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# AGRICULTURE

The National Agriculture Magazine

# TODAY

Issues and agenda  
for agriculture in

# 2016



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## Wishing a Prosperous 2016 in Agriculture

We have left yet another year behind. As we embrace New Year replete with hopes and resolutions, we also take with us lessons from the passing year. When we reflect over the events that shaped agriculture sector last year, there is particularly nothing much to cheer about. It wouldn't be untrue to say that 2015 did not leave behind any good memories for agriculture. Agriculture plays a vital role in India's economy. A less significant year for agriculture pulls down the prospects of the related agro industry as well. A bad year for agriculture is worrisome considering the impact this non-descript industry has on the country.

Indian agriculture last year survived a drought, making it one in a series of climate induced anomalies that has been rattling India's agriculture space. A drought during the last Kharif season (rainfall deficiency of 12 percent), losses due to hailstorm and another drought in Kharif season this year has again brought to the fore the uncertainty and risky nature of Indian agriculture. Deficit rain this year has affected crops spread over an area of 19 million hectares in just seven states.



Last year, India's capital, Delhi bore witness to the suicide of a farmer from Rajasthan, Gajendra Singh. The tragedy once again brought to the fore the sheer helplessness and insecure life that the farmers were facing. From January 1, 2015 to December 7, 2015, 1,024 farmers committed suicide, against 569 in 2014, and 207 in 2013 in the Marathwada region in Maharashtra alone.

The passing year was also not particularly a happening year for agri exports. In FY15, India saw a double-digit decline in agro exports after seeing a rising trend for the five years from FY10. Indian export of agro and allied products stood at \$32 billion in FY14. In FY15, it is slated to total \$29 billion, lesser by almost 10% than the year before. Price rise in commodities like onion and pulses again rattled the Indian market.

In 2015, a new urea policy was formulated. New Urea Policy 2015 for the next four fiscals carries multiple objectives of maximising indigenous urea production and promoting energy efficiency in urea units to reduce the government's subsidy burden. The policy will enable the domestic urea sector, with 30 urea producing units, to become more energy efficient, resulting in rationalisation of subsidy burden. The last year the government made an important announcement regarding setting up of a Unified National Market.

2015 was particularly not an impressive year for agriculture. The farmers were time and again tested by the nature. Some of them collapsed while the others bounced back. The year 2016 is therefore very important as we have laid an unduly large responsibility on the year to make up for all the losses that happened in 2015.

We wish our reader the very best for 2016. **A Happy New Year!**

**Dr. MJ Khan**



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## Motivating Madhya Pradesh

*MP's success story in agriculture is inspirational*

**M**adhya Pradesh today is a success story that is a matter of inspiration to the rest of the country. From a state which was closeted among the least developed states, MP has risen to formidable heights. With Shivraj Singh Chouhan completing his 10 years as the chief minister of Madhya Pradesh, the state's economy has made tremendous gains by doubling growth rates from around 4% in the period till 2005 to average around 8.7% in Chouhan's first nine years in office, with the growth rate surging up to double digit levels in the most recent year.

What makes this achievement even sweeter is that this economic upheaval was driven by agriculture. MP's agri-GDP grew at 9.7% per annum during FY06 to FY15, even surpassing the record-holder, Gujarat, which grew at 7.7% during FY06-FY14. The last five years have been even more spectacular. Agri-GDP has grown at 14.2% per annum. The achievements of the state was noted and MP received the Krishi Karman Award from the President three times in the last five years.

Agriculture driven economic development was possible because MP is primarily an agriculture state, with almost 70% of its workforce engaged in agriculture, much above the all-India average of 55%.

The agriculture growth was not an overnight phenomenon or the one that was achieved by manipulating numbers. The seeds of development was sown a decade ago and the development was all round. The irrigation ratio for instance increased from 30.6% in FY05 to 41.2% in FY14, an increase of 35% in ten years. Fertiliser consumption per hectare increased from 53.4 kg to 83 kg in FY15, an increase of 55%. Tractor sales, which are reported by private companies—increased from 28,500 in FY06 to 87,100 in FY15, a spectacular growth of more than 200%. The Seed Replacement Rate (SRR) for the major crops has also increased substantially, leading to better productivity of these crops. SRR for wheat increased from 8.8% in FY05 to 27.2% in FY14; for soybean, from 12.5% to 32.3%; for gram, from 2.3% to 15.8%; and for paddy, from 3.4% to 22.6%. Today, Madhya Pradesh is the largest producer of certified seeds in the country, producing 4.4 million quintals of these. This is a classic example of combining the best practices to achieve the desired result.

The result is evident in the farm lands of Madhya Pradesh. Wheat production has increased from 7.2 million tonnes (mt) to 12.9 mt, an increase of 79%. Soybean production increased from 3.7 mt in FY05 to 7.8 mt in FY13, but fell to 5.2 mt in FY14. The yields of all the major crops have risen. Yield of rice increased from 720 kg/ha to 1,474 kg/ha; of wheat, from 1,735 kg/ha to 2,405 kg/ha; of soybean, from 835 to 1,293 kg/ha; and of gram, from 928 kg/ha to 1,219 kg/ha—between FY05 and FY14.

Horticulture and livestock sectors, too, have showed spectacular improvement. Milk production increased by 75%, from 5.5 mt in FY05 to 9.6 mt in FY14, and meat production more than doubled in the same period. The production of horticulture crops increased from 1.2 mt in FY06 to 5.7 mt in FY14, an unprecedented increase of 375%.

MP's strong procurement system for wheat incentivised the state's farmers to increase the production of wheat, while improving the irrigation ratio. While Madhya Pradesh contributed only 2% of the total wheat procurement in India in 2002/03, the contribution went up to 24% by FY14. There are many lessons that can be learnt from the MP story. The factors that foster agri prosperity – irrigation, seeds, mechanization and fertilizers - are largely known to the stakeholders. But to combine them effectively and consistently for a long span of time is commendable. Chouhan's leadership in this whole growth story is notable. He started to fix the agri problem with developing infrastructure including roads, power and irrigation. He has also focused on agri-markets and crop insurance. In perishables, he is expecting milk and horticulture corridors, and is looking at the value-chains in efforts to fill the missing links.

Madhya Pradesh proves the point that a strong leadership is by far the most critical component of any development programme. The sincere will and commitment from the leadership front can do wonders. If such a growth is possible in the second largest state of India, the same is very much achievable in the rest of India provided the region comes with a strong political will.



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## Small Farms Risky Farms

*Smaller farms, lack of jobs push farmers to move to cities*

It does not come as a surprise that Indian farm holdings are getting fragmented and the average size of the farm is smaller than one hectare. But the fact that the fragmentation is happening at a more alarming rate is a matter of concern especially when we correlate the diminishing land area with the exodus of rural populace to urban centers. A survey by National Sample Survey Organization (NSSO) has revealed the alarming level of fragmentation in farmland and unavailability of jobs. As many as 69 per cent agricultural households own less than a hectare of farmland each, making farming unviable and forcing migration to urban areas as there are few non-agricultural jobs in villages.

There were more than 90 million agricultural households in 2012-13 (July-June), making for 57.8 per cent of total families in villages, when NSSO conducted the Situation Assessment Survey covering more than 4,500 villages with about 35,000 households across the country.

The situation is worse in poor and populous states like West Bengal, Jharkhand and Bihar. In West Bengal, 92 per cent agricultural households owned less than one hectare of land. Jharkhand with 86 per cent and Bihar with 85.3 per cent exhibited a similar trend. The agri heavy weights like Punjab, Karnataka and Rajasthan performed better showing that the size of farmlands is critical in making agriculture viable. The larger farm holdings provides the advantage of utilizing technology and practice economies of scale which ensures employment for the rural community spanning across different sectors in agriculture such as mechanization segment, crop protection, processing and value addition.

The diminishing area under farms has kickstarted the phenomenon of migration from rural to urban settings. The faster developing cities needed labour which were fulfilled by the potential farmers migrating from their rural homes. The trend is worrying as the smaller farms can no longer guarantee jobs for the rural population. The result - smaller farms and hence lesser production. The smaller farms will be less productive considering their inability to incorporate newer technologies and more productive systems.

Northern India peaked in terms of the number of agri households in comparison to their southern counterparts. NSSO revealed that Rajasthan had the highest percentage of agricultural households (78.4 per cent) among its rural households, followed by Uttar Pradesh (74.8 per cent) and Madhya Pradesh (70.8 per cent). Kerala had the least percentage share of agricultural households (27.3 per cent) followed by other southern states like Tamil Nadu (34.7 per cent) and Andhra Pradesh (41.5 per cent).

Looking at the economics behind agricultural households, the survey noted that 68.3 per cent of such households still relied on agriculture as their primary source of income. However, almost 22 per cent households reported salaried employment as the primary source of income. About 44 per cent were registered under the National Rural Employment Generation Scheme. Hinting at further stagnation of incomes, the survey revealed, average investment into productive assets by households was just Rs 513. But average consumption expenditure was about 12 times more.

The smaller the farm, lesser the farm income. The "Situation Assessment Survey of Agricultural Households", conducted during the 70th round of the National Sample Survey Office (NSSO) held in 2013 suggests that farmers involved in farming operations on land up to 2 hectares the small or marginal farmers cannot meet even their average monthly consumption expenditure from only incomes generated from farming (cultivation and animal husbandry). It says as many as 78.1 million of the 90.2 million farming households (86.6 per cent) do not earn enough from farming to meet their expenses.

The fragmentation is a worrying trend if we juxtapose the two studies. Smaller farms is not a suitable income proposition for the farmers whereas the bigger farms are. So the solution lies in consolidating the land fragments if we need agriculture to progress on an upward trajectory. Arresting further fragmentation and exhorting farmers to take up collective farming through cooperatives or farmer producer companies with well spelt out guidelines could be a doable proposition.

Farming, in the event of climate change and unstable market forces are becoming more riskier than ever. To make the conditions a little more stable, more productive models should be adopted, one of which would be to plan for larger tracts of farm and do away with the unproductive small farm models.

## Same Seed Same Price

*India to control cotton seed prices*

**M**onsanto suffered a major set back in their Indian operations with the Union government's decision to control prices of cotton seeds, including the genetically modified versions by fixing a uniform maximum retail price (MRP) from March. It has also been decided to fix and regulate the seed value and licensee fee including royalty or trait value, according to a notification issued by the agriculture ministry.

Bt cotton has a long and eventful history in India. The GM cotton was introduced in India in 2002 by Monsanto at a time when the country's cotton crops were exposed to boll worm, a pest that severely compromised India's cotton production. The Bt cotton technology was widely accepted by the Indian farmers and today India has grown into a global cotton giant. India's cotton is today largely sourced from the Bt cotton as the country has more than ninety per cent area under bt cotton. India's average cotton yield has increased from 400kgs per hectare in 2003-04 to 550kgs per hectare in 2013-14. In a way the Bt cotton technology has been responsible for revolutionizing India's cotton production.

But the higher cotton production came at a price – a rather hefty price. The higher yields from Bt cotton and the fixation of cotton growers with Bt technology have allowed the seed technology providers like Monsanto an upper hand over the prices. Bt cotton seeds cost Rs 1,600 for a 450 gram packet, compared with Rs. 9 per packet for regular seeds, with 45 per cent paid as royalty to Mahyco Monsanto Biotech (India) Ltd (MMBL) for the use of the technology. In 2006, Andhra Pradesh state officials capped Bt cotton seed prices at Rs. 750 price, and was swiftly followed by other cotton growing states, while Monsanto, under pressure, reduced its royalty to 20 per cent of the retail seed price. So the price structure being followed for Bt cotton differed from one state to another. In Punjab and Haryana, it was priced at Rs 1,000 for a 450g packet it was Rs 830 in Maharashtra and Rs. 930 in six states.

The current decision by the government to streamline the prices across the country follows several representation by farmers and the National Seed Association of India for regulating sale price of Bt cotton and other varieties in the country. In the notification dated December 7, the agriculture ministry said the Cotton Seeds Price (Control) Order has been issued for "uniform regulation" of sale price of cotton seeds with existing and future genetically modified technologies. The aim is to ensure cotton seeds are available to farmers at "fair, reasonable and affordable prices" and there is uniform rates for cotton seeds across the country, it said.

The new development will universalize the price of bt cotton and the farmers can avail the Bt cotton seeds in fairly favourable price. But the development comes as a blow to companies like MMBL. The MMBL was already in at ussle with the seed companies on the latter's refusal to pay royalties to the seed technology provider, that is , MMBL. A few Indian seed companies that used Monsanto's Bollgard (Bt) gene owes upto \$65m of unpaid royalties to MMBL.

With this order, the government has dared to venture into the uncharted territory of interfering in a private contract. When a similar move was made by Telengana some time back, that order was overruled by the courts, as an inappropriate intervention in a private contract.

Some believe that this move could deter the technology providers from doing business in India as it has created a climate of unpredictability in India and will hamper future investments in the sector. It is a matter of concern since Indian agriculture is currently at cross roads. Our farms have reached a point of stagnation and yielding enough to meet our food demands seems unrealistic for the near future. We constantly need innovation that can not only bypass yield stagnation but also survive climate change. The private players in the seed sector has made commendable contributions to Indian agriculture. The success of bt cotton in increasing India's cotton output is a perfect example. As a developing nation we will be constantly in need of technologies that will help further our agriculture goals. At this crucial juncture instead of having a conducive policy environment we are being regressive and controlling.



## Climate Proofing Agriculture

*Climate Smart agriculture can significantly reduce GHG emissions*

The United Nations Climate Change Conference's 21st annual session of the Conference of the Parties (COP21), held from Nov 30 to Dec 11 in the French capital was lauded as a success. On December 12th, 2015, the group emerged victorious with the first ever global accord in the fight against global warming. The agreement's overriding goal is to ensure that average global temperatures increase by no more than 2°C (3.6°F) above pre-industrial levels. The level of 2°C is critical threshold as above this temperature, the planet may face catastrophes like sea level rises and plant and animal extinction.

All 196 nations participating in the conference have agreed to decrease the use of fossil fuels that generate heat-trapping greenhouse gas emissions like methane and carbon dioxide as soon as possible. The agreement also stipulates that by 2050, man-made emissions should be reduced to levels that can be absorbed by our forests and oceans.

Environmental protection is one area where concerted efforts are needed by all the nations – developed and developing. Fortunately, there are no barriers or borders that delineate the environment of one country from that of another which makes it even more important for all the countries to act unitedly. Even applying unanimity to this proposition, the developing nations are in a much disadvantaged position as they are yet to catch the bus of development.

The biggest challenge at this point would be to attain a balance between the environmental needs and the development goals. Agriculture which is the main stay for many developing nations is one of the important emitters of greenhouse gases. The global food system, from fertilizer manufacture to food storage and packaging, is responsible for up to one-third of all human-caused greenhouse-gas emissions. On the other hand, agriculture is also the one enterprise that is directly affected by climate change. Crops, livestock, fisheries and forestry are hit with about a quarter of the negative effects from natural disasters like droughts or floods. By 2050, climate change could cause irrigated wheat yields in developing countries to drop by 13%, and irrigated rice could fall by 15%. In Africa, maize yields could drop by 10–20% over the same time frame.

With the increasing population of the planet, agriculture is perennially confronted with the task of producing more food. More and more resources are pumped in to meet the demand. Globally, 1,500 trillion liters of water are used up in agriculture. Many developing countries including India, has an inefficient method of water utilization which accentuates the problem. Conventional irrigation systems haven't been replaced by efficient micro irrigation systems. Rice and sugarcane, popular in Asia, are among the most water-consuming crops but so are cotton and wheat. These four account for about 58 percent of the irrigated land around the world. About 90 percent of the world's rice is grown in Asia. It takes as much as 5,000 liters of water to produce a single kilogram of rice.

Agriculture is a broad area with emissions coming from diverse sources such as agriculture's mechanical equipment, fertilizer manufacture, refrigeration, soil management, enteric fermentation (which produces, say, belches from a cow), manure management, rice cultivation and field burning. On the supply side, it includes transport, food processing, packaging, and sale of agricultural products. Agriculture when treated as an industry is a critical emitter of greenhouse gases. But emissions from small farmers barely contribute to the overall agriculture emissions because they use very little chemical fertilizer or depend on agri machines. Their production is more confined to local markets and hence don't contribute as much to the transport emissions as well. Also, fresh foods don't create as much emissions from processing, freezing, packaging and storing in supermarkets. Also, the practice of burning the stubbles to clear up the cultivated land postharvest is another area which is directly contributing to greenhouse gases.

Curtailing greenhouse gas emissions from agriculture is going to be a difficult task as farmers need to produce food to meet the global demand. But we have to find ways that reduce emission of greenhouse gases from agriculture. We have to think in terms of climate smart agriculture which not only reduces the gas load but also replenishes the environment. Varieties that need lesser inputs and those that can survive climate change should be the new direction in research. India can be a trailblazer in directing the world towards climate smart and sensible agriculture.



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## SEBI impounds Pearls Agro assets

Equities and commodities market regulator SEBI has initiated recovery proceedings against Pearls Agrotech Corporation (PACL) for failing to refund Rs 49,100 crore to investors. The action has been taken against 10 entities, including PACL and its promoters/directors. Under the recovery proceedings, SEBI has attached all bank and demat accounts, as well as mutual funds folios of the above entities with immediate effect and communicated the same to all banks, depositories and mutual fund houses. The company collected money from customers promising them land. However, no sale deeds have been signed with the investors. Harried investors of Pearls Agrotech Corporation had urged SEBI to seize the bank accounts and

properties of the company. Vishwas Utagi, Convener, All India PACL (Pearls) Investors Association, had said SEBI should open a separate counter for Pearls Agrotech investors to register their claims as was done in the Sahara case. "What is the use of imposing a fine on the directors and companies if they are not going to pay it even after 120 days after the order was passed? SEBI has all the powers to seize and dispose of the assets and it should use them to repay Pearls investors," Utagi had said.



## DuPont, Dow Chemical to combine in merger of equals

Dow Chemical Co and DuPont Co, two historic giants of US industry, will merge in a deal that's the first step in a plan to create three new highly-focused businesses. The merger, the largest ever in the chemicals industry, will combine products from both Dow and DuPont in the areas of agriculture, commodities chemicals and specialty chemicals to create the new businesses. It comes after two years of pressure from activist investors who argued that shareholders of both companies would realise greater value if they were broken up. Dow and DuPont will combine in an all-stock deal.

## Farm sector attracts \$1,764 m FDI

Foreign direct investment into agriculture services stood at \$1,763.57 million (Rs8,747.4 crore), higher than FDI into sectors such as textiles, mining and electronics during April 2000 to June 2015. "However, FDI inflow in agriculture services during the above period has been lower compared with computer software and hardware, telecommunications, automobiles etc," Minister of State in Agriculture Mohanbhai Kalyanjibhai Kundaria said in a written reply in Lok Sabha. In agriculture machinery, FDI inflows during the same period has been \$418.65 million. To attract more foreign funds in the agriculture sector, 100 per cent FDI has been allowed in coffee, rubber, cardamom, palm oil tree and olive oil tree plantations, besides tea plantation in which FDI has already been allowed.

## In a first, pvt firm gets FCI contract for paddy buying

The Food Corporation of India (FCI) has awarded a contract to the National Collateral Management Services Ltd (NCML) to carry out paddy purchase operations in Jharkhand.

This will be for the first time that a private party has been allowed to purchase rice from farmers on behalf of FCI in a bigger scale. In August this year, the Centre had decided to engage private players during the current kharif season for procurement



of rice in eastern Uttar Pradesh, Jharkhand, West Bengal, and Assam. NCML would be allowed to purchase paddy from the farmers in the identified clusters where operations of FCI are not robust.

The FCI would allow shortlisted private firms in only those clusters where there is possibility of procurement of one lakh tonne of rice equivalent of paddy. Besides, the new policy allows the private parties to open as many purchase centres as possible in the allotted cluster, subject to a cluster covering a minimum 500 to 1000 hectare. NCML has been offered a couple of clusters in Jharkhand for paddy procurement, which is likely to commence in the next few weeks. The corporation would soon announce successful bidders for the paddy procurement operations in eastern Uttar Pradesh and subsequently in West Bengal. Meanwhile, the Bihar government has stated that the state would involve primary agricultural cooperative societies in paddy procurement this season.

## 'SRI SATHYA AGRI BIOTECH PVT LTD' awarded the fastest growing Indian Company

► 'SRI SATHYA AGRI BIOTECH PVT LTD' was awarded "Fastest Growing Indian Company Excellence Award" in Bangkok, Thailand recently. The company which carries the brand name of "SRI SATHYA SEEDS" was established in the year 2004. Under the leadership of Mr. Kosana Ramakoteswara Rao, the company successfully expanded its activities successfully in the states of Andhra Pradesh, Telangana, Karnataka, Tamilnadu, Maharashtra, Orissa, Madhya Pradesh, Gujarat, Punjab, Rajasthan & Haryana. The Company has developed into a successful Seed Enterprise dealing in more than 25 Crops suitable for different agro-climatic conditions and geographical regions in India and providing employment to more than 300 personnel in a short span of inception. Apart from successfully leading the company, Mr. Rao has been rendering his services to Seed Industry, through Seedsmen Association and for the last 6 years he has been serving as Executive Committee Member of the Association. For his outstanding contribution to the seed industry, the Seedsmen Association, Hyderabad honored him with "Best Seed Entrepreneur" award for 2014, presented by the both Telangana and Andhra Pradesh states agricultural ministers. He was honored by H.E. Khun Korn Dabbaransi, Hon'ble Former Deputy Prime Minister of Thailand on 7th International Achievers Summit & Awards Ceremony on 26th, September, 2015.



## Tata Chemicals puts off plan to sell fertiliser biz

► Lack of interest from buyers has forced Tata Chemicals to put off the sale of its fertiliser business. This was to have been the first major restructuring of the Tata Group under Cyrus Mistry. "The Tatas have given up the plan of selling the business. No major buyer had shown interest at the price the Tatas were quoting," said a person aware of the developments. According to him, Tata Chemicals was looking for at least Rs 5,000 crore from the sale of its fertiliser business. Tata Chemicals has a 1.2 million tonne urea unit at Babrala, Uttar Pradesh, and a phosphatic fertiliser unit at Haldia, West Bengal. Aditya Birla Nuvo and Morocco-based OCP were approached but they were not interested because of tough market conditions. Deepak Fertilisers, IFFCO and Coromandel evaluated the business. IFFCO was the only player that had put in a bid of Rs 1,000 crore. A source in Deepak Fertilisers confirmed the company had evaluated Tata Chemicals' fertiliser business but decided not to bid because it did not want to acquire a urea plant. Deepak Fertilisers is plagued by gas supply issues after the government stopped supply of natural gas to its urea units. "We see no value in buying new assets in the urea business," the source said. "Urea-based facilities are under stress. Huge backlogs in subsidy bills and lack of stability in gas connections are the major issues plaguing the sector," said Saroj Poddar, chairman of Zuari Group, whose firm Zuari Fertilisers and Chemicals acquired majority control in Mangalore Chemicals and Fertilisers.



