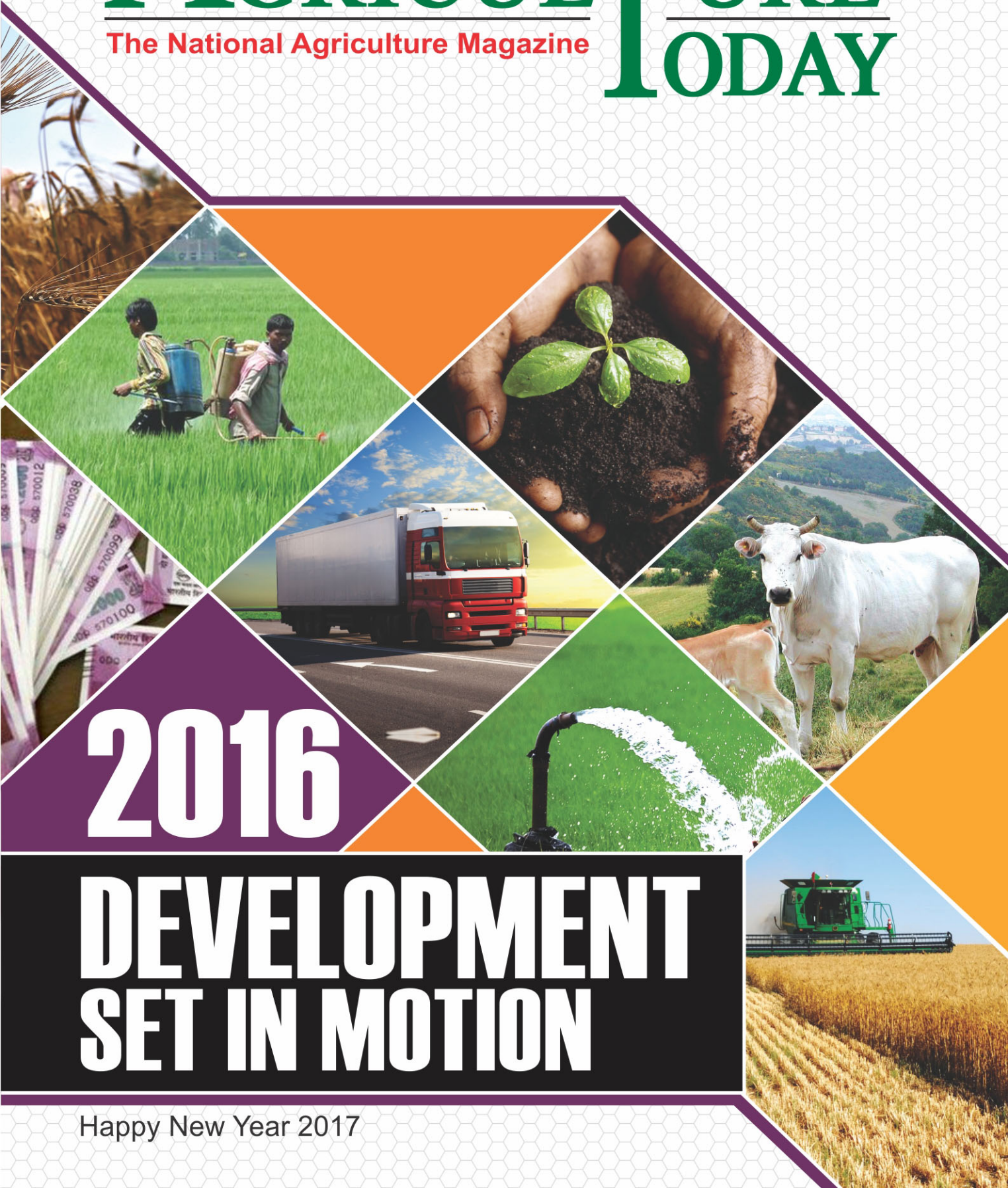


AGRICULTURE TODAY

January 2017, ₹45/-

The National Agriculture Magazine



2016

DEVELOPMENT
SET IN MOTION

Happy New Year 2017

JANUARY 2017 | VOLUME XX | ISSUE 1

President Dr. MJ Khan
Editor Anjana Nair
Assistant Editor Fariha Ahmed
Sub Editor Sanjay Kumar

