by Kisan Call Centre, KVK, ATMA, and ATIC service established by agricultural experts which are providing information support to smallholders.

### Cost factors and Cost break-up

ICT extension service providers incur high capital expenditure for solution and platform development, and content creation (including research and development costs). Some enterprises such as Digital Green are able to cover these costs through their partners either the government or private sector companies. These costs constitute a smaller component of the total cost, and are also lower compared to that incurred by non-ICT extension service providers. A number of ICT extension enterprises partner with local stakeholders to further lower these costs.

### Revenue Streams and delivering value to the Poor

ICT extension service providers earn revenues in two ways: the first, through sale of content that includes provision of advisory services, and management information system (MIS) solutions; and second, by charging segment fees per episode of broadcast content. The advisory services are provided to smallholder farmers either free of cost or at very nominal rates. The enterprises sell content to government and private extension service providers. Digital Green, for instance, earns revenues from sale of videos and technology to government and private extension service agencies that work directly with farmers. ICT extension enterprises are changing the manner in which smallholder farmers communicate with stakeholders and access requisite information to improve their agricultural productivity with these approaches such as Awareness, Acceptance, Accessibility and Affordability.

Sr. No.	Names	Objective
1.	e-Extension	Aims to analyse the soil of all the villages of the state & proposes to provide online guidance to farmers on their soil health condition.
2.	AGRISNET	Uses state-of-the-art broadband satellite technology to establish the network within the country.
4.	Agri Business Centres	It provides a web based solution to the small and medium Landholdings.
5.	e-KRISHI VIPANAN	Using latest advancement in ICT by collecting and delivering real time information, online.
6.	Query Redress Services	Empowering the farmer community through effective, need-based interventions
7.	Kisan Call Centres	The sole objective is to make agriculture knowledge available at free of cost to the farmers as and when desired.
8.	Tata Kisan Kendra	The concept of precision farming being implemented by the TKKs has the potential to catapult rural India from the bullock-cart age into the new era of satellites and IT
9.	e-Sagu	Improve farm productivity by delivering high quality personalized (farm-specific) agro-expert advice in a timely manner to each farmer.
10.	AKASHGANGA	AKASHGANGA's success demonstrates the potential of information technology to impact livelihoods in poor, rural Communities.

### Some Successful ICT initiatives in India

In India ICT applications such as Warana, Dristee, E-Chaupal, E-Seva, Lokmitra, E-Post, Gramdoot, Dyandoot, Tarahaat, Dhan, Akshaya, Honeybee, Praja are quite successful in achieving their objectives.

### Scaling up with Challenges

ICT extension services face a number of challenges that restrict the expansion of the business model. These few challenges are broadly categorized as technology challenges, human resource challenges, and content development challenges.

- Adequate internet and mobile bandwidth and connectivity are a limiting factors.
- Data is expensive in most remote rural areas, and hence cost becomes a major barrier for internet or mobile usage
- Lack of relevant content limits the application of proposed solutions.

### ■ Role of Government and Policies

The ICT extension services business model addresses the development challenge of information inadequacy on best practices in agriculture, weather updates and prevailing market prices that support the income potential of smallholder farmers in a number of developing countries. This said, the business model is very impactful if it is provided along with on-ground support. In the absence of market linkages for the produce grown, any information, however great and useful, will not raise farmers' incomes. In spite of this, most ICT models don't focus efforts on markets or partnering with enterprises doing this.

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# DIGITAL FARMING FOR SUSTAINABILITY

**A**griculture today is at cross roads with its declining share in economy as manufacturing and service sectors surge high while mouth to be fed are continuously increasing and estimated to be approximately 9.6 billion by 2050, requiring 70% more food. Besides, the resources like land and water are depleting in quantity as well as quality, and erratic climatic changes have agriculture more dependent on nature. Agriculture today withdraws approximately 70% of global water

which is expected to increase by another 45% by 2030 and meeting food demand would require 200 million more hectares of land.

