₹45/-

APRIL 2018

AGRICULTURE TODAY

The National Agriculture Magazine

VOLUME XXI | ISSUE 4 www.agriculturetoday.in

PRESSING FOR FOOD PROCESSING

APRIL 2018 | VOLUME XXI | ISSUE 4

Publisher & Printer – Dr. MJ Khan on behalf of M/s Concept Agrotech Consultants Limited, Published from 306 Rohit house Tolstoy Road New Delhi-110001 and printed by Everest Press E-49/8, Okhla Industrial Area-II New Delhi-110020 Phone No. 011-23731129 Fax No.011- 23731130

E-mail: editor@agriculturetoday.in
business@agriculturetoday.in

Any issues? contact us at the above addresses!

www.agriculturetoday.in

Pages in the magazine: 60

From the Editor's Desk

FOOD PROCESSING THE NEXT BIG STEP

Indian food processing segment is a brighter spot in today's agriculture. With a pressing task to augment farmers' income and managing the surplus, the food processing segment emerges as a naturally satisfying solution.

India with the second largest arable land in the world and a vast diversity in the crops raised, stands a good chance to reap the maximum benefit from the food processing segment. Being the largest producer of milk, pulses, sugarcane and tea in the world, and the second largest producer of wheat, rice, fruits and vegetables, investments in food processing is a natural progression.However, the record productions of agricultural commodities, year after year have not engendered a parallel development in the food processing segment. The degree of processing is appallingly low and ranges between 2-35% for different produce. India is one of the top rankers in the production of bananas, guavas, ginger, papaya etc., although processing levels in the country remain limited. This indicates an extensive opportunity in the food processing sector.

India produces a sizeable amount of agricultural commodities. However, India being a diverse country with scattered farm holdings, procurement of quality raw materials is a huge hurdle. Prevalence of obsolete harvesting techniques and handling methods, most often renders the produce useless for further post harvest operations. Poor economies of scale and huge operational cost negates the returns from this venture. Contract farming can serve as a solution for this problem. It is emerging as a viable solution considering the increasing demand for more standardized, higher-quality agricultural produce and the difficulty of underdeveloped supply chains and small farm sizes to meet this exceeding demand.

Inadequate knowledge about food hygiene and the standards and certification followed in this area can be counted as the biggest challenges facing food industries. FSSAI should work with other ministries to raise awareness and educate the public about workplace, farm, and household hygiene as well as safe use of pesticides. Clarity is needed with regard to overlapping and residual/pre-existing standards maintained by other regulatory bodies.

Inadequate infrastructure in terms of temperature controlled warehouses for the perishables, cold storage, appropriate logistics have all restricted the growth of the food processing segment. This area requires intensive efforts from the government and the corporates as it is investment intensive.

The Food Processing Industry in India is one of the largest in terms of production, consumption, export and growth prospects. However, the sector needs to be organized to reap the benefits of economy of scale and to bring all round development.

Anjana Nair

CONTENTS

VOLUME XXI | ISSUE 4 | APRIL 2018

Cover Feature

PRESSING FOR FOOD PROCESSING

54 *Know Your Leader*
Vijay Ramniklal Rupani

DHANUKA KHETI KI NAI TAKNEEK

dhanuka

HAR KISAN KI KHUSHALI KE LIYE

TRANSFORMING INDIA

Through Agriculture

Use of fertilizer and green manure according to Soil Test Report

Insured crop under Crop Insurance

Judicious use of Agrochemical

Adopt New technology in farming

Rain Water Harvesting and Drip & Sprinkler Irrigation

Seed Treatment and use of Hybrid Seeds

Safe for Environment to produce more from less to more

Commitment towards doubling the farmer's income

Dhanuka Agritech Limited

AN ISO 9001:2008 COMPANY

14th Floor, Building 5A, Cyber City, DLF Phase III Gurugram- 122002, Haryana, India
Phone +91 124 3838 500 Fax +91 124 3838 888,
E-mail : headoffice@dhanuka.com Website : www.dhanuka.com

Editorial Comments

The Red Revolution

Farmers' march in Mumbai should be an eye opener for the country

The streets of Mumbai bled on March 4, 2018. A sea of farmers dressed in red scaled a 180 km stretch in the blazing sun over six days on their bare foot from Nashik and brought the country's financial capital to a standstill. Bruised and burnt, the farmers marched stoically, reminding the larger public that state of farmers in the state is far from normal.

The farmer contingent, including tribal cultivators, led by the Left-affiliated All India Kisan Sabha (AIKS),had a handful of demands - A complete waiver of farm loans, remunerative prices for crops, pensions for agricultural labour, fulfillment of recommendations by the M.S. Swamination Commission on minimum support price and the Forest Right Act, besides relief from economic losses sustained due to implementation of demonetisation in late 2016. These demands were not new, in fact something which were echoed quite frequently and incessantly. However, it took the collective might of thousands of farmers for the authority to take note and issue instant remedial measures. The Chief Minister responding to the situation accepted most of their major demands such as expanding the list of those eligible for the farm-loan waiver announced in 2017, increased pensions to agricultural workers from Rs.500 to Rs.1,000 per month and transfer of land titles under the Forest Rights Act.

The state of marginal and small farmers is similar in the rest of the country. Farmers' uprising has become a regular spectacle in India. The fall in prices of many agricultural commodities and the inability of the farmers to secure even break even returns from farming have aroused considerable anger and resentment among the farming population. The protests which were initially sporadic have become more widespread spreading over larger geographical areas. The Mumbai march is just the beginning for many such protests to follow.

In India agriculture is practiced in diverse regions. Different crops are raised commercially in these regions. Around 20 agro climatic regions have been classified in this country with varying agricultural and climatic situations. Different languages and different cultures exist in these regions. Despite these differences, farmers across the country echo problems that are unnaturally similar and related. Farmers pine for better crop prices and better incomes. Their woes cannot be disregarded as this is not the problem of a very small population but that of the collective grievance of more than half of the Indian population, half of the Indian electorate.

Most of the farm reforms prescribed do not take into consideration the real farm situations. For instance, data released by the Census of India proves that Dalit farmers are not likely to benefit from farm reforms announced as the policies are aimed at owners of farm lands, rather than the agricultural labour force. Debt, a common denominator, in all farm situations have precipitated the farm crisis. More than 70% of agricultural labourers are in debt. Without any access to formal credit, their life mostly ends in suicides. Climate changes have been equally aggressive on farmers. Over dependence on monsoon, lack of dependable irrigation facilities, pest problem which change their nature and virulence with each cropping season, pesticide resistance, over production, glut, fall in prices, increase in cost of production and many other reasons have choked the agriculture system in the country and its practitioners equally. The government policies too impact the farmers. The recent demonetization took the farmers off guard and in the process they suffered short term losses.

Agriculture suffers from production as well as market risks. Farmers in the long chain starting from production to marketing has hardly any say in the cost of inputs or cost of their produce or policies directly related to them. But the hardships are solely endured by them. The governments should see beyond the immediate electoral gains. The way the political parties have used the pre election time to immerse in some serious 'electorate appeasing 'tactics since time immemorial should give way to more practical and long term strategies. If seventies were a period of green revolution, we are not far away from a Farmers Revolution.

Water Withdraws from Gujarat

Post March 15, Narmada dam would no longer irrigate crops for the summer

Water receded from the canals that were purported to irrigate agricultural field. Fields would turn barren this summer and security were deployed across canals to prevent farmers from pilfering water to irrigate their crops. These are scenes from agriculturally prosperous state of Gujarat.

Water was withheld from canals irrigating fields from March 15 as the storage in the Sardar Sarovar dam in Gujarat fell by 45%, the lowest in the last 15 years, mainly due to poor rainfall in the Narmada catchment areas in Madhya Pradesh last monsoon. In 2017, Madhya Pradesh received 27.69 per cent less than the average rainfall. Called the 'Lifeline of Gujarat', the Narmada dam water irrigates over 18,000 sq km of area across 12 districts of Gujarat. The current water level in the dam stands at about 105 metres, barely five metres short of the critical level of 110 metres. The water level stood at 124.4 metres on December 1, 2017. Its current expanse is less than 90 km, down from 214 km during the monsoon season. The move to disengage from irrigation in the summer season would deprive approximately two lakh farmers of one crop season, aggravating the farm distress that has primarily been caused by lower procurement prices of staple crops like cotton, groundnut and potato.Farmers had also been advised not to sow summer crops post-March 15 by depending solely on Narmada Dam water for irrigation.

Sardar Sarovar project provides for irrigation of 1.84Mha (75% area drought prone) in Gujarat, 0.246 Mha in desert districts of Rajasthan . It also provides for drinking water of 9490 villages and 173 urban centers in Gujarat, 1336 villages & 3 towns in Rajasthan. With this water crisis, water that is remaining will only be diverted to drinking water purposes.

The announcement must have come as a shock for the lakhs of farmers and those outside the state as Gujarat enjoyed a widely publicized image of being well water managed and efficient. A mirage of water abundance was also delivered to the country with completion of Saurashtra Narmada Avataran Irrigation Yojana (SAUNI) and Sujalam Sufalam Yojana. The elections that preceded the water cuts also rarely dropped hints of a looming water shortage. While some farmers are dismayed and anxious over their standing crops as according to them the warning reached late, some others are resorting to stealing water as they have no option to repay their debts. So far the government has remained strangely silent regarding any compensatory measures.

The pertinent question here would be why the authorities had waited so long till a directive was issued. Why weren't the farmers intimated about this issue months in advance? It is difficult to believe that this situation was not foreseen by the authorities. If so, it raises questions regarding competencies of the personnel manning these authorities. Political compulsions and the pressures of the election might have prompted or coerced the authorities to postpone the decision.

The situation seriously questions the credibility of the water management principles of the state government. Lack of transparency and influence of political elements may have precipitated the water crisis. The preferential treatment of domestic utility over irrigation obligations might spark a row in the society. Farmers' unrest and protest have already been witnessed in Gujarat against this water injustice. Unless the government comes out with a more comprehensive way of addressing the present crisis, the issue can blow out of proportion. A water war is imminent.

Water is going to be the most deficient resource in coming years. Water budgeting would become critical in the years to come and a transparent way of water allocation among different sectors, regions and states should guide the water economy of the state and not short term political gains.

Removing Distress from Agriculture

Government is actively pursuing options to ensuring MSP to farmers

Excess production is not a way out to agrarian distress. The myth that enhancing production can elevate farmers' income was quite eloquently busted with recent events. Be it the non perishables such as pulses or oil seeds or perishables such as tomato and potato, over production spills out misery, especially in India's skewed market dynamics. Until and unless the farmers are guaranteed proper price recovery, their income would show no sign of improvement, let alone the prospect of doubling them.

Faced by farmer unrest, despite producing bumper crops, the central government has been forced to brainstorm ways by which the stalemate can be resolved. The general elections in 2019 is yet another compelling factor. It is believed that the central government would be investing in more than one scheme to ensure that farmers get MSP even in the current market condition of bumper production and lower demand that have resulted in sharp fall in prices. The selection of the scheme therefore will be at the behest of the state government. They would also have the flexibility to have different schemes for different crops.The Centre on its part would part finance the schemes with its annual share expected between Rs 12,000 crore and Rs 15,000 crore.

The tried and tested schemes in different states such as Bhavantar scheme (started in MP), input assistance scheme (proposed by Telangana) or market assurance scheme (developed by the Centre) are in the government's short list. The 'price deficiency payment' system or PDP proposes to give direct subsidy to farmers to bridge the gap between MSP and market price for a particular crop. It is similar to the price deficit subsidy scheme (Bhavantar Bhugtan Yogna) of MP under which the market price for a crop is decided on the basis of a modal rate (the average sales price of the crop in 3 markets). The second scheme that has been debated by Niti Aayog is the market assurance scheme (MAS) where procurement is undertaken by states at MSP and the Centre compensates states up to a 40 per cent of MSP after procurement by the state and price realisation out of sale of the procured produce. The Centre is also interested in the input assistance scheme (Farmers Investment Support Scheme) proposed by Telangana in which the state government has said it will give financial assistance of Rs 4,000 per acre to all farmers. It will enable the peasants or the land cultivators to purchase farm inputs (seed, fertiliser, pesticides) independent of the moneylenders. The Centre could bear a part of the expenses for running such schemes. Niti Aayog and agriculture ministry is also discussing a private procurement and stockist scheme that allows empanelled private entrepreneurs to procure crops at MSP while the government giving it policy and tax incentives and commission. The amount of incentives and commission would be given on the basis of quotes received from private players under a transparent bidding process.

MSP system had played a very important role in increasing India's agricultural production. However, to translate that into income gains for the farmers, increasing or instituting MSP is not enough. Assurance that the farmers receive the MSP is critically important and so is the procurement of the commodities by the concerned authorities or bodies. Enhanced agricultural incomes would also need better inputs and better technology. Post production, the produce needs to be safely transported and stored. Most importantly, India needs more investments in storage segment – not only in terms of capacity but also in terms of quality. Value addition and Processing can also turn the excesses into valuable products.

Considering the loss of agricultural produce due to lack of proper infrastructure is an indication of inefficiency. Clearly the government has to think out of the box to bail the farmers out of perennial debt and poverty.

Rubber Rubbing against Environment

The spurt in rubber plantations in North East is a worrying trend

Rubber plantations' ascent in North East in the name of increasing forest cover and rehabilitation of tribal people have spinned off some undesirable effects on the environment. North East known for its pristine forest cover and undisturbed ecosystem, however, has seen a rise in rubber plantations lately, which unlike the natural forest cover are monocultures and poses greater risk to the environment.

Rubber by nature are voracious feeders and has earned the dubious reputation of draining the soil off nutrients and water. Their invasion in North East India, which accounts for a fourth of India's forest cover, is therefore a worrying trend. Rubber plantations in North East are largely raised as monocultures which are referred to as "biological deserts" by scientists, as these plantations do not encourage diverse plant and animal species.

Rubber plantations have usurped a fair share of natural forest cover in many parts of East Asia. The increasing demand for natural rubber worldwide has led to rubber monoculture on more than 2 million hectares of land, mostly in Asia, during the last decade. Rubber arrived in North East India due to similar reasons. It was first introduced in the Northeast by the regional forest department in the 1960s with the mission of increasing forest cover and to 'rehabilitate' tribespeople who practiced shifting cultivation, in which parts of forest are cleared, cultivated, harvested and then left fallow by turns for it to recover its fertility. Besides the Rubber Board's cash subsidy of Rs 30,000 per hectare to grow rubber was an added incentive for the growers. After Kerala, Tripura grows most rubber in India. The area under rubber plantation in Tripura grew from 574 hectares in 1967 to 70,295 hectares in 2014.

With scant regard to the natural environment, crops like rubber can disrupt the natural ecosystem. World over rubber plantations areas have been susceptible to insufficient water availability and soil erosion. Scientists have also linked rubber monoculture to reduction in water reserves, soil productivity and biodiversity in South-East Asia. Similarly, in Kerala, the largest rubber producer, rubber plantations have replaced natural vegetation and were pushed in regions which were environmentally unsuitable. Studies linked this to reduced biodiversity, river flow, and soil nutrients.

Besides the negative impact on the environment, monoculture predisposes the farmers to the the vagaries of the international market, and the situation can be really grim during the recession as the natural rubber economy of the world is facing since 2012. Besides, rubber is perennial which can occupy the area for atleast 25 years. A prolonged price dip cannot suddenly alter the existing cropping pattern.

Rubber plantation was introduced as an answer to Jhum or shifting cultivation in North East. The shifting cultivation which destroys patches of forest, altered and reduced the forest cover. And rubber's resemblance to forest trees might have prompted the authorities to pitch in for rubber plantations. However, rubber can never mimic natural forest cover. They are less efficient in terms of nutrient recycling, soil conservation and regeneration of forests affecting natural succession.

Despite so, their influence in socio economic lives of people in NER cannot be disregarded. Better economic returns from rubber have made the plantations a suitable alternative for the farmers. However, rampant conversion of forest to rubber in coming years need to be regulated. Also, rubber should be combined with other crops such as banana, coffee to support livelihood and to minimise environmental stress.

Our tryst with green revolution that promoted monoculture and its spill over effects have been widely debated. North East which is the reservoir of natural resources and forest lands needs to preserve its integrity. So the future agricultural interventions must be centered around environmentally suitable and sustainable agricultural practices.

Renuka Sugars MD quits as Wilmar raises stake

Narendra Murkumbi, founder promoter of Shree Renuka Sugars Ltd (SRSL), has resigned as vice-chairman and managing director after foreign partner Wilmar International increased its stake in the company to 39 per cent from 27 per cent. Wilmar will now have to make an open offer at Rs 16.29 per share, 5 per cent higher than Friday's closing price. Wilmar first picked up stake in Shree Renuka Sugars four years back at Rs 20.08 per share. The company's board has accepted Murkumbi's resignation. Murkumbi will continue to retain his post till the stipulated notice period of 90 days or completion of open offer by Wilmar, whichever is later. As of December 31, 2017, Shree Renuka Sugars had a consolidated loan book of Rs 98.75 billion. The company is the largest sugar refiner in India and sells both packaged and loose sugar. In February 2014, Wilmar International Ltd announced the acquisition of 27.24 per cent equity shares in Shree Renuka Sugars at an investment of $83 million through its 100 per cent subsidiary Wilmar Sugar Holdings (WSH). Wilmar Sugar Holdings has announced a total investment of $200 million, including acquisition of additional stake and rights issue. The terms of agreement also gave Wilmar Sugar Holdings options to receive allotment of 481.84 million, 0.01 per cent, preferences shares at a price of Rs 16.27 per share, which can be converted into equity shares. Last month, the Competition Commission of India had approved the company's acquisition of additional stake in Shree Renuka Sugars.

BASF SE in talks to acquire Bayer's vegetable seed biz

Chemicals firm BASF said its Germany-based parent BASF SE is in exclusive talks to acquire Bayer's entire vegetable seed business. Bayer intends to divest this business in context of its planned acquisition of Monsanto, it said. "The definitive agreement has not been concluded, however, with this acquisition, BASF targets to enhance its future seed platform and the market position of its agricultural solutions business," the company said in a BSE filing. In October last year, BASF SE had signed an agreement to acquire significant parts of Bayer's seed and non-selective herbicide business for USD 5.9 billion.