Business Manager Sonam Singh
9811494142

REGIONAL BUREAUS

Tirupati	V Rajagopal
Kerala	KR Sreeni
Jamshedpur	Shireen Tabassum
Gorakhpur	Jitendra Dwivedi
Himachal Pradesh	Rakesh Ahuja
Jammu & Kashmir	MH Shah
Hyderabad	Murli Krishna
Bangalore	HS Gangadhar
Lucknow	Alok Vashishth
Punjab	SS Virdi
Bihar	Gautam Kumar

Circulation Incharge Raj Kumar

LAYOUT & DESIGN

Graphic Designer A. Rehman

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

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



**Any issues?
contact us at
the above
addresses!**

No part of this magazine can be reproduced, imitated or transmitted in any form, including electronic, mechanical, photocopying, recording or any information stage retrieval system or extracted in any way without permission from the publishers. Views expressed in the magazine need not necessarily be those of the Editor / Publisher.

www.agriculturetoday.in

Pages in the magazine: 60

2016 – a Turning Point?

Agriculture had already survived continuous bouts of drought in the years prior to 2016 and so a decent monsoon was more than a welcome sign this year. The ensuing bright estimates of food grain production has also been helping the sector gain some of its lost ground. The year also saw the government's vision regarding rural India. The budgetary allocation received a quantum jump for rural infrastructure development.

Several innovative and promising policies were unfolded in 2016, the effects of which will take years to show the desired benefit. India's National Agriculture Market (NAM) was launched in 2016 which offers the spectacular possibility of the farmers and traders being separated geographically by several thousand miles whilst favouring unhindered trade between farmers and traders of different states, different market areas, different languages through a common e marketing platform. The e-NAM platform—a key initiative of the National Democratic Alliance government's promises to double farm incomes by 2022 is proposed to connect 21 mandis from eight states in the first phase.

Another major reform going to materialize shortly would be the GST tax regime. The benefits of such a unified tax regime would be a Unified market across the country which would mean the confluence of various taxes, increase in tax revenue, increase in exports due to cost effective production and an expected increase of GDP. As GST advocates uniform tax structure across the states, it would ease interstate movement of agricultural commodities which would improve marketing efficiency, facilitate development of virtual markets through warehouses and reduce overhead marketing cost.

The year 2016 saw the launch of an improved version of crop insurance scheme. The new scheme christened as Pradhan Mantri Fasal Bima Yojana (Prime Minister's Crop Insurance Scheme) sheds the hefty premiums of the previous crop insurance scheme and supposedly offers the lowest premium rate. To combat the uncertainties with the pulse production, India took several reforms which included contract farming with African countries, increasing pulse MSPs etc.

One of the biggest policy reforms came in the form of demonetization towards the end of the year. In a biggest-ever demonetisation exercise, Indian government withdrew Rs 500 and Rs 1,000 notes from public use with the intention to flush out illegitimately accumulated Indian money. Lauded as a bold move, the current devaluation of highest denominations of the Indian currency system to nothingness has however sent tremors of anxiety and concern among Indian farmers. Farmers are unable to buy inputs for the next agricultural season. Trade in Mandis or Agriculture Produce Market Committees (APMC) in many parts of the country has come to a standstill. Prices of agri commodities and their sales have also dropped considerably. The bigger worry came from traders and farmers of perishable commodities like fruits and vegetables, which needed to be traded immediately. Growers of plantation commodities such as tea and coffee are facing a different challenge: arranging cash to pay salaries. The Government of India in a big blow to farmers has decided to scrap the import duty on wheat.