Excessive use of chemicals to increase productivity and control pests have led us to this. Further, increasing production from limited land and water resources will result in aggravating ecological imbalance. In such a scenario, the only way to increase productivity in a sustainable manner is through digital farming. Digital farming refers to the cultivation of crop by making informed and appropriate decisions

with the application of accurate real time data for the precise geo location combined with external data. A variety of technologies are being used in digital farming including sensors, communication networks, Artificial Intelligence (AI), Unmanned Aviation Systems (UAS), robotics and other advanced machinery. These technologies often draw on the principles of the Internet of Things. Digital farming accumulates precise data on various aspects, analyzed further for accurate field operation to monitor and optimize crop. It means to create added value from large



amount of already available and real time data.

The success stories of digital farming are gaining attention and making it a feasible option for future agriculture, like low potassium lettuce, blue river technology for weed control and others. Digital farming can play a vital role in making agriculture sustainable as well as profitable. Though its application on large farms is certainly yielding good results but smaller farms are still grappling with adaptability issues. Digital farming in India has not been adopted as complete package rather different components are slowly percolating to the ground as per their requirement. Technologies that measure land moisture and sprinkling water have been introduced by some companies and land mapping through satellite to estimate crop is already happening. Advisory on sowing, irrigation, pest attack and harvest have been in picture since long. Smartphones with GPS to track where photos of field infestations or hail damage have taken place for technical support or insurance claims. However, a full-fledged digital farm with automated machinery, drones and robots will take time.

Virtually all stages of production, from refining crop genetics to managing transportation logistics, have the potential to be digitally integrated in the near future. This digital agricultural revolution will provide new means and methods for farmers to further optimize management of resources, improve crop quality and quantity, and remain productive in a changing climate. It will also revolutionize

the complete value chain and also will bring precise traceability in agriculture system.

Lack of awareness about technological advancements and digital illiteracy amongst farming community is major hurdle. Smaller farm sizes especially in hilly terrain restrict the applicability of such technologies; also due to smaller farm sizes economies of scale become inoperable, making it impractical for small and marginal farmers considering their low income. One more important aspect is that today farmer is being bombarded with information from all the directions but is not made aware of the practical aspects.

In-spite of the bottlenecks, the scope in the field is enormous. Large number of startups are entering the field and making an attempt to revolutionize agriculture. Today it has become an imperative need in India to design a road map and prepare a framework to increase digitization of agriculture not only for large farmers, marginal and small farmers as well to enhance productivity and sustainability. A detailed study is needed to analyze, understand and interpret various information, data and trends of digitalization in Indian agriculture as well as the shortcomings. This will provide a basis for taking informed decisions, both related to policy and business strategy as a whole for increasing digitalization for feeding growing population with limited resources and making agriculture profitable and sustainable simultaneously.

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Digital agricultural revolution will provide new means and methods for farmers to further optimize management of resources, improve crop quality and quantity, and remain productive in a changing climate

# GENERAL GUIDELINES FOR TAKING UP POLYHOUSE CULTIVATION AS A BUSINESS VENTURE



**O**f late cultivation of vegetables, flowers and seedlings under polyhouses especially naturally ventilated polyhouses is gaining popularity amongst the progressive farmers of India in enhancing the economic returns per unit area. Though, the structures are designed to withstand a wind velocity of 150 kmph, often it has been observed even in plain areas of India that the polyhouse structures are overtopped. The damage to these structures is more

severe during the months of June and July when the monsoonal rains occurs with high wind velocities. High initial investment of structure damaged with high speed winds is a cause of worry for the farmers who have adopted this technology and at the same time those who want to adopt it. The reasons for failure are many, it may be natural or man made.

In order to avoid such failures, the following guidelines needs to be followed by the farmers for establishment of proper structure and

crop cultivation under polyhouses.

- East and South for the sun is excellent for the green house, which can remain open on both these sides, but it should be shaded on the north and the west to protect from winds.
- The Polyhouse gutters should be preferably installed in North – South direction.
- All the vents should preferably face to East direction and the last vent of eastern direction to face to west direction.
- The site should be free from

shadow.