ITC to work closely with Punjab-based farmers

Kolkata-based conglomerate ITC will work closely with farmers, especially wheat and fruit growers, in Punjab to improve their yield and quality of products. S Sivakumar, Group Head — ITC's Agri Business, today said the company would be looking to increase its intake of wheat and fruits from Punjab for the flour and juices that it manufactures. For the purpose, the company has also started a new facility at Kapurthala from where it would be helping the farmers across the state to improve their yields with better quality seeds and other techniques. Spread over nearly 71 acres, this state-of-the-art food processing facility entails an initial investment outlay of Rs 1,500 crore. It will create large-scale livelihoods across sustainable agri-value chains. This world-class facility will manufacture ITC's popular food brands such as 'Aashirvaad', 'Bingo!', 'Sunfeast', 'YiPPee!' and 'B Natural' among others.

It has set a target of procuring around 60,000 tonnes of wheat from farmers in Punjab in 2018-19. Sivakumar said ITC's investment in the food processing sector in Punjab will add significant value to the state's agriculture potential. ITC believes that the food processing sector, being at the intersection of agriculture, industry and services, can make a multi-dimensional contribution to the state's economy by enhancing the competitiveness of the food-value chain, adding value to manufacturing and helping create sustainable livelihoods along the entire value chain. This facility will also include a wheat mandi which will enable ITC to procure directly from farmers, reducing transaction costs, improving efficiency and thereby raising income of farmers.

IG International brings Organic Apples for the fruit and health lovers in India

Committed to bringing a wide variety of fruits from across the globe to Indian consumers, IG International, India's largest fresh fruit importers and distributors, introduced Organic Apples from Wenatchee, USA for the first time in India. The apples are imported by the company through its association with Stemilt Growers, Northwest's largest grower-packer-shipper of organic apples, pears, and cherries. By adding Organic Apples to its assortment of exotic fruits, IG International aims to cater to the increasing health conscious consumer base inclined towards organic fruits and vegetables. Announcing the launch of Organic Apples in the market, Mr. Tarun Arora, Director, IG International Pvt. Ltd said, "With the launch of Organic Apples, we further emphasize on importance of healthy eating and want to convey that 'fruits are the best snacks'. Organic fruits

have picked interest from fruit lovers in the country and by launching the best of Organic Apples, we have delivered what the consumers want. Our collaboration with Stemilt has been a grand success and enabled us to bring variety of fruits to the consumers in India so far. We value our association with Stemilt and aim to work together with them to bring diverse variety of fruits to the consumers in India."

LOTS Wholesale Solutions joins hands with farmers in Bhatinda, creates opportunities in progressive farming

Lots Wholesale Solutions, a 100% subsidiary of Siam Makro, addressed more than 1,500 farmers at the 'Opportunities in Food Processing Sector' workshop facilitated by Ministry of Food Processing Industries (MOFPI) in Bhatinda. The focus of this workshop was to provide a platform for farmers to interact with industry leaders to get their insights on procurement models and practices for backward integration.Farmers interacted with LOTS Wholesale Solutions team and learnt about the company's legacy of having worked with local farmers in Thailand. Guided by the concept of 'Local Love', the team reiterated its commitment to sourcing fresh produce from local farming community, share know-how on packing and storage so that farmers can reduce wastage and boost income. The company also has plans to further support the community by opening cold storage chains as well as distribution centres that would feed its stores in northern India.Talking about the workshop, Mr. Tanit Chearavanont, Managing Director, LOTS Wholesale Solutions said, 'In CP Group, CP stands for Charoen Pokphand which literally means "prosperity in agriculture" and this is our clear motto. In Thailand, our parent company Siam Makro has been able to create several success stories by working with small and medium farmers. Today some of them are even international exporters of fresh produce. In India too, we would like to nurture such success stories. I am confident that together with MOFPI and farming communities across the country we will achieve this.'LOTS Wholesale Solutions recently announced about their entry into the Indian retail wholesale market. The company will bring specially curated assortments for each of its micro catchments to attract B2B consumers and stakeholders like traders, resellers, hotels, restaurants, caterers, food based start-ups, farmers, corporates, and SMEs. Additionally, exhaustive food safety training, quality control, customised last mile delivery, localised sourcing of food products, credit facilities to members and suppliers, transparent pricing at all touch points, and leveraging technology and innovation at all levels will all be facilitated by the organisation.

Urea subsidy to continue till 2020

The Cabinet has approved continuation of the urea subsidy till 2020 at an estimated cost of Rs 1,64,935 crore. The government also approved implementation of direct benefit transfer (DBT) for disbursement of fertiliser subsidy. Retail price of urea has not been changed from Rs 5,360/tonne or Rs 268/50-kg bag (excluding central/state tax and charges towards neem coating) since 2012. Prices vary from state to state and on an average farmers get urea at about Rs 300/bag. The Centre subsidises the difference between the cost of delivered fertilisers at retail store (both cost of production and freight) and the MRP paid by farmers. The subsidy is paid to fertiliser manufacturer/ importer by the government. The continuation of the urea subsidy scheme will ensure that adequate quantity of the fertiliser is made available to farmers at statutory controlled price, the government said in a statement. The implementation of DBT in the fertiliser sector will reduce diversion and plug leakages, it said.

Centres doubles guarantee for procurement of pulses, oilseeds at MSP

The Centre approved doubling of government guarantee, provided to lender banks, from Rs 9,500 crore to Rs 19,000 crore for procurement of pulses and oilseeds at minimum support price (MSP) by Nafed, a farmers' cooperative. The move will help in protecting farmers from making distress sales of these produce during the peak arrival period. Procurements of pulses and oilseeds by Nafed will be done under the existing Price Support Scheme (PSS) which is implemented at the request of the state government concerned. The decision to double the government guarantee was approved by the Cabinet Committee on Economic Affairs (CCEA). It also approved the government guarantee up to Rs 45 crore to the Small Farmers Agri-Business Consortium (SFAC) for meeting its existing liability and settlement of existing claims. It comes just a day after release of the agriculture ministry's estimate of record production of foodgrain (277.49 million tonnes) with the output of pulses too touching new high of 23.95 million tonnes (MT) during 2017-18 crop year (July-June). The estimated production of pulses during current year is likely to be is higher than the five years' average production by 5.10 MT.

Govt: GM soybean imports only after regulator's approval

The Union environment ministry has asked the Directorate General of Foreign Trade (DGFT) to stop imports of genetically modified (GM) soybean for food or feed without the approval of the regulator for transgenic products. A 23 February letter from the ministry of environment, forest and climate change, reviewed by Mint, said that the Genetic Engineering Appraisal Committee (GEAC) has received a complaint regarding "illegal/unauthorized import of GM soybean into India from countries like the US and Ukraine, (where cultivated soybean is mostly GM soybean)". "In this context, it is informed that the GEAC, which is the regulatory body for Genetically Modified Organisms (GMOs) and products thereof, has not authorized or approved GM soybean or any other products derived from GM soybean seeds for import or cultivation in India," the letter to DGFT said. "You are requested to consider taking appropriate action, and also issue suitable directives to concerned agencies and officers not to allow import of any GM soybean (seeds/grains or products derived from GM soybean) for use as food/feed or any other purpose without approval of GEAC," it added. The issue of GM foods has been controversial in India, with cotton being the only transgenic crop which is allowed to be cultivated. The environment ministry is yet to take a final call on allowing the commercial cultivation of GM mustard. The ministry's letter was prompted by a complaint by the Coalition for a GM-free India to GEAC about the illegal imports. The group had demanded a thorough investigation and requested GEAC to ensure that soybean seed imports at ports must be tested to ensure that they are non-GM in nature. According to the complaint, every year, India imports thousands of tonnes of soybean seeds for sowing and crushing. Illegal import of GM food has been taking place for year, said Kavitha Kuruganti, a member of the coalition.

Govt plans to protect farmers from price crash

The government proposes to fully compensate farmers in case market rates of a crop fall below the minimum support price (MSP), as it looks to address the deepening agrarian crisis in the pulses sector where bumper production and lower demand are keeping prices low. Sources said the Centre has asked Niti Aayog to quickly put in place an institutional mechanism that would facilitate nationwide introduction of a new 'Price Deficiency Payment' system or PDP in the agriculture sector that would give direct subsidy to farmers to bridge the gap between market price and MSP for a particular crop. This will also help address the problem of lower prices in the oilseed and pulses segment that have also been impacted by the Price Deficit Subsidy Scheme, or the Bhavantar Bhugtan Yogna of Madhya Pradesh, as its localised operation is creating a glut-like situation in other states resulting in crashing prices. A combination of factors such as a bumper harvest last year, export controls and stocking limits imposed by the government on private trade, and record imports have resulted in a sharp decline in prices for pulses and oil seeds. The government fears the current crises will fuel widespread agrarian protests of the kind witnessed last year in Mandsaur, Madhya Pradesh, that forced the state government to quickly launch the Bhavantar scheme.

Bt cotton seed price cut 7.5%, trait value by 20%

Two years after it imposed price controls on the widely-used Bollgard II variety of Bt cotton seeds and slashed the trait value (royalty) payable to the technology provider US-based Monsanto, the government has now reduced the seed's maximum sale price (MSP) in the retail market and the trait value further. According to a notification issued by the agriculture ministry, the MSP for the Bt cotton seeds in the 2018-19 kharif season will be Rs 740 for a 450-gm packet, down 7.5% from earlier. The trait value has seen a steeper 20% cut to Rs 39/packet. Before the Centre capped retail price of the Bt cotton seed, its price was in the range of Rs 830-1,000/450-gram packet, as existed in 2015-16 kharif season. While the price was capped at Rs 800/packet in March 2016 through a controversial move, trait fee, a component of it, was slashed 74%. The price-control has resulted in a sharp reduction in the royalty received by Mahyco Monsanto Biotech (MMBL), the India-incorporated firm, which has sub-licensed the Bt cotton seed technology to as many as 50 domestic seed companies since 2002. While the trait value was around 20% of the retail price before the price control was imposed, it reduced sharply to 6% due to the March-2016 move and, further to just 5.2% after the recent decision.

Urea to be sold in 45-kg bags

Urea, the commonly used and highly subsidised fertiliser, will be sold in the market in a 45-kg bag instead of 50-kg from this month, a move aimed to cut its consumption and promote balanced use of fertilisers. A 45-kg urea bag will be sold at Rs 242 excluding taxes, a government notification said. The price is determined on the basis of government's fixed price of Rs 5,360 per tonne. The Centre bears the difference between the maximum retail price (MRP) and cost of production. A senior Fertiliser Ministry official said fertiliser companies will be allowed to sell the old stock of 50-kg bags for next two months. The purpose is to reduce urea consumption and promote balanced use of fertilisers. Since urea is cheaper than other fertilisers, farmers are using this product widely, he said. As per the notification, the sale of 45-kg bag is effective March 1, 2018. The government has also permitted dealers to sell urea in smaller quantities not exceeding 25 kg. Annual urea subsidy is around Rs 40,000 crore. The country is producing over 24 million tonnes of urea since last year and importing around 6 million tonnes to meet the domestic demand.

Thousands of farmers protest in Mumbai over lack of Government support

Tens of thousands of farmers from Maharashtra reached the state capital of Mumbai on 12th March to protest what they called a lack of government support despite severe distress within the sector that employs the majority of the country's workforce. The protestors walked 180 kilometres (112 miles) from Nashik to Mumbai over the course of a few days and planned to stage a sit-in protest outside the state legislative assembly building, where the annual budget session is underway. The farmers demanded waivers on agricultural loans in the aftermath of unseasonal rains that destroyed crops as also more support from the government, fair prices for crops and the transfer of forest lands to tribals, who have been tilling them for decades. This is the second major local protest by farmers in less than a year and has put pressure on the state government headed by Prime Minister Narendra Modi's BJP. Maharashtra, India's most prosperous state, had announced a farm loan waiver of 340 billion rupees ($5.23 billion) in June 2017, but the protest leaders said it failed to benefit all needy farmers. The state has so far transferred 138 billion rupees to the accounts of 3.6 million farmers, state's Finance Minister Sudhir Mungantiwar said last week. All major opposition parties and the Shiv Sena, a coalition partner in the state government, are supporting the protesting farmers. The Devendra Fadnavis government of Maharashtra later agreed to the demands of protesting farmers and the government has given its acceptance in writing after a delegation of farmers met government representatives.

Farmers to get Rs 5-lakh life cover from June 2

The Rs 5-lakh free insurance scheme for farmers announced by Chief Minister K. Chandrasekhar Rao recently will be implemented from June 2 on the occasion of Telangana State Formation Day. Agriculture minister Pocharam Srinivas Reddy held a meeting with LIC officials to finalise the modalities for the scheme. The CM announced that there was no need for farmers to pay any premium to avail this scheme and the government itself will bear the premium on their behalf. As per revenue records purified by the state government recently, there are nearly 72 lakh farmers in the state. The families of deceased farmers will get Rs 5 lakh compensation in case of the death of a farmer covered under the scheme for any reason. Though the premium amount for each farmer is yet to be finali-sed, the government expects it to be nearly Rs 1,000. With this, the government needs to spend around Rs 720 crore every year towards payment of premium on behalf of farmers. The funds required for the purpose will be allotted in the Budget 2018-19.

Maha begins online farmer registrations to buy chana at MSP

The Maharashtra government has started online registration of farmers for the purchase of chana at the minimum support price (MSP). Chana prices have been sluggish and hovering between Rs 3,300 per quintal and Rs 3,500 per quintal in the market, while the MSP has been fixed at Rs 4,250 per quintal with a bonus of Rs 150 per quintal taking the total price to Rs 4,400 per quintal. The government has set up around 185 procurement centres in the state. The Centre has decided to procure some 3 lakh tonne chana under the Price Stabilistation Scheme (PSS) from the state and begun the online registration process for farmers from last week onwards. Chana procurement is expected to continue till May 29. The Agriculture Produce Market Committee (APMC) at Latur however said that the process has not begun yet in latur, a key pulse producing region.

Gujarat Govt eyes rubber cultivation to shore up farmers' income

The Gujarat government is learnt to be exploring options to encourage rubber cultivation in the State with the industry support for research and development of the crop that is currently concentrated in South and North-East India. The State, which has about 58 per cent of its land area under arid and semi-arid regions, is gearing itself up for natural rubber cultivation. "Gujarat is a land of opportunities. As we see large number of rubber consuming industry coming to the State, we would look to extend State support to encourage R&D in rubber cultivation in Gujarat. I urge the (consuming) companies to associate with the State Forest Department to take up research in natural rubber cultivation and come up with an integrated project for rubber production in the State," said Chief Minister Vijay Rupani. However, rubber cultivation in India has been traditionally confined to Kerala and Tamil Nadu. In recent years, rubber cultivation was also tried in the hinterlands of coastal Karnataka, Goa, Konkan, coastal Andhra Pradesh, Odisha and the North-Eastern States.

UP govt to open agro market for private investment

The Uttar Pradesh government has decided to allow private investment and participation in the state's organised farm produce market, estimated at ~600 billion a year. The cabinet approved a Bill to amend the UP Agriculture Produce Marketing Committee (APMC) Act, 1964, to allow private wholesale markets (mandis), giving competition to the government trun ones, operated by UP Mandi Parishad. The amendment would allow private companies to set up procurement markets/centres outside the periphery of existing mandis, for direct purchase of produce from farmers. This is aimed at giving more selling options to growers. Plus, a provision for mandi status to designated agro warehouses, silos and cold storages. Aggregate turnover in the 250 centres operated by UP Mandi Parishad across the 75 districts is pegged at about ~600 billion a year. The state is among the top agricultural and horticultural producers in India. Annual foodgrain production is in excess of 50 million tonnes. Actual annual turnover of farm produce is estimated at several times the volumes at the Mandi Parishad, since a substantial quantity never gets there. At the recent UP Investors Summit 2018 in Lucknow, the government received 236 proposals from companies evincing interest, to invest a total of Rs 187 billion in the agricultural and food processing sector. The APMC Act amendment should further boost the sector. And, Prepare the way for contract farming.

Kerala plan to lease Andhra Pradesh land for cashew fails

Kerala's much-touted initiative to lease 50,000 acre for cashew cultivation in Andhra Pradesh for the cashew processing industry in Kerala has drawn a blank. Because of acute shortage of raw cashew nuts (RCN), nearly 900 processing factories in Kerala are non-functional. "After the initial round of discussions in February 2017, Andhra Pradesh officials have been lukewarm about proceeding with the agreement," Kerala chief minister Pinarayi Vijayan told the state assembly here. He was candid that "the plan is unlikely to work out." The plan sponsored by the National Horticulture Mission was envisaged as a win-win situation for both states when the joint initiative was spelt out last year. Kerala, through its agency for expansion of cashew KSACC, would lease 50,000 acre in Andhra Pradesh at Rs 700 crore for five years to cultivate cashew nuts for the cashew processing industry in Kerala. For Andhra Pradesh, the potential job opportunity was the main attraction. Andhra Pradesh chief minister N Chandrababu Naidu had expressed enthusiasm about the collaboration and especially about the 75 lakh man-days of employment that the project would create for Andhra farmers.

'Drought has affected sugar production in Tamil Nadu'

Sugar output in Tamil Nadu is expected to be the lowest this season despite a bumper harvest reported by major sugar-producing States, according to the South Indian Sugar Mills Association (SISMA). There is bumper harvest in Uttar Pradesh, Maharashtra, and Karnataka during the current season (2017-2018), Palani G. Periasamy, president, SISMA, told The Hindu. However, Tamil Nadu is expected to produce just six lakh tonnes. "We used to produce 25 lakh tonnes six or seven years ago. Last year, we did 10 lakh tonnes. This year, it will be just about six lakh tonnes," he said. Tamil Nadu had been experiencing drought for almost four years leading to low availability of cane and affecting sugar recovery. "Usually, we crush cane for nine months in a season. This year, most mills in the State are expected to stop crushing by the end of this month. Capacity utilisation is just about 20 %," he said. According to data available on Indian Sugar Mills' Association website, in January this year, the association estimated sugar production this season (October 2017 to September 2018) to be 261 lakh tonne. Till February 18, about 500 factories have been in operation across the country and produced 203.14 lakh tonnes. Mr. Periasamy said since Tamil Nadu mills were under stress, SISMA sought a revival package from the State government.