The year 2016 ended with a promise and threat. The year to come will show the true colours of the policy initiatives taken and hence bears immense significance.



Anjana Nair

CONTENTS

VOLUME XX | ISSUE 1 | JANUARY 2017

Cover Feature

2016

DEVELOPMENT SET IN MOTION



58

Know Your Leader

Narendra Singh Tomar

Editorial	01
Editorial Comments	04
News Corner	10

Cover Feature	
2016: Development Set in Motion	20

ICFA NEWS	40
------------------	----

Animal Husbandry	
Application of Biotechnology for Livestock Improvement	42

Interview	
Rajesh Nath, Managing Director, German Engineering Federation (VDMA)	46

Technology	
Significance of R & D and Technology in Indian Agriculture	48

Mechanization	
Laser Leveling: An effective low-cost solution for saving water in agriculture	50

Report	
Policy Paralysis Hampering Poultry Sector Performance	54



Know Your Leader	
Narendra Singh Tomar	58
Different Strokes	60

As **water** becomes
a scarce resource,
how do we
conserve it?

☐ Grow less food

☐ Grow food that needs less water

syngenta®

Water is essential for life. But it is becoming increasingly scarce in many parts of the world. How do we feed a growing population with limited water resources? At Syngenta, we believe the answer lies in the boundless potential of plants. We are developing seeds that require less water and products that allow crops to grow in dry conditions. It's just one way in which we're helping growers around the world to meet the challenge of the future: to grow more from less. To find out more, please visit us at www.growmorefromless.com

Imports Inviting Trouble

Zero Wheat Import duty to be detrimental to farmers

The Center's decision to scrap the import duty on wheat to nil has further aggravated the farmers' disdain to the current array of policies emanating from the government. From the demonetization, which has visibly disturbed the household economics and has left a large section of the population especially the farmers penniless, to the current withdrawal of import duty on wheat, the entire gamut of programmes have specifically been hurtful and detrimental to the farmers' interests.

The news of zero import duty on wheat which was taken up by the government in December has not gone down well with the farmer cadres. This move that can dent the farmers' income quite ostensibly, has hence been harangued by agriculture experts and farmers' Union alike. According to the dealers, Australian wheat is available at \$235 per tonne, nearly 20 percent cheaper than local supplies. The zero import duty would increase imports that are cheaper and the influx of cheap imports can slash the domestic prices considerably especially when the government estimates a relatively heavier harvest of 93.50 million tonnes this season, up from 86.53 million tonnes a year ago.

The depleting government reserves and the mounting inflation were reasons that has pressed the government to take this route. Despite the taming of inflation, wheat prices haven't displayed a letdown. Wheat prices rose 6% in October, 7% in September and 10.3% in August. The local supplies would start appearing in the market by April 2017 and until then foreign wheat will try to mellow the price indices.

But since the directive came without an expiry date on the import waiver, the fear of the stakeholders are well placed. The year ahead thus will bring in uncertainties as to what the prevailing prices in the market would be. The wheat imported can very well depress the domestic prices affecting the farmer incomes and so the 'estimated' bumper harvest may not bring an expected income recovery for the farmers.

On the other hand, the current policy intervention will be beneficial to the corporates and other big traders as it ratifies their long standing demand of import cuts. The import duty which was recently revised to 10 % from 25% has further been slashed to zero percent giving a free run to the traders.

But this move invites a volley of question regarding the veracity of the estimates published by the government. If we are expecting a record crop why hit the zero import duty button? Despite the government's confident claims of rabi sowing remaining unaffected by the demonetization, the government is taking all precautions in case of poor wheat recovery. Farmers were deeply affected by the overnight withdrawal of high value currency and it had deeply compromised their buying capacity. Their inability to procure seeds and fertilizer in a timely manner might have affected sowing and the claims of increased sowing area can only be taken with a pinch of salt.