## Jain Irrigation gets land for agri-food park

► Jain Irrigation Systems has been allotted 623 acres in Kurnool district for setting up of an integrated agriculture and horticulture park as an anchor company. The Andhra Pradesh Industrial Infrastructure Corporation Ltd (APIIC), the nodal agency for land allocation for industries, had earlier filed the requisitions with the Kurnool district collector for alienation of the Government land and about 4.28 acres of assigned land meant for providing access to the Government land in the district. Jain Irrigation Systems Ltd had earlier filed a detailed project report for allotment of land in Kurnool district for the park. While the market value of the land is pegged at about Rs 4.5 lakh per acre and the total cost works out to Rs 28.05 crore for 623.40 acres, the company would get the land on a long term lease. Since the APIIC has a facility to allot land on long term lease, it was decided to allot the land on lease for 99 years, according to an order issued by SS Rawat, Secretary to Andhra Pradesh government and Commissioner Industrial Promotion.



## ReMS achieves Rs 500 cr turnover

► Rashtriya e-Market Services (ReMS), the first virtual unified market platform (UMP) for agricultural produce in the country so that farmers can fix price by bypassing middlemen, has already reached a turnover of Rs 500 crore. Karnataka Chief Secretary Kaushik Mukherjee said the ReMS has roped in six lakh farmers on its platform, who usually sell their produce via Agricultural Produce Marketing Committees (APMCs). (ReMS) has been established as a joint venture company, with Government of Karnataka and the NCDEX Spot Exchange having equal shareholding.





## New crop insurance scheme on anvil: Centre

► The central government will soon come out with a new crop insurance scheme in which farmers will have to pay lower premium and remove anomalies in claim settlement. Replying to a discussion in the Lok Sabha on the drought situation, Agriculture Minister Radha Mohan Singh said nine states, including Maharashtra, Telangana, Odisha and Jharkhand, have been affected but the government had put in place contingency plans which has limited its impact. He also said that the government will set up a Committee to look into the revamp of Minimum Support Price. Singh also vowed to create a national market for agricultural produce by May 2017, and provide soil health card to every farmer by March 2017. "Memorandums which have come from nine states mention that 207 districts are affected by drought. When the drought started, we had provided funds to the states. Because of the contingency plan that we had put in place, the impact on productivity has been less as compared to what it should have been," Singh said. Drawing parallels between the drought situations in India in 1965, he said two crop seasons were affected then and now and inflation shot up and the weather conditions were similar to this year. Government took a number of steps to contain its impact, including subsidy on diesel and seeds, he added.

## Govt makes jute packaging must for food grains, sugar

► The government approved mandatory use of jute packaging material for foodgrains and sugar, a move which will provide relief to 3.7 lakh jute mill workers. The Cabinet Committee on Economic Affairs in its meeting decided that at least 90 per cent of foodgrain output and 20 per cent of sugar production has been reserved for packaging in jute. As per the CCEA decision, at least 90 per cent of foodgrains produced and 20 per cent of the sugar production has been reserved for packaging in jute. However, the 90 per cent mandatory packaging requirement for foodgrains stipulates that "in the first instance, the indents for the whole requirement would be placed for jute bags and in case jute mills are not able to provide jute bags as per requisition, then a dilution upto 10 per cent would be permissible by the Department of Food & Public Distribution".



## Centre to control Bt cotton seed prices by fixing MRP

► The Centre has decided to control prices of cotton seeds, including the genetically modified versions by fixing a uniform maximum retail price (MRP) from March, a move that would deal a major blow to global hybrid seed company Monsanto. It has also decided to fix and regulate the seed value and licensee fee including royalty or trait value, according to a notification issued by the agriculture ministry.



## Centre likely to scrap or slash floor price for onion exports

► The Centre is likely to lower or scrap the minimum export price (MEP) for onions in response to demands by farmer groups for its removal, from States such as Maharashtra and Karnataka, as domestic prices have fallen significantly. MEP is the minimum price below which exports can't take place. While farmers are demanding that the MEP be scrapped, the Centre is looking at whether it is prudent to remove it at one go, or do it in phases. "The IMC will soon take a call on this," an official stated. The MEP for onions was increased to \$700 per tonne in August from \$425 per tonne, as domestic prices had spiralled due to unseasonal rains, affecting crops in some parts of the country. Following the increase in MEP, exports of onions almost stopped as it became unviable to export the commodity at such high prices.

## Centre may form panel to review national policy on farmers

➤ The government might form a panel to review the National Policy on Farmers, framed in 2007 (NPF-2007). If there is a new policy, officials said the transferring of subsidies and incentives, as well as a differential payment system during a sharp slump in prices, are expected to be one of the objectives. NPF-2007 was formed after the recommendations of a National Commission on Farmers, headed by eminent agricultural scientist M S Swaminathan. That panel gave five reports. One recommendation it



had made, on fixing of the Minimum Support Price (MSP) of crops at 50 per

cent more than the weighted average cost of production, was rejected by the then government. This might, it was decided, distort the market. However, the now-ruling Bharatiya Janata Party in its manifesto for the 2014 general election had promised to implement the Swaminathan panel's recommendation on MSP. There were 12 other recommendations the Swaminathan panel made but were not included in final NPF-2007. With more reports on farmer distress, there have been calls to review the old policy.

## Govt to bring national fodder policy: Agri Min

➤ Facing fodder shortage in the country, Agriculture Minister Radha Mohan Singh said the government would bring out a national fodder policy to boost domestic production. He stressed that a law, prohibiting the burning of crop residues on field to increase fodder availability and protect the environment, was the need the hour. "Fodder sources in India are from crop residues, cultivated fodder, forages and forests, permanent pastures and grazing lands. At present, India is facing a deficit of 35.6 per cent green fodder and 10.9 per cent of dry fodder," Singh said while inaugurating the 23rd International Grassland Congress in the national Capital. He said despite the shortage of fodder, India is the world's largest milk producer with 138 million tonnes of output. "It is imperative for the nation to produce food not only to feed its more than one billion population but also for an equal number of livestock," the minister added. Singh said, "We will come up with a national fodder policy to address shortage. Law should be made to stop crop burning as this would help in not only increase fodder supply but protect environment as well."



## Centre to create buffer stock of pulses to combat price rise

➤ The Cabinet Committee on Economic Affairs has approved the creation of buffer stock of pulses this year. For this, the Centre will procure about 50,000 tonnes of pulses from the kharif crop and one lakh tonne out of rabi crop of 2015-16. Government agencies such as Food Corporation of India, National Agricultural Cooperative Marketing Federation of India Ltd, Small Farmers' Agribusiness Consortium and any other agencies will be used for the procurement, a government release said.



## 'Govt for bringing cotton farmers under direct benefit scheme'

➤ The government plans to introduce the Direct Benefit Transfer scheme for cotton farmers and has increased the minimum support price for long staple cotton to 4,100 for 2015-16 marketing season, Union Textiles Minister Santosh Kumar Gangwar said. "With the world cotton consumption slowing down and the demand for higher minimum support price for cotton emanating from some states, the Centre is planning to introduce the direct benefit transfer scheme for the cotton farmers as well," Gangwar said.



## Rubber farmers desert farms as prices crash

➤ Natural rubber (NR) production in India is likely to decline sharply with farmers abandoning large areas due to unremunerative prices. Higher imports of NR has led to a sharp decline in prices hurting more than 12 lakh growers. United Planters' Association of South India (UPASI), the apex body of planters in the southern states, said here that among world producers, India is showing the maximum negative growth in production of -21%. India is the world's second-biggest consumer of the commodity and the world's fifth-biggest producer. The country produced 655,000 tonne of NR in the 2014-15 crop year. "In 2014-15, import was to the tune of 76% of production and 43% of consumption. UPASI



understands the need for import to bridge the gap between consumption and production, but the un-bridled imports beyond this gap is clearly causing harm to the domestic growing industry," N Dharmaraj, president of UPASI, said. "Projected production

for 2015-16 is expected to be below 600,000 tonne since large areas are being abandoned due to low prices. Dwindling production will not only affect the income of the growers but also lead to higher imports," he added. Suresh Koshy, president of National Federation of Rubber Producers Society, pointed out large scale imports of Block rubber (TSR) from southeast Asian nations is depressing rubber prices forcing growers to discontinue production. "Rubber imports this season ending October 2015 at 2.52 LT equal to 76% of the quantum of NR produced in the country. This year's production of NR which may be 6.0-6.5 lakh tonne is the lowest in the last 10 years and points to the distress in the sector," he said.



## Maharashtra plans 10,000 cr package for drought-hit farmers

➤ As pressure rises from allies and opposition parties to help drought-affected farmers in Maharashtra, the Bharatiya Janata Party-led state government is planning a Rs. 10,000 crore relief package that includes both short-term and long-term measures. Chief minister Devendra Fadnavis, who has refused to waive farm debt, may announce this package during the ongoing winter session, an official said. This official also said the state government may have to raise value-added tax (VAT) on some items by 1-2 percentage points to finance this package. VAT in Maharashtra is currently capped at 12.5%.

## Drought-hit Maharashtra's pulses output halved

➤ Even as the state reels under a shortage of pulses, estimates for the drought-hit kharif season which just ended show that the crisis could worsen. They show a steep 52% drop in the production of kharif pulses and a 30% fall in the production of kharif cereals for 2015-16 compared to a normal year. The overall production of kharif foodgrains is set to decline by an estimated 34%. Toor dal production is set to fall by 42% and moong dal by a steep 71% compared to the normal kharif yield in the state, the estimates show. The production of Urad dal is set to decline by as much as 74%. The coarse cereals are also set to take a major hit with jowar production set to decline by 73% and bajra by 71% compared to a normal year. The estimates are part of the memorandum submitted by the Maharashtra government in November to seek central government assistance for the drought.



## New sugar factory to come up at Kabirdham in Chhattisgarh

► A new co-operative sugar factory with sugarcane crushing capacity of 2,500 metric tonnes will come up in Chhattisgarh's Kabirdham district, with a vision to promote agro-based industries in the state. Chief Minister Raman Singh laid the foundation stone of the factory, to be constructed at Biseshar village of Pandaria block at a cost of Rs 163.12 crore. The factory premises would be spread in an area measuring over 80 hectares. "The state government is making every possible effort to promote the agriculture-based industries in the state in a bid to improve the economic condition of the farmers," the chief minister said while addressing farmers on the occasion. "Over 10,000 farmers in the region are stock-holders in this factory and thus they are its real owners," he said. Singh also distributed certificates among stock-holder farmers. He further called upon



the farmers to take interest in sugarcane production apart from paddy cultivation. Notably, this is the fourth sugar factory of the state and second in Kabirdham district, based on the cooperative model. The two other sugar factories are already functioning at Kerta of Surajpur district and Karkabhat of Balod. This factory, which has been named after India's "Iron man" Sardar Vallabhbhai Patel, will benefit

about 20,000 farmers living in Pandaria region of Kabirdham, besides Mungeli and Bemetara districts, he said. Moreover, the sugar factory will also produce about 14 MW of power through biomass produced by the factory, which is sufficient enough to power about 20,000 houses. Cooperative and Culture Minister Dayaldas Baghel and Agriculture and Water Resources Minister Brijmohan Agrawal were among other dignitaries present on the occasion.

## NDDB to set up tomato, peas processing plant in Jharkhand

► To help vegetable farmers get better prices for their produce, the National Dairy Development Board (NDDB) would set up tomato and peas processing plant in Jharkhand within the next one year. Anand (Gujarat)-based NDDB plans to involve at least 50,000 farmers in procurement and processing of peas and tomato in Jharkhand while Safal, its marketing arm, would sell these processed vegetables in the market. The board will invest around Rs 70 crore for this processing plant. "Often vegetable farmers in Jharkhand go for distress sale in the absence of marketing efforts. We would be helping farmers in producing quality tomatoes and peas for processing purpose," T Nanda Kumar, chairman, NDDB said. Kumar said during next few months, NDDB through Safal would educate farmers about the quality of tomato to be grown which could help in processing and creating products like ketchup, puree, pulp, etc. Safal is the fruit and vegetable business initiative of Mother Dairy Fruit & Vegetable Pvt Ltd, a company owned by NDDB. Jharkhand is the third biggest producer of peas amongst the states while the eastern state is sixth largest producers of tomato in the country. By setting up of the vegetables processing plant, the apex body of dairy cooperative is trying to expand its base in processing and marketing of vegetables across the country.



## Punjab sees more area under horticulture

► With the Punjab government encouraging farmers to opt for crop diversification to take them away from wheat-paddy cultivation, the area under horticulture crops in the agrarian state has increased by 68 per cent in the past decade, an official said. "Diversification has shown quantitative change in Punjab as the area under horticultural crops has increased by 68 per cent during 2004-05 to 2014-15," said a horticulture department spokesman. "The 10-year-long success story of horticulture has also led to an increase in GDP share of horticultural produce to agricultural produce from 6.44 per cent in 2004-05 to 10.15 per cent in 2014-15," he pointed out. While the total area under horticultural crops went up from 2.1 lakh hectares in 2004-05 to 3.11 lakh hectares in 2014-15, the percentage of horticultural area to total cropped area increased from 2.78 to 3.95 per cent during this period. Production of horticulture crops has gone up from 33.84 lakh metric tonnes (MT) in 2004-05 to 59 lakh MT in 2014-15. Horticultural productivity has gone up by nearly three lakh MT per hectare in this period.



## For speedy **crop-loss settlement**, IRDA mulls use of satellite technology

► The country's insurance regulator — IRDA — is actively considering the use of satellite remote sensing technology as a mapping tool for agricultural yield estimation and crop losses in a bad monsoon year. The move, aimed at ensuring faster settlement of crop insurance losses, comes at a time when the country has experienced back-to-back monsoon failures — the first since 1986-87. IRDA has concluded a series



of discussions with stakeholders in this regard, officials indicated. A number of research studies and experiments are also being undertaken by institutions associated with agriculture and rural development throughout the country, they said, adding that the use of this technology should mark a move towards speedy assessment and settlement of crop losses.

## Corp Bank to write off Rs 532-cr **loan to REI Agro**

► State-run Corporation Bank recently announced that it will technically write-off a Rs 532-crore loan given to REI Agro, under the CBI scanner for alleged loan fraud, in the December quarter after making full provisions. The Central Bureau of Investigation (CBI) had registered a case against Basmati rice exporter REI Agro on the basis of a complaint filed by a consortium of bankers. The consortium, led by UCO Bank, alleged that the company had defrauded them to the extent of Rs 3,815 crore since 2013 through conspiracy, cheating and forgery. Corporation Bank Chairman and Managing Director S R Bansal said the lender had already categorised the account as fraud and has been making provisions for it since January last, as per the regulatory requirement. "We have been making provisions for the account for the past three quarters... The December quarter will be the last one and then we will just technically write-off the account," Bansal told reporters here after launching the bank's institutional broking services through its wholly-owned subsidiary CorpBank Securities. He said the bank has an exposure of Rs 532 crore to the Delhi-based company, which is registered in Kolkata. Regarding taking action against the company, Bansal said the PSU lender has given its consent to the lead bank, which is taking action on behalf of all the consortium members. In the last week of October, CBI had conducted searches at four premises of the company and its directors in Kolkata. The central agency also searched three rice processing units of REI Agro at Rewari in Haryana.

## Banks seek affordable **crop insurance**

► Farmer suicides in India can reduce if the government modifies the crop insurance scheme by making premiums more affordable and bring more crops under its ambit, experts say. "The present crop insurance is not farmer-centric but area-centric, and the claims given by insurance companies often fall short of the losses incurred. The involvement of state governments also makes it time-consuming to settle claims. There is a need to restructure the present schemes," said a government official. Crop insurance in India in the present form is unable to address the issues of the farmer suicides as many small and marginal farmers are not in a position to pay premiums, and losses due to hailstorms and cloudbursts are add-on products, requiring additional higher premiums. Banks have been doing their bit by restructuring their agri loans. State Bank of India (SBI) restructured Rs 560 crore of Kisan Credit Card (KCC) loans to help farmers tide over natural calamities during 2015-16. Though KCC is a comprehensive product, it covers only crops notified by the government. "If the crops are not notified then they are outside the ambit of insurance coverage, which is resulting in losses for the farmers leading to loss of lives. We have directed banks to undertake awareness programmes so that farmers renew their insurance on time," said the official.

## Odisha asks banks to give timely **loans for rabi crops**

► With debt-ridden farmers allegedly committing suicide in the state, Odisha government today asked all banks to ensure adequate and timely advance of loan to peasants for current Rabi crop, official sources said. The banks have also been asked to go for re-phasing of Kharif loan in view of the drought condition due to deficient rainfall this monsoon. The directive to the banks was issued by Chief Secretary G C Pati while addressing a state level Bankers Committee meeting here. Pati also directed the banks to revise the unit wise scale of finance for rabi crop so that adequate money is available to the farmers to grow crops and they do not have to borrow money from any other source.

## Odisha Govt to reschedule farm loans: Naveen

➤ With Odisha witnessing a series of farmer suicides allegedly due to crop loss and debt burden, Chief Minister Naveen Patnaik has asked farmers in the drought-hit areas not to worry about re-payment of loans saying the government will reschedule farm loans. "Together we have faced many calamities in the past. The farmers of the drought affected areas need not worry about re-payment of their loans," Patnaik said in a statement to reporters after returning from a visit to Delhi. Stating that the state government was with farmers and has all along been working to protect their interests, the Chief Minister said "the state government is implementing a drought package of about Rs 1,000 crore." The state government has taken a decision to reschedule agriculture loans and strong action would also be taken against unscrupulous money lenders, he said. The state government would make all out efforts to mitigate the sufferings of farmers and protect



their interests, Patnaik added. During his week-long visit to Delhi, Patnaik met Union Finance Minister Arun Jaitley and demanded a special central assistance of Rs 3,500 crore to mitigate the dry-spell situation, which has resulted in crop loss in about 5.23 lakh hectares of cultivable land.

## New lending norms will hurt small farmers

➤ Back-to-back droughts have prompted the Reserve Bank of India to go back to the policy of setting a direct agricultural lending target for banks. But lifting the cap on indirect lending may defeat the purpose, with damaging implications for agriculture. Direct lending implies finance to individual farmers, including SHGs, for dairy, piggery, poultry and beekeeping, among other activities. It includes crop loans, investment credit, post-harvest credit and purchase of land by small and marginal farmers for agriculture purposes. Indirect lending entails loans to agro and food processing units, finance for the purchase of agri-machinery, loans to NBFCs and for the construction of storage facilities, among other activities that require more capital than direct lending.



## Banks miss agri credit target in 2014-15

➤ Within priority sector credit, both public sector and private sector banks have missed the 18 per cent target of advances to the agricultural sector in FY15, says the Reserve Bank's statutory report on trend and progress of banking in India 2014-15. "Following the overall trend, credit growth to the priority sector also declined during 2014-15 and this decline was spread over all sub-sectors with growth in credit to agriculture declining to 12.6 per cent from 30.2 per cent in the previous year. Credit to priority sectors by PSBs (public sector banks), PVBs (private sector banks) and FBs (foreign banks) was 38.2 per cent, 43.2 per cent and 32.2 per cent (of adjusted net bank credit (ANBC)/credit equivalent of off-balance sheet exposure, whichever is higher) respectively, during the year," the report said.

## 'Nabard needs long-term funds to boost capital formation in agriculture sector'

➤ The National Bank for Agriculture and Rural Development (Nabard) needs long-term finance to ensure flow of adequate funds to cooperatives and boost capital formation in agriculture. Full-fledged funding of the National Rural Credit Long-Term Operations Fund and the National Rural Credit Stabilisation Fund are available options, says All-India Nabard Employees Association. A delegation of the association met Jayant Sinha, Minister for State for Finance, in New Delhi recently and handed over a memorandum listing this and other demands. In the backdrop of growing agrarian crisis with its attendant problems of dispensation of institutional agri credit, there is need to strengthen the organic relationship between the RBI and Nabard as it existed earlier. There is a serious need for countries like India to invest more in adaptation and mitigation efforts, given the growing problems connected with climate change and its impact on agriculture. Nabard is accredited as the first National Implementing Entity of the Green Climate Fund of the UN Framework Convention on Climate change





## Cotton fills warehouses around the world

► There's enough cotton sitting in global warehouses to make more than 127 billion T-shirts, or 17 for each person on the planet. That's bad news for investors betting prices will rise. World inventories at the end of this season will be the second-largest ever, just slightly less than last year's record, according to a US Department of Agriculture (USDA) forecast last week. It's a signal that supplies will remain ample even after the agency cut its outlook for production. Hedge funds raised their bullish cotton bets to the highest in more than a year, only to face the first weekly price drop since

early November. While threats to the American crop helped make the fiber this year's best-performing commodity, the gains may not last much longer as demand slows. China, the world's largest user, is curbing cotton imports by more than 30 per cent, helping to shrink global trade for a fourth straight year, the International Cotton Advisory Committee estimates. Cotton is one of only two gainers this year among the 22 components of the Bloomberg Commodity Index, which is trading near a 16-year low. But the fiber's rally is starting to dissipate. Prices are now up 5.7 per cent in 2015, paring advances of as much as 13 per cent.



## France is heading for a wheat overload

► France may become inundated with wheat in 2016, as if that were not already the case. France grows 27% of the European Union's wheat, and is the fifth-largest wheat-producing country in the world. It is a primary supplier to North African countries such as Algeria. In 2015, France harvested nearly 43 million tonnes of wheat, breaking the 40 million mark for the first time. Soft wheat, the variety used for bread, makes up 96% of France's total wheat volume. With the bearish markets of late, French farmers have been hesitant to sell their wheat.

## UN Declares 2016 The Year of Pulses

► Pulses, including all kinds of dried beans and peas, are an inexpensive and highly nutritious source of protein and vital micronutrients that can greatly benefit people's health and livelihoods, particularly in developing countries. For this reason, the United Nations has declared 2016 the International Year of Pulses. Using the slogan "nutritious seeds for a sustainable future," the International Year of Pulses will raise awareness of the many benefits of pulses, boost their production and trade, and encourage new and smarter uses throughout the food chain.