Punjab government to go for its own crop insurance policy

Punjab will form its own crop insurance policy for which the Amarinder Singh-led Congress government has already sought suggestions from the state farmers' commission. The northern state, in the process, gave a thumbs-down to Prime Minister Narendra Modi's ambitious Pradhan Mantri Fasal Bima Yojana (PMFBY). While banks have declared 1.39 lakh farmers as defaulters in Punjab, non-performing assets of these banks due to farm loans run into Rs 6,611 crore. The outstanding amount to be paid to the Punjab farmers is Rs 83,316 crore. At a meeting of state agriculture ministers with their Union counterpart Radha Mohan Singh in July last year, Punjab had informed the Centre of its plan to set up its own agriculture insurance corporation — a proposal which was accepted. The government, then, held a meeting with insurance companies but nothing turned up. Subsequently, a committee was formed to find out the possibilities of forming an insurance corporation. The agriculture department is now likely to submit a draft of the agriculture insurance policy to the-government after the budget session in March. "The draft of the insurance scheme is being prepared along with the agriculture policy," a senior official said. Sources said Punjab made some suggestions to the Centre for amending some sections — including the clause that the Pradhan Mantri Fasal Bima Yojana is applicable only if there is 40 per cent crop damage in a village — of the insurance scheme. But, the suggestions were neither adopted nor the Centre gave any response to the state. Sources said some 5,000 cases for insurance claims are lying with crop insurance companies. The Congress government has already given an ultimatum to these companies to clear the claims of farmers on time and release payments.

Banks struggle with farm loan target due to waivers, may lean on PSL certs

With agriculture lending growth remaining muted, banks are struggling to meet year-end targets in this department. So far this year, growth of farm loans by banks has remained flat at 0.6 per cent, compared with 3.2 per cent last year. Banks are facing a peculiar sitution in which, on the one hand, the loan outstanding in their books has come down after a series of debt-waiver schemes, while on the other, fresh loan approval has been slow on the back of higher delinquencies. Under the latest debt-waiver scheme announced by Rajasthan chief minister Vasundhara Raje this month, the government has provided Rs 80 billion for one-time crop loan waiver of up to Rs 50,000 for small and marginal farmers, apart from land revenue exemption. "Banks may have difficulty in meeting agriculture lending target, as the loan outstanding has come down on account of debt waiver. However, banks may achieve the overall priority sector lending target, as corporate loan growth has been very slow and banks are focusing on retail loans," said an official of a public sector bank. According to priority sector norms, scheduled commercial banks have to extend 40 per cent of their loans or Adjusted Net Bank Credit (ANBC) to identified priority sectors. Of this, 18 per cent is earmarked for the agriculture sector within which, a target of 8 per cent of ANBC is prescribed for small and marginal farmers. Banks that fail to meet the targets need to deploy amounts equal to the shortfall in the low-yielding Rural Infrastructure Development Fund (RIDF). In April 2016, RBI had introduced Priority Sector Lending Certificates, which banks can trade too meet sub-targets.

Nabard lists agrarian crisis factors in TN

Agriculture in Tamil Nadu continues to face the challenge of shrinking acreage, over-exploitation of groundwater, diversion of agriculture land to non-agricultural uses and disparities in yield rates of crops, according to the National Bank for Agriculture and Rural Development. Nabard, in its annual exercise of assessing the credit flow potential to the priority sector, has pointed out in the document for 2018-19 that these factors have contributed to a steep fall in the contribution of agriculture to GSDP. In 2011-12, it was 14 per cent and it has dropped to 5 per cent (at current prices) in 2016-17. Inadequate availability of water for agriculture is a major cause for farmers' distress in the State, according to Nabard. The Potential Linked Credit outlay for priority sector in 2018-19 is pegged at Rs 2,06,683 crore, an 8 per cent increase over that of the previous year. Projections for crop loan is estimated at Rs 82,287 crore. Estimates of sectorwise credit projections are: farm credit Rs 1,13,929 crore; agriculture infrastructure Rs 7,610 crore; Ancillary activities Rs 7,507 crore; MSME Rs 38,696 crore; Export credit Rs 5,715 crore; Education Rs 7,417 crore; Housing Loan Rs 11,524 crore; renewable sources of energy and waste management Rs 2,145 crore; others Rs 10,107 crore; and social infrastructure with bank credit Rs 2,029 crore. In 2016-17 the ground level credit flow was Rs 1,52,405 crore which was 7 per cent higher than that in the previous year.

'Rs 11-lakh crore agri credit flow achievable next fiscal'

Finance Minister Arun Jaitley expressed confidence that the banking sector will be able to achieve the agriculture credit flow target of Rs 11 lakh crore for 2018-19. This will add to the momentum in doubling farmers' income by 2022, Jaitley said while addressing the NABARD board. He also reviewed the funds announced in the Union Budget 2018-19 and stressed the need for all stakeholders to collaborate to improve farmers' income. Further, he emphasised that the banking sector must invest in long-term assets to improve capital formation in the farm sector. Jaitley also said that investments in financial technology over the past few years have brought in efficiency, speed and transparency in the rural financial ecosystem. Rajeev Kumar, Secretary, Department of Financial Services, stressed the need for financial inclusion and adoption of technologies to make use of the opportunities arising out of higher GDP growth. He urged the banking system to concentrate on geographies such as the North-East, East and Central India, where formal credit can give a fillip to growth. Kumar also said his department is actively engaged with other ministries to create an enriching ecosystem. Harsh Kumar Bhanwala, Chairman, NABARD, said that the organisation has operationalised the funds announced in the previous Union Budget. The Prime Minister's Grameen Awas Yojana is about to be supported through Rs 9,000 crore shortly, he added. The Rs 5000-crore Micro Irrigation Fund, which will promote water conserving and productivity enhancing technologies, will also be operationalised shortly, he said. Bhanwala emphasised the need for the formation of robust Farmer Producers Organisations.

Farm loan waiver Phase-II in Punjab: 35,000 farmers to get certificates

After a gap of over two months, the Punjab government going to disburse farm loan waiver certificates to around 35,000 marginal farmers in five districts. The scheme was rolled out on January 7 from Mansa district where around 47,000 marginal farmers from five districts in Malwa region were given cheques towards loans taken from cooperative lenders only. The total amount waived was Rs 167 crore. With the second phase, the number of farmers getting farm loan waiver would reach up to 82,000, which is much below the target set by the state government. In the second phase, farmers from Ludhiana, Jalandhar, Kapurthala, Fazilka and Ferozpur districts will be given the waiver certificates. D P Reddy, chairman of Punjab State Cooperative Bank Limited, said the verification process was going on and the actual number of beneficiary farmers may go little up and in the second phase.

Good demand for Indian cotton in overseas markets on depreciation

There is good demand for Indian cotton from overseas markets this season. Bangladesh, Pakistan, Vietnam, Indonesia and various other countries are buying cotton from India heavily this season. Around 40 lakh bales of cotton have been exported from the country so far and another 15-20 lakh bales are expected to be exported by the end of this season, top officials of the Khandesh Ginning & Pressing Factory Owners & Traders Association said Interestingly, there are market reports of the likelihood of export of some 10 lakh bales to China this season. Alongside exports, imports have also gone up this season because of the Pink Bollworm infestation, according to industry people. There is good demand coming from these countries for Indian cotton, according to Pradeep Jain, president of the Association. Around 14 lakh bales have been exported to Bangladesh so far, 9 lakh bales to Pakistan and the remaining to Turkey, Vietnam and Indonesia. Exports from India this year have received a fillip thanks to the rupee depreciation, he said. Industry experts pointed out that China has not been importing cotton for the last two to three years and has been using its buffer stock of some 1 crore bales and may soon tap overseas markets for some 20-25 lakh bales in the next 7-8 months. In addition to exports, the country has also imported around 10 lakh bales so far and there is the possibility of imports touching 35-40 lakh bales, industry experts pointed out. The Cotton Association of India (CAI) has lowered its crop estimates for the ongoing 2017-18 crop year at 367 lakh bales. The association has released its January 2018 estimate of the cotton crop for the year 2017-18 beginning from October 1, 2017. The CAI has lowered its estimate for the ongoing season by 8 lakh bales. The reason is severe Pink Bollworm infestation, Atul Ganatra, president of CAI had stated. In accordance with the advice of the scientists, the farmers in several areas, particularly in Maharashtra and Telangana, have uprooted their cotton crop without waiting for further pickings, he said. The projected balance sheet drawn by the CAI estimated total cotton supply for the season at 417 lakh bales of 170 kg each, including the opening stock of 30 lakh bales.

Oilmeal exports drop 47% in February

Exports of oilmeals during February 2018 have dropped 47% in comparison to February 2017 to 161,969 tonne, according to figures compiled by the Solvent Extractors' Association of India. The overall export of oilmeals during April 2017 to February 2018 is provisionally reported at 2,677,536 tonne compared to 1,714,984 tonne during the same period of last year, which is a rise by 56%. On 17th November 2017, government raised the import duty on edible oils by 12.5% to 15% across the board and increased MEIS on soybean meal to 7% from 5%. These steps have made Indian oilmeal more competitive in the world market and resulted in to larger export of oilmeals during current year. Secondly, after two difficult years, export of oilmeals has revived in the current year, but still lower than earlier years, when India used to export over 40-45 lakh tonne of oilmeals annually. During April 17– February 18, oilmeal exported to Vietnam is reported at 564,091 tonne compared to 323,297 tonne. This consisted of 42,456 tonne of soybean meal, 84,788 tonne of rapeseed meal and 436,847 tonnes of de-oiled rice bran extraction. South Korea imported 756,946 tonne compared to 514,702 tonne, consisting 267,360 tonne of rapeseed meal, 459,414 tonne of castor meal and 30,172 tonne of soybean meal. Bangladesh imported 138,889 tonne compared to 230,588 tonne, comprising 26,037 tonne of rapeseed meal, 5,857 tonne of de-oiled rice bran extractions and 106,995 tonne of soybean meal. Thailand imported 167,681 tonne compared to 16,925 tonne, consisting 105,997 tonne of rapeseed meal, 13,502 tonnes of de-oiled rice bran extractions and 48,147 tonne of soybean meal. European countries were the major importers of Indian soybean meal. France imported 141,948 tonne of oilmeals compared to 208,489 tonne, consisting of 136,519 tonne of soybean meal and 5,429 tonne of castor meal. Rest of the European countries imported 341,145 tonne of oilmeals, mainly soybean meal.

Sharp increase in tariff on palm oil, chickpea

The central government has sharply raised the import duty on palm oil and chana (chickpea or Bengal gram). The duty on crude palm oil (CPO) has been raised to 44 per cent from the earlier 30 per cent and on RBD (the refined variety) to 54 per cent from 40 per cent. For kabuli chana (white chickpea) the import duty of 40 per cent is now 54 per cent. For desi chana (black chickpea), the duty of 40 per cent has been raised to 60 per cent. Following the duty hike, CPO May futures price fell about 3 per cent to 2,469 ringgit on Bursa Malaysia. Import duty can be raised up to the "bound rates" applicable under World Trade Organization (WTO) rules to protect farmers. For edible oils, these go up to 300 per cent. For chana and soybean oil, 60 per cent and 45 per cent, respectively. In the Union Budget he presented on February 1, Finance Minister Arun Jaitley announced an import duty increase from 12.5 to 30 per cent on crude edible vegetable oils and for the refined form from 20 per cent to 35 per cent. There is no change in duty for soft oils like rapeseed-mustard, soya oil and sunflower oil. After a 10 per cent social welfare cess, the net import duty will be 59.4 per cent and 66 per cent, respectively, for kabuli and desi chana. Edible oil duties have been increased many times in the past six months, to support Indian crushing mills. Oilseed prices have fallen significantly in recent months, due to a better crop. India primarily imports palm oil from Indonesia and Malaysia and soy oil from Argentina and Brazil.

Import duty effect: Buyers set to cancel upto 1 lakh tonnes of palm oil cargoes

Indian importers are seeking to cancel up to 100,000 tonnes of crude palm oil cargoes as costs have risen since the country raised import duty on the product last week, three trade sources said. "After the increase in duty the cost of imports has gone up by $107 a tonne for crude palm oil but the domestic price has risen by around $60 a tonne," said a palm oil broker, speaking on the sidelines of an industry conference in Kuala Lumpur. India, which buys about 800,000-850,000 tonnes of crude palm oil a month, last week raised import tax on crude and refined palm oil to the highest level in more than a decade in a move designed to support domestic farmers. "In April imports would be substantially lower," a Mumbai-based broker said; "Most people are trying to cancel or renegotiate April shipments." Malaysian palm oil futures declined as traders feared the prospect of cancelled shipments to India and after forecasts made at an industry conference in Kuala Lumpur. The benchmark palm oil contract for May delivery on the Bursa Malaysia Derivatives Exchange was down 1.4 percent at 2,443 ringgit a tonne.

Global NR production growth slower by 1.2%

India is not alone while facing the slowdown in the growth of natural rubber (NR) production. Analysis of NR trends and statistics in January 2018 by the Association of Natural Rubber Producing Countries (ANRPC) predicts a slump in the growth of NR production as well as its demand in the current year. Growth of NR production is down by 1.2%, according to ANRPC secretary general Nguyen Ngoc Bich. Eleven member countries of ANRPC accounts for as much as 92% of world's NR output. "The slower production growth in 2018 is mainly attributed to a lower production anticipated by Thailand at 4.375 million tonne, down by 1.2% on a year-to-year basis," Nguyen Ngoc Bich writes in the latest news bulletin. At the same time, the global outlook of NR supply is anticipated at 13.784 million tonne in 2018, up 4.5% from 13.196 million tonne recorded in 2017. "This seasonal phenomenon will soon happen in other major producing countries. Slowdown in NR supply may be expected, and this may lead to a much-balanced supply-demand NR market in the coming months," says the secretary general's note.

This 'probe-trapper' from TNAU can keep insects away from grains

The worms that surface when a bag of stored grain (say rice) is opened can be nauseating. Cleaning it can be equally disgusting. If only there is a device to make the task simple, it can help save both - labour and loss of the stored grain. This was the principle on which S Mohan, Professor of Agricultural Entomology, Tamil Nadu Agricultural University, worked when he developed the (stored product) insect monitoring device in the mid-90s. There were few takers then. But two decades later, when some French nationals visited the TNAU in December last and purchased 25 units of the insect probe trap to monitor insect pests in stored corn, the locals too have started evincing interest in the device, says Mohan. The one-foot device is made of stainless steel. It consists of three parts – a main tube, an insect trapping tube and a detachable plastic cone at the bottom. Equispaced perforations of 2 mm diameter are made on the main tube. The behaviour of the insect has been exploited in this technology. Insects love air and move towards it. The device is inserted vertically into the grain. The top red cap must be in level with the grain. "When insects creep towards the air, they make their way through the small holes in the device and fall into the detachable cone at the bottom. The cone can be unscrewed and cleaned once a week or so," Mohan explained, highlighting its utility value. "It is free of chemical, no maintenance cost and needs no power to keep it running." According to him, two units can be used in a bag containing 25 kg of the grain, and every household can have one or two units of the device.

Farming may soon be an 'assured' activity

In a major initiative to apply disruptive technology in agriculture, a consortium of researchers has been formed in partnership with 3 leading institutions in the country, with the aim of turning farming from an 'uncertain' to 'assured' activity. The platform, the Consortium of Researchers for Disruptive Technologies in Agriculture (CDTA), is a joint venture of the academic-cum-research scientists of IIITMK, Thiruvananthapuram, GB Pant University of Agricultural Sciences and Technology, Pant Nagar (Uttarkhand) and Indian Institute Space Technology, a press release said. The team will advocate and implement application of technologies like Artificial Intelligence (AI), Data Analytics (DA), Internet of Things (IoT), Cloud Computing (CC), Aerospace Observation and Miniaturised Sensors in the agriculture domain. They together present the untapped potential to overcome challenges facing Indian agriculture and to transform it from an Uncertain to Assured one. Assured agriculture represents a scenario where individual farmers are guided at every stage of crop growth and provided with timely advisories and physical or fiscal assistance, to ensure beneficial returns for investment; without compromising on biological diversity in the immediate vicinity. Having seized the need for tapping the tremendous potential of disruptive technology in agriculture, it was considered necessary to create a platform for advocating, creating, applying and sharing the new knowledge for the benefit of the Indian farming sector. Dr R Jaishanker (Associate Professor, Ecological Informatics, C V Raman Laboratory of Ecological Informatics, IIITM-Kerala), Prof Ajeet Singh Nain (Head, Department of Agro-Meteorology, GB Pant University of Agricultural Sciences and Technology, (Uttarakhand) and Dr V K Dadhwal (Director, Indian Institute of Space Science and Technology, Thiruvananthapuram (Mentor) are the lead role players of the initiative. The CDTA envisions to become a platform to share knowledge, good practices and support training in disruptive technologies to scientists and researchers, focusing on agriculture.

Agricx Lab raises $500,000 from Ankur Capital

Agricx Lab, an agritech startup that uses smartphone imaging to assess the quality of agricultural produce, has raised $500,000 led by India focussed venture capital fund Ankur Capital. IIM Ahmedabad´s Centre for Innovation, Incubation and Entrepreneurship (CIIE) also invested in the company. The agritech startup has developed mobile app that uses computer vision and artificial intelligence on images to yield objective, accurate and faster quality assessment of agriproduce. Agricx Lab was started to createaquick, accurate, portable and easytouse quality assessment tool for agricultural produce.