On one hand the government is trying to rein in the inflation of wheat and on the other, they are trying to artificially depress the price of wheat. The move falls in sharp contrast to the government's larger interest of 'Make in India' and doubling farmers' income. Proactive though, the measure lacks a long term vision and is just directed to tide over a possible near crisis. Farmers survived two back to back droughts, demonetization and while rejoicing at a better harvest this season, the government surprised them with a possible glut. Their hopes of a recovery has been mercilessly thwarted,

Managing food supply for 1.3 billion people at affordable prices is a daunting task. But that does not vindicate the government from their responsibility towards the farmers. The situation can further be salvaged if the government can assure the farmers and put in place a system that guarantees the farmers of good prices and effective procurement. Rather than price recovery, the farmers need a reason to continue farming and faith in the government.

Celebrating IR -8

World celebrates IR8's fiftieth anniversary

India's agriculture fortune evolved from a humble rice variety. November this year, the world celebrated the 50th anniversary of the official release of the semidwarf rice variety, IR8 to Asia and the world. When the country was facing famines and severe shortage of food, technological interventions like IR8 salvaged the country's existence. Fifty years later, the variety still lives on as a component of other varieties aiding and abetting the country's progress in agriculture.

IR8, the world's first high-yielding rice variety and the first rice variety released by the International Rice Research Institute (IRRI) was introduced to this world in November, 1966. The variety soon latched on to the Indian fields and produced spectacular results. The variety got the stamp of approval of farmers as it was of short growth duration and with a high-yield capacity. This variety required nearly about 130 days to get mature, whereas the traditional ones took around 160 to 170 days. Being a dwarf variety, it could also withstand wind action unlike the traditional tall paddy. IR8 sparked the green revolution in India and harbingered the transition from low yielding traditional varieties to a more input responsive technology driven farming. Having saved millions from the verge of starvation and destitution, introduction of IR8 was a milestone in Indian agriculture. It was one of those incidents, which managed to create a long standing relationship between technology and agriculture in India. The country's food production increased five times and from being a net importer, India joined ranks of food exporter.

Introducing IR8 to a country as diverse and big as India was no petty task. Apart from the illuminaries like MS Swaminathan, the then Agriculture Minister, C. Subramanian and a host of other illuminated minds, one person who played instrumental role in popularizing IR8 variety was Nekkanti Subba Rao in Andhra Pradesh. His efforts in popularizing IR8 earned him the moniker, Mr. IR8. Subba Rao was the first farmer in India who planted and widely shared seeds of IR8 in India in 1967. The next year, IR8 was planted on 1,600 hectares in his village. The variety gradually spread to other parts of the country and soon replaced other popular varieties. The 'Miracle Rice' later on became an indispensable component in future breeding programmes. Thanks to the superior yield attributes, the variety has managed to upscale rice yields from 257 million tonnes in 1966 to 686 million tonnes by 2010.

IR8 continued to spin success by becoming a part of the breeding programmes and eventually around 300 plus varieties evolved from it and were generously distributed to rice-growing countries in Asia, Africa, and Latin America. IR8 carried different names in different places. In Vietnam, IR8 was called "Honda rice", as one good harvest of this rice assured farmers enough money to fund a Honda motorcycle. One of these varieties, IR36, is the most widely planted food crop ever grown.

IR8 has touched the lives of many people in different continents of the world. It was responsible for bringing in a positive change and has helped to tide over famine in a most phenomenal way. Today when we are confronted with challenges of malnutrition and climate change, it would be a good idea to resort to science and technology and invest in varieties that can once again holds the potential to turn around human history and agriculture. One of the reasons why IR8 was a runaway success in India and around the world was the involvement of farmers. The faith reposed by farmers on the scientific community led to the widespread cultivation and production of IR8. The synergy between scientist, policy makers and scientists paved the way for green revolution. The future also demands such association to lead the planet to its next revolution in the offing.