- Long trees/wind breaks are preferred in West direction atleast 20 m away from the west corner of the structures.
- The site should be at a higher level than the surrounding land with adequate drainage facility.
- Availability of good quality irrigation water and electricity.
- pH of irrigation water should be in the range of 5.5 to 7.0 and EC between 0.1 to 0.3mS/cm.
- pH of soil should be in the range of 5.5 to 6.5 and EC between 0.5 to 0.7 mS/cm.
- Structure should withstand to minimum wind velocity of 150 km/h
- Provision be made for opening one portion at either side for entry of small tractor/ power tiller.
- Structure should be aerodynamic in shape i.e., semi circular shape.
- Proper closure of side curtains in the evening hours (5.00 pm) and their opening at around 10.00 am every day.
- Operation of foggers should be short period i.e., 15-30 sec and should not be operated after 2.00 pm.
- Use of micro sprinkler for controlling excess heat during summer from outer side of film of structure.
- Trellising systems design should design at minimum load bearing capacity about 25 kg/m<sup>2</sup>

Inorder to minimize the structural as well as crop related problems associated in naturally ventilated polyhouse cultivation the following general guidelines needs to be followed by the farmers. Naturally Ventilated polyhouse with minimum ventilation area should be 30% of total polyhouse floor area. During high velocity winds, side curtains must be closed. Length of polyhouse in (East-West) direction should be as

per requirement, however in North South direction the length should not exceed 45.0 m. Aerodynamic shape all along the four sides with curvature shape (semi circular) and structural material used should be Hot dipped Galvanized tubes (pipes). All the structural components i.e., the tubes (pipes) should be as per IS 1161. Welding of the pipes should be avoided. All the fixtures like brackets, clamps, nuts & bolts etc., should be made of galvanized material. Gutter should be made of Galvanized sheet of 2 mm thickness in trapezoidal shape having 500 mm wide perimeter (in a single length without joint). The polyhouse ridge height should be 6.5 m from foundation level. Pipe foundation should be of telescopic type. Side curtains are to be operated using 20 mm GI pipe having 2 mm thickness and curtain rod length should not exceed 20 m. Curtain wall may be provided around the poly house in the form of brick masonry of 0.2m thick, 0.70 meter high (0.3 m below GL and 0.4 m above GL). Double door entry must be provided to the poly house. Only one door open at time on entry of or exit from polyhouse. Shadenets used inside the polyhouse should be with 50 per cent Shade factor and for vegetable cultivation the preferred colour of the net should be white/black/red. Side curtains net for vegetable cultivation should be insect proof net (40 / 50 mesh) incase of flower cultivation shadenets are preferred. Trellising system must be installed at a spacing of 1.2 m X 1.2 m. GI wire rope of 4 mm thickness to support the plant and 3 mm cross wire to support the trellis system, by providing trellis purlin of 42 mm OD, 2.6 mm thickness, GI pipe on all four sides separately. Trellising system for vegetables should be designed in such away that it can take minimum load of 25 kg/m<sup>2</sup>. Inorder to manage the humidity inside the polyhouse

foggers are to be installed. Four way anti leak fogger with 28-30 lph flow rate with droplet size of 65-70 microns and foggers spaced at 2.5 m X 2.5 m, connected with 16 mm lateral class-3 which in turn properly connected to PVC pipe (63 mm), ISI 6 kg/cm<sup>2</sup>, valves, filter, end caps and appropriate capacity of pump exclusively for foggers to be connected with 2000 l water tank with all the necessary fittings and accessories installed completely in ready to operate condition, which is separate from irrigation system. In Naturally ventilated polyhouse, the preferred direction of beds for planting is East-West, therefore drip irrigation sub main should be in North-South direction. Proper selection of crops and their varieties is important. Some of the predominant crops and their varieties that are available in commercial / R&D institutions are: Rose Gold-strike, Grand gala, Noblesse, Revival, Bordeaux, avalanche, etc.; Gerbera North star, Ornella, Paradox, Tropic Blend, Topaz, pink fantasy, etc.; Capsicum (Bell Pepper) Red colour: Bomby, NS-280, Nun-3019, Bharat etc ; Yellow colour: Orebelle, NS-281, Swarna etc.; Green colour: Indra, California wonder etc.; Tomato Avinash-3, Badshah, Himsonha, Nun-7730, Naveen, Arka Rakshak, Tanuja etc. ; Cucumber Keon, Citis, Hilton etc

By following the information provided in the article the farmers can address the problems associated in polyhouse cultivation to make such cultivation practices as a successful business venture.