'RICH' technology awaits State farmers

A tinkering lab for farmers is one of the projects the Research and Innovation Circle of Hyderabad (RICH) will establish as part of an emphasis on pushing technologies from laboratories to farmland. Tissue culture lab, aquaponics, vertical farming unit, green houses for biotechnology research, farm machinery demonstrations as well as plots for incubatees are among the facilities planned at the Agri Tech Park, for which various locations are under consideration. "I don't think it will cost us more than ₹20-25 crore," RICH Director General Ajit Rangnekar said. It already has an informal funding commitment from the Centre, he said, adding the land for the project would be sought from the Telangana government. About 70-75 acres is the estimated requirement for the project that will serve as a forum showcasing technologies from various institutions to farmers. The idea is to create a facility that will serve as a hub for farmers to learn more about the technologies and get an opportunity to work on them. Besides agri-tech park, RICH, a government of Telangana initiative and made up of a lean, six-member team, has lined up a host of other projects to pursue as it steps into second year. These include a Regulatory Guidance Cell; Advisory Boards; CEO Circles; Finishing School; collaboration with international like-minded institutions, and creating a directory of resources. Mr. Rangnekar was speaking on Saturday at an event to celebrate the first anniversary of RICH, a programme in which IT and Industries Minister K.T. Rama Rao and various stakeholders participated.

Tamil Nadu adopts revenue sharing price fixation

Giving fresh breath to the ailing sugar industry in the state, the Tamil Nadu government has decided to switch over to the revenue sharing price fixation model from the current season. Under the new model, farmers will be assured of fair and remunerative price (FRP) and will also receive a share in the profits over and above the FRP. Tamil Nadu finance minister and deputy chief minister O Panneerselvam announced the new policy in his budget speech. Maharashtra and Karnataka have already migrated to the revenue sharing price fixation formula based on the recommendations of Dr Rangarajan Committee. But Tamil Nadu continues to fix state advisory price (SAP) over and above the FRP. To resolve this issue, the state has decided to switch over to the new model from the current season, he said. The sugar industry has been going through an extended phase of distress due to various factors such as failure of monsoon, varietal degeneration, reduced recovery, decline in area under sugarcane and the resultant reduction in capacity utilisation of sugar mill. This has affected timely payments to farmers.

Gujarat adopts 'transparent' agri-procurement through video, CCTV monitoring

In a first for the agri-procurement mechanism in the country, the Gujarat government plans to make videography and CCTV monitoring mandatory for the procurement of agricultural produces through State agencies. According to top government sources, the State, which is currently procuring tur and groundnut under the price support scheme at the minimum support price (MSP) level, will videograph the entire process at all the procurement centres and install CCTVs at all the warehouses to keep a close vigil on the commodities. "This is going to be a big booster for the farmers' confidence as it will ensure fair practices. After online registration and fund transfer through Aadhar-linked bank accounts, now videography of the procurement process will discourage illegal activities and unfair practices," said Bhagavandas Patel, Director, Gujarat State Warehousing Corporation (GSWC). According to top government officials, initially, the videography will be done for the current procurement that is being done for 1 lakh tonnes of groundnut and 1.2 lakh tonnes of tur (pigeon pea) beginning first week of March. "We will also conduct videogrpahy of the samples, to help in monitoring of right quality. Although we are being careful in current practices, we want to be extra careful. In immediate basis, CCTVs will be installed at the warehouses where the immediate unloading is taking place, and in due course other warehouses will also be covered," said a senior State government official. The State is preparing itself for a mammoth task of procuring record groundnut at about 9 lakh tonnes after witnessing record crop of 32 lakh tonnes in the kharif 2017-18.

PRESSING FOR FOOD PROCESSING

India's demographic landscape has witnessed a sea change, since its inception as a sovereign nation. Once the destination of cheaper imports, the country, today has become an ace destination for investments in innovative food products. India's strong agricultural background and a steady supply of agricultural commodities which forms the raw materials of the food processing segment are dependable drivers of this segment.

The possibilities that are in store for the Indian food processing segment are enormous. According to ASSOCHAM-Grant Thorton Research paper, the sector has the potential to attract US$ 33 billion of investment and generate employment of 9 million persons days by FY 2024. Besides, India's perennial problem of food wastage due to multiple factors can be effectively addressed by food processing. Value addition, better income realization for the farmers, rural entrepreneurship and better exports are other attributes of this segment.

The Potential

Indian agriculture segment has been witnessing a drain in work force, which was once considered an important determinant of India's strength in agriculture. With younger population reluctant to take up farming, the migration of resourceful labour from rural to urban centers of production has peaked in the recent years. The increasing cost of production without a concomitant increment in the returns have forced the younger generation to abandon the primary centres of production. However, with a thrust on food processing, the trend can be reversed as food processing is not only a key contributor to employment generation but also a suitable avenue to develop rural entrepreneurship.

The ASSOCHAM-Grant Thornton joint study on 'Food Retail: Investment: Infrastructure' has noted that by 2024, food processing sector is expected to employ 9 million people in India and expected to generate about 8,000 direct and 80,000 indirect jobs. According to the study, Indian food processing industry is pegged close to US$ 121 billion to US$ 130 billion.

India with the second largest arable land in the world and a vast diversity in the crops raised, stands a good chance to reap the maximum benefit from the food processing segment. Being the largest producer of milk, pulses, sugarcane and tea in the world, and the second largest producer of wheat, rice, fruits and vegetables, investments in food

The record productions of agricultural commodities, year after year have not engendered a parallel development in the food processing segment. India is one of the top rankers in the production of bananas, guavas, ginger, papaya etc., although processing levels in the country remain limited

processing is a natural progression.

However, the record productions of agricultural commodities, year after year have not engendered a parallel development in the food processing segment. The degree of processing is appallingly low and ranges between 2-35% for different produce. India is one of the top rankers in the production of bananas, guavas, ginger, papaya etc., although processing levels in the country remain limited. This indicates an extensive opportunity in the food processing sector.

Another factor which plays a crucial role in encouraging the development of the processing segment is the expansion of the Indian food and retail market. The change in the lifestyle of Indian population and consumer preferences have spurred this trend. The study points out that Indian food and retail market is projected to touch US$ 482 billion by FY 2020 from the level of US$ 258 billion in 2015.

India is also a famed food exporter, exporting different categories of food to different continents. So naturally there lies an opportunity of exporting processed food products. With globalisation and increasing trade across the borders, approximately about 460 million tonnes of food valued at US$ 3 billion is traded annually. India has thus a great potential for global trade in agricultural and processed food products. The share of food processing exports in total exports was around 12% in the last few years. During FY 2011-15, India's exports of processed food related products have been growing at a CAGR of 23.3%. Further, India's geographical location gives it a unique advantage when it comes to exports, having convenient connectivity to Europe, Middle East & Africa from the western coast, and Japan, Singapore, Thailand, Malaysia, Korea, Australia & New Zealand from the eastern coast.

Also, the unorganised sector accounts for 42% of India's food processing industry. Food and grocery constitute a substantial part of India's consumption basket accounting for around 31% share in the total. In contrast, consumers in other countries spend a much lower proportion of their income on food and grocery — 9% in the United States (US), 17% in Brazil and 25%in China. Food and grocery is the largest segment in India's retail sector,

with a share of more than 60% in India's total retail market in 2014.

Food processing is a priority sector for the Indian Government, as well as one of the focus sectors in the Make in India initiative. Further, the availability of affordable credit and other fiscal incentives have also led to India being considered as a one of the most favourable markets. This has also invited foreign investments in this sector. The foreign direct investment (FDI) in the food processing sector is expected to rise by 38 per cent to USD 1 billion this fiscal according to Union Minister,Harsimrat Kaur Badal. Proposals worth USD 14 billion were signed during the 'World Food India 2017' event held in November, 2017. "FDI in food processing is increasing. It stood at USD 727 million in 2016-17. In the first seven months of this fiscal, FDI in the sector has reached USD 500 million. It will touch USD 1 billion by end of this fiscal," Food Processing Minister Badal said.

Surplus Raw Materials

India's advantage lies in the enormous production potential of agricultural commodities. Being first in many commodities, India can always channel the excess production to fuel the food processing segment. Major industries constituting the food processing sector in India are grain milling, sugar, edible oils, beverages, fruits & vegetables processing and dairy products.

India's food grain production has been recording newer heights and record productions have become the new reality. For the crop year ending June 2018, the agriculture ministry has reported that India's foodgrain production is forecast to grow to a record. Foodgrain output is expected to increase 0.9% to 277.49 million tonnes, exceeding the previous record of 275.11 million tonnes during 2016-17. Output of rice, pulses, coarse cereals, cotton and sugarcane is expected to be higher this year. Rice production is expected to climb to a record 111.01 million tonnes this crop year, 1.2% higher than last year's output. Wheat output is pegged at 97.11 million tonnes, a decrease of 1.42% from the previous year. The country's highest wheat production was at 98.51 million tonnes in 2016-17. Pulses are projected at 23.95 million tonnes compared with 23.13 million tonnes in the previous year. Production of oilseeds, including groundnut, castor, sesamum, niger, mustard, linseed, safflower, sunflower and soyabean, is set to fall 4.45% to 29.82 million tonnes, led by a 13% decline in soyabean. Production of sugarcane is estimated at 353.23 million tonnes, which is 15.4% higher than last year's 306.07 million tonnes.

India is the second largest producer of fruits and vegetables. Over the years, India's strength in horticulture front has increased manifold. Production of horticulture crops like vegetables and fruits is expected to touch a record 305.4 million tonnes (mt) in 2017-18, about 1.6% higher than the previous year and 8% higher than the previous five years' average according to the first advance estimates. Within horticulture, production of vegetables is estimated at 181 mt in 2017-18, about 1% higher than the year before, while that of fruits is estimated at 95 mt, 2% higher than the previous year. Between 2015-16 and 2017-18, productivity of horticulture crops have risen from 11.7 tonnes per hectare to an estimated 12.3 tonnes per hectare. The record production during 2017-18 will mark the sixth straight year of horticulture production outstripping

India accounts for half of the global trading in spices. India produces about 75 of the 109 varieties of spices listed by the International Organization for Standardization (ISO)

that of foodgrains (estimated at 276mt in 2016-17). With increasing penchant towards perishables, food processing becomes an absolute necessity. The vacuum in this segment was particularly noted during last year when over production of onions, tomato and potatoes led to a heavy slump in prices and heavy losses to farmers.

India is the world's largest producer, consumer and exporter of spices. India accounts for half of the global trading in spices. India produces about 75 of the 109 varieties of spices listed by the International Organization for Standardization (ISO). India exported 5,57,525 tonnes of spices and spice products valued at Rs.8,850.53 crore during April-September 2017 as against 4,50,700 tonnes worth Rs.8,700.15 crore during the corresponding period a year earlier, registering an increase of 24 per cent in volume and 2 per cent in rupee terms. The value added products have gained good market abroad. The export of value-added products like curry powder, mint products and spice oils and oleoresins also rose both in volume and value terms during the period. During the period, 8,800 tonnes of spice oils and oleoresins valued at Rs.1,332.22 crore were shipped against 6,617 tonnes worth Rs.1,237.06 crore last year.

Milk holds immense potential in processing. India has abundant sources of this raw material. India is the largest producer of milk in the world with over 150 million tonnes of production and per capita availability of over 300 grams per day. India's milk production rose by 19% in the last three years to touch 163.6 million tonnes. However, only 20% of the total milk production is converted into value-added products. Milk being a perishable commodity needs to look for more value addition and processing.

There is abundant raw materials for India to convert into value added products. What is required more is the will and conviction among the stakeholders.

Policy and Scheme Support

For accelerating the growth of the sector, the government has allocated a significant number of schemes and programmes. In the Union budget 2018, government allocated double the amount from Rs. 715 crore in 2017-18 to Rs.1400 crore in 2018-19.

A new Central Sector Scheme – Pradhan Mantri Kisan SAMPADA Yojana (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) has been approved by the government with an allocation of Rs. 6,000 crore for the period 2016-20. PM Kisan SAMPADA Yojana is a comprehensive package which will result in creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet. It will not only provide a big boost to the growth of food processing sector in the country but also help in providing better returns to farmers and is a big step towards doubling of farmers income, creating huge employment opportunities especially in the rural areas, reducing wastage of agricultural produce, increasing the processing level and enhancing the export of the processed foods. PM Kisan SAMPADA Yojana is expected to leverage investment of Rs. 31,400 crore for handling of 334 lakh MT agro-produce valued at Rs. 1,04,125 crore, benefiting 20 lakh farmers and generating 5,30,500 direct/indirect employment in the country by the year 2019-20.

Mega Food Park is another scheme under SAMPADA which aims at providing a mechanism to link agricultural production to the market by bringing together farmers, processors and retailers so as to ensure maximizing value addition, minimizing wastage, increasing farmers' income and creating employment opportunities particularly in rural sector. The Mega Food Park Scheme is based on "Cluster" approach and envisages creation of state of the art support infrastructure in a well-de-

P K JAIN

Chairman- PMV Group
Former President: PHD Chamber of Commerce & Industry
Founder President: Gurgaon Chamber of Commerce & Industry

"The food processing industry in India is one of the largest in terms of production consumption, export and growth prospects. Food processing industry plays a significant role in the development of Indian economy because of the integration and synergy it provides between agriculture and industry, the two pillars of economic prosperity. The Government has been reinforcing this sector with various policy initiatives to encourage commercialization and value addition to agricultural produce. Considering the growth witnessed by this sector in the last decade, and further improvement in growth rate expected in the years to come, this sector presents varied opportunities for investment across the entire agri-value chain. Challenges being faced by food processing are high levels of fragmentation in marketing and distribution of food products in India, growing concerns about food safety across developed and developing nations of processed foods, unorganized food retail and the requisite skilled manpower required in this sector. Thus, it is now time for consolidation process of growth drivers by making corresponding changes in policies governing marketing, industrial development and skills as well as creating awareness about food quality and safety norms. Keeping in view the growth and development potential of the food processing industries which in turn will provide a boost to the agriculture based economy, I would recommend that there is a need to identify areas which are surplus in crops, vegetables and fruits and production need to be developed as sound economic clusters. Such adjoining areas should be clubbed together to form clusters. Such specific product wise pockets may serve as feeders for other major agro industries centres. All necessary infrastructural development like rural extension set up for technology transfer, timely supply of quality inputs, storage, road and transport, power supply, irrigation system etc. should be undertaken intensively in and around such clusters to increase and sustain agricultural modernization."

fined agri / horticultural zone for setting up of modern food processing units along with well-established supply chain. Mega food park typically consists of supply chain infrastructure including collection centers, primary processing centers, central processing centers, cold chain and around 30-35 fully developed plots for entrepreneurs to set up food processing units. So far Nine Mega Food Parks, namely, Patanjali Food and Herbal Park, Haridwar; Srini Food Park, Chittoor; North East Mega Food Park, Nalbari; International Mega Food Park, Fazilka; Integrated Food Park, Tumkur; Jharkhand Mega Food Park, Ranchi; Indus Mega Food Park, Khargoan;Jangipur Bengal Mega Food Park, Murshidabad and MITS Mega Food Park Pvt Ltd, Rayagada are functional.

The Scheme of Cold Chain, Value Addition and Preservation Infrastructure is to provide integrated cold chain and preservation infrastructure facilities, without any break, from the farm gate to the consumer. It covers pre-cooling facilities at production sites, reefer vans, mobile cooling units as well as value addition centres which include infrastructural facilities like Processing / Multi-line Processing / Collection Centres, etc. for horticulture, organic produce, marine, dairy, meat and poultry etc. With a view to promote investment in Cold Chain, Ministry of Finance has covered Cold Chain under Infrastructure category.

Scheme for Creation/Expansion of Food Processing/Preservation Capacities is involved with the creation of processing and preservation capacities and modernisation/ expansion of existing food processing units with a view to increasing the level of processing, value addition leading to reduction of wastage. The setting up of new units and modernization/ expansion of existing units are covered under the scheme. The processing units undertake a wide range of processing activities depending on the processing sectors which results in value addition and/ or enhancing shelf life of the processed products. The Scheme is implemented through organizations such as Central & State PSUs/ Joint Ventures/ Farmer Producers Organization (FPOs)/ NGOs/ Cooperatives/ SHG's/ Pvt. Ltd companies/ individuals proprietorship firms engaged in establishment/ upgradation/ modernization of food processing units.

Under the scheme, financial assistance is provided for setting up of primary processing centers/ collection centers at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport

The Agro Processing Cluster scheme aims at development of modern infrastructure and common facilities to encourage group of entrepreneurs to set up food processing units based on cluster approach. Under the scheme, effective backward and forward linkages are created by linking groups of producers/ farmers to the processors and markets through well-equipped supply chain consisting of modern infrastructure for food processing closer to production areas and provision of integrated/ complete preservation infrastructure facilities from the farm gate to the consumer. Each cluster has two basic components i.e. Basic Enabling Infrastructure (roads, water supply, power supply, drainage, ETP etc.), Core Infrastructure/ Common facilities (ware houses, cold storages, IQF, tetra pack, sorting, grading etc) and at least 5 food processing units with a minimum investment of Rs. 25 crore.

Scheme for Creation of Backward and Forward Linkages provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centers/ collection centers at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport. The Scheme is applicable to perishable horticulture and non-horticulture produce such as,fruits, vegetables, dairy products, meat, poultry, fish, Ready to Cook Food Products, Honey, Coconut, Spices, Mushroom, Retail Shops for Perishable Food Products etc.The Scheme would enable linking of farmers to processors and the market for ensuring remunerative prices for agri produce.

Also, schemes to ensure Quality and Food Safety have become paramount for food processing segment. For the all-round development of the food processing sector in the country, various aspects of Total Quality Management (TQM) such as quality control, quality system and quality assurance should operate in a horizontal fashion. Apart from this, in the interest of consumer safety and public health, there is a need to ensure that the quality food products manufactured and sold in the market meet the stringent parameters prescribed by the food safety regulator. Keeping in view the aforesaid objectives, government has been extending financial assistance under the scheme under the following components: Setting Up/Up-gradation of Quality Control/ Food Testing Laboratories and HACCP/ ISO Standards/Food Safety/Quality Management Systems. Besides this, the Ministry of Food Processing Industries has been extending financial assistance to undertake demand driven R&D work for the benefit of food processing industry in terms of product and process development, efficient technologies, improved packaging, value addition etc.