## Iranian team checks out Indian tea practices at farm and factory

► India is hopeful of boosting exports to the high-value Iranian tea market following the just-concluded visit of an Iranian team, which included officials from ISIRI, and health ministry officials. ISIRI is Iran's official standards body under the Ministry of Trade. It is described on its website as the 'sole organisation in the country for developing and designing official standards'. While it is usual for trading countries to interact through trade, industry and official delegations, this visit was unique in that it was an interaction solely on quality and safety issues.

## Oilmeal exports down 41% on low demand

► Oilmeal exports dipped 41 per cent in November to 1.12 lakh tonnes (lt) against 1.89 lt in the same period last year. The sharp fall in export was attributed to disparity in prices with shipments from India costing more than that of competing countries, said the Solvent Extractors Association of India in a statement recently. In the first eight months of this fiscal, exports were down 38 per cent at 8.95 lt (14.52 lt). Export of soyameal hit a record low of 55,889 tonnes in the first eight months of this financial year against 2.50 lt logged in the same period last year. Similarly, rapeseed meal export also was reduced to one-third over last year. The industry is passing through tough time and many plants have either shut down or operating at very low capacity due to shrinking margins. The capacity utilisation of these oil mills are at the lowest level, said BV Mehta, Director, SEA.



## Indonesia's 2016 palm output to rise by 5-7 lakh tonne, says industry group

► Indonesia's palm oil production will rise by 500,000-700,000 tonne next year, an industry group in the world's top producer said, with the El Nino dry weather pattern offsetting gains made by maturing plantations. Any slowdown



### Iran comes to rescue of Indian rice farmers

► Rice farmers and mills in India are banking on Iran to end a two-year slump in prices. Iran's decision to end curbs on imports is set to boost demand for basmati rice, the aromatic grain used in biryani and pilaf dishes, and send its prices soaring, according to KRBL Ltd., a rice miller and exporter based at Noida, near New Delhi. Exports to Iran may increase for the first time in two years, the company said. Basmati rice prices plunged more than 50 percent in the past two years after Iran cut purchases and Indian farmers boosted planting. The easing of international trade sanctions on Iran sees the country having access to more supplies at a time when Thailand is looking to dispose of its near-record state stockpiles. The scrapping of the import ban, imposed to protect domestic farmers during the harvest, may lead to fresh purchases, according to the All India Rice Exporters Association.

in output rates could support palm oil prices, which touched a near six-and-a-half year low earlier this year, and currently trade at 2,283 ringgit (\$536) a tonne. "Indonesia's palm oil output will rise to 32.5-32.7 million tonnes next year from 32 million tonnes in 2015," Fadhil Hasan, Executive Director, Indonesian Palm Oil Association, said. Hasan's estimates differ slightly from his previous forecasts. "We have the effect of El Nino, but have new, mature trees that were planted three or four years ago," said Hasan. "All in all, production may still increase, but only slightly." The El Nino weather phenomenon typically brings dry weather to Southeast Asia, impacting palm yields and lowering output. Indonesia's peak palm oil output usually runs from August to September, and an easing in production is typically expected in the following months, as the country heads into the beginning of its wet season from November. Hasan said the worst affects of El Nino were now over and key palm planting areas in Sumatra and Kalimantan had now experienced rains. Indonesia's palm oil exports will be between 23-24 million tonnes next year, down from 25.7 million tonnes in 2015, said Hasan, as domestic biodiesel demand increases.

## Global pepper production estimated to rise by 6,000 tonne

► Global pepper production during the crop year of 2016 is estimated to increase by a marginal 6,000 tonne mostly on higher production in Vietnam, according to the reports of the 43rd annual meet of International Pepper Community (IPC) held in India recently. Black pepper production is expected to increase only marginally to 3,26,063 tonne from 3,25,033 tonne in 2015. The total production of black and white pepper is estimated to be around 413,713 tonne as against 407,158 tonne in 2015. The annual meeting of the IPC collates figures provided by the member nations to arrive at production, consumption, and export figures for pepper. Vietnam, the largest producer, is projected to have production of 1,40,000 tonne for the new crop year, of which 20,000 tonne would be black and the rest white. In 2015, the country is estimated to have produced 1,30,000 tonne of pepper. Vietnam is estimated to export 1,50,000 tonne of pepper next year from the new crop and carry forward stock of 12,613 tonne from 2015. During 2015, Vietnam is projected to export 1,30,000 tonne and import 15,000 tonne. Indian production is projected to decline to 53,000 tonne in 2016 from 65,000 tonne in 2015. Exports from India are estimated at 21,500 tonne and imports 11,500 tonne. It still remains the largest consumer of pepper from the producing countries with a projected consumption of 49,000 tonne.





## Orange producers' body floated

► With the support of NABARD and under the initiative of Kalong Kapili, a non-governmental organisation for rural development, the Orange Producers Organization (OPO) was formally floated at a function organised today in Bandorgog village under Nartap Gaon Panchayat, Kamrup (Metro). Around 100 orange growers took membership of OPO so that they can directly sell their produce to the buyers. These orange growers hailing from villages like Bandorgog, Marlap, Magursila, Markang, Pithagog, Kolongpur etc., on the Assam-Meghalaya border, had for long been at the mercy of middlemen. Compelled by financial constraints, these farmers had to go for contract-based cultivation, with the middlemen deciding the rates of their produce.



## First Genetic Map of Wheat Created

► Scientists from University of Liverpool created the first map of wheat epigenome that can lead to a new tool to improve crop breeding technologies. Epigenetic marks are chemical tags that physically attach to DNA and modify its function without changing the genetic code.

## India's grape growers expect record exports

► The country's grape growers are expecting a good export season this year. According to an estimate, India is likely to export 2 lakh tonne grapes if the weather holds up in the main growing regions. The country had exported 1.12 lakh tonne grapes in the last season and a record 1.92 lakh tonne in 2013-14. According to Jagannath Khapre, president, All India Grape Exporters Association, nearly 2 lakh tonne of grapes are expected to be exported from the country this year. "New markets are opening up to Indian grapes. Canada, Australia and Russia have shown their interests in grapes from India," he said. "Harvesting has begun at some vineyards in Nashik and some flowering has been destroyed owing to rains. Around 10% of the crop has experienced cracking. But this should not impact the export scenario," he said. Farmers have begun registering with Apeda under GrapeNet, the online platform. So far there have been some 25,547 registrations from Maharashtra and 31 registrations from Karnataka, officials from the State Horticulture Department said. There were some 25,000 registrations on GrapeNet for export last year and the numbers have marginally gone up this year, officials said.

## New high-yield arhar variety could solve pulses shortage

► As the country grapples with recurring increase in pulses price, scientists at the Indian Council of Agriculture Research (ICAR) have come up with a solution to address the shortage in the commodity. Scientists at Kanpur-based Indian Institute of Pulses Research (IIPR), an affiliate organisation of ICAR, have developed an arhar (tur) variety, which has the potential to give much higher yield - almost double - compared to existing variants. The average yield of existing pulses varieties in the country is 9-10 quintals a hectare, but the new variety developed by IIPR scientists has the potential to give 20 quintals.

## Aprikula: A village where women do farming

► There is a speciality about Aprikula village located just 20 kilometres from Guwahati city. Farming in this village which falls under 52 Dispur LAC, 55 Kamarkuchi Gaon Panchayat and Dimoria Development Block and is situated beside the Digaru River, is done only by women. Paddy fields cover an approximate area of 250 bighas in this village which has a 100 per cent tribal population. Everything, from sowing the seeds to harvesting the paddy to carrying them home, is done by the women of the village. Also, this village does not use any kind of chemical fertilizer, pesticides. It depends on natural manure and the farmlands are fully organic. But sadly, neither the Union Agriculture Ministry nor the State agriculture department pays any attention to this remote village of Assam bordering Meghalaya.



## 2015 – A Bitter Pill for Agriculture

As we gear up for the New Year, it is natural to step back and reflect on the year that passed by. While we expect the New Year to be fruitful and productive, we can also learn some lessons from the passing year. As far as agriculture is concerned, these lessons can be advantageous to derive at plans and policies that can further improve the performance and status of the industry. The year 2015, do not hold good memories for agriculture. Drought, international market, inflation has all taken its toll on agriculture and the stake holders.





**T**he year that passed by was particularly not impressive as far as agriculture was concerned. Back to back droughts have affected the production and area under crops. A less significant year for agriculture pulls down the prospects of the related agro industry as well. A bad year for agriculture is worrisome considering the impact this non-descript industry has on the country.

Agriculture plays a vital role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP). As per estimates by the Central Statistics Office (CSO), the share of agriculture and allied sectors (including agriculture, livestock, forestry and fishery) was 16.1 per cent of the Gross Value Added (GVA) during 2014–15 at 2011–12 prices.

2015, left behind a trail of events that impacted agriculture and the population dependent on it.

### Living up the drought

Indian agriculture last year survived a drought, making it one in a series of climate induced anomalies that has been rattling India's agriculture space. A drought during the last Kharif season (rainfall deficiency of 12 per cent), losses due to hailstorm and another drought in Kharif season this year has again brought to the fore the uncertainty and risky nature of Indian agriculture. According to the government, 207 districts in nine states have been hit by drought this year. The actual numbers may even be higher as these represent only those states who have approached the Centre.

Nearly half of the country's 676 districts are in the grip of drought due to deficit monsoon rainfall and barring a few states, most of them have remained causal in their approach. This is the second consecutive year of drought in India. Even though the kharif sown area this year was higher than last year, the deficit rainfall is expected to affect the overall output.



## Beyond Paris and Nairobi

**T**he Paris Climate consensus essentially restores the status quo with reference to the implementation of the provisions of the 1992

framework convention on climate change.

I am glad that there is a commitment to limit temperature rise to 1.5 degree centigrade. Even this amount of increase will lead to the loss of 6 to 7 million tonnes of wheat in the Punjab, Haryana area. Countries in the Northern latitudes will however benefit. I am happy that the principle of common but differentiated responsibilities has been reiterated.

What is now urgently needed is the redoubling of our efforts in the area of both adaptation and mitigation. In agriculture adaptation will involve shifting our emphasis to the per day productivity of crops rather than per crop productivity. There is also need for greater attention to reduce ammonia volatilisation by replacing normal urea with neem coated urea. Our food security can be safeguarded by promoting a biogas plant, a water harvesting pond and the planting of nitrogen fixing trees in every farm. To honour our commitment in the area of shifting to renewable energy and a low carbon pathway of economic development, there is need for intensive attention to the R&D aspects of solar, nuclear, wind, biogas and biomass energy. This is also the pathway to sustainable agriculture which constitutes the No.2 goal of SDGs, which will be replacing from next year the MDGs.

The outcome of both the climate conference held in Paris and the WTO Negotiations held in Nairobi is of great significance to the future of Indian agriculture and the fate of our Food Security Act. Fortunately the Paris meeting did not take any decision which will harm our agriculture, but this cannot be said about the Nairobi outcome. The Nairobi meeting of WTO did not reaffirm in an explicit manner the Doha Development Agenda. No definite agreement was reached in the area of Special Safeguards Mechanism. It is not surprising that the Indian Minister of Commerce and Industry, Smt Nirmala Sitharaman has expressed her disappointment on the conclusions of Ministerial meeting held at Nairobi. The market has been left very volatile and the very heavy subsidies being given by industrialised countries under the green box provision will be continued and probably enlarged. Whatever may happen at the international arena our national policy should have as its bottom line the livelihood security of resource poor farmers and the food security of resource poor consumers. It is unfortunate that industrialised nations are so inward looking in the area of agricultural trade, particularly since hardly 2 to 3% of their population depend on agriculture for their livelihood. Nairobi has paved the way for famines of the future."

*Prof. M S Swaminathan*

Maharashtra has declared 20 out of 36 districts as drought hit. The state has already witnessed a steep 52% drop in the production of kharif pulses and a 30% fall in the production of kharif cereals for 2015-16 compared to a normal year. The overall production of kharif foodgrains is set to decline by an estimated 34%. Toor dal production is set to fall by 42% and moong dal by a steep 71% compared to the normal kharif yield in the state, the estimates show. The production of Urad dal is set to decline by as much as 74%. The coarse cereals are also set to take a major hit with jowar production set to decline by 73% and bajra by 71% compared to a normal year. This is the second consecutive year of drought in the state. The drought covers 34% of the villages, with Marathwada and north Maharashtra being the worst hit. In the months between June and September, the state received just 59% of the normal rainfall. Also, the rains were erratic with an initial burst of heavy rain followed by a long dry spell. The effect of drought in Maharashtra will be crucial considering that Maharashtra produces almost 10% of the foodgrains in the country.

So far, Karnataka, Chhattisgarh, Madhya Pradesh, Maharashtra, Odisha and Uttar Pradesh have declared drought in 27, 25, 27, 21, 21 and 50 districts, respectively. The north-western parts of the country, which includes Punjab, Haryana, Uttar Pradesh and Rajasthan, had received the least amount of rainfall, at 83 per cent of the long-period average in the 2015 southwest monsoon season.

The ensuing rabi season has already taken the hit. The overall area under winter-sown crops is lower by more than 9% from the year-ago period according to the data released by the ministry of agriculture. The total area sown under rabi crops is reported at 442 lakh hectare against 486 lakh hectare reported a year ago. Wheat sowing is still lower by 16% compared with the year-ago



period. Most of the key growing states — Uttar Pradesh, Madhya Pradesh, Haryana and Punjab — have reported lesser areas compared to last year. The rabi season is particularly crucial as it accounts for roughly two-thirds of the country's annual pulse production, and considering India's poor pulse economics, this can further aggravate the pulse deficiency which has already witnessed a double-

## Increase Investments in Agriculture

**I**ndia—one of the world's fastest growing, most populous economies and one of its largest farm sectors, is emerging as a potentially large market for global agricultural trade and investment. But at the same time, the Indian farmers are exposed to a lot many concerns. It would be great contribution for farming community, if all agrarian stakeholders make cumulative and symbiotic efforts to strengthen the hands of those who feed the nation.

The critical issues that plague Indian agriculture are the knowledge deficit and infrastructure deficit. Farmer's knowledge may prove a driver of innovations and investments. Investment is the prime mover of growth as the amount invested determines the required growth in income via the operations of multiplier and accelerator effects. Hence, the need for increasing investment in agriculture is being felt as never before.

Although the proportion of Small & marginal farmers

among Indian farming community is high but their investible surplus are too limited.

I personally believe that the agricultural sector needs critical reform in infrastructure. Little has been done in vital areas like land consolidation, making land leasing legal, reforming farm marketing, Agri logistics and improving sustainability of agriculture.

The Government has taken really very good steps in recent past but still a lot is left for ground realization. Focus on strong Long Term perspective plan for developing rural infrastructure and increased investments in agricultural infrastructure is the need of hour. This is high time for the farmers to shift their focus from primary agriculture to secondary, wherein they have ample opportunity for value addition of their produce and utilization of all possible by products."



*Dr. Rakesh Gupta, GM, Punjab National Bank*



## Future of Agriculture is Bright



“Contrary to the belief, Indian Farmers are intelligent and hard working. In spite of severe droughts this year there is 2.5% growth in Agriculture. With Government policy of removing hurdles and improving infrastructure, I strongly believe that future of Agriculture in India is bright. Government, industry and farmers should work together”.

**Raju Shroff, UPL**

### Rabobank's Agri-Commodities Outlook 2016

Following several consecutive large harvests, most agri commodities also enjoyed healthy global production levels in 2015, despite difficult growing conditions across many regions of the world. And as we approach 2016, supply remains ample, with global stocks at very high—or even record—levels. This will impact price levels going forward. US dollar prices of many agri commodities reached multi-year lows in 2015, and—although prices are expected to improve slightly—the world might be faced with several years of a price environment well below that seen from 2010 to 2014.

Of course, current low price levels also provide ample opportunities for consumers, and the improved stock levels are expected to keep price volatility low. But climatic and macro-economic risks will persist in 2016, and short term price increases, as well as an expected further depreciation of commodity currencies, will in turn allow producers to benefit.

As 2016 draws near, the food & agribusiness sector must prepare to weather the ‘new normal’ of prices. The years ahead will present both opportunities and challenges for primary producers, processors, traders and retailers.”



digit rise in the wholesale price index for nine months now.

### The Suicidal Farmer

Last year, India's capital, Delhi bore witness to a tragic event of a farmer, Gajendra Singh from Rajasthan ending his life in front of the nation. The tragedy once again brought to the fore the sheer helplessness and insecure life that the farmers were facing. In 2014, the National Crime Records Bureau of India had reported 5,650 farmer suicides. The highest number of farmer suicides were recorded in 2004 when 18,241 farmers committed suicide. The farmers' suicide rate in India has ranged between 1.4 to 1.8 per 100,000 total population, over a 10-year period. Farmer suicides account for 11.2% of all suicides in India. Being a turbulent year for agriculture, crop failure and indebtedness has pushed the farmers to the edge.

From January 1, 2015 to December 7, 2015, 1,024 farmers committed suicide, against 569 in 2014, and 207 in 2013 in the Marathwada region in Maharashtra. An estimated 3,000 farmers

committed suicide in the state from January 1 to December 7. Maharashtra holds the dubious distinction of reporting the highest number of farmers' suicide in India and the highest was recorded in 2006, when the number stood at 4,453.

The farmer suicide rate in Karnataka has hit the highest level in a decade, highlighting agrarian distress in the state. A total of 158 farmers killed themselves in July alone in the state, bringing this year's toll of farmer suicides to 197, the most since 2003. Sugarcane growers top the list of suicide data, followed by cotton and paddy cultivators. The main reason being suggested is the farmer income collapsing for reasons such as price crash or delayed payments. Mandya, known as the 'sugar bowl' of Karnataka, has seen a spate of farmer deaths. The National Human Rights Commission has expressed 'grave' concern over alleged farmers' suicides in Mandya district of Karnataka over low payment by sugar mills.

Telangana, the newly formed state last year, has also

reported wide spread farmers' distress and suicides. A battered agriculture landscape has nothing much to offer its dependents. When the revenue from their vocation dips and the debts mount, the farmers prefer to follow the route preferred by many of his fellow farmers – suicides. Telengana has also reported farmers suicides this year, although the government has preferred to pin the reason for that on the farmers' lavish life styles! The number of farmer suicides reported in the state from June 2014 to October 2015 was 782.

Many states which have a major stake in agriculture are bearing the brunt of drought and the general distress that is spreading among the farming community. Suicides are just one manifestation of the agrarian distress, albeit a serious one.

### Agri Exports Plummet

The passing year was also not particularly a happening year for the agri exports. In FY15, India saw a double-digit decline in agro exports after seeing a rising trend for the five years from FY10. Indian export of agro and allied products stood at \$32 billion in FY14. In FY15, it is slated to total \$29 billion, lesser by almost 10% than the year before.

The WPI inflation is down to minus 2.5% in FY15 while it was at 5.53% the year before. The WPI-food remained stable around 8% in both the years while the

## RESEARCH PRIORITIES TO BE RELOOKED

"I would like to think seriously on the research activities maize and pigeon pea for the betterment of farming community.

From double and 3-way cross hybrids, the country has moved into single cross hybrids in maize with the entry of MNCs. No doubt single cross hybrids are high yielding and uniform, in majority of the cases either one or both the parents are susceptible to major diseases like blights or wilt. Sometimes even the hybrid(s) is susceptible to wilt causing huge losses to the farmers and to the seed growers. Further, single cross hybrid seed production is expensive (ranges from 700 to 1000 kg/acre) there by the cost of hybrid seed to be made available to the farmers would be very high. It is not that easy to convert a single cross hybrid into a 3-way without scarifying the yields, but it is possible. The production yields of the 3-way ranges from 2000 to 3000 kg/acre, which is highly economical to farmer. Further, the hybrid seed can be supplied at a reasonable price to the commercial farmer. The disease problems can also be minimized by adding a disease free third parent.

The cost of "arhar" dal crossed double century mark which is an alarming situation in the country. Since area under commercial crops like cotton, chilly etc. has increased (though not very remuneratory in the present situation), pigeon pea crop has been neglected by opting into marginal and sub-marginal soils, without any fertilizer and supplementary irrigations. The existing varieties, though are doing very well, attention should be paid towards good agronomy and plant protection."

*Dr.S.Venkateswarlu, CEO & Research Head, Sun Crop Sciences Pvt. Ltd, Hyderabad*



rupee has weakened by 10%. Thus, the export efficiency of India should have increased, even though marginally. But the exact opposite has happened. International commerce stands destabilised by strategic confrontations of big powers, creating deflationary shift in commodity prices.

The Indian government belatedly announced a \$64 (R4,000) per million tonne subsidy for raw sugar exports. Another export subsidy from Maharashtra, of \$16 (R1,000) per million tonne of raw sugar is also being rolled out. But even with this \$80-per-million-tonne subsidy, sugar exports remain challenged. Indian wheat exports—at the rate of \$275 per million tonne fob—have no takers from the private sector. According to the food secretary, the government stockpiles will not be touched for export, with India being in no position to export wheat unless it is subsidised by



## Reorienting Crop Protection Policies for Evergreen Revolution

“At present, only one-third of the cropped area is under assured plant protection umbrella, and is limited to a few crops and States only. The government should come forward with



education and incentive system to expand the area under plant protection coverage, to save avoidable crop losses of 20-30%. The 100% seed treatment campaign needs to be augmented as soil and seed borne diseases continue to significantly affect the yield. Further, pesticides be also exempted from sale tax and excise duty, like other inputs-fertilizers and tractors, etc.

The government should encourage fast track introduction of eco-friendly molecules, as it takes nearly five years after submission of an application running into over 1,000 pages involving data on a large number of aspects, to get approval of the Central Insecticides Board & Registration Committee (CIB & RC). Special campaigns, on regular basis, need to be launched to curb the tendency of a few NGOs coming up with sensational news by highlighting pesticide residues, quoting non credible sources. The Govt. may also take strict measures to check sale of spurious pesticides (chemical, bio-pesticides) flooding the major rural markets, as these are eroding credibility of effectiveness of pesticides, causing great financial loss to the farmers, and the State exchequer.

The Govt. of India though is advocating public-private partnership in research and development in agriculture, yet at the ground level there are not many such initiatives especially in Integrated Crop Management (ICM), which also includes Crop Protection. The guidelines need to be restructured to foster participation. To attract rural youth, economically viable agro-based models including avenues of non-farm income; skill based training of cutting edge technologies, and hassle free soft-term loans as a single-window delivery system, need to be made available.”

*R. G. Agarwal, Group Chairman, Dhanuka Agritech Limited*



about \$70 per million tonne. The export figures for agro and allied items in January 2015, as estimated by the commerce ministry, are alarming, given the negative realisations.