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# 'MECHANIZATION HAS OPENED AVENUES WHICH ARE OF INTEREST TO THE YOUTH'



**CLAAS, a family business founded in 1913 is today one of the world's leading manufacturers of agricultural engineering equipment. The company, with corporate headquarters in Harsewinkel, Westphalia, is the European market leader in combine harvesters. CLAAS is also the world leader in self-propelled forage harvesters and a top performer in world-wide agricultural engineering with tractors, agricultural balers and green harvesting machinery. The CLAAS product portfolio also includes state-of-the-art farming information technology. CLAAS employs more than 11,000 workers worldwide and reported a turnover of 3.8 billion euros in the 2018 financial year. In an interview with Agriculture Today, Mrityunjaya Singh, Managing Director, CLAAS Agricultural Machinery India Pvt Ltd discusses the relevance of agri mechanization in India and elaborates on their activities in India.**

## **What is the scope of agri mechanization in today's 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 cost of input and improve productivity, thereby increasing the overall profitability of the farmers. Although there is wide scope for process mechanisation 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, maize harvesters, balers, forage harvesters, paddy transplanters, etc. These machines play a significant role in the sector but are often ignored. However, there is a huge disparity in the level of adoption of farm technology in the country. While states like Punjab, Haryana, Andhra Pradesh, Telangana, Tamil Nadu etc. have led the way in usage of combine harvesters in 80% of farmland, the same level of adoption is not seen in eastern and north eastern states. Even a

big producer state like Rajasthan is still quite a laggard in terms of adoption of mechanised harvesting for crops like Pulses, Mustard, Guar etc. Finally, there are other sectors that can benefit immensely from mechanization. For eg, in dairy farming, the use of forage harvesters can greatly enhance the availability of quality cattle feed. India, being the largest producer of milk in the world, is in dire need of widespread use of machines to fill the demand and supply gap of cattle feed. But it is encouraging to see that Central as well as many state governments are promoting farm mechanisation in different ways, the most common of them being subsidizing the purchase of equipment. There is renewed push for public private partnerships through Custom Hiring Centers (CHC) to make machines affordable and accessible for small and marginal farmers. We see this as a great opportunity that must be tapped into.

## **What are the challenges associated with mechanization in India?**

While a huge scope for mechanization exists in the country, so do the challenges. Firstly, the biggest roadblock we face

is the lower average farm size holding in India, which is just a hectare per farmer. This restricts the usage of new advanced technologies on account of less purchasing power. The return on investment is negatively affected as the output is limited. Secondly, the over dependence of Indian agriculture on monsoons due to just over 50% of irrigated land is putting the livelihood of millions of farmers at a great risk. Just one year of insufficient rains leads to significant drop in agricultural production in the country. Thirdly, the availability of finance for machines other than tractors is still not up to the mark. Financial institutions are reluctant to provide much needed credit to deserving farmers just because it is safer to finance low value equipment like Tractors than any other equipment. Lastly, there is an ever widening supply & demand gap of skilled manpower to operate and maintain high efficiency machines of advanced technology. There is stark deficiency of an ecosystem to create such skilled manpower.

### **How can we address the gaps in skill development in agri mechanization space in India?**

Agricultural mechanization is a continuously growing and has a greater demand for diverse skills now more than ever. A report by India Brand Equity Foundation in 2018 states that Agricultural machinery market in India has grown at a CAGR of over 10% during 2013-18. As the development of technology rapidly continues, so does the future need for technically competent people in managing agricultural machinery. CLAAS has identified this gap and is working continuously towards bridging it. Showing a strong commitment towards the need of skill development, we have established a state-of-the-art CLAAS Academy at our Faridabad HQ. We are also training and upskilling operators and technicians through hands-on training on CLAAS machinery by partnering with agricultural universities and state

governments across the country.