Skill Development has also evolved into a crucial element for the food processing sector. Apart from implementation of the Skill component under PMKSY, a number of initiatives have been taken by GOI to address the skill gap in the food processing sector

Skill Development has also evolved into a crucial element for the food processing sector. Apart from implementation of the Skill component under PMKSY, a number of initiatives have been taken by GOI to address the skill gap in the food processing sector. The Ministry of Food Processing Industries is working in close collaboration with other related agencies to augment skilled manpower in the food processing sector. Then Ministry is collaborating with the Food Industry Capacity and Skill Initiative (FICSI), the sector Skill Council (SSC) in food processing, for the validation of the Qualification Packs (QPs) for identified

job roles and developing course curriculum for food processing sector through the National Institute of Food Technology Entrepreneurship and Management (NIFTEM).

Challenge

Food Processing has grown into a crucial segment of Indian agriculture. Undoubtedly, India possess all positive attributes needed to make it big in the field of food processing. Nevertheless, India needs food processing to convert its gains as a major food producer into tangible incomes to the producers and others in the production chain. India unfortunately hasn't been able to fully exploit its advantageous position. The reasons vary from being lack of skill to lack of infrastructure.

India produces a sizeable amount of agricultural commodities. However, India being a diverse country with scattered farm holdings, procurement of quality raw materials is a huge hurdle. Prevalence of obsolete harvesting techniques and handling methods, most often renders the produce useless for further post harvest operations. Besides poor economies of scale and huge operational cost negates the returns from this venture. Contract farming can serve as a solution for this problem. It is emerging as a viable solution considering the increasing demand for more standardized, higher-quality agricultural produce and the difficulty of underdeveloped supply chains and small farm sizes to meet this exceeding demand.

Another serious inequity existing in this segment is the inadequate knowledge about food hygiene and the standards and certification followed in this area. It can be counted as the biggest challenges facing food industries. The tiny, small- and medium-scale industries—find it difficult to identify relevant procedural and compliance changes and they lack the capacity to track regulatory changes. The unawareness is also prevalent among the producers, consumers, food handlers, and even officials. The awareness among Indian consumers regarding food safety has been heightened in the recent years. Rural consumers also deserve safe, high-quality food, and the government can reach them through mass-media campaigns. FSSAI should work with other ministries to raise awareness and educate the public about workplace, farm, and household hygiene as well as safe use of pesticides. When consumers demand safe foods, industry, producers, and food handlers will comply. The Food Safety and Standards Act (FSSA) of 2006 was designed to improve the overall food safety of the population and the food trade within and outside the country. The FSSA consolidated responsibility for food safety in the hands of the Food Safety and Standards Authority of India (FSSAI). In spite of the decade-old transition from the previous food safety laws into the FSSA's integrated standards and regulations, there remain overlapping and residual/pre-existing standards maintained by other regulatory bodies. Clarity is needed if all stakeholders are to conform to FSSA regulations.

Inadequate infrastructure in terms of temperature controlled warehouses for the perishables, cold storage, appropriate logistics have all restricted the growth of the food processing segment. This area requires intensive efforts from the government and the corporates as it is investment intensive. The only way of revolutionizing the food processing segment is by channelizing the capital to this niche area. The government has taken up this massive responsibility and has committed to spend Rs6,000 crore over the next three years to create the infrastructure which will leverage investments worth Rs31,000 crore. Considering the seasonality in the procurement of the raw materials, infrastructure can play a significant role.

The Food Processing Industry sector in India is one of the largest in terms of production, consumption, export and growth prospects. The size of the sector is partly due to its disaggregated nature. So one of the biggest tasks is to aggregate them. This will not only help them reap the advantages of economies of scale but also for the advancement of the food processing segment in general. India has achieved remarkable success in food grain production. Now it is time to create a similar revolution in food processing segment.

AGRICULTURE TODAY

The National Agriculture Magazine

JOIN OUR TEAM

India's premier agriculture magazine is growing. We are looking for journalists and marketing managers for our regional bureaus. If you are keen on curating original farmer stories from your region, liaise with relevant government departments and private sector companies operating in the agri-business sector, please get in touch.

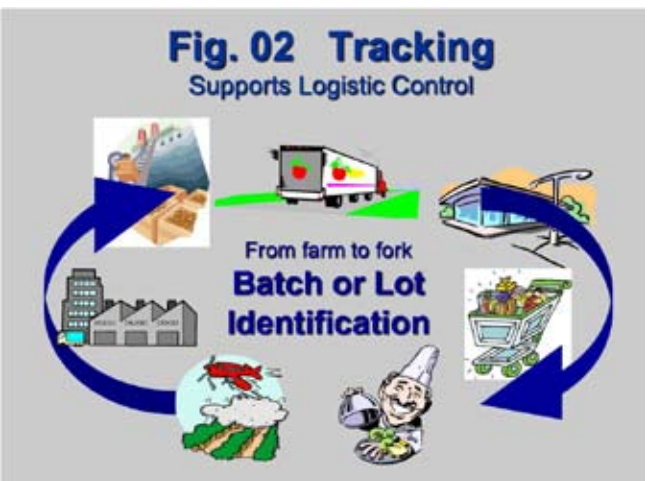
You can write to us at pallavi@agriculturetoday.in
with your updated resume or call us on 011 415 01465.

TRACEABILITY FOR MAPPING PRODUCTS TO TRACK FROM THE TRADE CHANNELS

The concept of traceability originated from tracing bio-engineered products (GMOs) and now it has become an important aspect of competitiveness of the food industry. Food safety and traceability are currently at the forefront of the government, industry and world trade around the world. Traceability is essential for identification and information management for fast and accurate product withdrawal and recall from the market in the event of food safety concerns being discovered anywhere in the food chain. To make traceability a successful system, it requires a continuum of responsibility of all stake holders in the food chain.

A traceability system is a useful tool to assist a food establishment operating within a food chain to achieve defined objectives and being influenced by regulations, product characteristics, customer expectations and demands of international trade. The complexity of the traceability system can vary depending on the product features, length of the food chain and the objectives to be achieved. The definition of traceability has necessarily to be broad based because traceability is a tool for achieving a number of different objectives. No single approach is adequate for every objective. Moreover, it is almost impossible to have complete traceability. Even a hypothetical system for tracking beef, in which consumers scan their packet of beef at the check-out counter and receive information on the date and location of the animal's birth and many other information, does not provide traceability with respect to pest control in the barn (a potential food safety issue) and other

Trade channel traceability



Consumer end traceability

related important issues, for instance, genetically engineered feed etc. A firm's traceability system not only helps minimize potential damages for individual firms, it also helps minimize damages to the whole food industry and to upstream and downstream industries. Contaminated products on sale and food borne illness outbreaks damage the reputation and business of the whole food industry.

CONCEPT OF FOOD TRACEABILITY

Traceability system comprises two primary capabilities, the ability to track movements and to trace custody of a food product in the food chain. In defining traceability, it is important to distinguish between the terms "tracking" and "tracing". Tracing is the ability to recreate the history of a product in the food chain and to identify the origin, movements and relevant associated information of a particular unit and/or batch of product located within the food chain by reference to records held upstream (Fig01).

Tracking is the ability to trace the destination of a product in a food chain and to follow a path of a specified unit and/or batch of product through the supply chain as it moves from organizations towards the final point-of-process, point-of-sale, point-of-service or point of consumption (See Fig.02). In other words, it is the movement of the product forward through the food chain to understand where it has gone, what it has gone into and what it has come into contact with.

TRACEABILITY PRINCIPLES AND ENABLING TECHNOLOGIES

Traceability systems should be able to document the history of the product and/or locate a product in the food chain. It is a system to contribute to the search for the cause and investigation of problem and the ability to withdraw and/or recall products, if necessary, from the market channel and to improve appropriate use and reliability of information, effectiveness and productivity of the organization.

Traceability systems should be able to achieve the objectives from a technical, trade and economic point of view. Movement can relate to the origin of the materials, processing history or distribution of the food, and should address at least one step forward and one step backward for each organization in the chain. On agreement amongst the organizations concerned and applicable regulatory requirement, it may apply to more than one part of the chain.

Principles

The traceability system to be meaningful and practical, it should be based on the following principles:

- verifiability of data and information,
- applied consistently and equitably through the food chain,
- results oriented,
- cost effective and practical to apply,
- compliant with applicable regulations or

policy, and
- compliant with defined accuracy requirements.

Objectives

In developing a food chain traceability system, it is necessary to identify the specific objectives to be achieved. These objectives should take into consideration the principles.In evolving a traceability system, following general objectives of traceability system should be to:

- support food safety and/or quality objectives,
- meet customer specification(s)/ requirements,
- determine the history or origin of the product,
- facilitate the withdrawal and/or recall of implicated products,
- identify the responsible stakeholder in the food chain,
- facilitate the verification of specific information about the product,
- communicate information to relevant stakeholders and consumers,
- fulfil any local, national, regional or international regulations and
- improve the effectiveness, productivity and profitability of the organization.

WHY TRACEABILITY?

Traceability has mainly been fuelled by concerns for the safety of consumers.There have been many instances of food borne illnesses, where there was a need to find the product, ingredient or packing material causing the illness. Thus a well-designed traceability system becomes a necessary requirement in the trade. This should cover three major aspects of traceability system.

- to ensure food safety throughout the food chain,
- conformity to fulfill legal requirement and
- customer satisfaction to ensure that customer needs and expectations are met.

Benefits to food industry implementing traceability system:

- It facilitates International Trade,
- It enhances competitiveness and innovation
- It enhances public health & safety
- It helps in Risk mitigation and cost reduction
- It improves operational efficiency,
- It improves food supply chain management
- It enhances cost effective distribution systems and reduced recall expenses
- It helps compliance to regulatory requirements and consumer satisfaction
- It opens up new market opportunities.

GLOBAL VARIABLE REQUIREMENT FOR FOOD TRACEABILITY

There are variable approaches both in different regulations and directives and national and international standards to food traceability. Thus traceability means different things to different people. The European Union General Food Legislation, for instance, requires identification of the suppliers of materials to a food business, identification of the business to which products have been sold and be able to make this information available on demand.

Considering variable approaches providing uneven stringency in tracking and tracing system, ISO has brought ISO 22005-2007 Traceability in feed and food chain -General principles and basic requirements for system design and implementation. This has laid a firm foundation for harmonization of traceability system. To exemplify ISO requirement in the field of food safety, Codex Alimentarius Commission has brought out CAC/GL-60 2006- Principles for traceability / product tracing as a tool within a food inspection and certification system. These two together provided guidelines for food industry to develop food traceability system suiting to a particular situation.

There are widely practiced private standards which have also defined traceability requirements such a Global GAP standards for agriculture produce.

NEW ADVANCES IN TRACEABILITY

As food chain is truly becoming global with geographically dispersed suppliers of ingredients, additives, feed etc., an efficient and seamless traceability system with standardized identifiers for tracking food items, stakeholders facilities etc., through electronic information flow is necessary. It also facilitates meeting challenge of food recalls effectively accurately and with speed through reverse logistics of implicated batches of products in the world market.

Many enabling technologies have been developed for:

a) Automated identification
b) Automated data capture
c) Electronic data processing
d) Electronic data interchange

For instance, GSI Global Traceability Standard and EAN•UCC System for speedy and accurate tracking and tracing batches of food in the food chain. These techniques are being increasingly used in the traceability systems around the world.

Food safety and traceability have become a requirement of government regulations and industry deliberations and international trade. Numerous initiatives designed to introduce various forms of tracking and tracing functionalities in the food Supply Chain are underway. They must be directed towards harmonization of traceability system so that food industry in the international business do not have to face multiple traceability requirements.

Any product that needs to be traced or tracked must be uniquely identified. In a majority of food Chains, products are tracked and traced by their production batch, which has undergone the same transformation (production process) and by their transport/storage path (distribution process).

SOHRAB
Former Director, Bureau of Indian Standards in charge of Certification of Management Systems, Food Safety Expert, United Nations Development Organization (UNIDO) & Team Leader, SPS Implementation, Asian Development Bank

THE GREEN INITIATIVE SANTO'S KITCHEN GARDEN

The words of famous painter, Pablo Picasso: "Action is the foundational key to success," finds resonance with Santo Devi's story. A resident of Bedoulia village of Bajidpur Panchayat in Samastipur block of Bihar, Santo is a member of a below poverty level family. She and her husband work as wage labourers. The family barely makes ends meet. However, for Santo conceding to life's challenges has never been a solution.

During one of the training sessions of the Village Leadership School conducted by Sehgal Foundation in Bedoulia village, Santo learnt about the benefits of kitchen gardening and started being inquisitive about the initiative. Says she: "I gathered courage and expressed willingness to receive the kitchen garden kit distributed by the foundation. I wanted to try something new. And, why not? In February 2017, after receiving the kit consisting of seeds of 10 types of vegetables, I started sowing in the backyard of my house, toiling hard, and following the instructions given in the school to the 'T'. I took care of the garden like it were my own child - watering the seeds at regular intervals, feeding them with organic manure from time to time and keeping the garden clean. By the third week of February, my efforts were rewarded. I planted almost all the seeds except lal saag (amaranth) and bhindi (okra). There was boom in my kitchen garden within two months of sowing the seeds."

After retaining the adequate amount of vegetables for family consumption, Santo Devi sold the surplus at the local bi-weekly market (haat). She earned approximately Rs 150 per day from the sale of vegetables in the haat. Besides, not buying any vegetables for home consumption helped her save a considerable amount of money. "I used the surplus income, generated from the sale of vegetables, to cater to other household needs like buying stationeries for my school going children," adds Santo with a smile.

Apart from increase in income, the kitchen garden initiative has helped many families to ensure food and nutrition security for her family. As Santo explains: "I do admit that there is an improvement in the nutrition status of the family, though it is not possible to measure the same at this stage. However, the diversification of the menu in my household and the regular intake of nutrient rich vegetables have improved the energy and efficiency levels of my family members."

Overall, the success of Santo Devi's kitchen garden did not simply yield socio-economic benefits, but also empowered her as woman and a mother, who being the primary care taker of her garden is now able to ensure nutritious food for her family. She now feels confident and looks forward to many more profitable seasons of kitchen gardening. Though kitchen gardening did not provide her enough means to step out of poverty, yet the boom of vegetables in her garden provided her with the much needed self confidence, and also helped her meet some of the immediate needs of her family apart from addressing nutritional deficiency.

Life is all about taking chances, trying something new...This adage is so aptly applied to Santo's story. She took the initiative to learn, understand and apply; she mustered the coverage to take a risk, a chance, and try something different, which yielded the results she desired, both for herself and her family. Kudos to an initiative well taken.

COCONUT BASED CROPPING SYSTEM FOR INCOME GENERATION AND NUTRITION OF FARM WOMEN

Agriculture constitutes the major livelihood of more than 60% of population. Agriculture sector in India involves nearly 85% women. Women take active role in farming in almost all agro-climatic situations ranging from high mountains to deep valleys. Agricultural production and practices are different in different parts of the country so also the role of farmers and Farmwomen. Coconut farming is an important livelihood option for women in coastal India. Coconut in Odisha occupies an area of 50910 ha with a total production of 32838 million nuts, thereby occupying the fifth position among Indian states in area and production. About 60 % of the area and production of coconut comes under coastal districts of Puri, Ganjam, Cuttack, Balasore and Nayagarh. The productivity of coconut in Odisha is 6451 nuts/ha, which is low compared to coconut productivity in India.

Coconut farming provides nutrition, fuel, fibre to farm families in addition to income. It is a source of food, beverage, oil, fibre, timber and several health products. Health and nutritional benefit of coconut can't be undermined as its oil does not contain cholesterol and is easily digestible. It contains vitamin E and is rich source of lauric acid. It also reduces fat accumulation in body & aids in faster absorption of calcium. Coconut oil has antimicrobial properties and helps in the absorption of vitamins, minerals and amino acids. It has huge export potential. The major coconut products exported from our country include activated carbon, coconut fatty soap, hair cream & coconut oil, coconut water, copra, desiccated, dry, grated/sliced and fresh coconut, shell charcoal and several other miscellaneous products amounting to a total revenue of Rs. 1,450 Crores

(CDB, 2015-16).

Hence women's participation, role, issues affecting their productivity, constraints,operational drudgery involved, benefit sharing etc.in coconut based cropping system is very important to study for making them partner in agricultural developmental process. ICAR-Central Institute for Women in Agriculture situated at Bhubaneswar is a unique institute in whole ICAR system taking care of the different needs of women in agriculture. Besides, the Institute is acting as a leader in research, development, technology transfer and as a repository of knowledge pertaining to women in agriculture.

Importance of coconut farming for farmwomen

Coconut plant is usually managed by male farmers due to its vigour and tree height. However, with technological intervention, farm women are also playing active role in coconut orchards. Women play a significant role in postharvest management, value addition and processing. Among the coconut based cropping models, multi-storeyed cropping model is highly productive, remunerative and women friendly. It ensures optimum spatial and temporal utilization and therefore ensures improved productivity and better revenue generation. At ICAR-CIWA, multi storey cropping model has been developed and intercrops were chosen carefully to cater to the financial and nutritional needs of farm families. Multi storey cropping ensures optimum spatial and temporal utilization and therefore ensures improved productivity and better revenue generation. It can be practiced in nascent and in established orchards.

i. Nascent orchards

Coconut + leguminous vegetables like french bean, cowpea, pea, lablab bean + pineapple + tuber crops like elephant foot yam, colocasia or Yam

ii. Established orchards

Coconut (1st storey) + banana/ papaya/guava/drumstick (2nd storey) + Pineapple/ seasonal vegetables/ shade loving plants like turmeric or ginger (3rd storey), tuber crops like elephant foot yam, colocasia, turmeric.

Technological interventions for reducing Drudgery of farm-women in coconut farming

Women experience acute drudgery in different activities of coconut cultivation and post harvest management. For reduction in drudgery and improvement in livelihood, ICAR-Central Plantation Crops Research Institute, Kerala has developed different technologies. These technologies can be helpful by systematic evaluation with gender perspective keeping in mind the ergonomics of women. Few gender friendly technologies are-

- Safety device for coconut climbing machine
- Snow ball tender nut machine: To

produce snowball tender nut from tender coconut.