The agro based industry too have reported sluggish market for their products both locally and globally. Rallis India Ltd reported weaker-than-expected performance for the September quarter. Consolidated sales dropped 21%. Its export business, which was supposed to cushion the company from domestic weakness, did not fare better either. Business from Brazil, a major market, has been hit by currency devaluation and drought. Higher inventories and low crop prices impacted demand in the US. In India, deficient monsoon rain and a long dry spell has hit Rallis hard. Monsoon deficien-

cy has affected acreage growth and yields. Low farmer incomes as a result affected the agro input industry. Low rainfall and drought-like conditions in the key markets of Andhra Pradesh, Telangana, Karnataka and Maharashtra have hit agrochemical usage. Farmers either delayed or postponed pest control measures. In recent annual general meetings, P I Industries Ltd and Bayer CropScience Ltd were cautious about their domestic agrochemical business and gave the impression that growth in the current fiscal year can be slower than last year. Key stocks in the agricultural input space have hit their 52-week lows during November due to weak monsoon, falling commodity prices and concerns on the upcoming Rabi season. Drought conditions in Brazil and weak intermedi-



## Relaunch Agriculture as Industry

“Time has come to re-launch the agricultural sector as an industry. If we consider United States, only 2% of their population are involved in agriculture, but they are on top of every commodity production just because nowadays agricultural is viable only on large scale. They are more in crop safety than crop production. In the Indian scenario however, farming is mostly restricted to small fragmented areas. We can't separate farmers from their agricultural occupation but by forming them into Cooperatives we can enhance the output. Currently uneducated farmers also have the smart phones which can access various applications on weather, PS, Maps etc. At the same time, it is necessary to develop online applications for soil texture and conditioning, weed identification, and fertilizer and pesticide and seed efficacy help. Excessive application of urea and foreign import should be reduced which in turn will save the foreign exchange.

With the involvement of youth in agriculture, the day shall come when modern technologies like Agriculture Drone, Air, Irrigation, Crop & Soil Sensors, Automatic Intra-Tractor, Agri-bots will be used frequently in Indian agricultural scene. Closed ecological systems will be the finest method to cultivate best qualities of crops. Lack of land will convert skyscrapers into vertical farms. Prevention of vegetables and crop loss and maximum utilization will also reduce the pressure on our agriculture. Kerala citizens have initiated a cooperative movement to prevent vegetables & food spoilage. Government should provide subsidy for the technologies which can promote the food spillage prevention eg: food waste Biodigesters. Even food waste can be converted as farm manure and media for Biofertilizers.

Farm water harvesting is suitable option for save water campaign. Because subsoil moisture is much more fruitful. Waste land could be biggest reservoir for the storm water. Government and Private Companies should promote agriculture extension facility. Alternate crops will be the biggest cure for current drought problems

Also we should save our water and nutrients. So technologies like underground drip irrigation which is currently used in Israel would be helpful for water scarcity zones.”

*N.S. Raju, Vice President, BEC Fertilizers*



## The Agricultural Biosecurity Bill

“The countries across the globe have either already taken or are in the process of implementing stringent agricultural biosecurity measures. This has become a necessity in the light of booming trade of agricultural products, cattle, poultry, fishes and humans. The Indian Agriculture Biosecurity Bill, which is hoped to replace the century old regulations, was tabled in the lower house of Parliament in 2013. It calls for establishing an Agricultural Biosecurity Authority of India with headquarters in the national capital region and regional Centers all over the country. The authority is expected to be responsible for regulation of the import and export of plants, animals and related products; prevention of entry of quarantine pests; and implementation of post-entry quarantine measures.. However, this bill which needs to be brought out on priority to safeguard agriculture production and trade from devastating exotic diseases and pests is still pending. This adds to the woes of the farmers who are already struggling with climate change, production and market access issues.

The Bill though speaks of creating a National Agricultural Biosecurity System, in the present shape unfortunately lacks the provision of covering zoonotic diseases (caused by organisms that can transmit from one vertebrate to another such as Avian Flu and SARS), food safety issues and the inter-state movement of pests and diseases through in-country trading of agricultural commodities. Besides, modalities of dealing with biosecurity emergencies that happens with outbreak of diseases and pests in epidemic proportions also need attention by making provisions of Rapid Response Strategy for mitigations. The Ministries of Health and Family Welfare, Home, Defence and External Affairs should also be roped in to encompass provisions of managing bioweapons and food safety issues in the larger interest of the country in a holistic manner. The FAO of United Nations has come out with a biosecurity toolkit and it will be worthwhile if the policy makers also look into that to cover the relevant aspects adequately under the bill.”

*Dr. Ravi Khetarpal, Regional Advisor,  
(Strategic Science Partnerships),  
CABI South Asia, New Delhi, India*





## Conservation Agriculture: The way forward for agricultural sustainability

**I**ndian agriculture is a success story, which not only enabled us to feed our people with home grown food but the strategy adopted in recent times has also enabled the country to export food grains largely grown in Indo-Gangetic plains (IGP), to the needy people around the globe. In the process, however, - the food bowl of the country (IGP) has been exposed to 2nd generation green revolution problems which threatens sustainability of the agriculture production system in IGP. Many farmers commonly report that it needs more investments to grow the same amount of food, grown a decade back, as the increasing cost of fertilizer, non-renewable energy, labour and tube well power tariffs have all together reduced the profitability of agriculture. Therefore, in order to make agriculture more attractive, we need to adopt the twin strategy, viz., (i) sustainably increase total system productivity and (ii) reduce the crop production costs such as to improve farm gate incomes. Bulk of the evidences across the world bring out that 'Conservation Agriculture' can handle the twin problems enumerated above. Globally 'conservation agriculture' (CA) should form an important component of the overall strategy for food security and poverty alleviation, health for all, rural development, enhancing productivity, improve environmental quality and preserve natural resources.



When CA was introduced to edaphically contrasting rice-wheat system of IGP, it was initially observed that rice productivity slightly declined more due to inexperience of researchers and farmers, and non-availability of new herbicide molecules for efficient weed control in direct seeded rice. But the loss in rice productivity was compensated by the enhanced wheat productivity in zero-till CA systems. With better-bet crop management practices, if CA is continuously practised for few seasons in the presence of residues, it begins to reflect on improved soil health, and improvement in crop productivity and net returns besides reduced production costs. The benefits could be as high as about Rs.30,000/ha/year including saving on tillage in the rice-wheat system. Raised bed planting reduces crop lodging, improve quality of grains, and saves scarce irrigation water. Paired row planting of wheat on raised-beds facilitates growing an additional crop of legume (mung bean) as intercrop or after wheat harvest in the eastern as well as north-western plains. If adopted in half of the IGP (4-5 million ha area), it is capable of producing 3-4 million tonnes of mung bean that will make India self-sufficient in pulses. It goes without saying that sustainability of cereal-cereal system can be substantially enhanced through introduction of a legume crop in rice-wheat system. A legume crop planted before onset of monsoons is likely to discourage farmers from burning the crop residues, and mop up residual NO<sub>3</sub>-N from the soils before it joins the ground water aquifers. Direct seeded rice saves almost 50% of water without yield penalty and thus, greatly reduces the problem of falling water tables in many parts of the country. Any policy prescription that facilitates 'Carbon Farming' and supply of appropriate machinery for planting into anchored / loose residues will help CA's adoption in a big way."

*Dr. HS Gupta, Director, Borlaug Institute for South Asia, New Delhi*

ate chemical prices, too, contributed to softer demand and realisations. Thus, it's not surprising that Rallis, Bayer Crop Science, Kaveri Seeds, and P I Industries have been trading weak.

### Onion - The Hot Potato

2015 was yet another year where onion trouble resurfaced. Once again the country witnessed sharp rises in onion prices.

Onion prices this year had sky rocketed recording the highest in two years. The reasons pointed to the sudden price rise are the usual stories of Indian agriculture - unfavourable weather and poor storage infrastructure. This year it was the unseasonal rains during the rabi harvesting period that jolted the onion stability. The Rabi season accounts for 60 per cent of the total onion production while the kharif and late kharif varieties make up the rest. India produced 18.9 million tonnes (mt) of onions in 2014-15, marginally lower than the 19.4 mt produced the previous year. The poor quality of the winter harvest, which accounts for 55-60% of total production in a year torpedoed this year's harvest. While this is a harsh reality of Indian agriculture, what could be even crueler is our apathy towards harvested produce. As much as 3-4 million tonnes (mt) of onions are wasted every year due to lack of adequate storage facilities. India produces 19 mt of onions each year of which 15-16 mt reach consumers. The rest gets wasted due to lack of storage facilities and cold chains. This year this loss has paved the way for the price crisis.

The signs of such a crisis were fairly evident as early as February when untimely rains and hailstorms played spoilsport destroying the standing crops in many states. When the government agencies failed to take notice of these events, hoarders and traders quite cunningly used the events to their advantage and started hoarding this commodity much to the annoyance of the government. Even the private traders were quick to respond to the crisis in summoning consignments from other onion producing countries.

Onion is a potent political instrument and carries a fair share of political history

## 2015- A Mixed bag for Fertilizer Sector

**T**he calendar year 2015 started on a positive note for RCF as it closed the FY 2014-15 with an outstanding performance in all the areas. The Company achieved the highest ever Net Profit of Rs. 322 crore during 2014-15.

During the year 2015, many positive changes took place in the fertilizer policy front also. The New Urea Policy 2015 was notified in May 2015 and it has laid down a road map for the future to promote energy conservation and maximize indigenous urea production from the existing plants. A gas-pooling mechanism has also been implemented to streamline gas supplies for the urea industry so that urea manufacturers get gas at a uniform price.

Again in June 2015, Government made it mandatory to produce 100% neem coated Urea, considering the enormous benefits and advantages that can be derived from using neem coated urea such as increasing nutrient use efficiency, increasing crop productivity, reducing risk of diseases in crops, check the illegal diversion of subsidized urea to industrial use, etc.

Agriculture in India is largely dependent on monsoon. In 2015, though monsoon started well in June, due to poor and inconsistent rains in the subsequent months except August, many parts in the country received

deficient rainfall leading to drought like situation. As a result, the fertilizer consumption in 2015-16 has been affected and the fertilizer inventory is piling up.

Another main issue bearing heavily on the performance of the Company is the non-receipt of fertilizer subsidy dues from the Government in time. Because of inadequate budget provision, for the last several years, there has been a backlog of huge pending subsidy carried forward into the next year. The resultant inordinate delay in subsidy payments has led to working capital crunch and ultimately to higher interest burden. Unless additional provision is made in the Budget, the total outstanding for the industry may touch Rs. 40,000 Crore.

Other areas of concern that are affecting the performance of the company include uncertainty in the availability of domestic gas for P&K fertilizers and industrial chemicals, recovery against use of APM gas in production of non-urea products with effect from 2006, N-recovery for use of domestic gas in P&K fertilizer production, etc. Being an integrated fertilizers cum chemicals complex, RCF's Trombay unit requires continued allocation of domestic gas for its non-urea activities to remain on board in this competitive environment. The matter relating to recovery towards unintended benefits for use of cheap domestic gas and continuation of supply of domestic gas for manufacture of P&K

fertilizers has been referred to an Inter Ministerial Committee (IMC), and the final decision of the IMC is awaited.

At present RCF is actively pursuing two major brownfield projects - Thal III in Maharashtra, which is a gas based project for 1.27 million MT urea and Coal gasification based joint venture project of RCF, GAIL, Coal India and FCIL for revival of the closed FCIL unit at Talcher to produce 1.27 million MT urea. The Company is also engaged in developing a JV Urea project in Iran. The Company is hopeful that PIB/CCEA clearance for the Thal III project will be granted shortly so that we can start executing the project in the financial year 2016-17. For the Talcher project, a JV Company "Rashtriya Coal Gas Fertilizers Limited" (RCGFL) has been incorporated and we expect to complete other pre-project activities in the coming year. In the Iran project also, selection of Iranian JV partner as well as various pre-project activities will be expedited in 2016-17."

*Shri RG Rajan, Chairman & Managing Director, Rashtriya Chemicals & Fertilizers Ltd*



with it. Onion prices were an index of a government's efficiency. It was first used by Indira Gandhi as early as 1980s on her comeback post emergency where she used this tool to decimate the incumbent government under Chaudhary Charan Singh. The same principle was used in 1998, when the BJP government of chief minister Madanlal Khurana in Delhi was ousted. So it's a threat politically to the reigning governments.

Despite having a history of regular onion price spike, somehow there is no mechanism to manage the issue or predict it, other than to endure it.

### Pulse Spurt

Another agriculture commodity that has been facing the heat of price



rise in 2015 is the pulses. The prices have been rising steadily over the last few months. Inflation in lentils stood at 46% in November, after hitting 42% in October, according to the Consumer Price Index (CPI) numbers released by the ministry of statistics and programme implementation. In fact, it has been consistently on the rise for the past few months, forcing the government to announce a number of measures to check hoarding of pulses. During April-November, pulses inflation stood at 27%, as against 7% in the year-ago period.

Demand for pulses has been in-



## Technologies for Sustainable Agriculture

**A**griculture will remain the backbone of the Indian Economy primarily for two reasons. First and foremost, India can make a dent on poverty and unemployment only by growing at double digits, and for that to happen agriculture needs to grow at a minimum of 4per cent. Secondly, around 50per cent of the workforce is still engaged in agriculture and allied activities that will have a bearing not only on ensuring food production but also employment in the economy.



The population increase and climate change issues have made agriculture more complex than ever. By 2050, India's population will have increased to 1.7 billion and their food requirements will have changed significantly. To meet the expected increase in demand and tackle the vagaries of weather, farmers in India will not only have to increase crop production substantially but also adopt the latest technologies in farming.

The present government is aware of the challenges and Prime Minister Narendra Modi's recent comment "kam zameen, kam samay, zyaada upaj" sums it all. To combat the changing weather patterns, the farmers need to grow better and more crops in lesser time. Another important message from the Prime Minister was on the urgent need to take research from the lab to the farm. He highlighted the challenge of water shortage by saying, "we have to manage water scientifically and ensure more crop per drop." The government has also emphasized on the most critical foundation of maintaining soil health for robust agriculture growth.

We are also witnessing that many state governments are vigorously supporting Farmers Producer Organizations (FPOs) for not only helping them to organize better but also to link them with markets. This can happen only when there are enough opportunities for successful Public Private Partnerships (PPPs) for integrated agriculture development.

At Syngenta, we firmly believe that it is critical not only to ensure farmers produce more but also enjoy a good return on investment. For making agriculture profitable for farmers, it is also necessary that technologies are available to conserve natural resources, promote exports and increase value addition for higher and inclusive agricultural growth.

For achieving a sustained 4per cent growth in agriculture, implementation would be key."

*Mr. Bipin Solanki, Territory Head, Syngenta South Asia*

creasing as the per-capita incomes rise in India and people improve their dietary pattern. Supply remains constrained at 17-19 million tonnes annually over the past few years as yields stagnate and acreage remains stable. Two consecutive droughts have also adversely impacted pulses production, thereby exerting pressure on the prices. Around 12% of the area under cultivation of pulses is irrigated, with the remaining 88% of the land dependent on rainfall, thus exposing pulses to the vagaries of nature.

The area under cultivation of pulses has come down to 23.1 million hectares in 2015, from 25.2 million hectares in 2014. Consequently, production of pulses has also come down to 17.2 million tonnes in 2015 from 19.3 million tonnes in 2014.

### India's New Urea Policy

The New Urea Policy 2015 for the next four fiscals carries multiple objectives of maximising indigenous urea production and promoting energy efficiency in urea units to reduce the government's subsidy burden. The policy will enable the domestic urea sector, with 30 urea producing units, to become more energy efficient, resulting in rationalisation of subsidy burden.

India is currently short of gas and the fertilizer plants are subjected to restrained supply of indigenous gas. The supply is much lower than the requirement of the fertilizer plants which is 42.4 million standard cubic metres a day (mscmd). The entire requirement of the fertilizer plants are never met by indigenous gas supply as the government has put a cap of 31.5 mscmd on supply of domestic gas to fertiliser plants. Urea units have for long been subject to cuts in supply of administered pricing mechanism (APM) gas affecting their working. As a result, the fertiliser sector's dependence on imported liquefied natural gas (LNG) has ballooned to 36 per cent.

India's annual consumption of urea is 31 mt. The shortfall in domestic supply is met through imports. Last year, India imported 8.74 mt of urea. The new urea policy will thus reduce our import bills. The policy will also result in direct saving of subsidy of around Rs. 2,618 crore and indirect saving of Rs. 2,211 crore on account of revised specific energy consumption norms and import substitution, respectively, during the next four years. Total sav-





**India's annual consumption of urea is 31 mt. The shortfall in domestic supply is met through imports. Last year, India imported 8.74 mt of urea. The new urea policy will thus reduce our import bills**

ings would thus amount to Rs 4,829 crore.

The government's move early this year to make it mandatory for domestic fertiliser firms to neem-coat at least 75 per cent of their urea production will also improve the soil health. This is aimed at checking the excessive use of urea which is deteriorating the soil health and adversely impacting overall crop yield. The department of fertilisers recently confirmed that the ratio of NPK application has worsened from 4:2:1 in 2009-10 to 8.2:3.2:1 more recently. The arrest in productivity growth of some crops and the loss of land fertility is attributable to the skewed use of NPK. The fertilizer subsidy, which makes available urea at a retail price of Rs 5,360 a tonne against the average industry cost of production of Rs 20,000 a tonne has been the main reason behind this. Neem-coated urea is a little more expensive than the plain variety, but it will more than compensate for that by reducing nitrogen (N) loss by 10 per cent and improving the fertility of land. Recently, the government has removed the cap on neem coating of urea, and has allowed fertiliser firms to coat the 100 per cent of urea produced by them with neem. With the use of neem coated urea, there will be more yield to the extent of 15-20 per cent and with less use of urea to the extent of 15-20 per cent. Besides, the higher usage of neem-coated urea would check diversion of urea for industrial use and make it more available in the fertilizer market.

The pro active policies is believed to impact the urea production and according to Union Fertiliser Minister Ananth Kumar, India will soon become an urea surplus state from a deficit state and start exporting it. Kumar told Lok Sabha during question hour that the country will produce 20 lakh tonnes additional urea after a number of pro-active steps, including revival of defunct fertilizer plants, taken by the government.

## Awaiting a 'New Year' in Agriculture

**F**or the year ahead, there are certain developments in the agriculture front that the whole country is looking forward to.



The nation is eagerly waiting for the new crop insurance scheme as announced by Government of India. Would a farmer get the crop insured as grown on his or her field? Or would it be the same old insurance product where the fortunes of a farmer are clubbed with many others growing same crop in a group of villages? Would the power of remote sensing technology be used first time to make crop insurance more meaningful to the farmers? Would agrarian distress be a thing of past as there would be in operation a robust crop insurance system?

A national market is on the anvil. It would be interesting to see whether notorious APMCs would allow it to function. Traders having license only for an APMC or a state will have to be allowed to bid nationally. In the absence of a national legislation, how would it work? Let the national market be a reality in the New Year in a real sense of the term.

Let a plethora of government's programmes be woven into Public Private Partnership programmes for establishing integrated value chains. PPP-IAD frame work is available. Let the New Year see it to be a major initiative of both, the Centre and the states. Let the New Year be the beginning of a revolution in which every farmer becomes a part of value chain from production till marketing in next five years.

Farmer Producers Organisation (FPO) are weak and disconnected from the market. Capacity building programmes are divorced from market tie ups. Let the New Year see a major initiative by the governments as well as corporates to integrate FPOs into their strategy for agricultural development.

Agricultural credit of Rs.8.5 lakh crores to one third of farmers contributing to Rs.5 lakh crores of agricultural GDP should worry governments, RBI and NABARD. Hopefully, the New Year would see a complete overhaul of the credit system. Let the New Year be a year of value chain financing for which new financial products are introduced which are combinations of crop and investment credit."

*Dr. Sudhir Kumar Goel, Board Member, Indian Council of Food and Agriculture and Chairman ICFA Working Group on States Affairs*



## In 2016, Food Inflation Management will decide Quality of Governance

**I**t is high time to do the reality check before it is too late. I can also paint a rosy picture and create illusion that everything is good and great. Will it help the country? We can choose to ignore the facts, but facts always prevail.

Growing population, stagnant crop productivity, growing imbalance in food supplies, growing import dependency on pulses and edible oils, lack of feed and fodder for livestock sector, increasing labour cost, depleting natural resources like soil and water, rising pollution, poor agriculture infrastructure and essentials like irrigation and quality seeds will decide the food inflation in India. Lack of action on ground, poor extension services and lack of timely availability of quality agriculture inputs to farmers will add to pressure on food inflation.

Per capita availability of food items is going down. Today, Food and nutritional security of India is becoming increasingly dependent on imported commodities. This is risky for sovereign political and economic policies of India.

Country is waiting for agriculture, food and feed security policy, action plan with timelines and resource allocation from the government. Until now, all the announcements made by government were to encourage private sector to invest and perform. So far, no action has been visible on agriculture, education and health care front. Cost of food, education and healthcare is going up. No action plan is visible about how to minimize these costs for common man. Food costs are already at its peak and in coming months it is likely to increase further. Farmers are suffering due to stagnant minimum support price (MSP) and rising input costs. Food provider, i.e. farmer, often remains hungry and helpless. Livestock sector also needs serious planning from breed, feed and fodder point of view.

Considering the complexities in agriculture sector and growing challenges for food security, it is advisable that government without losing much time must come out with agriculture, food and feed security policy for the country. Planning and Implementation will also take time. Agriculture is a state subject, and no state has plans to ensure food security. Planning at central level will be of little help because states will not execute them due to political short sightedness and resources constraints.

Concerns on rising food cost will force common man to stop spending money on non-essential items and this will seriously impact economic growth of industrial and non-essential services.

In 2016, economic growth will depend upon whether Indian policy makers, both at Center and state, will address the food inflation or not. Surplus disposal income in the hands of common man will decide the future of Indian economy. Nopolitical discourse inside or outside parliament or in media or on TV channels can improve economic condition unless common man has disposable income. Short-sighted political vested interest will derail the economy – stand on GST is clear evidence.”

In my view, performance of the government in 2016 will be judged by how they will manage food inflation and at what cost.

*Vijay Sardana, International Agribusiness & Commodity Expert*



### A national unified market

The last year, the government made an important announcement the one capable of revolutionizing the agricultural marketing. The Union cabinet's nod to the setting up of the National Agriculture Market will electronically unify agriculture market and introduce transparency and reduce intermediation costs. The concept of electronic agricultural markets is not new to India. National and regional players have tested the waters by setting up electronic cash and derivatives markets for trading in agricultural commodities.