### **Tell us about the association of CLAAS with agriculture universities in India?**

CLAAS has partnerships with 6 Govt. Agricultural Universities / training institutions across India. These include Dr. Panjabrao Deshmukh Krishi Vidyapeeth – Akola, Mahatma Phule Krishi Vidyapeeth – Rahuri, University of Agricultural Sciences – Dharwad, Punjab Agricultural University – Ludhiana, Bihar Agricultural University – Bhagalpur and Odisha Farm Machinery Research and Development Center – Bhubaneswar. In a shared effort, the institutions provide the infrastructure and CLAAS contributes with technical knowledge, training aids and machines for training of participants. Through these partnerships, over 13,000 man hours of training was facilitated last year alone. The project is aimed at upskilling the agrarian labour force, by bringing CLAAS' expertise in efficient farm machinery to the table.

### **How has mechanization empowered rural youth?**

A large number of youth are migrating to cities in search of jobs due to lack of perceived opportunities in rural areas. However, technology and mechanization has opened avenues which are of interest to the youth and can empower them. For one, mechanization has created a demand for skilled jobs in rural areas thus encouraging educated youth to remain in or return to their villages. These range from skilled operators to technicians, which helps them in earning a decent income while staying connected with their families. Those having sufficient funds to invest in machines, but with little or no interest in farming, have the opportunity to purchase machines and rent it to farmers in their area. This way, rural youth are becoming entrepreneurs in their own way, creating a model of renting out machines in their communities. To encourage this, CLAAS also launched a unique initiative called CLAAS DOST

centers, where we identify youth with the potential of running this model and give them machines on soft repayment model. They are able to build a profitable earning model based on this and not only pay for the machine within months but also sustain a decent family income. With the advancement in technology, several ancillary services are also empowering youth. Franchise, retailing, agency, service centers are visible examples.

### **What are your views on gender-sensitive farm mechanization options?**

It is true that farm mechanization in India is more male dominant while rural women perform numerous labour intensive jobs such as weeding, hoeing, grass cutting, picking, cotton stick collection, separation of seeds from fibre, managing livestock etc. With women playing a key role in all stages of agricultural value chain - pre-harvest & post-harvest production - we feel they should be equally involved in bringing about increase in farming efficiency through mechanisation. However, as of now there are several challenges to women adopting farm machines. Finance is the most important constraint as men have more purchasing power than women in the rural countryside. However, gender inclusive loan policy and efforts by the Government can help bridge this gap. Further, there is a cultural nuance to this also, where men have been traditionally more technology savvy while women have taken care of the household. However, our on-ground experience says that women do participate in mechanization behind the scenes such as influencing selection of machines, their financing and even upkeep for optimum output. The objective of listing some of the challenges in gender sensitive farm mechanization is to present this as an important aspect of Indian agriculture where gender-inclusion is essential. But this is only possible when we all work together to change mindsets and bring more economic opportunities to women.



“Real India lives in rural India. Nearly 52 per cent of overall manufacturing GDP comes from the hinterland, and most leading fast-moving consumer goods (FMCG) companies say that 45-50 per cent of their sales comes from there”



**HARSH KUMAR BHANWALA**

Chairman, National Bank for Agriculture and Rural Development

“There is a lot of scope for reducing untargeted food and fertiliser subsidies and for enhancing revenue administration, including for the GST”

**PAUL MAURO**

Deputy Director, the International Monetary Fund's (IMF) Fiscal Affairs

“Every country that has conducted large scale reforms, has reformed agriculture first. There should be zero intervention in agriculture. Farmers should be allowed to buy, sell, and export whatever”



**SURJIT BHALLA**

Former Member, Prime Minister's Economic Advisory Council



“It would be better to do cash transfers against loan waivers. Cash transfers will help farmers who are badly affected. However, in the case of loan waivers, it may encourage others to follow suit with the impression of getting the benefit of loan waivers”

**GITA GOPINATH**

Chief Economist, International Monetary Fund