- Shell fired copra dryer: For drying coconut to make copra for oil extraction.
- Tender nut punch and cutter: For drinking tender nut water
- Virgin coconut oil by fermentation and hot process method: To produce virgin coconut oil from coconut milk–a value added product from coconut
- Vermi-composting of coconut farm waste by Earth worm
- Coconut de-shelling machine: The coconut de-shelling machine removes shell from partially dried copra
- Coconut shell removing machine: The coconut shell removing machine reduces both time and drudgery involved in the manual de-shelling process. The machine is gender friendly, as women can operate it with minimum experience. The machine has a capacity to remove the shell of120 coconuts per hour.

Involvement of women in coconut value chain

Coconut offers ample scope for starting entrepreneurial activities by women. Various processed products from coconut like coconut chips, virgin coconut oil, coconut water squash,neera, coconut sugar, coconut jaggery and coconut honey has high market demand. Processed products from coconut by-products are important avenues for income generation. From coconut shell, women can prepare charcoal, activated carbon, shell powder, handicrafts and many more things. Preparation of coir pith holds promise for women as composted coir pith is excellent organic manure for indoor plants as well as for horticulture crops. A number of decorative items are made from coconut by-products like copra and shell, which includes wall hangings, vase, candle stands, jewelleries, show pieces, dolls and several other animations. The coconut wood because of its distinct characteristics is ideal for making wall panels, furniture, doors and windows,

show pieces, etc. Plaited coconut leaves are used for thatching houses, brooms and making baskets. Farm women are mostly involved in such activities and it is an important source of livelihood for coastal farm women. Linking of women entrepreneurs with innovative marketing linkages like digital media, online shopping, federations, govt agencies will provide an excellent opportunity for income generation and dominance of women in coconut value chain. For availing the benefits from schemes and programmes of government and other developmental agencies, they must work in well formed producer groups for ensuring sustainable livelihood.

Future Prospects for farmwomen

Coconut is the lifeline for coastal women. However for preparing women to harness the benefits from the coconut farming, both primary and secondary sector, their capacity building and skill enhancement is still a challenge. For creating awareness and popularising coconut cultivation, 2nd September is celebrated as Coconut day by Asia and Pacific Coconut Community (APCC), at Indonesia. India as a member of the APCC also celebrates the Coconut day on September 2 with the aim of creating awareness about the importance of the coconut and its potential in alleviating poverty, thus encouraging and promoting the development of coconut industry. For involving more women effectively in coconut farming, gender sensitive coconut based cropping models need to be popularized, which can meet the nutritional need of farm families besides providing livelihood opportunities. At the same time the value chain of coconut need to be more gender friendly by engendering the coconut research, extension, developmental programmes and policies. Women leadership development can help in quick dissemination of technologies and their adoption.

Laxmi Priya Sahoo, Ankita Sahu, Jatinder Kishtwaria, Manoranjan Prusty, Tapaswini Sahoo & Sanjay Kumar Behera
ICAR-Central Institute for Women in Agriculture, Bhubaneswar


Looking to enter Indian Market?
Look No Further.
IACG
Market Entry and Business Facilitation
INTERNATIONAL AGRICULTURE CONSULTING GROUP
For more details, visit: www.iacg.in
Global consultants and Industry players interested in collaborations, write to ceo@iacg.in

AGRI-ENTREPRENEURIAL SUCCESS: START BEFORE YOU ARE READY!

Entrepreneurship Management has been a very big area in as much as it speaks of the capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. As such: entrepreneurial spirit is characterized by innovation [innovation plus invention] and risk-taking, and is an essential part of a nation's ability to succeed in an ever changing and increasingly competitive international marketplace.

Establishing the core principles of "entrepreneurial management" within an organization calls for a certain strategic choice that affects a company in multi-dimensions. The aim is to empirically measure entrepreneurial management (it's existence and degree) and to link this measured strategic choice for or against entrepreneurial management with firm performance. On this score, it is clear that companies that follow core principles of entrepreneurial management should outperform other more administrative firms in certain measures of strategic performance. Naturally, the linkage is very strong – linking the measured degree of "entrepreneurial management" with firm performance.

Success: The Ultimate Goal

Successful entrepreneurs recognize that change is a catalyst for innovation. So, the need is to develop the entrepreneurial mindset needed to energize existing / new companies, insights and analytical frameworks to assess market opportunities, as well as pragmatic leadership skills to launch and nurture new business ventures within a larger organization.

They may come from families in Business: From Generation to Generation or may have taken direct entry. No doubt, in today's global marketplace, family businesses are a major force and are amongst the most vibrant competitors in most industries. While family-owned companies often have enviable strengths - long-term relationships, a reputation for quality work, aggressive reinvestment, and high stakeholder loyalty - they also can be hindered by traditional practices, internal politics, and family conflicts.

In a marketplace characterized by new players and intensified competition, leading a family business has become increasingly complex. To prevail, a family-owned company must address special challenges, such as nurturing effective family work and shareholder relationships, passing the business from one generation to the next, and maintaining ownership control. These tasks require sensitive leadership of the business and the family.

A family can contribute greatly to the success of its business - and vice versa -

only if the family follows a discipline mapped out by successful family-owned companies from around the globe.

Success in today's turbulent business environment demands smart innovators who possess the unique set of skills required to identify a business opportunity and transform it into a successful company or to launch a new line of business for an existing small-to-midsize company.

The entrepreneurs are to essentially improve their analytical skills, make sound investment and management decisions, manage growth, and develop essential leadership capabilities in as much as in today's fast changing environment the situation has turned to be a complex process of exploiting disruptive opportunities to build successful new businesses. New business initiatives; selling the concept to investors, partners, and other parties; attracting resources; and evolving key strategies as the business grows, thus, have been intricately getting involved into the process.

Launching New Ventures:

Obvious enough, starting up a new venture amid rapid change and increased competition is fraught with challenges. Launching new ventures focuses on overcoming the common obstacles facing entrepreneurs in startups and executives building an entrepreneurial culture in larger organizations. This essentially calls for building a successful business by turning disruptive innovation into a competitive advantage - how to lead and grow a profitable enterprise at every stage of its lifecycle.

Growth in developing economies like India, Bangladesh, Philippines, South Korea, among others, is creating opportunities for talented entrepreneurs who know how to build a successful business, to identify the right opportunity, build organization, attract resources, plan and execute strategy, and navigate complex business environment to drive sustainable success for the company.

Product Innovation

The crucial need is there to examine the core challenges of managing product development in a competitive, unpredictable marketplace, and train up the entrepreneurs to take innovation to a new level, backed by cutting-edge concepts and pragmatic frameworks, providing new insight into product development issues, such as the alignment of product innovation with corporate strategy, the impact of disruptive technologies, and the management of risk.

Leadership and Strategy

To develop the leadership and management skills the need is to identify breakthroughs with the greatest market potential, find sources of capital, and develop a team with a deep understanding of both science and business.

It has been a fact that constant and intense focus on running a business leaves little time to learn about the latest resources, techniques, and solutions. Business owners often feel alone, not knowing where to turn for advice and answers. Often, they lack the perspective to assess their company's performance and potential - as well as their own. This gap calls for immediate adequate attention.

Gaining valuable new insights, sharing and developing decision-making techniques, creating an environment that fuels their passions, in turn, could bring in far-reaching changes and something powerful could surely happen in the coming days provided a planned approach is adopted.

Capital Support

Fund, no doubt, has been flowing into the business sector – much more than what was there even a decade's back. In today's complex private-public equity environment, players across the industry - investors, entrepreneurs, Governments, banks and financial institutions and professional intermediaries alike – have been taking greater interest on this score. On the part of the entrepreneurs, time is ripe to have better understanding in the arena of financing ventures by studying the antecedents and consequences of funding decisions both domestically and internationally. Locating sources of fund is just the beginning in as much as a lot depends on how the fund is utilized in a risk-managed manner.

Upshot: Success Story; Not a Matter of Copy and Paste!!

It is Benel D. Lagua, Executive Vice President at the Development Bank of the Philippines, an active FINEX member and a long time advocate of risk-based lending for SMEs, who is quite right in opining that these days, 'it is fashionable to become an entrepreneur, to start one's own business according to one's values and to be your own boss.....running a business may not be for everyone and to believe anyone can be a business entrepreneur is a myth.Entrepreneurship entails taking a lot of risk and people's attitudes towards risk vary considerably. Risk taking requires a specific personality type and a special mental toughness. Successful entrepreneurs have special skills not all of us possess. They are astute managers of money, people and resources. They are quick to identify opportunities where other people only see problems and challenges. They are comfortable with uncertainties, changes and a volatile environment and have a readiness to take calculated risks (not gamble). They are good negotiators and can deal well with all kinds of people, from the lower workers in the organization to the most sophisticated partners and customers. They are good implementers and executors who walk the talk. They get up when they initially fall down and are resilient and consistently on the go. They are not easily discouraged and are passionate about what they do'.

Business is risk-based, locate, measure, control and manage, success is the result !!

Dr B K Mukhopadhyay, a noted Management Economist, an International Commentator on Business and Economic Affairs and Professor of Economist and Management, ICFAI University, Tripura, India, can be located at m.bibhas@gmail.com

IMPROVE FARM PROFITS: ELIMINATE FARMER SUICIDES

Even as the 21st century begins, India continues to be a nation of farmers, since around 60% of the population is of farmers and farm dependent labour. The contribution to GDP from farming is around 16%. Food grains and pulses, vegetables and fruits, and even flowers, are abundantly available. The export of farm goods has increased substantially over the years, reaching a level of around 10% of all exports. The central and state governments are continually improving the infrastructure for farming and farming productivity has been gradually increasing at about 2-3% per year. Undoubtedly, many farmers are doing a good job of production to make all this happen. However, during the same period of past 20 years, the farmers have been and are committing suicide by the thousands, more in some states and less in some others; but the numbers are alarmingly large even in the best year with good rainfall. A large majority of the farmers are deep in debt, and are unable to repay it. The demand for waiving the loans keep on being made, sometimes violently, causing wanton destruction of produce and property. This, indeed, is a great paradox that needs a rational resolution.

The main cause of the great paradox of farming is the land holding pattern; a very large proportion of the farmers own very small areas of land. They are caught in the vicious circle of "small farm land –poor productivity –low income even at normal prices – not enough income in years of poor rainfall –no savings even with life style at survival level –no investment possible for increasing productivity without loans –no capacity to repay such loans – productivity continues to remain poor".

If a solution is to be found for ending this viscous circle, we need to consider farming as a business that it truly is. A business must be anlaysed in terms of its profitability; and no kind of subsidy should be necessary to run a business.

Land Holding Pattern

The land reforms of 1960s gave the land ownership to the tillers. This has resulted in the average farm

Table 1: Farm Land Holding: 2001 and 2011

Land Holding (hector) 1 hector=2.5 acres	Average	Hectors	How many	Farmers %	Area	Cultivated %
	2001	2011	2001	2011	2001	2011
Less than 1	0.4		62	67	18.7	22.5
1 to 2	1.4		19	18	20.2	22.1
2 to 4	2.7		12	10	24.0	23.6
4 to 10	6.1		6	4.2	24.0	21.2
Above 10	17.2		1	0.8	13.2	10.6
Average/Total	1.38	1.15	100	100	100	100

holding becoming very small.Just 2.28hectares in 1971, it became 1.38 h in 2001, (Table 1) going down to 1.15 h in 2011. The percentage of small farmers with less than 2 h of land increased from 81% to 85 % and is increasing every generation.

We know that about 70% of farms are rain-fed and a majority of these farmers grow grains.Given this situation, a representative sample of small farmers would be: landholding of 2 acres and rain-fed farming of grains on a medium quality land. If this 2 acre farming can be made a viable business with good income to the owner, it will certainly be more profitable for larger landholdings on one hand and for farmers producing higher value crops on the same 2 acre land. For those with average one acre holding –around 67 % - the exercise would need to be done differently.

Farmer Suicides

The most hurting consequence of the vicious circle described above is the large number of farmer suicides. The burden of unpayable loans becomes unbearable and the farmer seeks a 'release' through suicide, making his family suffer much more as a consequence. During 1995 -2003, the average number of farmer suicides per year was 15,400; during 2004-12 this number was 16,000. In 2014, there were 5,640 suicides, in 2016, over 8000.Let us look at' farmer suicides' in juxtaposition with 'general suicides.'The average rate of suicides in India is 18 per lakh population. The farmer suicide rate is 1.6 per lakh, which works out to about 9% of all suicides. Now, the farmer population is about 50% and only the men commit suicide. Therefore, if the rates of suicides for the general public and for the farmers were to be same, about 4.5 suicides per lakh (25% of 18) would be by farmers; but actual rate is only 1.6. This is an indicator that farmers are more resilient;good returns from farming will certainly prevent farmer suicides due to unpayable loans.

About 67% of suicides are by farmers owning less than one hectare i.e., 2.5 acres. So, if the business of farming on 2 acres of ordinary soil in rain fed areas can be made profitable, farmer suicides can be effectively avoided.

Profitability of Farming

Using the representative example of 2 acres of rain-fed land being cultivated for grains, let us examine the profitability of farming at present. The left side of Table 2 shows normal farming, while the right side shows improved farming after giving the right inputs.

In reality, rainfall is not good every year. The situation is somewhat like a 4 year cycle of good and poor rains, as shown in Table 3.

As seen from Table 2, the profit –net income –from raising grains in a 2 acre land of medium quality is Rs 63,300 in a year of good rainfall. This income of Rs 5,275 per month is just about sufficient for family of 4-5 persons. But the average income over 4 years of Rs. 32,512 means a monthly income only of Rs 2,792! Unless substantial amount of loan is taken during the bad years, the family cannot survive. These realistic estimates of the income of small farmers clearly show that no matter how hard working the farmer is, farming of grains on a two acre rainfed land is just not a viable business proposition.

When a business is not profitable, one looks for means to improve its profit performance. If all available knowledge is used and the farming practices are improved, the profitability is expected to improve substantially. The improvements made are:

1. A well provided for supplying water even in summer time (Rs 5 lakhs)
2. Organic manure from cow dung used to improve the quality of soil. (Rs 20,000 every 3rd year)
3. Drip irrigation provided with a pump (Rs 1 lakh) and distribution pipes (Ra 40,000 per acre)
4. Used high quality seeds
5. Used fertilisers of the right kind in right quantities to suit the soil and the crops.
6. Sprayed the right insecticides at the right time in right quantities.

These measure have increased the yield two fold, as a conservative estimate.(In reality, such measures have shown the productivity can become 2.5 to 4.0 times the 'normal in a year of good rains'.)

We find that:

- The expenses involved in increasing farm productivity and simultaneously becoming much less dependent on rains are substantial.
- In our example of farming on 2 acres, the additional profit from improved farming are Rs 69,500 (76,400 -31,650 = 34,750 x2 =)
- The extra capital expenditure is Rs 6.8 lakhs (5.0 + 1.0 + 2x 0.4 =)
- If Rs 63,300 are used to double the income of the farmer, only Rs 6,200 are left per year for paying back the loan for capital expenditure
- It will take more than a 100 years to pay back the loan!

A simple way to look at repayment of loan is to consider

Payback Years = Capital Loan/Annual Repayment.

This ratio –simple payback –needs to be about 3-4 years in order to

Table 2: Grain Farming: Per acre of rain-fed land of medium quality: (All values per acre in a year of good rains.)

Current Normal Farming Expenses Rs/acre							Improved Farming Incremental Expense Rs./acre		
Process/ Crop	Rabbi	Wheat Kg x Rs	Kharif	Bajra	Summer	Corn	Wheat	Bajra	Corn
Ploughing	2000	Tractor	-----		2000	Tractor			
Tilling	2000	Tractor	2000	Tractor	2000	Tractor			
Seeds	2000	50 x 40	200	5 x 40	1000	10 x 100			
Seeding	1200	Bullock	1500	Bullock	3000	Men			
Tilling	3000	10 x 300	2100	7 x 300	3000	Men			
Harvesting	2100	6 x 350	3000	10 x 30	3000	Men			
Sacks	600	12 x 50	500	10 x 50	750	15 x 50	600	500	750
Dispatch	700	Truck	700	Truck	1400	Truck	700	700	1400
Dung ma-nure							7000*	Three to	gether
Fertilisers							13,000	Three to	gether
Other							2000	Three to	gether
Total Ex-pense	13,600	---	10,000	---	16,150	Extra	26,650		
					Total	39,750	Total	66,400	
Income	26,400	1200 x 22	15,000	1000 x 15	30,000	1500 x 20	52,800	30,000	60,000
Total Income					Normal	71,400	Improved	1,42,800	
Profit					Normal	31,650	Improved	76,400	

**** Rs 20,000 once in 3 years***

manage the true payback including interest in about 6-7 years. This simple payback would work out to fewer years if the yield becomes 3 fold. A little computation would show that the simple payback is about 8-9 years and the true payback would take about 1.5 times this number. Far too many!

In other words, grain farming on 2 acres of land in a rain fed area does not become viable as a business even if the productivity becomes three times. Let us, therefore, consider the other alternative of increasing the land holding.Up to about 20 acres, the same well will be able to supply enough water if drip irrigation is used.

Only when the total land reaches 20 acres, the simple payback period becomes about 5 years, and the true payback about 7-8 years. In other words, unless at least 10 farmers with 2 acres of land each come together to form a group and conduct all the farming operations together, the business of farming does not become viable economically. After such group farming, the annual income of the farmer family that owns 2 acres of land will be Rs 1,26, 600 ; I .e a monthly income of Rs 10,550. If the entire capital loan were to be given as a grant, the monthly income will become only a little higher at Rs. 10,790.

A farmer who earns this order of almost assured income every year will certainly not commit suicide.

In reality, such groups of farmers will be able to protect themselves by availing of crop insurance as a group, and gradually be able to triple their productivity compared to the normal good year's yield. This will further improve his life style to pay for the education of children and for good health care etc.