Spot exchanges have been offering online trading in various commodities with standardised contracts wherein farmers, traders, processors, exporters, importers, can buy/sell in a transparent manner, with the exchanges providing counter-party guarantee for the trades. This has been a marked departure from the traditional mandi system and has helped facilitate efficient price discovery and transaction functions of the market place. Two national-level spot exchanges have achieved relatively better success in creating an electronic seamless spot market mechanism, largely by way of support of the exchange ecosystem of their derivatives exchange counterparts.

In the mandi system, farmers get a very low share of the rupee due to a long chain of intermediaries and cartelisation at the physical marketplace, which adds two major costs: the intermediaries' margins as well as multiple handling costs.

Further, there are various limitations under the current framework related to direct marketing legislation, multiple tax levies and licences, logistics and infrastructure. These challenges in the existing system and low returns to farmers prompted the Centre to visualise the creation of a unified National Agriculture Market (NAM). NAM has been proposed to induce transparency in the marketing system, leverage state of the art technology for a well-regulated market, and enable participation and benefits for the entire agri value chain, from farmer to consumer. The proposed NAM framework envisages real-time electronic auctioning of the commodities along with integrated assaying, weighing, storage and payment systems. It proposes to issue a single licence for trading across the country in order to promote increased participation. Assaying, weighing and FIs will be integrated with auctioning in such a manner that the payments will be credited directly to the farmers' ac-

## Enabling Policies for Scaling-up: Climate Smart Agriculture

**A**griculture in India is at cross roads in the 21st century largely due to scarcity of land and water resources to produce sufficient nutritious food and to provide improved livelihoods for 1.29 billion population. Current farmers' yields are lower by two to three folds than the achievable potential, largely due to unscientific and subsistence agriculture model which is one of the main cause of distress in agriculture. Through science-led development and enabling institutions and policies support for value addition through market linkages, agriculture in India can be transformed to a business model. A new paradigm of developing scaling up models for large impacts need to be developed by keeping aside the business as usual where different sectors and subsectors work in compartments and in the process new technologies/products do not

move forward from discovery to proof of concept and pilot stage to impacts. A holistic science-led development approach has shown good results in the state of Karnataka since 2009 through mission program Bhoochetana implemented by Department of Agriculture with technical support from ICRISAT benefitting 4.5 million farmers with increased crop yields and incomes by 20 to 66%. Such mission approach calls for building partnerships, use of new science tools (example, ICT, GIS, crop modeling, remote sensing, molecular breeding etc.) along with innovations in the area of institutions, capacity building, value addition and linking farmers to the markets.

For achieving impact on large scale, we need to undertake and develop science of delivery to reach millions of small farm holders. For developing agriculture in India as a business model, use of ICT not only for communication

and building the capacity but also for decision making based on real-time data analytics be promoted to benefit small farm holders. Mechanization of small land holdings calls for different approaches where each farmer may not have the expertise nor the resources to use all the mechanization unless new models through PPPs are developed for promoting mechanization.

Finally agriculture in India can be transformed through convergence of different actors and their actions and bringing transparency in the services provided through digital agriculture and PPPs where farmers can harness maximum share in the profits through value addition and market linkages."

*Suhas P Wani, ICRISAT Development Centre, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)*

## Raise Income of the Farmers

**I**ndian farmers have been in stress due to untimely weather and drought conditions for the last four consecutive years specially in Bundelkhand (UP) and Marathwada (Maharashtra) region. More than 1000 farmers are reported to have committed suicide in Marathwada region alone in the last one year. Governments need to hold the hands of these farmers by raising their incomes. One such measure would be to making Minimum Support Prices remunerative specially for pulses and other rainfed crops. Recommendation of National Farmers Commission to fix MSP at cost plus 50% seems reasonable. Second, governments should ensure operation of at least one public work under MNREGA in each affected gram sabha till the drought conditions last. Third, exports, agri processing and agri marketing need to be strengthened. Last, process of crop insurance claims settlement need to be made easy and fool proof".

*Dr Anis Ansari IAS (r), Chairman CARD*



will further facilitate unification of the isolated markets by rationalising the tax regime. The framework of NAM shall go a long way in encouraging private sector participation in marketing reforms, both for the physical as well as soft infrastructure.

The electronic national agriculture market will cover 250 mandis (wholesale markets) by next September. "The government has drawn a timebound programme for developing the agriculture market. The national e-platform developed for this proposes will cover 250 mandis by September 2016 and, by March 2018, a total 585 mandis will have the system," says Radha Mohan Singh, Agriculture Minister.

The national agriculture market will offer a common marketplace by providing real-time prices on a national level to the participants of the agri produce ecosystems. It will create a trading system that will enable transaction between buyers and sell-

counts. In this context, the Prime Minister's Jan Dhan Yojna can be a great enabler towards payment facilitation for marginal and small farmers. Well-equipped warehouses will be created in the vicinity of major production clusters. It will provide a dual benefit

to producers by averting the need to bring produce to the market physically and enabling them to avail funding against the commodities stored in the warehouses, thus strengthening the price risk management framework for the farmer. The imposition of GST



## Grain legumes: solutions to human health and agricultural sustainability

“Grain legumes (edible seeds of leguminous plants) are currently underutilised in comparison to cereals in spite of the known benefits to agricultural productivity, sustainability and human health. Grain legume production is static or declining in developing countries, in the face of an increasing global demand. These crops are grown across a range of farming systems, from subsistence agriculture to sophisticated commercial production systems, so research and development needs to target particular species to each of these various agro-ecological and cultural systems.

India is the largest producer and consumer of grain legumes. The current grain legume production in India is about 18-19 million tonnes. However the gap between demand and supply is widening and hence about 4 to 5 million tonnes of grain legumes are annually imported into the country.

Farming systems need to be profitable and sustainable to meet the growing needs of India's population and respond to the changing climate. Farmers need to optimise the use of inputs such as water and fertilisers.

Grain legumes have a significant role in cropping systems because of their sustainable and environmental benefits such as reducing the carbon footprint and the need for nitrogen fertilisers. They provide nutritious human food and animal feed in both commercial and low-input subsistence agriculture.

The health advantages of a grain legume-rich diet are many faceted. Their role in global health including the reduction of non-communicable diseases, such as obesity, diabetes, heart disease and neurodegenerative diseases is underappreciated. A diverse diet including a range of legumes is required for health benefits.

As part of the Worldwide Universities Network (WUN) a workshop on Legumes 2020: The hub of diversification and adaptation to climate change in agriculture was held at Zhejiang University, China on 22 to 25 November 2015. The key recommendations from the workshop included: (i) developing a global, publically funded network of shared access to germplasm and data, (ii) developing a better understanding on the health effects with regard to the global obesity epidemic and increased prevalence in diabetes, (iii) undertaking further research to understand cultural attitudes towards the use of legumes,

to promote the health benefits and how these can be effectively marketed, (iv) include more participatory approaches

to transfer of long established and recently developed technologies related to grain legume production to resource-poor rural communities, (v) developing a comprehensive understanding of the value addition chain for the particular sub-sector, to better understand the bottlenecks, (vi) undertaking fundamental research into biological nitrogen fixation and nitrogen use efficiency, as well as phosphorus in relation to climate change and (vii) developing the underpinnings of transformative technologies necessary for producing new elite varieties.

The above strategies should secure the position of grain legumes crops in agricultural systems and contribute the overall goal of food and nutritional security.”

*Professor Dr Kadambot Siddique,  
The University of Western Australia,  
Australia*



ers from their existing locations. This will expand the existing market as well as facilitate transactions in places where markets do not physically exist.

The year, 2015 brought with it a series of problems that deeply disturbed the agriculture balance of the country. It is time and again proved that agriculture is a risky affair and our farmers are still at the mercy of monsoon and nature to get a good crop. While the total exclusion of the climatic parameters in agriculture is never a possibility, the extent of the dependence however can be altered. The interests of the farmers need to be protected and they should be shielded from the after effects of these calamities. Hope the next year will bring with it fortunes and a good year for agriculture. ■

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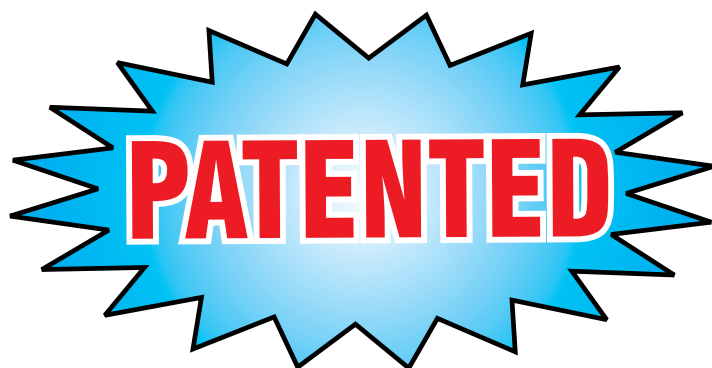
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# Agriculture Research and Education in India - Missing “Agribusiness”, missing “accountability”?

**R**esearch! A mere excuse for idleness; it has never achieved, and will never achieve any results of the slightest value” --Benjamin Jowett (1817-93), British theologian and Tutor in the University of Oxford. Over the years, a lot of activity has gone into agriculture research and education in the country. There has been increase in the production of various crops. The country had witnessed one green revolution during the sixties and is aiming for a second green revolution in the coming future. However, there has been an undying debate on the increase in wellbeing of the farmers and the debate never ceases for decades now. Indian farmers, who are feeding the nation, don't get enough yield, do not get the price they deserve and are always painted as a poor, hand to mouth folk.

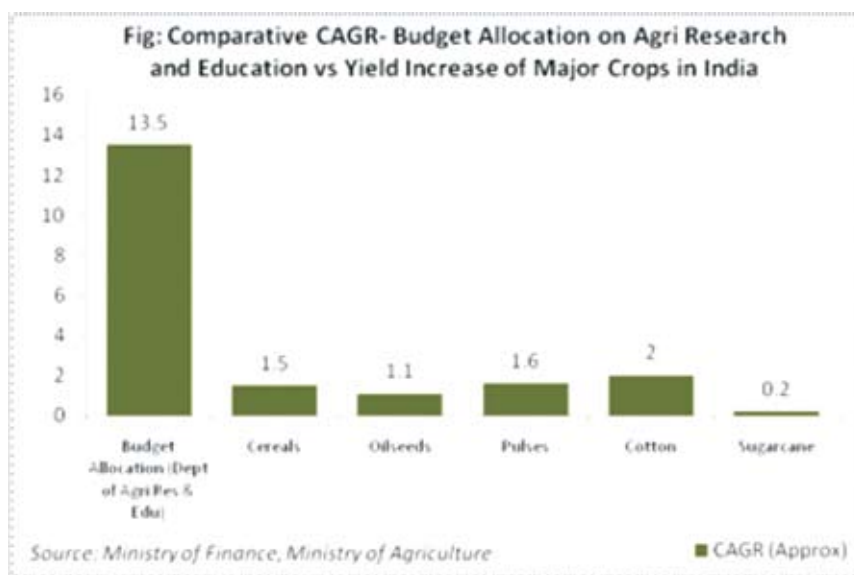
Agriculture research and education, though not the only one, but is a very important instrument for bringing welfare to the millions of farmers across the country, mainly through cutting edge research and extension. Some would opine that it's difficult to ascertain a kind of a “return on investment” in academic research and education. However, from simple management point of view of “something that cannot be measured cannot be managed”, perhaps a time has come to make an attempt of quantification on the return from the billions of rupees spent on agriculture research and education in the country. Like any other sector, accountability should be in place for how and where the large amount of government money allocated on research and education for developing the agriculture sector of the country is spent. Like any other sector, perhaps time has come also for the scientists to take care of how much of investment has gone into a particular government funded research program and what is the net outcome in

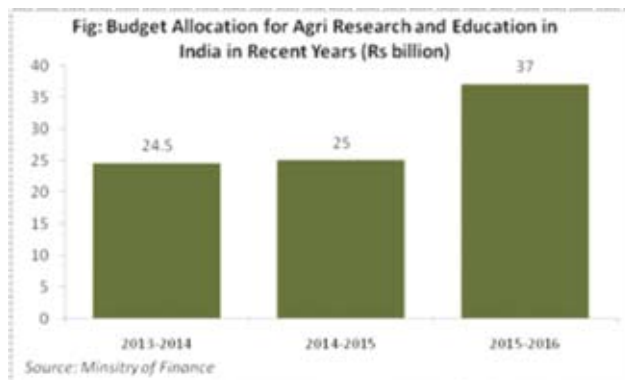
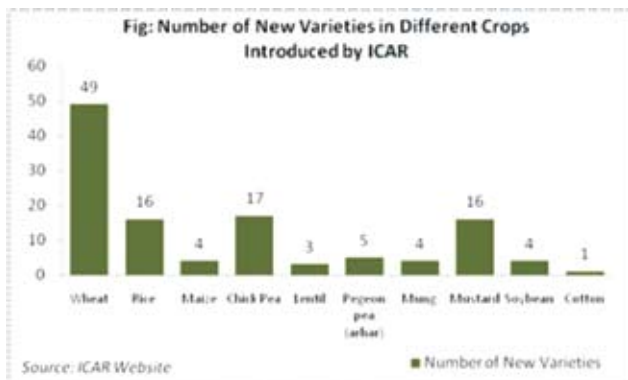


terms of quantitative and qualitative aspects of each project.

Just a quick crunching of data for a 20 years period reveals that while budgetary allocation in the agricul-

ture research and education department under the ministry of Agriculture and Cooperation increased by a CAGR of 13.5%, the CAGR of yield increase of some of the major crops





grown in the country has grown by 1.5% for cereals (rice, wheat, maize etc.), 1.1% for oilseeds, 1.6% for pulses, 2% for cotton (notwithstanding the fact that yield of cotton has increased significantly in the country after the introduction of Bt cotton, which is again not totally a R&D outcome of Indian agriculture research institutes) and sugarcane by 0.2%. Though no one is arguing or demanding that there has to be a direct correlation between CAGR of budgetary allocation for agriculture research and education and CAGR of yield increase of important crops of the country, however, one could always ask for a decent quantifiable return on the investments made in agriculture research across the country.

A simple search on the website of the Indian Agricultural Research Institute (IARI, also known as the “mecca” of agriculture research in the country) reveals that so far, 49 new varieties of wheat, 16 new varieties of rice, 4 varieties of maize, 17 for mustard, 3 for lentil etc (as shown in the graph) have been developed. There is no mention of the period though and therefore one can consider the numbers to be since the inception of IARI! There is also no mention of how many of these new varieties have been commercialized so far and adopted on a large scale by Indian farmers so that one can get some idea about some direct/indirect reference to the return on investment made to develop and introduce these new varieties.

There also seems to be a total disconnect of the agriculture research and education sector from agribusiness. Various research and development programs across major agri-research and education institutes in the country appears to be heavily tilted towards theoretical and technical research aspect whereas the financial and business related aspects of agribusiness are given a side glance. Majority of the scientists and the agriculture educationist in the country till today believe that their job is solely to increase yield and production techniques (though one could argue about the amount of significant success achieved so far even in this area) and they have nothing to bother about imparting “financial” and/or “business” literacy to farmers. Till today, a vast majority of the farmers are unaware that they are actually doing some serious business opera-

tions in the form of agribusiness and they have hardly even learnt to maintain a basic book of account. One understands the argument around illiteracy of majority of farmers in the country but the question here is, has there been any attempt on, for example developing an easy to maintain book of account by farmers, or for example a handbook of basic business principles involved in agribusiness etc. It is not good to always consider farmers to be naïve and fool, and proper training to farmers and some simple financial tools can help them to understand that what they are actually doing in the name of agriculture is actually a serious agribusiness, alike any other business. Even while implementing various programs of government like the latest Farmers Producer Organizations (FPOs), from experience of working on the ground, one finds that there is hardly any mechanism or system in place to provide “market literacy” or “financial literacy” to the farmers. A purely commercial entity like FPO are still given hundreds of trainings for example on the advantages of line sowing, improved varieties to be adopted etc. but hardly any training on making them understand the basics of business and how to do a business. They are still today taken for exposure visits to a number of research institutes, each of them doling out the same old “gyan” on technical aspects of crop cultivation and hardly there is any attempt to expose them to any real time business process scenario or business organization.

Perhaps time has come to develop some mechanism for a quantifiable return on investment on research and education of the Indian agriculture sector, link research programs more intricately to agribusiness and overhaul the research institutes in terms of going beyond academic research and intricate business, which is actually the integral component of agriculture, perhaps one of the most ancient business activities of mankind.

While the article started with a very negative thought of a renowned academican on research, there is perhaps also some light at the end of the tunnel.

“Science is the belief in the ignorance of the experts”-- Richard Feynman, American physicist. ■

**Pinaki Ranjan Dey, Executive Director,  
Indian Council of Food and Agriculture**



# BIG DATA ANALYTICS IN AGRICULTURE

**T**he humungous quantity of digital data available to us is changing the way in which we think, do business and conduct our day-to-day lives. Services industries such as E-commerce, financial services and retail have already witnessed the benefits of the science. The phenomenon, aptly known as 'big data', has the potential to revolutionize agriculture as the demand for food increases rapidly alongside the briskly growing population.

Big data is defined as large and complex digital data sets, structured and unstructured, collected from wide variety of sources. The magnitude of the data requires it to be analyzed only through sophisticated data processing applications. According to leading industry analyst Doug Laney, three parameters – volume, velocity and variety – define big data. IBM, the global IT consultancy, estimates that 90% of the world's information since

the beginning of history was collected in the last two years.

The intervention of this science in a field as diverse as agriculture is rather interesting. The Food and Agriculture Organization (FAO) of the United Nations estimates that global food output will need to increase by at least 60% by 2050 to meet the demands of a rapidly growing world population. At the same time, the earth does not have too much land left to entertain this demand. Hence, as much as 91%

**Big data analytics intervention can help farmers become more efficient and effective in their operations. The technology helps precise decision-making by guiding farmers in their approach to planting, nurturing and harvesting processes**

of the increased production will have to be sourced from yield increases and advances in productivity. Big data analytics will play an extremely important role in ensuring that this happens.

## Understanding Big Data Intervention in Agriculture

Agri-scientists are extremely excited about the opportunity to unite big data and agriculture. According to them, the merger has the potential to usher in the second generation of green revolution around the world. Critically, the knowledge of big data can help create an environment for farmers to capitalize natural tendencies to harvest more crops at a lower price. In addition, it can promote the popularity of natural processes and help retain natural phytonutrients. According to experts, the intervention of big data will impact the application of water and chemicals and the effective use of natural fertilizers.



One of the best examples of big data intervention in agriscience is that of precision agriculture. IBM explains the science as follows: "Traditionally, agriculture is practiced by performing a particular task such as planting or harvesting against a predetermined schedule. But by collecting realtime data on weather, soil and air quality, crop maturity and even equipment and labour costs and availability, predictive analytics can be used to make smarter decisions. This is known as precision agriculture." One of the methodologies of precision agriculture imbibes the use of global positioning system (GPS) technology in large fields. The GPS co-ordinates give concurrent information on assorted variables such as soil and elevation. With the assistance of these finely tuned planting tools, farmers can monitor in real-time – while they are planting – where every seed is placed. The technology also comes in handy at the time of harvesting the crop. With the help of yield monitors agriculturists can measure the yield across every metre of their land. This is just a single illustration of big data intervention in agriculture that can help farmers in increasing yields, decreasing time, optimizing costs and enhancing profits.

### Employing Big Data to Feed a Growing World

Much of the population growth in the years to come will happen in emerging countries, which co-incidentally are also agrarian economies. The challenge is to enable these economies to capitalize sustainable technology to maximize food production, minimize environmental damage and reduce costs. For instance, 90% of all crop losses are due to weather. Weather-related crop damage could be reduced by as much as 25% by employing big data intervention. Here is where technologies such as precision agriculture and predictive weather modelling come in.

Big data analytics intervention can help farmers become more efficient and effective in their operations. The technology helps precise decision-making by guiding farmers in their approach to planting, nurturing and harvesting processes. In post-harvest



practices, big data intervention can help reduce wastage of the commodities' journey from farm to fork. The impact of this intervention can be huge – research shows that 50% of the crops harvested are lost during transmission. To illustrate, the science of predictive weather modeling can be employed to understand the effect of weather on transportation networks. With the aid of this knowledge, companies and farmers can make better decisions on deciding which route would be the best option to transport the harvest in the most time-effective manner. Consequently, supply chain efficiency has a positive impact on the price points of commodities. Thus, all stakeholders across the agri value chain – including the farmers, customers, consumers as well as the economy – are benefited. The enhanced levels of efficiency lead to lesser wastage and hence, a less hungry world.

### Big Data Analytics in Indian Agriculture

India is an agrarian economy although the contribution of the sector towards the national economy has reduced drastically over the years. According to Central Statistics Office estimates, agriculture and allied sectors will contribute 16.1% of gross value added (GVA) during FY15. In terms of employment, the sector is a source of livelihood to nearly 59% of the rural households. Though India is one of the largest producers of food globally, it has the dubious distinction

of losing one of the highest amounts of food grains owing to inefficiencies in post-harvest infrastructure. Big data analytics in Indian agriculture could change the disproportionate situation and enable farmers to earn more for their efforts.

The big data strategy is in tandem with the Digital India initiative, which aspires to empower the remotest hamlets across the country with the power of the internet. The data that can be acquired through the process can be mind boggling. However, the challenge is to capitalize this super abundant data for the revitalization of the agriculture sector and for the welfare of the farming community. To put things into perspective, India is home to an estimated 500 million farmers and the status of the agriculture sector would change substantially if data scientists avail every micro-bit of data from even a portion of these farmers and process it in real time. The outcome can be mind boggling when the same exercise is replicated on a larger and comprehensive scale.

Indeed, if meticulously formulated and earnestly implemented, the big data phenomenon holds the key to solve the three major problems of post-harvest processes in India including procurement, storage and distribution.



**Mr. Amith Agarwal,**  
*Co-founder & Executive  
Director, StarAgri  
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Management Company*



# Customised Fertilisers

## Preferred Products of the Future

Coromandel International Limited, India's second largest Phosphatic fertilizer player, is in the business segments of Fertilizers, Specialty Nutrients, Crop Protection and Retail. The Company manufactures a wide range of fertilizers and markets around 3.2 million tonnes making it a leader in its addressable markets. In its endeavor to be a complete plant nutrition solutions Company, Coromandel has also introduced a range of Specialty Nutrient products including Organic Fertilizers. The Company clocked a turnover of Rs. 11,285 Crore during FY 2014-15. It was ranked among the top 20 best companies to work for by Business Today and was also voted as one of the ten greenest companies in India by TERI, reflecting its commitment to the environment and society. Coromandel is a part of the INR 269 Billion Murugappa Group. In an interview with Agriculture Today, Dr. Ravi Prasad, President, Corporate Affairs & Strategic Projects, Coromandel discusses the general scenario of fertilizer industry in India.