No one emphasizes the fact that farming is a business and this business must become profitable without any subsidy from government. Periodic loan waivers is not a solution to the problem of inadequate income of small farmers and the consequent farmer suicides. Even making water available through conservation efforts will not 'solve' this problem of low profitability arising out of very small land holdings. The small farmers can survive and grow only if they form groups with farm land of at least 20 acres (8 hectares). Unfortunately, No agency or expert has stated emphatically that group farming is the only viable solution, as demonstrated above.

While the above statement is valid for all small farms in the rain-fed areas of India, we will now turn specifically to Maharashtra as a specific case.

Group Farming in Maharashtra

Group Farming is not a new idea; the first such was formed in 1986 in Maharashtra. But this received a major boost in 2000, when Dr. Jeevan Kapase took the lead in the drought prone Jalna district of Maharashtra. He and his colleagues started a large number of Farmer Groups and have demonstrated that the yield per acre can be raised to 2.5 to 4.0 times

Table 3: Four year Cycle of Rainfall: 1 acre land

Year	1	2	3	4	Average
Rain %	100	50	25	100	69
Income Rs.	71,400	28,200*	0	71,400	42,750
Expense Rs.	39,750	22,475#	4000	39,750	26,312
Profit(Loss) Rs	31,650	5,725	(4000)	31,650	16,256

• Wheat + corn each 50% # (39,750-10,000 Bajra– 1725 sacks, dispatch 50%-5550 harvesting, thrashing 50% =) 22,475

the normal yield. However, detailed information on the kinds of crops these groups produce is not readily available. The total number of Farmer Groups in Maharashtra are guessed to be around 4000, but no authentic statistical information is available. The groups started by Dr. Kapase meet regularly once a month on the 12th day of the lunar month to exchange views and experiences; these are termed as "Dwaadashi Charchaa"Such experience exchange has also played a big role in gradually increasing the farm productivity.

Water Conservation in Maharashtra

We have assumed in our example that the well dug for irrigating 20 acres of land will have enough water to irrigate the entire 20 acres, even during the summer months, because drip irrigation is used. Even so, this is not certain in many terrains where the rainfall is scanty and irregular. Therefore, several efforts are going on for water conservation in all states of India. Many of these are initiatives from the state governments and several are from NGOs who are active in improving the living conditions of villagers. These efforts are geared to enthuse and involve the affected villagers, who will taste success and see the fruits of good work. Systems of water conservation such as digging canals, building small bunds, creating small lakes etc. are then expected to spread faster through the initiative of farmers in the surrounding villages.

As illustration, consider the organisation WOTR – Water Organisation Trust – which has been active since 1993 in Maharashtra and 6 other states in India. This trust, established by a German and supported by Swiss, American and Indian donors, is active in 3700 villages in the area of water conservation and life style improvement. The work by WOTR at Darewadi, Maharashtra, (1996-2009) has shown that this village of 131 families has improved in all aspects, starting with water conservation. It illustrates how the use of government schemes and voluntary work by villagers under the guidance of a good NGO can lead to profitable farming, better hygiene and education.The Paani Foundation started by the famous film actor Amir Khan and his wife Kiran Rao in 2016 is encouraging a large number of villagers in Maharashtra to take up water conservation on their own. They have announced a competition named "Satyameva Jayate Water Cup" for rewarding the maximum amount of digging work done for conserving water. Funding support has been given for this scheme by several large companies like the Tata group, Reliance, Wipro. The winning village councils – gram-panchayats are given prizes of Rs 50 lakhs, 30 lakhs and 20 lakhs. Each village is expected to act on its own, with no financial support from the foundation.The villagers are free to raise funds on their own. The Paani Foundation stipulated that each participating village must send 4 persons for a specially designed 4-day training programme. The training was given by the WOTR trainers who had good experience in developing and implementing optimum solutions for conserving water to suit the local conditions. Right type of digging helps in increasing the level of ground water, and water in wells is available at a lower depth. Good results are seen in the year after the first rains, and the water situation improves over the next 2-3 years to a good steady level. In 2016, this competition was announced only for three talukas, and the response was quite good. Encouraged by the response from the first 3 talukas, the scheme has been extended to 33 talukas in 2017. After confirming that this scheme is enthusing drought prone talukas towards self-help in water conservation, this scheme can be used all over India for improving the living standard of farmers in rain-fed areas.

Group farming should be encouraged simultaneously with efforts to conserve water in order to maximize the benefit to the small farmers who have been in distress since long years.

Shashikant Wagh and
Ashok Garde

Table 4: Medium quality land and improved farming: acreage and payback

Farm land acres	Annual Repayment Rs	Capital Loan Rs	Simple Payback Years
1	13,200	6.4	52
2	26,400	6.8	29
3			
4			
6			
10	1,32,000	10.0	8
20	2,64,000	14.0	5

CLIMATE REALITIES, FACE TO FACE AND IT'S CHALLENGES

This is nowadays a highly, single relevant topic, each day brought to notice and attention for one and all. Hence the importance is very very HIGH ! Perhaps,the central issue of our century.

Most of the climate scientists would agree that somewhere between 90 to 95 percent of such change is real and caused by human activities,largely on account of and through land management practices and burning up of the fossil fuels.Thus collectively we all must own up to this and try to understand as to how the rapid growth and industrialization in present day civilization has made the situation come about.

Not all have equally contributed to the situation but the irony is that this phenomenon is hitting hardest the poorer countries and the poor within those countries.

Planetary carbon is held within and amongst five pools : oceans, fossils, soils, biotic pool and the atmosphere. The soil biota and fossil pools hold much more, maybe 3 to 4 times, than what the atmosphere holds and thus all can see the effect that human land management and burning of non renewable fossil fuels is contributing negatively to the climate change.

Climate change has happened many times before in the history of the planet, but the scope now is highly amplified. Now, this time around, it is largely human induced and taking place in a context of huge habitat fragmentation. It already damaged natural systems on account of negatively impacting agricultural and settlement practices etc.

AGRICULTURE is possibly the leading cause of it to be realized, but the positive side is there too,in as much the agriculture can not only reduce emissions, but actually sequester huge amounts of carbon from the atmosphere and trap it in soil and above ground bio mass.

The ruminant livestock,and poorly managed manure accounted for over 70 % of emissions from agriculture during 1990 to 2012.

And then, you add the fossil fuels that power the farms, agrochemicals, ploughing and subsoiling, combine harvesters and pumping water for irrigation.

Undeniably, the production of food, it's processing and distribution is certainlythe largest economic activity in the world.

Imagine, what is euphemistically mentioned as 'land use change' is largely deforestation and land clearing, and which in many ways expose soil organic carbon to oxygen and converting it into carbon dioxide. Ploughing and tilling is most destructive to soil carbon.

Research has revealed that from the farm to the plate, our food systems contribute about 40% to global greenhouse gas emissions.

If the points raised herein are looked at and understood it may well be seen and acknowledged that agriculture can also do much to sequester carbon by change in practices and become a part of the solution through "carbon farming". To generate ideas as to how each practice can trap and recapture carbon instead of releasing it, by the way we farm is for farmers to imagine and attempt.

Towards this the assistance of Institutions, policy makers, scientists, academia and the citizens is desirable. All together with healthy exchanges and ideas between farmers and rest would promote debate and discussions on the topic and perhaps yield pleasant outcomes.

Ashok Trivedi
Tea Farmer

National Bank for Agriculture and Rural Development

Our Mission: Promotion of sustainable and equitable agriculture and rural prosperity through effective credit support, related services, institution development and other innovative initiatives.

- Research and Development on matters of importance pertaining to agriculture, agricultural operations and rural development including the provision of training and research facilities.
- Consultancy services related to Agriculture & Rural Development through subsidiary (NABCONS).

Our Functions:

- Provide Credit/Refinance for production credit and investment credit to eligible banks and financing institutions.
- Development functions undertaken through Farm Sector Promotion Fund (FSPF), Financial Inclusion Fund (FIF), Watershed Development Fund (WDF), Tribal Development Fund (TDF), Rural Infrastructure Development Fund (RIDF), etc.
- Supervisory functions in respect of Cooperative Banks and Regional Rural Banks.

Head Office Plot C-24, 'G' Block Bandra Kurla Complex, Bandra (East) Mumbai - 400 051

INFORMATION AND COMMUNICATIONS TECHNOLOGY IN AGRICULTURE

Agriculture contributes about 18% of the total Indian Gross Domestic Product and this is the basis of livelihood for more than 70% of rural Indian people. Similarly agriculture sector in India is also the largest employer contributing 49% of the total workforce. Apart from employment, agriculture also plays an important role in food security. However the growth rate of the agriculture sector in India has not been static. The performance of agriculture is envisaged through performance of small holder farming. Therefore, empowering small and marginal farmer can only revolutionize the agriculture sector. Access of information technology to convey recent mode of agricultural practice, government endeavor, resources, markets, institutions and services are various limiting factors which hinder farmers to gain. Scientific advice of experts on crop production and marketing is not reaching farmers in time due to communication gap. Therefore, farmers have to follow the advice of local shopkeepers/ agents who sell them seeds, fertilizers, insecticides, pesticides etc. Introduction of Information and Communication Technology (ICT) enables the dissemination of requisite information at the right time. This revolution in information technology has made access to the information easy and cost-effective. Information and communication technology in agriculture (ICT in agriculture), also known as e-agriculture, is developing and applying innovative ways to use ICTs in the rural domain, with a primary focus on agriculture. ICT in agriculture offers a wide range of solutions to some agricultural challenges. It is seen as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. In this context, ICT is used as an umbrella term encompassing all information and communication technologies including devices, networks, mobiles, services and applications; these range from innovative Internet-era technologies and sensors to other pre-existing aids such as fixed telephones, televisions, radios and satellites. E-agriculture continues to evolve as new ICT applications and is being harnessed in the agriculture sector. More specifically, e-agriculture involves conceptualization, design, development, evaluation and application of innovative ways to use ICTs in the rural domain, with a primary focus on agriculture. Provisions of standards, norms, methodologies, and tools as well as development of individual and

institutional capacities, and policy support are all key components of e-agriculture.

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

ICT is an integration of the technologies and the processes to distribute and communicate the desired information to the target audience and making the target audience more participative in nature. Information and Communication Technology (ICT) comprises three components; Computer Technology, Communication Technology and Information Management Technology. These are applied for processing, exchanging and managing data, information and knowledge. Any system applied for getting information and knowledge for making decisions in any industry should deliver accurate, complete, concise information in time or on time. The information provided by the system must be in user-friendly form, easy to access, cost-effective and well protected from unauthorized accesses. (ICT) can play a significant role in maintaining the above mentioned conditions related to information as it consists of three main technologies as mentioned.

Features of ICT:

There are various features of ICT. Few of them are enumerated below.

A. Free Access to the astounding store-house of information.
B. Instant, around the year and clock availability of information.
C. Helpful in interactive communication.
D. Universal and certified information due to global network.
E. Dynamic and ever growing ways of communication.

ICT's potential in agriculture sector

ICT enables vital information flows linking rural agricultural communities with the Internet, both in terms of accessing information and providing local content. New information and

communication technologies hold scope to minimize rural poverty, inequality and to bridge the gap between information rich and poor. As farming is becoming highly knowledge intensive, commercialized, competitive and globalised against traditional resource based approach, the need to adopt right means to bring in all players of agribusiness, cannot be over emphasized.

Innovations in ICT are offering a platform of communication circumventing all traditional physical barriers and backwardness. ICT includes both public and private sectors and has innate strength of offering a reliable, good and cost effective communication platform to various management agencies involved in the extension to and from farmers. Therefore ICT holds much potential to accelerate the extension activities for advancement in agricultural technologies and marketing of the produce.

Contribution of ICT

A. Enhancing Agricultural Production: Farmers (especially small ones) often face threats like poor soils, drought, erosion and pests. Key areas where ICT can help to improve this by up-to-date information about pest and disease control, early warning systems, new varieties, new ways to optimize production and regulations for quality control.

B. Improving Market Access: ICT helps in the information on the market prices of commodities, inputs and consumer trends. This can improve farmers' negotiating capability and decision making skill to excel in the marketing sector.

C. Capacity-building and empowerment: ICT technologies can be used to strengthen communities, farmer organizations and their own capacities. It helps them to represent their constituencies while negotiating input and output prices, land claims, resource rights and infrastructure projects. Rural communities can interact and reduce social isolation. Besides that, ICT make processes like law-making and land-title approvals more transparent.

Initiatives of government for promotion of ICT in agriculture:

Under NATP, ICT infrastructure is created in NARS by ARIS in order to promote information management culture. More than 400 ARIS cells have been created in NARS. PC (Personal Computer) workstations, servers, UPS (Uninterrupted Power Supply) and all major network equipment such as switches, hubs, routers, network management, LAN cabling, Internet etc are main components of the cell. These cells are expected to promote information technology in agricultural research, education and extension all over the India. Libraries of NARS are improved with ICT (Hardware, Software, LAN, Internet, Digitization, On-line/Off-line resources etc), under the Library Improvement and Networking of NATP. ICT has

also been implemented for agriculture extension activity under ATMA. Under NATP, e-Extension by connecting 200 selected KVKs and 8 Zonal Coordinating Units (ZCUs) through an Intranet and Internet has been taken-up by ICAR to strengthen extension activities of these selected KVKs. Village information kiosk is supposed to be an Internet connecting node with minimum facilities to link with Internet and to access information sources. These kiosks may run on payment mode like STD/ISD telephone booths. Some of the states viz., Andhra Pradesh, Maharashtra, Karnataka, Madhya Pradesh, Kerala, Tamil Nadu etc. has already established such kiosks and are growing at fast pace. Use of ICT for rural development and transfer of agriculture technology has been done by Government and private organizations (including NGOs) too. The Ministry of Communication and Information Technology (Government of India) and the Telecom Regulatory Authority of India (TRAI), as well as several state governments, have already developed strategies for accelerating the growth of the Internet and broadband connectivity in rural India. Bharat Sanchar Nigam Limited (BSNL) has laid fiber cables capable of reaching nearly 70 per cent of villages. Government of India and State Governments have also been working in various e-Governance projects in India. Different models of ICTs established for making significant difference in the delivery of services and information in Indian agriculture are Kisan call centers, Gyandoot project, Bhoomi project, Village knowledge centers, AGMARKNET etc,..

Kisan Call Centers (KCCs)

KCCs were launched on January 21, 2004 by the Department of Agricultural and Co-operation. This is associated with Desktop computer system with Internet connectivity, High bandwidth telephone line (preferably 128 kbps ISDN line) and Telephones with headphones and teleconferencing facility (if required).

Sl. No.	Sources (public & private sector and NGOs of ICT for rural India):
1.	http://www.icar.org.in
2.	Cyber extension program of MANAGE (http://www.manage.gov.in/)
3.	National Informatics Centre (NIC) (http://home.nic.in)
4.	Community Information Centre (CIC) (http://www.cic.nic.in/)
5.	Warna Wired Village Project (http://www.mah.nic.in/warana)
6.	Bhoomi (http://www.bhoomi.kar.nic.in/
7.	e-Seva (http://www.esevaonline.com)
8.	DACNET (http://dacnet.nic.in)
9.	http://ruralinformatics.nic.in/
10.	N-Logue- http://www.n-logue.co.in/home.htm
11.	http://edevelopment.media.mit.edu/SARI/mainsari.html
12.	http://www.drishtee.com/
13.	http://www.lokmitra.gov.in
14.	http://www.gyandoot.net/
15.	http://www.agmarketnet.nic.in
16.	http://www.itcportal.com/sets/agreeex_frameset.htm
17.	http://www.agriwatch.com
18.	http://indiagriline.com/
19.	http://www.ikisan.com
20.	http://www.manage.gov.in/
21.	http://www.sristi.org/

The main aim of this center is to deliver the extension services to the farming community in the local languages. The farmer dials the help line, a toll free number, 1551, and is responded by agricultural graduates, level II and level III executives. This cost is almost zero, and it is operational in local languages. If needed, the agricultural scientists also visit the field to resolve any further queries.

AGMARKNET

AGMARKNET, (Agricultural Marketing Information Network), is a joint venture of the Directorate of Marketing and Inspection (DMI) and the National Informatics Center (NIC). DMI and NIC are the sponsoring agency of AGMARKNET. It has increased the efficiency in marketing activities by establishing a nation-wide information network, which provides details about market functionaries, sold and unsold stocks, as well as the sources of supply and destination. These timely information data are helpful to producers, traders and consumers.

Tools of ICT:

Model of ICT runs with the help of following tools Like Radio, Television, Cell Phones, Video, Web Portal, Web site, E Mail. etc. Radio and Television continues to play, an important role in agricultural extension and in getting farmers in touch with key services. The Farm Radio international has played a key role in this regard and has documented many such use cases. Mobile phones either use voice, text or photos within the farmer/extensionists interaction. There is a need to formulate the right messages for and with farmers, addressing illiteracy and empowering farmers to use mobile phones can lead to increased adoption of new technologies and improved practices. Videos also continue to be useful in extension services, for example Access Agriculture offers an internet-based platform for agricultural research and development (R&D) staff and other stakeholders including farmer organizations. They have branded this service AgTube. Another example is Digital Green in India which trained rural communities to produce videos by farmers, of farmers, and for farmers to exchange best agricultural practices to boost farm productivity and improve nutrition. Internet contains billions of web pages created by people and companies from around the world, making it a limitless place to locate information and entertainment. The Internet also has thousands of services that help make life more convenient. For example, many financial institutions offer online banking that enables a user to manage and view their account online.

Deepak Kumar Patel, Tribhuwan Kumar and Santosh Kumar
Bihar Agriculture University, Sabour, Bhagalpur

Subscribe Today

I would like to subscribe to **Agriculture Today**

Term	institutions & Library	Individuals	Students
☐ One Year	₹800	₹500	₹300
☐ Three Years	₹2000	₹1200	₹700
☐ Life Membership		₹6000	

I will Pay with

Demand Draft ☐ Cheque ☐ Cash ☐ ☐ VISA ☐

No. _____ Bank Draw _____ Dated _____

DD should be drawn in favour of **Agriculture Today**

Name: Ms/Mr: .....

Organization Name: .....

City: ..... office: .....

Ph: (Resi.): ..... Fax: .....

Mobile No: ..... E-mail: .....

Terms & Conditions: Rates and offer is valid in India only please allow one weeks time for the delivery of magazine by post. For the subscription related quries please contact: 306 Rohit House Tolstoy Marg, New Delhi- 110001, Ph: 91-11-23353406, 91-11-23731129, E-mail: subscription@agriculturetoday.in,

www.agriculturetoday.in

AGRICULTURE TODAY

Role of Transfer of Technology in Relation to Agriculture and Climate Change

Technology means application of science to the practical aim of human life. It refers to the transformation of specific laws into machines, tools mechanicals devices, instruments, innovations, procedure and techniques to attain tangible ends or manipulate averment for practical purpose. In respect to transfer of technology, conventional agriculture research and technology transfer efforts were more concerned with increasing agriculture production. The researches were conducted on large farms with the help of heavy dose of external inputs. Techniques of genetics and plant breeding were employed to enhance the productivity. As a result, the benefits of these technologies were more evident among larger farmers and more developed regions. Climate change will certainly affect agriculture, but agriculture can also be harnessed to mitigate greenhouse gas (GHG) emissions. A key element in supporting agriculture's role is information and technology. The costs of adapting agriculture to climate change can be large and the methods not always well known. Mitigation efforts will require information, education, and technology transfer. Agricultural extension and advisory services, both public and private, thus have a major role to play in providing information about technologies, and education on how to copewith climate change and ways to contribute to mitigation. This support is especially important for resource-scarce smallholders, who contribute little to climate change and yet will be among the most affected. Support from extension for farmers in dealing with climate change should focus on two areas i.e. adaptation and mitigation. The role of technology transfer in agricultural development is going to be significant in future initiatives for transforming agricultural research for development worldwide. Recently more rural people and farmers are using community radio, mobile phones and the Internet. In some contexts, farmers have used video through Internet applications to gain advice on crops, animal husbandry, the threats posed by weather in relation to climate vagaries, and in this process enhance their access to and use of derived technology. Agricultural extension and advisory services (AEAS) deal with any organization in the public or private sectors such as NGOs, farmer organizations, private firms etc. that facilitate farmers' and other rural actors' access to knowledge, information and technologies, and their interactions with other actors; and assists them to develop their

own technical, organizational and management skills and practices, so as to improve their socio-economic status.In regard to AEAS, it has changed substantially, shifting away from a production oriented, technology transfer tool for a greater emphasis on broader development objectives such as improving rural livelihoods through a demand-led, participatory and market-oriented approach.

Emerging Concept of transfer of technology (TOT)

Development of new technology and their integration into farmer's social system are of paramount importance to developing nations with predominantly agriculture economy. New viewpoints are regularly coming up to mitigate the imbalance cause by new technologies to large majority of small farmers. Thus segregation of research and extension organisation from farmers is being questioned. There is increasing concern on holistic understanding of farmers farming as well as socio-political environment to be able to unravel several connections of technology. Such understanding demands close proximity and participatory methods emerging to give new direction to TOT. The first departure from conventional discipline-based research has been noticed in farming system research and extension. Participatory technology development (PTD) is a new strategy for development of intervention that fully acknowledges the superiority of rural people's accumulated wisdom and benefits of scientist. The strategy emphasises on community based organizations to strengthen people capabilities for technology development and extension. Besides such approaches calls for new methods of working with people. Rapid rural appraisal (RRA), participatory rural appraisal (RRA), indigenous technology (ITK), networking etc. are increasingly being talked about now to support the new approaches. An attempt has been made here to discuss such emerging concepts.

How can extension help with adaptation and mitigation?

There are several ways that extension systems can help farmers deal with climate change. These include adaptation and contingency measures for what cannot be prevented. Extension can help farmers prepare for greater climate variability and uncertainty, create contingency measures to deal with exponentially increasing risk, and alleviate the consequences of climate change by providing advice on how to tackle with droughts, floods, and so forth. Extension can also help with mitigation of climate change. This assistance may include providing links to new markets information about new regulatory structures, and new government priorities and policies. Discussed below are three ways in which extension can help with adaptation and mitigation: technologies and management information, capacity development; and facilitating, and implementing policies and programs. Climate change will initiate extreme events like sudden onset of disasters and new vectors of human and livestock diseases. Evidence is emerging that the biggest impacts will be in the form of small droughts, floods, and other events that cause severe hardship but do not attract the attention of the international community. The capacity of farmers to get rid with such different forms of risk will become ever more crucial, and extension efforts must pay special focus on educating farmers about their options to enhance resilience and response capacity. There is a need to engage new sets of actors, including humanitarian agencies. Education must thus move beyond technical training to enhance farmers' abilities for planning, problem solving, critical thinking, and prioritizing, negotiating, building consensus and leadership skills, working with multiple stakeholders, and, finally, being proactive. Capacity development is important within extension as well. Extension agents have traditionally been trained only in technical expertise and often lack "soft" skills such as communication, development of farmer groups, systems thinking, knowledge management, and networking. There are many different

ways to inform and educate farmers about adaptation options. Climate change adaptation funding should focus on extension systems and programs that incorporate a good understanding of what practices and skills are needed to best promote activities that help in the climate change mitigation efforts and on increasing the capacity of extension agents and farmers, where needed.

Since to a large extent in rural areas agriculture is carried out by smallholder farmers, they are exposed to many challenges including shortage of reliable markets, lack of falling labor and land productivity due to an application of poor technology transfer and dependence on unreliable and irregular weather conditions. In such circumstances, technology transfer by the extension can be critical in assisting smallholder farmers to raise agricultural productivity by addressing market information asymmetry problem and facilitating their accessibility to extension services.

Technologies and management information

Extension is traditionally imparting information and elevating new technologies and new ways of managing crops and farms. Extension personnel introduce locally appropriate technologies and management techniques that enable farmers to adapt to climate change. For example, developing and disseminating local cultivars of drought-resistant crop varieties with information about crops advantages and disadvantages. Additionally, extension staff can deliver knowledge about cropping and management systems that are resilient to changing climate conditions such as intercropping, sequential cropping. Some of these practices have the added advantage of improved natural resource management. It is important to provide farmers with

information about how the various options will potentially increase income and yields, improve soils, enhance sustainability, and generally help to alleviate the effects of climate change. At the same time, extension staff can play an important role in transferring indigenous technical knowledge to help farmers worldwide.

Why extension is considered than another institution for climate change?

About 90% of the world's extension personnel are located in developing countries, gathering information is expensive. Extension has proven itself to be a cost-effective means of bringing about greater economic returns for farmers with significant and positive effects on knowledge, adoption, and productivity. Extension is thus a cost-effective tool that can play an important role in dealing with climate change, while at the same time helping to increase productivity and reduce poverty.

Suggested negotiating outcomes:

- Extension has a major role to play in helping farmers adapt to and mitigate climate change.
- To capture this potential role, adaptation and mitigation, funds could be used to support extension efforts that deliver new technologies, information, and education about increasing carbon sequestration and reducing GHG emissions.
- Traditionally extension has worked to promote new technologies and management techniques, educate farmers, and act as a facilitator or broker for rural communities. Now, too, extension can help link practice in the field to new policies regarding climate change.
- Perhaps the most important purpose for extension today is to bring about the empowerment of farmers, so that their voices can be heard and they can play a major role in deciding how they will mitigate and adapt to climate change.

All of these roles can be exploited in a cost-effective way to help resource-poor smallholders deal with the issues of climate change that will so radically affect their livelihoods.

Amit Kumar, J.S. Malik & Abhilash Singh Maurya
Department of Extension Education, CCS Haryana Agricultural University, Hisar

CONCEPT AGROTECH CONSULTANTS LIMITED

Catalysing agribusiness growth ...

Mission

To be the prime movers of business growth in agriculture sector with our widening role in information management, research & studies, business consulting and human resource services

We fulfill staffing needs of blue chip companies. Visit us to see details...

www.agrijobs.in

We provide complete business consulting solutions to agri sector. Visit us to see details.....

www.cacl.in

We provide comprehensive information solutions to agri sector. Visit us to see details.....

www.agriculturetoday.in

Some of our esteemed clients

- Tata Chemicals Ltd.
- Deepak Fertiliser and Petrochemicals Corporation Ltd
- ACME Group
- Netafim Irrigation India (P) Ltd.
- Nuziveedu Seeds Ltd.
- Reliance Industries Ltd.
- Nagarjuna Fert. & Chem. Ltd.
- DCM Sriram Consolidated Ltd.
- FIL Industries Ltd.
- PI Industries Ltd.
- Multicommodity Exchange of India Ltd
- J.K. Seeds Ltd.
- Advanta India Ltd.
- EI DuPont (I) Pvt. Ltd.
- Excel Crop Care Ltd.
- Indofil Chemicals Company
- Jubiliant Organosys Ltd.
- Mahyco Monsanto Biotech Ltd
- Sudarshan Chemical Industries
- Government of Uttaranchal
- AP State Remote Sensing Agency
- Indo-Gulf Corporation
- United Phosphorous Ltd.
- IFFCO Limited
- Field Fresh Ltd.

We till **Concept** till Harvest

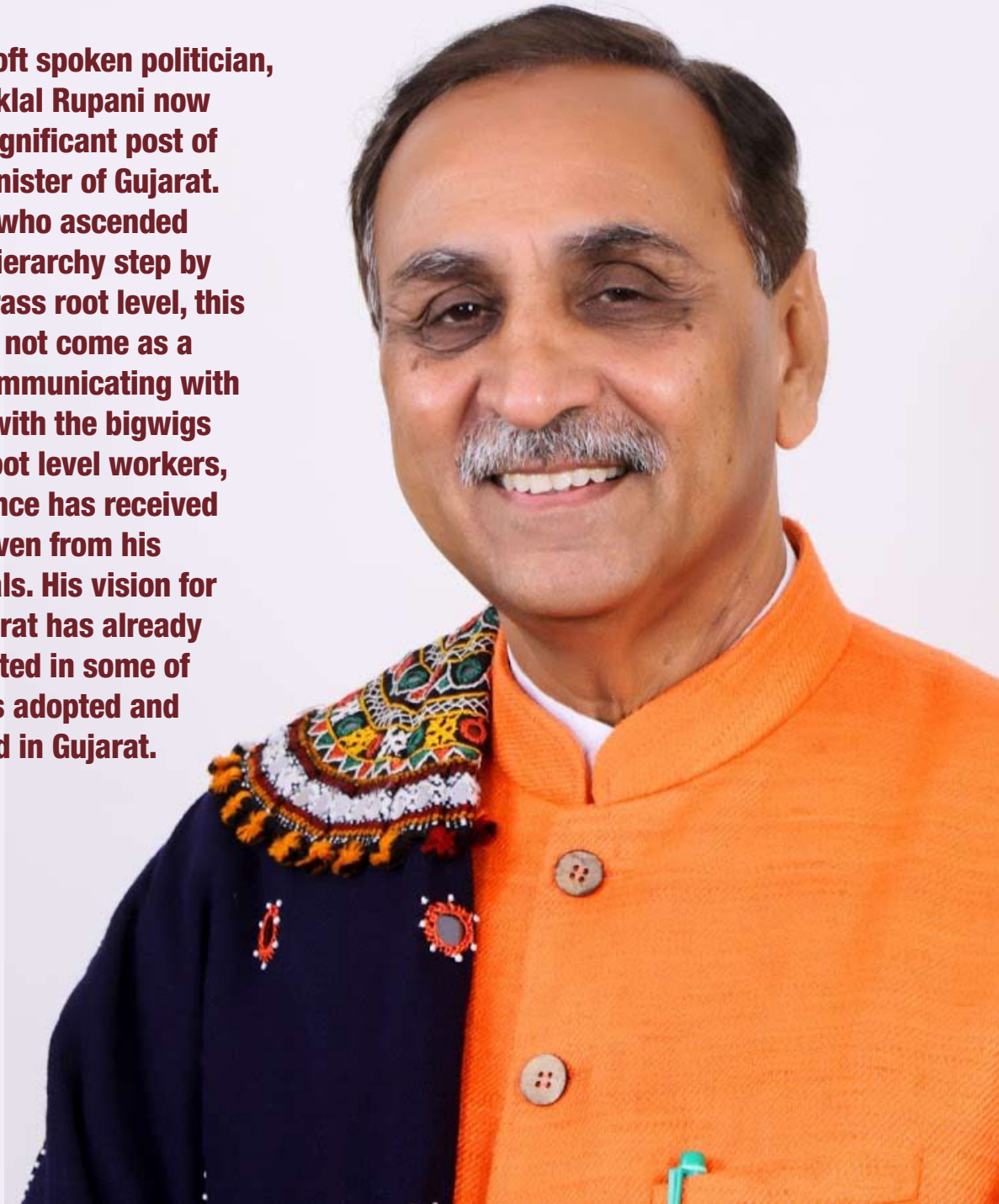
AGRI NEWS SERVICE
A unique information tool

Agriculture information is exploding, but now it's easy to manage and available on a single click...

306, Rohit House, Tolstoy Road, New Delhi - 110001, Tel: 011-23731129, 23353406
Email: ceo@cacl.in agriHR@cacl.in research@cacl.in Website: www.cacl.in www.agrijobs.in

FOR ADHIKHAM GUJARAT

A humble, soft spoken politician, Vijay Ramniklal Rupani now helms the significant post of the Chief Minister of Gujarat. A politician who ascended the power hierarchy step by step from grass root level, this climax does not come as a surprise. Communicating with equal ease with the bigwigs and grass root level workers, his governance has received accolades even from his political rivals. His vision for a Taller Gujarat has already been resonated in some of the schemes adopted and implemented in Gujarat.



Vijay Ramniklal Rupani, the Chief Minister of Gujarat assumed the office on 7th August 2016. Affiliated to Bharatiya Janata Party, he is a member of the Gujarat Legislative Assembly representing Rajkot West.

Born in 1956 in Rangoon, Burma to Mayaben and Ramniklal Rupani, in a Jain Bania family, he was the seventh and youngest son of the couple. Political instability in Burma, forced his family to move to Rajkot in 1960. A Bachelor of Arts from Dharmendrasinhji Arts College, Rupani also earned his LLB from Saurashtra University. A partner in a trading firm, Rasiklal & Sons, founded by his father, he had also worked as a stock broker.

Vijay Rupani's tryst with politics began during his student days. He was an active student activist associated with Akhil Bharatiya Vidyarthi Parishad (ABVP). Later on, he continued his political journey through Rashtriya Swayamsevak Sangh (RSS), and subsequently joined Jan Sangh in 1971. He has been associated with Bharatiya Janta Party since its establishment. Rupani is one of the few current BJP leaders in the state who was incarcerated during the Emergency period.

A Pracharak of RSS from 1978 to 1981, he was elected as a Corporator of Rajkot Municipal Corporation (RMC) in 1987 and became the Chairman of Drainage Committee. He became the Chairman of Standing Committee of RMC from 1988 to 1996. He was again elected to RMC in 1995. He served as the Mayor of Rajkot from 1996 to 1997. He became BJP's Gujarat Unit General Secretary in 1998 and served as the Chairman of Manifesto Committee during Chief Ministership of Keshubhai Patel. He was appointed as a Chairman of Gujarat Tourism in 2006. He was a Member of Rajya Sabha from 2006 to 2012. He served as BJP's Gujarat Unit General Secretary four times and Chairman of the Gujarat Municipal Finance Board in 2013 during the Chief Ministership of Narendra Modi. He also assumed the significant role of the State BJP president.

He was inducted as minister in the first cabinet expansion by Chief Minister Anandiben Patel in 2014 in which he held the ministry of transport, water supply, labor and employment. He succeeded AnandibenPatel and was sworn in as the Chief Minister of Gujarat on 7 August 2016 with Nitin Patel as the Deputy Chief Minister.

Unlike his predecessors, Vijay Rupani has anon aggressive persona. If the state was dubbed 'Vibrant Gujarat' under Modi and 'Gatisheel Gujarat' (progressive Gujarat) under Anandiben Patel, Rupani went with 'Adikham Gujarat' (a Gujarat that stands tall). Under his visionary leadership, Flagship programmes such as SevaSetu and fairs aimed at providing one-stop solutions to administrative problems faced by the common man were the high point of his government. Even as opponents targeted Rupani on a personal level, he maintained: "I am not here to defeat anyone but to win the hearts of the people."Within two months of becoming the Gujarat chief minister in August 2016, Vijay Rupani gave up the traffic privileges accorded to his convoy for the larger interests of regular commuters.His friendly approach within the party and outside helped the state gain much-needed stability after Anandiben Patel's controversial two-year term. The Chief Minister has also been able to create an impact on the agriculture sector of the state. Gujarat government has waived GST (goods and services tax) on equipment use in micro-irrigation, (and announced) interest-free loans of up to Rs.3 lakh for farmers and a bonus of Rs.500 per quintal on cotton. The government is also procuring groundnut at a price of Rs.900 per 20 kg, against the current market rate of Rs.600 per 20 kg. In the year 2016-17, the government purchased groundnuts, cotton and toor dal worth Rs.1,719crore from farmers. Apart from that, lakhs of farmers have been covered under the Pradhan Mantri Fasal Bima Yojana.

An affable and accessible politician, Mr. Rupani has to fill in the legacy of Modi and Anadiben. Within a short span of time, he has already brought in a fresh perspective and approach in governance which has been well received and appreciated.

"I am sorry to say that very simple and short-term strategies like loan waiver are adopted. Writing off the loan is not the best way to tackle the distress in the farming sector. Loan waiver is only an easy way to get a new farm loan. But writing off does not guarantee repayment of the next loan unless farming is made viable."

DR. MS SWAMINATHAN
Renowned Agriculture Scientist

"If you want to change the fortunes of Bharat, then farmers' fortunes must change."

NARENDRA MODI
Prime Minister

"The government's commitment to agriculture sector is uncompromising. We will provide higher allocations in the agriculture sector."

DEVENDRA FADNAVIS
Chief Minister, Maharashtra

"Agriculture Price Commission should get autonomy and Constitutional status. There should not be government's interference in it. Eminent agriculture experts should be appointed in the Agriculture Price Commission and then the farmers will get fair price of their produce"

ANNA HAZARE
Social Activist