### What is the outlook of Indian fertilizer industry in the current fiscal?

Indian fertiliser industry outlook in this current financial year, is progressive. As far as volumes are concerned when compared to the earlier year, even though the precipitation and monsoons were not satisfactory, overall growth has been registered in the volume of sales, but the consumption levels are not satisfactory as the movement to farmers has not been encouraging. Poor liquidity in the market today is an added problem, which has resulted in poor collections from trade. The impact of the monsoon has been extremely bad on crop productivity and quantum, resulting in poorer returns to the farmer. Disbursal of subsidy payments also has been largely satisfactory till November, but with the clearance of old arrears, subsidy amounts have started drying up for the urea group, and soon the subsidy payments for the P & K group are expected to stop, as the budget would have been exhausted. Interest burden due to receivables from the market has gone up as companies had to borrow large amounts of working capital; warehousing costs have gone up due to high volumes of stocks and receivables on account of subsidy, i.e., old, balance payments have also started impacting working capital borrowings significantly. Overall situation is satisfactory.

### Are you satisfied with the current per capita consumption of fertilizers? How can the present situation be improved?

In the current situation, the per capita consumption is very high in some states and extremely poor in others. This needs to be corrected. We cannot have Andhra Pradesh at 227 kg, and Odisha at 98 kg, while Assam languishes at 65 kg. If the states where irrigation potential exists and large tracts of land are cultivated, consumption should increase significantly, otherwise our overall food production targets will be affected. As some states will over fertilise their soils and damage their soil structure, while

many others will not apply requisite dose, thus impacting productivity. Focussed activity is the need of the hour to correct this imbalance. Further amongst the nutrients, excessive usage of a particular nutrient should be avoided, as this may cause imbalanced use of fertilisers.

### **How significant is the fertilizers for Indian agriculture?**

Fertilisers today have become an integral part of agriculture. High yielding varieties of seeds respond to fertilisers giving bountiful yields. It is also a known fact that for crop yields, 50% contribution is attributed to fertilisers. Therefore for meeting the food grain target of 280 million tonnes, fertilisers are critical. It is also a known fact that all macro, secondary and micro nutrients are essential for crop nutrition.

### **What are the new trends in fertilizer market?**

As far as India is concerned, trend is shifting towards fortification of fertilisers, with micro and secondary nutrients. Use of water soluble grades of fertilisers and bio tech compounds are also gaining importance. Organic carbon replenishment through MSW and sugarcane pressmud is gaining popularity. Neem oil coated urea is also becoming popular with the farmers. Micronutrient usage especially boron is being encouraged by various governments.

### **What is the scope of new generation of fertilizers in India?**

As long as the subsidy system continues for some products, which are selected in the NBS, the scope of growth of new products is limited. New generation products need to be on even platform with subsidised products to be acceptable to the farmers from price point of view.

### **Do you think the introduction of soil health card will**

### **positively improve the way fertilizers are applied in the field by farmers?**

While the overall capacity is around 12 million samples per year, the average samples collected did not exceed 10 million per year. With over 125 million ha of arable land, comprehensive sampling, of every hectare of land makes it almost impossible. With average holding of less than 2 ha of land, if all the land holdings have to be sampled as a part of soil health mission, at current capacity levels of soil testing it will take 12 to 14 years and in this period, the first set of sampled fields would have undergone drastic changes as far as nutrient status is concerned. Therefore this activity is a long term exercise which needs to be followed with missionary zeal to succeed. Based on the soil analysis, farmers can be trained to apply the required dosage of fertilisers.

### **Recently lot of emphasis is being laid by the different state governments on organic agriculture. Being a chemical fertilizer company how do you view this trend?**

Soil organic carbon is essential for improved fertiliser use efficiency and reduction in the use of nutrients, ultimately leads to reduced fertiliser subsidy. Our country's soil organic carbon levels have deteriorated to dismal levels which need to be reversed. Use of compost from MSW, pressmud, improves soil organic carbon levels dramatically. Our company is the pioneer in the marketing of organic fertilisers, like compost, low grade potash from molasses, PROM, oil cakes and branded gypsum. Currently, this set of products need encouragement from government in the form of marketer subsidy so that the end product is made available to farmer at affordable rates. The government of India through the 'Swachh Bharat' mission, is aiming at clearing accumulated garbage in many cities which can be converted into compost and thereby providing

vital Carbon to Indian soils while simultaneously cleaning cities and protecting the health of the citizens.

### **What are the challenges ahead of fertilizer industry?**

The industry today faces a bleak future as far as working capital is concerned. Since agriculture is not considered by the banking industry as a priority lending field, and fertiliser subsidy is always budgeted lower than the projected estimate, industry is unable to invest in profitable areas. Introduction of new products is still a painful and prolonged process. NBS has also restricted the distribution of subsidy to existing group and extending this group further is also time consuming. The return on investment is very poor and capital investments for greenfield plants both within the country and outside is frightening. With a significant move towards direct transfer of subsidy to farmers, the working capital pressure may ease. Excess use of urea needs to be curbed and newer grades need to be popularised and introduced. Allocation of natural gas to fertiliser sector and assured supply would help remove the capacity limitation of manufacturing urea and ammonia. Improved availability of phosphoric acid would help improve indigenous manufacture of Phosphatics, and complex fertilisers. Fortification will reduce application cost of micronutrients, while simultaneously improving crop yields.

### **What future changes do you see in this sector?**

Consolidation of the industry will take place across the country. New grades, unique grades will be well accepted by the cost conscious farmer. DBT will reduce working capital issues for the industry. Electronic intervention and ICT would enable transfer of technology through cell phones. Brand building initiatives will be taken up, once the fixed freight policy is introduced. Customised fertilisers would be the preferred products of the future.



# 2016 INTERNATIONAL YEAR OF PULSES

2016 has been declared by the United Nations as the International Year of Pulses under the slogan 'nutritious seeds for a sustainable future'. The spotlight on pulses, focusing global attention on this unsung commodity, comes not a day too soon. With prices of pulses going through the roof, the humble "daal", the main source of protein in the aam aadmi's meal, is soaring out of reach.

Pulses have played an important role in the Indian diet and in the country's farm economy. In combination with wheat or rice, daal-roti or daal-bhaat, pulses describe the average bill of fare. They are a rich source of protein, and together with snacks and savouries complement cereals in the food thaali. The value of pulses in the average diet is assessed from the fact that compared to most commonly consumed vegetable foods, they contain the highest level of protein (20-25%) per 100 gram of edible portion. Their protein content compares well with that of egg and

meats. For a balanced diet, however, both the quantity and quality of protein is essential. Pulses in appropriate combination with cereals provide the essential amino acid balance needed for growth and maintenance of health.

It is, therefore, a matter of concern that the ratio of per capita availability of cereals and pulses which was 1:0.17 in the early 1960s has declined to 1: 0.08 in the years 2012-14. This implies that for every kilogram of cereals consumed, the amount of pulses consumed has reduced to half during the last fifty years. The tardy, almost stagnant, growth in pulse production, relative to that of cereals – especially wheat and rice -- is leading to distortion in dietary balance.

Besides serving as an important source of protein for a large portion of the population, pulses also contribute to healthy soils and climate change mitigation through their nitrogen-fixing properties. Moreover, they are able to utilize limited soil moisture and nutrients more efficiently than cereals. They

are especially suitable for low external input sustainable agriculture.

## Declining trends in pulse availability



*Dr. Rita Sharma*

Pulses occupy a unique position in Indian agriculture. They are cultivated on around 23 - 25 million hectares. No other country in the world has as much area under these crops as India. Pulses production received a setback in the aftermath of the Green Revolution. Annual pulse production which was about 11 million metric tonnes in the early-1960s increased to 18 million metric tonnes between 2012-14, an increase of 63% in the past five decades. In the same period, population rose over 175%. Consequently, per capita availability of pulses fell from about 65 grams to 42 grams per day.

Cereal production over the last half century rose substantially, especially wheat and rice. The former increased by over 850%. Wheat output is now over five times the production of pulses, whereas both were almost equivalent in the pre-Green Revolution period. Per capita availability of wheat more than doubled from about 75 grams to over 180 grams per day. This change in production mix of cereals and pulses has important implications for balanced diet and nutrition especially for low income households whose primary source of protein is derived from pulses.

There are many reasons for this state of affairs. With the advent of the modern improved varieties of wheat and rice, cropping patterns in



prime irrigated agricultural locations shifted to high-yielding cereal varieties. Minimum Support Price (MSP) and State procurement of wheat and rice provided further incentive to farmers to switch to these cereals. There was no similar scientific breakthrough in pulses technology. Their yields remained at low level between 700 to 900 kg/ha in contrast with say wheat, where yields tripled to over 3200 kg/ha. Consequently, these legumes were relegated to marginal and less fertile lands in rainfed conditions and treated as residual crops with little attention to pest and nutrient management.

Government's MSP system did not prove as effective for pulse procurement as it did for rice and wheat. Moreover, with high levels of fluctuation in output, farmers consider pulses as a risky option being prone to biotic and abiotic stresses. 85% of pulse cultivation is under rainfed conditions. A poor monsoon can severely affect output. Besides, the option of importing pulses to augment supply is limited because pulses such as arhar, urad, moong, masoor, etc. are not grown in abundance anywhere else.

70 per cent of India's annual pulses production comes from the four states of Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. Any drought or unseasonal rain, pest or disease attack can seriously jeopardize domestic supply leading to spurt in prices, as is happening currently with back-to-back acute monsoon deficiency, two years in a row in Maharashtra, Karnataka and Uttar Pradesh. Bundelkhand accounts for almost 40% of UP's pulse production.

While there was no quantum jump in yields of pulses, the scientific breakthrough did come in the form of short-duration varieties. Arhar which used to occupy the field for 240-270 days has given way to short-duration (140-160 days) varieties which fitted well in crop sequences. This has provided opportunity to farmers to accommodate other crops in the same area. Development of short-duration varieties of pulses has helped increase the area and production under arhar despite no improvement in productivity. Similarly,

short-duration moong varieties (60-70 days) with synchronized maturity and resistance to yellow mosaic virus have been adopted as catch crop during summer season (between rabi and kharif) in a wide range of intensive cropping sequences. Large area under moong is covered in Andhra Pradesh, Maharashtra, Orissa, Bihar, Karnataka, Orissa, Tamil Nadu and U.P. Area under short-duration urad, especially in rice fallows cultivation in Andhra Pradesh, Karnataka and Tamil Nadu, also received a boost. Promotion of pulse cultivation under the National Food Security Mission and the 60,000 pulse villages programme, with emphasis on short-duration varieties succeeded in increasing area to a record 25.23 million hectares and the highest output of 19.27 million tonnes in 2013-14 despite average yields at a mere 800 Kg/ha.

### The way forward

The Indian Institute of Pulses Research (IIPR) has projected that by 2030 pulses requirement will be of the order of 32 million metric tonnes. To meet this demand, additional 3-5 million hectares will have to be brought under pulse cultivation and productivity will need to rise to over 1350 kg/ha from the current about 800 kg/ha.

The strategy to meet the projected requirement can be broadly categorized into short, medium and long term.

In the short-term some of the suggested measures could include (i) timely import of pulses and their effective distribution; (ii) incentivizing the producer through an attractive MSP and a robust procurement network; (iii) active involvement of the National Dairy Development Board, the Small Farmers Agri-business Consortium (SFAC) through Farmer Producer Companies and their sale/ distribution at various outlets. (iv) rationing of pulses at subsidized rates to BPL households through the Public Distribution System; (v) inclusion of pulse-based snacks/ food in the mid-day meal programme of schools; (vi) enforcement of the National Food Security Act in all States to enable the BPL households to save on wheat and rice and free-up income to purchase pulses; (vii) action under the Essential Commodities Act

to recover illegal stocks from hoarders and black-marketeers (viii) expediting the crop insurance scheme to cover risky crops such as pulses.

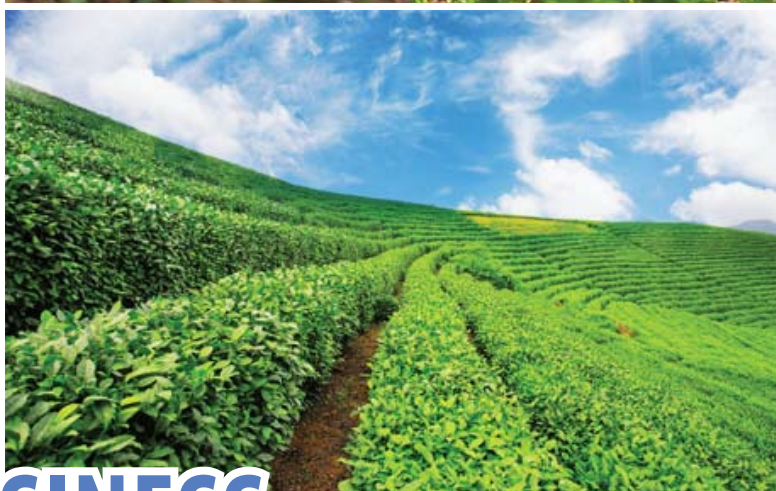
In the medium-term to (i) create buffer stock of around two million metric tonnes and release it to stabilize prices; (ii) plan for imports well in advance based on realistic and scientific projections of domestic output; (iii) mount a campaign for reducing post-harvest losses and monitor closely; (iv) organize Self-Help Groups under the Aajeevika Mission to produce quality seeds in adequate quantity (v) coordinate with on-going programme of Saansad Adarsh Gram Yojana and Climate Smart Villages to factor in pulses in crop rotations.

For the long-term (i) orient research and extension to fit pulses into all farming systems through inter-cropping, cultivation in fallows, field-boundaries; (ii) incentivize farmers in irrigated areas to take up pulse production through re-orienting the subsidy regime (iii) highlight the climate-smart aspect of fitting pulses into crop rotations especially with Agroforestry (iv) develop both short-duration and high yielding varieties; (v) breed stress-tolerant varieties to be resistant to biotic (pest & diseases) and abiotic (drought) pressures (vi) contract farming in land-abundant countries to grow pulses for India.

The International Year of Pulses, 2016 provides a unique opportunity to reflect on the status of pulse production in the country and the growing mismatch between availability and demand for pulse-protein, essential for nutrition security, especially of the weaker sections. It is time we got our finger on the pulse.

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# KENYAN AGRIBUSINESS THE INVESTMENT DESTINATION

Agriculture is integral to the Kenyan economy. Employing 60 percent of the working population, the sector accounts for 65 percent of Kenya's export earnings and directly contributes about 27 percent to the country's GDP. However, the contribution to the GDP has increased only by 4 percent over the last decade. Realizing the agriculture potential of Kenya, it comes as no surprise that many local and foreign firms are increasingly building partnerships. In addition, firms are keen on introducing technological innovations such as M-Farm to increase revenues in the sector. The impacts of these innovations are garnering attention

worldwide.

Kenya has a very diverse agricultural sector ranging from cash crop farming (coffee, tea, sugarcane, and cotton), dairy farming, horticulture, apiculture to aquaculture. The ongoing implementation of the country's Agricultural Sector Development Strategy (ASDS), which is projected to raise agriculture's GDP contribution in line with Kenya Vision 2030 is instrumental in stimulating a heavy shift from subsistence farming to value added agricultural production and agricultural export. New technological developments such as Mbegu Choice and M-Farm have been developed locally for Kenyan farmers. Mbegu Choice is an online application that enables farmers to

plant the most appropriate seeds for their soil and climate. M-Farm provides a suite of services to farmers including up-to-date market prices via an app or SMS, direct connection with buyers and production analysis to increase profits. M-Farm has been instrumental in innovating the way farmer's access information, providing information on 42 crops in 5 markets across the country. Utilisation of these technologies will enhance agricultural output increasing Kenya's competitiveness in international markets. With these factors in place, Kenya's agricultural sector is ready for a boom.

Farm mechanisation is an important element in modernizing Kenyan agriculture and undoubtedly a potential



area for partnership between India and Kenya. Farmers in Kenya are already using machinery developed in India including harvesters and tractors. In 2014, Kenya had around 15,000 tractors whilst the actual requirement was for almost 100,000. The other area where India can partner in creating Kenya's own agri revolution is harnessing solar power for farm mechanisation.

Kenya's agricultural sector is increasingly focusing on value added agriculture as opposed to exporting raw materials to other countries for processing. According to World Bank statistics, the country's Value Added Agriculture as a percentage of GDP rose from 27.8 percent in 2010 to 30.3 percent in 2014, signifying increased value added activities. This has in turn led to an increase in demand for local agricultural produce, farmers' profits, in addition to increased share of the sector's contribution to GDP. There are immense investments opportunities in value addition. Value addition opportunities exist in processing edible oil from simsim, sunflower, and groundnuts in addition to palm oil. Other opportunities exist in avocado, strawberries, leather and cotton processing.

Establishing continued growth for agriculture requires adaptation and mitigation to the effects of changing weather patterns. In recent times, the government has taken various steps aimed at increasing food security and increasing agricultural production by increasing the amount of irrigated land. Only 105,000 ha of land in Kenya is currently irrigated, although irrigation potential stands at 540,000 ha. Kenya's one million acres 'Galana Kulalu Irrigation project' in Tana River and Kilifi counties, once complete will have 500,000 acres of land under maize production, 200,000 acres under sugarcane farming, and 150,000 acres on beef and game animals, 50,000 acres under horticulture, 50,000 acres for dairy farming and the remaining 50,000 acres to

grow fruits. The Ministry of Agriculture indicates that more than 80 local and international investors have expressed interest in the projects, thus highlighting the attractiveness of investing in the agricultural sector.

Although Kenya is a leading producer of cereals (maize, wheat, rice and sorghum) in the East African Region, demand for the cereals outstrips supply. The country has yet to reach its potential in cereal production. Increased Indian investment, along with rapid population growth and product demand, creates considerable potential for the development of Kenyan agriculture. Greater cooperation in the agricultural sector will create an opportunity for both the countries to address the challenges in food security and the disparity in product supply and demand. Assisting through technological expertise and infrastructure development could reduce the cost of crop production, including that of maize, which currently depends on manual labour and crude farming methods. India's manufacturing industry can also directly benefit from this relationship through the export of maize milling and maize grinding machines to Kenyan farmers. Shared agricultural expertise between India and Kenya could also assist in the establishment of better crop disease management practices.

Kenya has diverse opportunities for investment in food production because there is a large gap between production and consumption of various agricultural produce. A good example of this is sugar. While Kenya produces around 550,000 tonnes of sugar annually, annual demand stands at 800,000 tonnes signaling a 300,000 tonnes deficit mostly filled by imports. In order to boost production, the government is focusing on privatising



five millers in the country to increase efficiency and increase output. In addition, a number of international investors are seeking to invest in the sugar industry. Wheat production, in the country stands at 320,000 metric tonnes while annual consumption is 900,000 tonnes, with the country importing more than half of its annual requirements. Kenya consumes 300,000 tonnes of rice annually against a production of 45,000 to 80,000 tonnes. .

Although Kenya's agricultural industry has its share of challenges, the sector oozes immense potential. Over the next few years, the sector is projected to contribute significantly to the country's targeted economic growth of 10% per annum in line with Vision 2030. With the strategic support of the Kenyan government, intelligent investments from the international and the local private sector, and Kenya's entrepreneurs finding new markets for their value-added products, the future for the sector is very bright. Events like Kenya International Investment Conference – KIICO2015 –organised by the Kenya Investment Authority (KenInvest) offers a platform to international, regional and domestic investors to consider business opportunities across various sectors of the Kenyan economy, including Agribusiness as a key growth industry.

**Dr. Moses Ikiara,**  
Managing Director, KenInvest, Kenya

# BROAD SCENARIO AND DEVELOPMENTS IN COLD-CHAIN SECTOR

India has developed an enviable capacity in terms of cold storages across the country. This development has helped single season harvests of crops like potatoes and fruits like apples to be traded and supplied all across the year. A major success story is the case of potatoes, which though not native to India, have become a staple food item, thanks to cold stores. In case of dried chillies too, the opportunity to trade across seasons has opened up because of extending their holding life in cold-chain.

India can lay claim to having created almost 7200 cold stores equivalent to almost 33 million tonnes in holding size (Between 2014 and July of 2015, India added about 200 units of million tonnes to its cold storage space). Though about 5% of the facilities may have become obsolete over the years, as per the 2014 report by International Association of Refrigerated Warehouses (IARW), India had 131 million cubic metres in cold storage capacity, overtaking USA which has 115 million cubic metres. China

has the third largest capacity globally with about 76 million cubic metres in cold storage space. The worldwide capacity in refrigerated warehouses was reported as 552 million cubic metres in this report by IARW.

India's cold stores also are used to service market demand for the "cannot-do-without" segment like ice-creams and frozen or processed products. However, there is another market demand, the "must-do" segment of fresh fruits and vegetables that remains under serviced by the Indian cold-chain. This set of produce types are emphasised as "must-do" as they are of great import to our large small holding farming base, the economic inclusion of these farmers in overall development and to fulfil domestic demand shift for higher nutritional value foods. India will remain one of the largest demand centres for vegetarian foods (fresh fruits and vegetables) in the foreseeable future and this demand should be primarily met by domestic produce.

The importance is even more critical because fruits and vegetables suffer the high-

-est level of loss in their 'to-market transit' from farms and this loss effectively has a negative impact on our environmentally friendly agendas. Every kilo lost has a multiplier effect in the loss incurred of input resources, such as water, fertilizer, power and effort, besides degrading economic value. Today, it is estimated that horticulture alone contributes to almost 30% of total agricultural GDP (a remarkable feat considering that only about 15% of cultivated land is under horticulture). Every percent of value saved from loss, will only add to economic development of our nation.

So, despite the largest capacity in cold storage, what is missing in our cold-chain, and where lies the lacuna? Number one, the concept of cold-chain needs to be understood at the conceptual level. For too long has "cold-chain" been held synonymous with developing or creating cold stores. Just because we have had success with long term storage of potatoes and dried chillies, one cannot assume the same mechanisms will hold true in case of other perishable



produce.

A tomato, spinach, okra, mango, papaya or banana will not remain edible across months like potato. These food types can buy a short time in the cold-chain, a life extension of a couple of weeks or so only. In these cases, much like in the case of milk, the cold-chain needs to operate as a conduit to markets. Mere storage facilities will not serve the purpose - held in cold stores, these food items will still perish and all involved will incur a loss. The alternate is to process all the fresh produce into canned, frozen or preservative based products, but consumer demand for fresh whole produce continues to grow.



Since, the majority of our fresh whole produce does not have long term holding ability, a dynamic time sensitive and market linked approach to cold-chain development is required. The time bought through the application of cooling and other scientific handling, needs to be utilised to carry the produce to consumption end. To serve as an effective market conduit, the cold-chain requires more development in the form of farm-gate pack-houses, reefer transport and distribution hubs. Such a chain of infrastructure components will help set up meaningful supply chains, making Indian agriculture more relevant and future ready.

Keeping in mind that India's agricultural mainstay is rapidly moving towards high value produce (fruits, vegetables & livestock), cold-chain logistics has been directly linked as part of the second green revolution. The

*"Since, the majority of our fresh whole produce does not have long term holding ability, a dynamic time sensitive and market linked approach to cold-chain development is required"*

policy makers have put in place appropriate support mechanisms to develop the missing links in cold-chain development and thereby realise this hitherto untapped potential. In the 2015 budget session, preconditioning of fresh produce was made exempt from service tax. This preconditioning (sorting, packing, precooling, etc.) activity is undertaken at modern pack-houses and critical to initiating the flow of fresh farm produce to distant markets. Modern pack-houses with pre-coolers are provided a 35% capital subsidy (50% in scheduled areas). Refrigerated transport, a much ignored yet key missing link, is also subsidised for promoters. In addition, to boost multi-modal transport (railways, waterways, roadways), reefer containers for domestic use are also subsidised. The erstwhile subsidy for old stores has been rationalised and minimum system standards

have been developed to help the users. To ensure that subsidy is utilised for physical creation of infrastructure, the assistance is directly linked to bank credit and is disbursed after commissioning of the asset base.

A tax deduction of 150% of the capital invested in cold-chain infrastructure (vehicles, pack-houses, storage) can be availed. Income tax exemption is also offered for the first ten years. Besides the fiscal and financial support from government of India, foreign direct investment into cold-chain logistics is open for 100% through the automatic route. A low interest credit window for private entrepreneurs was also opened in the previous year through NABARD, with a corpus of Rs. 5000 crores. This can be availed by promoters for all components that comprise cold-chain logistics.

The whole world eyes India as a burgeoning market, including for food. Whereas demand for other consumer goods will see large variations for various reasons, demand for food is eternal. India actually produces enough to meet its domestic demand and with appropriate logistics networks, will have greater reason to produce more and meet external demand. Having recognised the current and future importance of cold-chain, the government of India has laid grounds for an enabling environment for greater and more relevant development in cold-chains. These initiatives now require to be met by equal cognisance of the opportunity and the option to create legacies by the private sector.

With ever growing consumer demand for fresh foods, increasing purchasing parity and lower cost of inducting technologies, India's cold-chain is poised to scale up momentarily. I can visualise our rural landscape dotted with pack-houses, crisscrossed with transport linkages, knitting India's landscape to bridge urban with rural. Cold-chain can do all this, pioneer the revitalising of our agriculture, and make India the food basket of the world.

*Pavanexh Kohli, CEO, NCCD,  
Councillor and working group chairman in the  
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# Coalition of Attracting and Retaining Youth in Agriculture (CARYA) Initiative

**A**griculture continues to be central to the livelihood security of a majority of the rural population. As poverty is more extensive in rural areas and is concentrated in the small, marginal and landless farming households, which account for nearly 60 per cent of the Asia and Pacific population, efforts towards its alleviation must be in place as an explicit agricultural growth strategy. With the persistent yield and productivity gap on one hand and the centrality of high competitiveness on the other, agricultural developments must become increasingly knowledge intensive and efficient. For this, the youth especially the agricultural graduates, should be the torch bearers for agriculture transformation in the globalised world. Ironically, the agricultural graduates and other educated youths, although unemployed, are rarely looking at farming as a profession and it is difficult to retain even a small number of them in rural areas.

To discuss the challenge of retaining youth in agriculture, Coalition of Attracting and Retaining Youth in Agriculture (CARYA) initiative led by M.S. Swaminathan Research Foundation organised a round table meeting in New Delhi on Nov 05, 2015 to seek suggestions from top agriculture experts for retaining youth in agriculture and making farming more attractive and remunerative for youth.

Opening the session, Prof MS Swaminathan stressed upon the importance of the efforts to retain rural youths of the country in the backdrop of an ageing farming population of the country and the migration of the young generation from rural areas in the pursuit of taking up more profitable profession. He pointed out that though India has done appre-



ciable improvements in terms of the Millennium Development Goals that ended recently this year, most of the achievements are in the broad area of poverty alleviation but not for abolishing hunger which is closely linked to food production.

Dr. RS Paroda, Chairman, Taas in his briefing to the participants of the conference said that the whole agenda for the small holder farmers should be re-oriented and young women needs to be attracted towards farming which would also ensure household nutritional security. He also observed that the number of farm related innovations in the country from the farmers and especially

the young farmers of the country outnumbers those from the research institutions. He is of the opinion that to encourage more innovations and to sustain these innovations, the country now needs a National Youth Innovation Fund, which could encourage more youth to stick to agriculture and bring about more innovations. He also stressed on the importance of establishing a global farmers' forum.

Dr. Rita Sharma, former Secretary, Ministry of Rural Development and Chairperson of the Policy Group of the Indian Council of Food and Agriculture observed that farmers in India are always painted poorly and this is creating a negative impact on the minds of young people in the farm families. It is in turn discouraging the youth from taking up farming as a profession. She said that studies have revealed that at least 40-45% farmers are not interested in staying back in the agriculture sector including their children. She said the while the Green Revolution in the country emphasised on ushering technology to Indian farming, efforts are now on to user in a sustainable Green Revolution which should also attract the youth in agriculture. She said that with a growing middle class and with their food preferences chang-



ing drastically over the recent years, the whole food value chain is being redefined these days and entire range of new areas of farming is emerging.

Dr. S. Ayyappan, DG, ICAR said that the young farming generation of our country needs demonstration of new technologies and need to see profitability in farming. Today, the biggest challenge is to provide options before the young farmers to play across a larger part of the agri value chain as they are not satisfied with restricting themselves to just one portion of the value chain. He expressed the view that agriculture sector should emerge as a preferred alternative destination for young Indians when on a large scale, other sectors like IT etc. are getting saturated.

Dr. JNL Srivastava, Managing Trustee, IFFCO Foundation and former Union Agriculture Secretary stressed on the need to identify strategies to retain youth in agri sector. He said the need is to make agri sector intellectually sound and financially remunerative to attract youth. As farming operations are entrepreneurial in nature and are subjected to various risks, there should be a system of attracting venture capital in farming activities like any other sectors. Also, currently there is a need to orient programmes like NRLM, Skill development mission etc. towards agriculture. He also observed the fact that currently it's not just in the developing nations, but the challenge of retaining youth in farming is more serious in developed countries.

Dr. RB Singh, Chancellor, Central Agriculture University expressed his opinion that currently it's more of a crisis of implementation than ideas, and that already a number of ideas and schemes exist that needs to be implemented properly in order to attract and retain youth in the farming sector. He stressed the need to

have an Innovation Fund in the country. There is need to train the youth effectively and redesign the current curriculum and there is a need to have an implementation pathway.

Dr. MJ Khan, President, Agriculture Today Group said that in his opinion, it could be farming and regular agriculture operations which could be not so attractive to the youth but when it comes to farm entrepreneurship, attracting youth is not that kind of a challenge. Areas like food processing, organic farming etc. are attractive. In fact many people from outside the agri community is looking up at opportunities in the agri-business sector with many ICT based communication platforms, e-commerce platforms etc coming into this sector. Dr. Khan also observed that Indian farmers are actually far more innovative than their counterparts in the developed nations. He said that MANAGE- Hyderabad is active with initiatives like ACABCs and their expertise could be utilized. There is need to relax the eligibility criteria for ACABCs and should be thrown open to also general life sciences graduates as many agriculture graduates are not showing interest in ACABCs as they get jobs elsewhere. He said that the agro-eco tourism scheme that is existing already with the ministry of tourism could be invigorated further and young boys and girls of urban areas can be oriented towards farming through such efforts.

Dr. H. S. Gupta, Director, IARI said that currently agriculture is not remunerative enough and is not considered to be a dignified profession. He said that the national skill development scheme should be linked more with agricultural training of the youth. He also stressed on the need to link agriculture sector to various other related sectors.

Dr. Islam Siddiqui, Sr. Adviser, Global Food Security Project, Center for Strategic & International Studies, Washington emphasized the urgent need for attracting youth to the agriculture sector. He also said that this is a problem of even the developed countries and therefore, it should be a global initiative.

Mr. Vijay Sardana, Head-Food and Agri, UPL group emphasized on precise identification of the problem, so as to why they are not interested in farming. He observed that agri sector is very peculiar with inbuilt contradictions, where farmers want more price for their produce, whereas the consumers want to pay less and the government wants to contain inflation but restricting the price rise of agri commodities. He stressed the need to identify those portion of agri value chain that would provide more money to the young farmers.

Dr. Anupam Verma opined that current problems are very complex and to retain youth in agriculture, extension activities should be focused. Currently, agri extension is the weakest link in the total chain of activities. It needs some extraordinary works on the part of every one to make farming attractive. He said that in order to make farming attractive, it's also necessary to decide on the maximum number of people who would be engaged in agriculture. In the US, currently less than 2% of the population does farming. He said for landless farmers, it's necessary to build farmers partnerships. He said it is time for all to look inside and identify the contradictions within.

Dr. Ajit Kumar, VC, NIFTEM also pointed out the lack of money in farming activities and the availability of inadequate infrastructure for a profitable farming. He said that viability and profitability in farming would come from value addition. There is also a need to change the mindset of the farming community and they should be oriented more towards getting a scientific bent. One can also think of linking SMART village mission to farming operations by the youth. He also emphasized



to change the curriculum of the agri education in the country. He said the students of various universities could be encouraged to adopt villages during their study period and there should be more efforts to develop entrepreneurship in the food and agri sector.

Dr. A.K. Singh, DDG, ICAR pointed out that villages should also have some of the basic amenities like in the towns and cities that could help retain youth from migrating. He said there should be more training in areas of entrepreneurship development in youth in farming and there should be a national forum for the youth. He pointed out that currently the agri skill council is just engaged in issuing certificates but it needs to be more active. It is important to identify as to how many people we want to retain in the agri sector to make it profitable.

Dr. T. Mohapatra, IARI emphasized the need to exactly identify what this coalition of CARYA should do and whether it could emerge as a platform for providing policy guidelines and suggestions. One burning

problem about agriculture sector is that it cut across different ministries which increase the complexities. He also expressed the need to decide as to how many people should be retained in the agriculture sector of the country. Vocational education at the school level should be encouraged. There should be units at the panchayat level that could train and retain youth in agriculture in the respective local areas.

Mr. Raju Kapoor, Director Corporate Affairs, Dow AgroSciences limited said that like any other enterprise, farming also needs resources as farming is basically an enterprise activity. The role of private sector should be more emphasized in the whole coalition and there should be linkage to various enterprises. Unless the whole economy grows, agriculture sector would remain with more people. He opined that rather than retaining youth in the agriculture sector, in effect, people should ideally be moved out of the sector to make it more profitable. He said that agriculture sector should freely compete with other sectors and also



observed that currently, most of the exodus from farm sector is to the construction sector which is again not that remunerative these days. This coalition for retaining and attracting youth in agriculture should be active on the policy level. He emphasized the need to bring demand to the core of agriculture and then decide what needs to be produced. He said viability of farm sector should be increased by initiatives like group farming, FPOs, super FPOs etc. He said that like the lead banks, there should be a lead corporate agency in specific areas for taking charge of the extension activities in the area.

Mr. Alok Sinha, former Chairman, FCI and Chairman, International Agriculture Consulting Group pointed out the need to decentralize various growth centers. Agriculture sector needs diversification and various other sectors are linked to the agriculture sectors. He is of the opinion that this coalition should not depend just on government support and should emerge as a think tank.

Mr. Sunil Khairnar, President, Indian Society of Agribusiness Professionals opined that the profitability of agriculture sector is a major point of concern and looking at this, one can actually rename this coalition as CAYA because these days, one should de-emphasize the retention aspect of youth in agriculture. He is of the opinion that there is a wide regional disparity when it comes to attracting youth to agriculture sector. Southern and the western region have many young farmers who are doing profitable farming. It's the re-

gion like the east and some parts of the northern India where youth are showing disinterest in farming and these areas are also less developed agriculturally when compared to southern or the western parts of India. He said that time has now come to convert the earlier success stories of profitability in rupees lakhs into rupees crores. Profitability is also a challenge in dry land agriculture and any additional attraction of youth and enabling them to undertake profitable farming through improved and climate resilient technologies. This would in turn add several billion dollars of earning into the total economy. He suggested that group farming consisting of 10-20 farmers should be promoted in dry land areas. He said that still a number of farmers are committing suicides in the Bundelkhand region.

Dr. Parasuraman of MSSRF pointed out the scope and need for promoting exchange students from African and other Asia Pacific countries. He emphasized the fact that young people need more exposure visits. He also said that this coalition should also include members from other Asia Pacific countries as the challenges of attracting youth in agriculture cuts across several countries and is a common problem.

In her concluding remarks, Ms Rita Sharma pointed out that this coalition should not be considered to be panacea to the problem of attracting and retaining youth in agriculture sector. She suggested that smaller groups be constituted within the coalition to deal with different is-

sues and aspects. She also pointed out that it has to be decided whether this coalition would be a government led initiative or emerges as a think tank or could be a hybrid model. She said it's important that this coalition decides early about what kind of structures should be in place, what would be the channels through which it will address the problems, what would be the niche issues that it will address. She said factors like marketing and value addition, entrepreneurial skill development, agri eco tourism etc. could be the niche areas of focus.

Dr. Khan while concluding pointed out that there is not much clarity in understanding about attracting youth in agriculture and suggested that the coalition renames it in the line of attracting the educated youth of the country. This would give more clarity in the objectives of the coalition. He said that the knowledge and the services part in farm business should be included and success stories should be highlighted adequately. He suggested that fellowship be introduced and can be named as MS Swaminathan Fellows who would propagate the message of profitable farming to the youths of the country. He said that Tamil Nadu Precision Agriculture Project can be showcased as a model of successfully introducing advanced technology and also attracting rural youths to agriculture. He pointed out the need for including a subject on Business Management in the course of B. Sc. (Agri). He also pointed out that glamour and charm of agriculture sector can also be promoted by the Ministry of Human Resource Development (MHRD) by including agriculture as a subject in school curriculum and taught in various schools across the country.

Prof Swaminathan happily observed that the deliberations and discussions of the day clearly indicated that the idea of coalition seems to be already taking shape. He said that the 50 years of Green Revolution should be celebrated highlighting the fact that Green Revolution is in itself a successful example of effective coalition.



# Changing India's Pulses and Oilseed Fortune

India lost a great visionary, scientist and “The People’s President”, Dr. APJ Abdul Kalam recently. Dr. Kalam, always believed in knowledge sharing and teaching, and was a vehement proponent of the use of science and technology in making our country one of the top five, most developed and powerful countries in the world.

Dr. Kalam, in his ‘India Vision 2020’ document, had laid down five key focus areas for achieving this mission, with Agriculture being the first of those five pillars. His main vision for the Agriculture sector was to improve and double the current production levels of both agriculture and food processing in the country, through scientific research on key crops which he believed would help us attain long term food security. During his visit to ICRISAT Centre in Hyderabad in 2013, Dr. Kalam stressed on research in agriculture biotechnology to enhance agriculture productivity.

According to a recent United Nations Report, India is expected to surpass the population of China to be the most populous country of the world by 2022. This only brings into attention the challenge of feeding such a large population with nutritious and healthy food. We also need to be mindful that the future generations would be more educated, aware and health conscious, with fast changing lifestyles and rapid urbanization. The increase in population and changing per capita income will put a huge pressure on our agricultural production, both in terms of composition and quantity. If we believe the estimates of the CII-McKinsey report published in 2013 on changing Indian food consumption patterns and the Vision 2030 document of ICAR, we would need 345 million tonnes



of agricultural production and would need more of fruits, vegetables and complex proteins of animal and vegetable origin. To meet such high food demands in the next few years, it will be imperative for us to produce more nutritionally-rich food to keep our people healthy and fit.

While India is self-reliant in a few crops, mostly cereals, and also exporting to other countries through a huge impetus received from the first green revolution almost fifty years ago and thereafter the hybrid revolution changing the face of our agriculture sector boosting the production through improved techniques and technologies in the field, there is still enough to be done to improve our productivity in key crops. We still rely on imports for crops such as pulses and oilseeds, where production has not kept pace with demand from a burgeoning population. With better employment opportunities coupled with higher disposable incomes, the demand for nutritious food especially pulses and vegetables are going up dramatically as they remain the primary source of nutrition and protein for a large part of India’s population.

Production of pulses, however, is not meeting the current demand and the country has been relying on imports of large quantity of pulses to fulfill the demand. Although we are the largest producer of pulses in the world, we are unable to meet the demand, creating a huge demand-supply gap. The situation is so grim that recently our honourable Prime Minister Shri Narendra Modi, drew the attention of the nation and its farmers to the mounting large import bill on its account and urged the farmers to grow more and more pulses. For the record, India imports around 3.5 million tonnes of pulses annually from various countries.

According to the Indian Institute of Pulses Research’s (IIPR) Vision 2050 document, about 24 to 25 million hectares of land is under pulses cultivation in India producing about 19 million tonnes of pulses annually. The yield (around 780kg a hectare) therefore, is far less than the global average and the per capita availability is one-fifth lower than what the nutritionists recommend. This despite the fact that pulses are generally grown post-monsoon and are not a water-

guzzling crop like rice.

The same vision document states that by 2050 India would need to produce about 39 million tonnes of pulses to meet its internal demand. This translates to, a projected annual growth rate of 2.14%, at an average yield of about 1200 kg per hectare besides adding about 3 to 5 million hectares under pulses production. The growth of pulses production has largely been stagnant which has only compounded the problems of availability leading to increasing prices and large imports thereby taking this key nutritional ingredient away from the reach of the common man.

Apart from production woes, we are also having to battle policy incentives skewed towards growing cereals, poor irrigational infrastructure and crop loss due to pest attacks which are difficult to overcome through conventional methods of breeding.

### **The BT cotton case study and how it can be replicated in pulses**

In such a scenario, agriculture research backed by science and technology is critical for India to address these concerns. The technology intervention resulting in the first green revolution has been well told. We have to usher in the second green revolution now to make India the leading producer of major crops and vegetables, to not only make the country self-sufficient in food, but also export to other countries and help increase the agriculture sector's share in the economic growth of the nation.

Dr. Ashok Gulati, renowned Agricultural Economist and Infosys Chair Professor for Agriculture at the Indian Council for Research on International Economic Relations (ICRIER) has also highlighted the urgent need for revolutionary methods to dramatically boost food supply for the nation's 1.2 billion people.

Apart from various inputs required for a desired productivity in farm, seed is one of the most critical inputs, which play an important role in the overall productivity of the crops. Although it forms only a minor pro-

portion of the total cost of inputs in the farming, it plays an important role in determining the final output and productivity of the crop. High quality seeds can help the farmer produce a better and healthier crop which will result in higher yields and improved profits. Developing high quality seeds with resistance / tolerance to pests, diseases and various abiotic stresses involves collaborative efforts from various functions and organisations. Apart from developing such high quality seeds, one has to ensure that they reach the farmers and farmers are educated to use them with appropriate cultivation practices. From amongst the available agriculture research technologies, biotechnology, which is also popularly known as genetically modified (GM) crops, has proved to be successful in overcoming many farming challenges globally in recent years. GM crops have been proven to significantly improve yield through high levels of tolerance to diseases and pests, improved weed management, tolerance to abiotic stresses, etc. To quote the leading global agri-biotech industry ISAAA's report of 2014 which states that "a record 18 million farmers in 28 countries planted more than 181 million hectares in 2014, more than 100-fold increase in area from 1.7 million hectares in 1996 to 181 million hectares in 2014."

In India too, we have a good example of biotechnology helping to improve crop productivity significantly. Bt cotton, India's first and only GM crops so far is a great example of successful technology introduction in agriculture and the potential offered by this technology to our agriculture sector. Since the introduction of Bt Cotton in 2002, both the area and productivity of cotton have grown significantly making India the largest producer of cotton in the world. According to the Cotton Advisory Board's (CAB) March 2015 estimates for last season's production, our cotton production reached 390 lakh bales for the last crop year (2014) from 136 lakh bales in 2002. Lint productivity per hectare exceeded 500kgs from a low of 300 kgs of lint

per hectare. India has become a net exporter of cotton from being an importer prior to Bt cotton introduction. We need to replicate the success of Bt cotton in pulses and we have the capabilities to do so with increased focus on research and development in this area.

There are many who have taken initiatives to collaborate with public institutions to deploy biotechnology in pulse crops. One of our group companies has partnered with Assam Agricultural University to develop insect resistant Chick pea. Chickpea is the major pulse constituting close to 40% of total pulses production in the India. We produced about 9.88 million tonnes of Chickpea in a cultivated area of 10.22 million hectares during last year at an average yield of about 967 Kg per ha. Pod borer is the major insect impacting the crop productivity of Chickpea, upto even 90% in severe cases. The insect resistant Bt chickpea technology aims to reduce losses caused by pod borer pests, and thereby improve the production of pulses significantly. Trials in the green house and open field conditions have been very positive showing an average yield increase of 25%. If we extrapolate these results, Bt Chickpea has the potential to increase the annual production of Chickpea by atleast 2 million tonnes. This quantity is equivalent to more than half the quantity of total pulses imported currently. Thus this technology can help to reduce the current imports by more than half. Given this large potential benefit to farmers, consumers, and the economy, we are optimistic that this product would fast progress in the regulatory process before finally becoming available to our farmers. There are similar initiatives on biotech applications by such public private partnerships in the pipeline, that would help the country to overcome the current demand – supply gap of pulses and oilseeds in the near future.

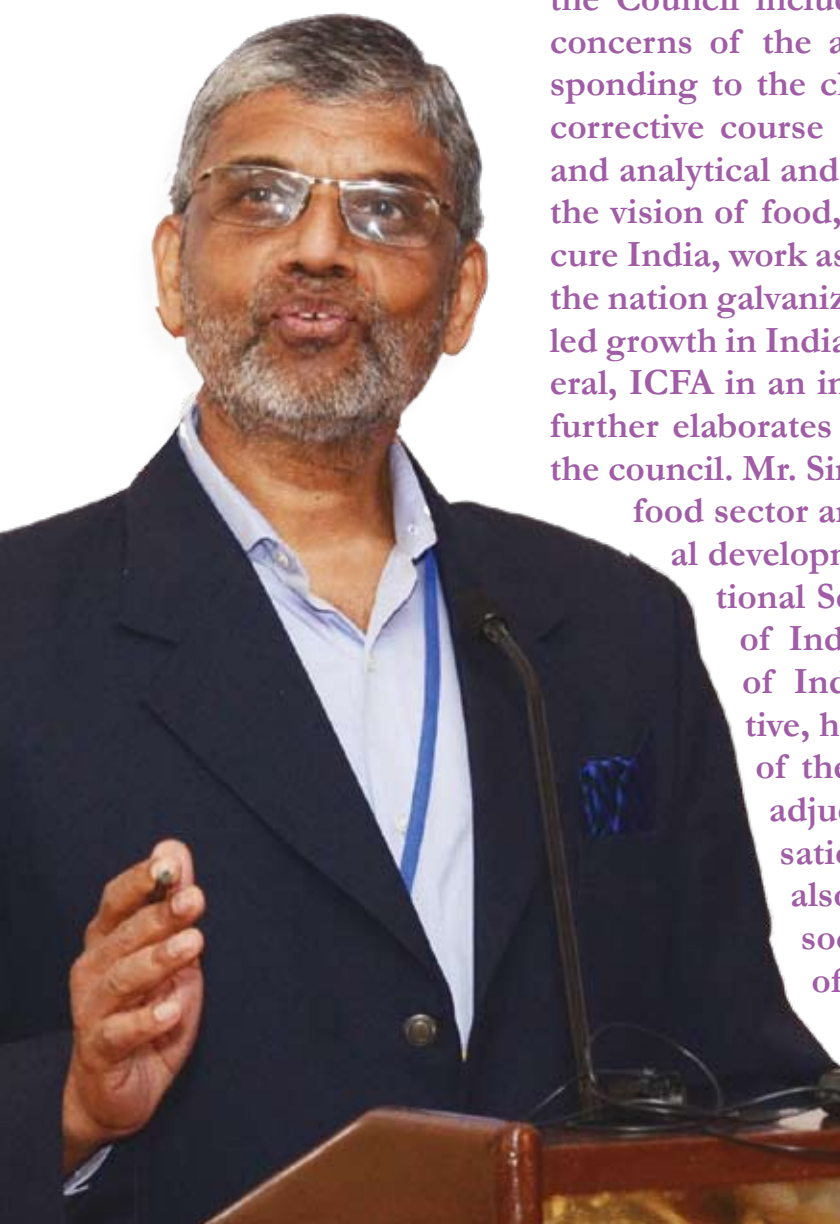


**Raju Barwale,**  
*Managing Director,*  
**Mahyco**



# ICFA - Galvanizing India's Agriculture Led Growth

Indian Council of Food and Agriculture (ICFA) was launched on 18 September, 2015 along the side lines of the eighth Agriculture Leadership Summit by Shri Rajnath Singh, the Union Home Minister. ICFA was established to serve as a single platform to address issues in agriculture and be a think tank, facilitative research engine linking all the stakeholders in agriculture. The multiple objectives of the Council include articulating the agenda and concerns of the agriculture and food sector, responding to the challenges of the sector seeking corrective course correction, generating advisory and analytical and advocacy products for realizing the vision of food, nutrition, renewable energy secure India, work as the body act as a think tank for the nation galvanizing agriculture and allied sector led growth in India. Mr. Alok Sinha, Director General, ICFA in an interview with Agriculture Today further elaborates the mandate and the vision of the council. Mr. Sinha has served eight years in the food sector and seven years in the agricultural development sector. He has been Additional Secretary Agriculture in the Govt of India and CMD Food Corporation of India. On Supreme Court's directive, he has been serving as a Member of the Orissa Claims Commission (to adjudicate land acquisition compensation rates) since Nov 2010. He is also Chairman of the ABCCI (Association of Business Chambers of Commerce & Industry).



## Why India needs an organisation such as Indian Council of Food and Agriculture?

The fast changing trade and economic environment globally requires a paradigm shift in our approach. We have to act proactively and respond positively to the changing dynamics of global trade and agriculture. The bench-marks are now global and we have to prepare our policies and strategies with global perspective. Though the country has become self reliant in food grains production, our average productivity and quality is low and the cost of production high, which puts the challenge of competitiveness before our agriculture in the world market. There is need for a comprehensive approach to address the issues in agriculture and tapping the emerging global business opportunities in food and agriculture. With the new Government at the centre, there is increased interest among the major countries in the world about engaging with India and exploring opportunities for trade and cooperation. There is need for a dedicated body to facilitate such engagement while promoting India's interests. We also need institutional mechanism at the district levels, wherein various stake-holders could meet and deliberate upon issues and agenda. ICFA proposes to provide that mechanism and go for being a mass based organisation with large scale membership through state and district chapters, while maintaining the class character for working at the national and international level.

There are however issues in our policies with compartmentalized approach due to absence of coordination and a dialogue mechanism among various stake-holders. The Government, policy makers, research and academic bodies, extension agencies, industry, NGOs, financial bodies, developmental institutions and farmers groups think in different directions, often with contradictory approaches for the same ultimate cause. In this

context, there is a long felt need of having an apex body, which could act as a think tank, research centre, information bank, facilitation point, advocacy body, development catalyst and monitoring centre for food and agriculture sector at the national level. This should act as parallel to trade bodies like CII, ASSOCHAM and FICCI, but be different from them in scope and objectives to represent the interests of other stake-holders such as farmers, academic and research bodies, financial and developmental institutions, entrepreneurs, cooperative and rural bodies and FPOs etc.. in agriculture sector, besides trade and industry. The national body by the name Indian Council of Food and Agriculture would give voice at global platforms on trade, multilateral negotiations and AOA etc. as also analyse the developments in major countries of the world and monitor their impact on Indian agriculture and food trade on one hand and influence policy decisions, reforms progress and direction to food and agriculture, promote technologies, investments and markets on the other hand.

## Who will be members of ICFA? Will you enroll some farmers as members?

ICFA seeks to represent the interests of all the key stake-holders in India's food and agriculture sector. While agri and food industry, developmental Institutions, banks, research and academic institutions, policy making bodies play important roles in India's agriculture system, 12.5 crore farm families form the backbone of Indian agriculture. And this class is most under represented and in a way voiceless at the policy, planning and global trade level discussions and decisions. ICFA has created a Working Group on Farmers, headed by Dr. Rajaram Tripathi, Chairman, Herbal & Medicinal Farmers Association. We are seeking memberships from all the other farmers organisations to become part of this Working Group with the presidents of each of the 30 major

farmers association to be ex officio member of this Working Group.

## Are there any similar organisations globally?

Yes, there are many. French Chamber of Agriculture, Chinese Chamber of Food, Agriculture and Livestock Products, Danish Council of Agriculture and Food and various organisations in US are just a few. In fact the idea of instituting a body on agriculture emerged 14 years ago when the Chairman of ICFA, Dr. MJ Khan was in China where President of Chinese Chamber of Commerce asked for their counterpart in India. The idea crystallized when he visited Denmark and observed a similar body functioning in advancing the cause of agriculture, horticulture and dairies sector growth.

## There are many organisations across India that claim to represent farmers. So, how different is the ICFA?

In India we have some 30 noticeable farmers' bodies, but depending upon the parameter one takes, this number could come down to 10 or go to 1000. In addition, there are commodity specific farmers' bodies, such as Apple Growers Association, Grape growers Association, Banana Growers etc. About 20 of them are promoted by National Horticulture Board. While many of the core farmers' bodies have more of social and political intent in their working and orientation, and the NHB promoted are confined to their specific interest areas, we needed for long a professional body, which focuses on farmers' broad policy needs. ICFA seeks to fulfil that gap, with its conciliatory approach, broad agenda and common program.

## What challenges do food and agriculture sectors face in India?

India has made commendable strides in food and agriculture. India, whose existence depended on shipments carrying food grains from other

countries, today has become a major food exporter. Thanks to the green revolution and a slew of supportive policies from the government. But the glory of green revolution has started to wane. The production numbers are stagnating. Our productivity is still very low compared to other countries. Mechanization hasn't caught up with the majority of farms. More than sixty per cent of farms depend on monsoon for irrigation. A bad monsoon will wreak havoc in the agriculture sector in the country pushing the farmers into debts and the country into inflation. We have poor storage infrastructure destroying 20-40 per cent of stored farm produce annually. Injudicious use of resources have led to unsustainable agriculture depleting ground water and contaminating the environment. Investments on research are still low in India. Agriculture in India has to move on from the state of uncertainty to certainty and clarity. We have to develop technologies that can circumvent our over dependence on external factors and channel our agriculture towards sustainability. In the times to come, as India becomes self sufficient in most items of agriculture production, including oilseeds and pulses, post production activities will see massive changes and happenings in this area with major global players entering with their innovative models and integrated chain approach from "farm to fork concept". Majors such as Walmart, Metro, Pepsico, Cargill will further expand their operations to provide integrated chain of activities from partnering with farmers for supplies to delivering the farm produce fresh directly to consumers. The benchmarks will have to be global and quality and standards and efficiency of operating chains will change the dynamics of the competition in this area. Post harvest management, storage, logistics, certification, processing, value addition, branding, marketing, trade etc..will dominate the policy perspective in food and agriculture. Back in production side, precision farming with greater

employment of technologies with water saving, energy saving and input saving systems will find increasing adoption at farm level. Micro-irrigation, biotechnology, ICT, Solar energy etc. will make production systems more efficient and cost effective to enable farmers compete globally in an increasingly globalised world of trade and agriculture

**Central and state governments in India have been spending a lot of funds on agriculture and irrigation. Still, farming community seems to be in problem. What's main reason for this?**

In our studies we find the positive effect of the major programs such as Rashtriya Krishi Vikas Yojana, National Horticulture Mission, National Livestock Mission on production and growth in the respective fields. The travails of farmers and unabated suicides have a number of reasons to attribute, besides of course poor implementation of the programs, funds leakage and lack of the social audit of the spendings. But broadly speaking, there is lack of structural reforms in agriculture, which make farmers buy at retail price their requirements of inputs and sell their produce at whole sale price, which puts them at double loss. Again, while they buy their inputs at the internationally ruled prices with most MNCs making it a global price parity, they are bound to sell their produce at local prices. The cost of capital is high at 8 – 10% interests, post harvest losses are exorbitant at 12 – 26%, irrigation is only at 40%, technology losses are at 44%, value addition low at 4% and lands are fragmented, making adoption of scale technologies difficult.

**There seems to be lots of interest in the country on food processing industries. Will they (food processing industries) bail out farmers?**  
Yes. Food processing at primary

level can help in reducing losses and adding value, which can make farming more profitable. Even if we are able to reduce losses which are prevailing at 25% and add value by some farm level primary activities, we will be adding approximately Rs. 2,00,000 crores additional to the farm economy every year. To accelerate pace of food processing and taking it to a level of 10% from the current level of approximately 4%, we need an investment of Rs. 1,00,000 crore or more. In our country, food processing is viewed largely as a large industrial activity. This view defeats the important activity of farm level post harvest management and value addition. Simple concepts and awareness such as "handling with love and care", while plucking and packaging the tomato or any other perishable produce, can significantly enhance its shelf life and market value. This concept was given by the Ministry of Food Processing Industry in 2001, but later forgotten. At States level, under NHM there are provisions, but not actions. The creation of Farmers Producer Organisations (FPOs) on a large scale and their professional hand holding can help fulfil this gap.

**Do you oppose global giants into Indian multi-brand retail sector?**

No, let them set standards. Indian companies will quickly learn and outdo them in many areas. In the process Indian farmer and the consumer, both will gain. Competition is always good. Look at the industrial and economic scenarios post liberalisation. All apprehensions of Indian industry to be wiped out have proven wrong. It has rather gained, and gained substantially. Similarly, there was huge hue and cry that computerisation will take away all the jobs and Indian youth will be on the street. The fact is that not only computerisation and later IT has helped in creation of massive number of jobs, but has also emerged as the driving force of India's economy and global standing.



# SHRIRAM's Wheat Story

Wheat followed by rice is the 2nd largest food crop cultivated in India on about 30 million hectares. Wheat yields in major wheat growing States of India show large variations due to soil health, irrigation availability, number of cold days and temperature during winters, and prevailing agronomical practices. For example, wheat yields in irrigated, high agri-input intensive areas of northern India (Punjab, Haryana, and Western Uttar Pradesh) are above 4.5 tonnes per hectare, while yields in central and western States (Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh & Bihar) are relatively lower (2.4 – 2.8 tonnes per hectare).

Most commonly grown wheat varieties are experiencing fatigue, and the agriculture scientist in Public & Private Sector are busy developing new wheat varieties with higher yield potential, disease tolerance and better grain quality. Wheat varieties, hitherto, were released by public

sector organizations in India, and given that seed production and marketing are administered by public sector institutions. The new wheat varieties have been slow to make inroads due to inadequate seed multiplication, distribution and extension activities. Vulnerability of the wheat crops to Stripe (yellow) rust in North Western States, delayed sowing in the North Eastern Plains zone owing to rice-wheat cropping cycle and earlier than the normal rise in temperature during February-March at grain filling stage are other major areas of concern that need to be addressed.

Aware of these problems, limitations and, therefore, opportunities to make its own space, Shriram Fertilisers & Chemicals (unit of DCM Shriram Ltd. New Delhi), perhaps the only private sector organization decided to begin the Wheat Variety Development Project in 2005. A team of experienced and renowned wheat breeders led by World Food Prize Laureate and Padma Shree Dr. Sanjay Rajaram, could develop, identify and release

5 new wheat varieties for North-West, East and Central Zones. With excellent seed production mechanism and stringent field & laboratory quality control system in place, the farmers reaped excellent yields.

Farmers of East Plain Zone, after a long time, could find their dream variety in 'Shriram Super-303' giving 3-4 quintal/ acre yield benefit, besides its high degree of tolerance to Helminthosporium disease and good grain quality, suitability for late sown conditions and tolerance to lodging due to its sturdier tillers. Farmers in central zone, cultivating wheat under limited irrigation, terminal stress and heat problem, have also witnessed similar success story of 'Shriram Super-111' wheat variety. Besides yields, better and bold grains and good chapatti making qualities of these varieties, have made the variety the first choice of farmers of Central Zone. It is worth mentioning here that a woman farmer of Chindwara (Madhya Pradesh) was awarded the 'Krishi Karman Award' of 2012-13 by



'Krishi Karman Award' given by Hon'ble President to a lady user farmer of Super-111 from Chindwara, MP



Features & benefits of Shriram Research wheat are demonstrated on demonstration fields



Dr. Sanjay Rajaram, The World Food Prize Laureate interacting with Punjab farmers during a field day on Shriram Research Wheat



Prominent display Shriram Research Wheat at a retail outlet



'Mandi' shows help the farmers to recall the name of Shriram Wheat varieties and helps him in taking a buying decision

Hon'ble President of India, Mr. Pranab Mukherjee, who cultivated Shriram Super-111 in the very first year of its commercialization.

Knowing that for any of the wheat variety to become popular among farmers of Punjab and Haryana, it has to have high degree of tolerance to stripe rust disease which often attains epidemic proportions like the one in Rabi 2013-14, Shriram Fertilisers & Chemicals are ready for full scale launch of two varieties from Rabi 2016. These varieties have high degree of tolerance to prevailing strains of stripe rust and higher yield potential. Since beginning the wheat project in 2005 and release of first two varieties Shriram Super -152 & Super -172 in Rabi-2009, Shriram's wheat seeds are maintaining leadership market share because of farmers' acceptability.

Notwithstanding the fact that the yield benefit and quality of a product is ultimate, creation of awareness and interest among farmers and the dealers in a particular product are very important. Consequently, utilising the company's strength of reaching the farmers, extensive on-field promotional campaigns in the entire targeted marketing territories are regularly conducted, involving field demonstrations, farmer meetings, field days, crop shows and distribution of educational handbills. Processes for on time Quality Control results including 'GOT' test, processing, packaging and transportation are also streamlined for on time delivery of quality seeds of Shriram Research Wheat seeds.

'Wheat team' at Shriram Fertilisers & Chemicals are working with clear objective of helping wheat farmers

in all the major growing states to get at least 5 quintal per hectare yield increase over prevailing varieties, and get higher market price with better grain quality to make wheat as preferred crop for cultivation.

With collaborative efforts of Public and Private sector, if we could succeed in helping farmers to increase the targeted yields by adoption better adapted varieties in varied agro-climatic zones, it is possible to get an increase of another 10 million tonnes by adoption in about two-third of the total wheat acreage. There is need to harness the production, distribution and extension potential of private sector organisations like Shriram Fertilisers & Chemicals and many others, and collaborative Research & Development for developing better varieties.





## US AWASTHI - A VISIONARY PAR EXCELLENCE

A venerated visionary who took the Indian Farmers Fertiliser Cooperative Limited (IFFCO) to enviable heights, Dr. Awasthi injected dynamism and verve into organization. Armed with four decades of experience in the fertilizer sector, Dr. Awasthi contributed immensely not only in the development of IFFCO but also in the development of the country's agriculture sector. Acclaimed as a Manager par excellence in India, Dr. Awasthi has been committed to Indian fertiliser industry since 1967 after completing his graduation in Chemical Engineering from Banaras Hindu University.

**D**r. Uday Shanker Awasthi, the Managing Director of Indian Farmers Fertiliser Cooperative Limited (IFFCO) is an internationally renowned chemical engineer and has about four decades of experience exclusively in the fertiliser sector. Dr. Awasthi's managerial experience spans the diverse segments of private, public and cooperative sectors of the industry in India. He has contributed immensely to the development of fertilizer sector of India. An expert in the area of project management, he has played crucial role in setting up a number of Ammonia-Urea, SSP and NPK/DAP projects in the country.

Ever since taking over as the Managing Director of IFFCO, a leading player in India's fertiliser industry in February 1993, Dr. Awasthi propelled the cooperative to new heights. He was the architect of "VISION 2000", a strategic road map for IFFCO, to make it a global leader in fertiliser production. New records and milestones were created in projects, production, energy conservation, environmental protection and sales.

Dr. Awasthi's tenure presented IFFCO with excellent financial results which remains unchallenged in the history of IFFCO. IFFCO's activities spilled beyond the fertilizer domain with Awasthi's diversification plans such as IFFCO-Tokio General Insurance Company Limited (ITGI) and power project in Chattisgarh titled IFFCO Chattisgarh Power Limited (ICPL). The instincts of this visionary was instrumental in establishing a joint venture agreement with Jordan Phosphates Mines Company (JPMC) for setting up Phosphoric acid plant in Jordan which ensured steady supply of phosphoric acid to IFFCO's plants in India.

Cognizant of the benefits of inculcating emerging technologies for the welfare of the farmers, he led IFFCO's forays into National Commodity & Derivatives Exchange Limited (NCDEX). Dr. Awasthi's modernisation plans of IFFCO included aggressive penetration of Information Technology at all levels of the organisation. In order to meet the challenge of communication requirements of villages of India and to provide them with most appropriate information to equip them to take right decisions, a unique joint venture "IFFCO Kisan Sanchar Limited (IKSL) was launched. Dr. Awasthi is the inspiration and leading force in all these unique ventures of IFFCO. Dr. Awasthi

is constantly keen on envisaging special agriculture projects in the areas of drip irrigation, bio-pesticides, bio-fertilisers, use of plastic in agriculture, agricultural mechanisation, farm forestry etc. He nurtured a special interest in educating farmers through numerous farmers' education programmes. Every year, a large number of farmers from all over India benefit from the agricultural extension activities of IFFCO. He initiated IFFCO's ICT Initiatives for farmers and cooperatives to extend the benefits of computers and communications to rural India. He takes keen interest in evolving appropriate content for farmers & cooperatives as well as effective delivery mechanism through a well conceived farmers' kiosk network. He is an enthusiastic and active cooperator and takes keen interest in the growth of cooperative movement in India. He was also instrumental in promoting "IFFCO Foundation" to strengthen cooperative movement in the country.

Dr. Awasthi has held several positions in various bodies. He was elected president of International Fertiliser Industry Association (IFA), during 1997-99, which is an organisation of 457 member companies from 80 countries. He was the first Asian to occupy the coveted position of IFA. He was the Chairman of Fertiliser Association of India (FAI) during 1994-96.

He is on the Boards of several Indian as well as international companies: Chairman, Industries Chimiques du Senegal (ICS), Senegal Deputy Chairman, Jordan India Fertiliser Company, Amman, Jordan. Dr. Uday Shanker Awasthi has been the Managing Director of Indian Farmers Fertiliser Cooperative Limited (IFFCO) since February 1993 and serves as its Chief Executive Officer.

Dr. Awasthi is a recipient of several honours and awards for his outstanding contributions and achievements in the fertiliser industry and Indian agriculture such as Uttar Pradesh Gaurav Award by the Society of Environment & Agricultural Advancement, Distinguished Alumnus Award by Benares Hindu University and Eminent Chemical Engineer Award by Indian Institute of Chemical Engineers. He was conferred with Honorary Fellowship of Indian Institute of Chemical Engineers (I.I.Ch.E) during the Indian Chemical Engineering Congress (Chemcon - 2001) held at Chennai. Dr. Awasthi is an honorary visiting Professor at Indian Institute of Technology (IIT), New Delhi.



“Medicines for ailments is not a hungry man’s priority. Rich European countries are opposing introduction of GM crops because they have sufficient food. Their propaganda against GM crops is affecting hungry people in the developing nations. To help people in need, we need more science in politics and less politics in science”

**RICHARD JOHN ROBERTS**  
Nobel Laureate



“We will soon become a urea surplus country from a urea deficit country as we are going to produce 20 lakh tonnes additional urea this year. We will start exporting urea soon”

**ANANTH KUMAR**  
Union Fertiliser Minister



“India needs to have enough instruments in hand to protect its poor against sudden changes in food prices”

**NIRMALA SITARAMAN**  
Commerce and Industry Minister



“We cannot depend on nature as the climate is playing hide and seek with farmers. In such situation, we have to adopt new technology and do experiments with new crop that can improve the financial condition of farmers. Farmers must take the help of scientists, experts and change their mindset”

**DEVENDRA FADANVIS**  
Chief Minister, Maharashtra



“We need a big push that raises agriculture productivity in pulses. And this will require organisational (support), science and technology, prices, policy, etc. It is something the Centre is trying to address”

**ARVIND SUBRAMANIAN**  
Chief Economic Advisor