Recognizing Soils

December 5 is celebrated as World Soil Day

The world celebrated the 'World Soil Day' on December 5, 2016 with the theme, "Soils and pulses, a symbiosis for life". A very pertinent theme as the United Nations has declared the year 2016 as the International Year of Pulses and it was natural to associate it with the Soil day. Pulses have always had a symbiotic association with the soil medium in which it grows. The pulses which harbor N fixing soil bacterium in its roots contribute positively to the development of soil nutritionally and physically.

World Soil Day is held on December 5th because it corresponds with the official birthday of H.M. King Bhumibol Adulyadej, the King of Thailand, who officially sanctioned the event. World Soil Day celebrates soil as a critical component of planet Earth. It is vital to the existence of human race as it interferes with the life of human beings by contributing directly in food production and in umpteen number of ways in securing the earth as a livable planet. Soil provides living space for humans, as well as essential ecosystem services, which are important for water regulation and supply, climate regulation, biodiversity conservation, carbon sequestration and cultural services.

The increasing human population and as a result of tweaking with the integrity of the soil to promote mankind's existential needs has led to the medium being constantly degraded and destroyed. Soils are under immense pressure to deliver to the needs of the burgeoning population, higher demands for food and competing land uses. Approximately 33% of our global soils are degraded. On a global scale, around 10 - 20% of drylands and 24% of the world's productive lands are degraded. Each year, an estimated 24 billion tonnes of fertile soil are lost due to erosion which translates to 3.4 tonnes lost every year for every person on the planet. Soil erosion within conventional agricultural practices can occur at rates up to 100 times greater than the rate of natural soil formation. Natural processes can take more than 500 years to form 2 centimetres of topsoil. In a nutshell our soil economics is in a bad shape and is in need of an urgent reparation.

Unfortunately, a perilous association exist between land degradation with areas of high poverty incidence. It is estimated that roughly 40% of the world's degraded land occurs in areas with the highest incidence of poverty.

The story of loss is no different in India. India is losing 5,334 million tonnes of soil every year due to soil erosion because of indiscreet and excess use of fertilisers, insecticides and pesticides over the years. About one millimetre of top soil is being lost each year with a total loss of 5,334 million tonnes annually due to soil erosion. The rate of loss is 16.4 tonnes per hectare every year, according to a study conducted by Central Soil Water Conservation Research and Training Institute (CSWCRTI), Dehradun. Experiments conducted by Indian Council of Agricultural Research (ICAR) indicated that non-judicious and imbalanced use of inorganic fertilisers (NPK) over years may result in deterioration of soil fertility/nutrient deficiencies.

While the world has assimilated enough knowledge on reasons of rampant soil degradation, it is time to dedicate our thought process in remedial processes. Concerted efforts in spreading the concept of Integrated Nutrient Management (INM) which relies on conjunctive use of both inorganic and organic sources of plant nutrients can promote soil health. Need based application of fertilizers becomes crucial at this point.

The current theme of Pulses and Soil has further more significance as it addresses the twin concerns that planet Earth faces today. The scares of Soil and human malnutrition have been addressed in this year's theme. When the people and the soil are deprived of nutrients, what better theme to resonate the twin objectives that is most pertinent today.

Crumbling Co-Operative Banks

Demonetization has brought cooperative banking to a standstill

A disaster of sorts is gripping Kerala's financial sector as the liquid transaction has come virtually to a standstill. Few days into monetization, the government strictly prohibited cooperative banks to accept old notes of Rs. 500 and Rs. 1000 nor to issue any new currency. They were left to deal with lower denominations. With cash transaction coming to a halt, many cooperative societies across the nation is left with a few thousand rupees in hand.

Cooperative banks are a crucial entity in India's banking sector. Providing succor to the hinterlands and ensuring last mile delivery, cooperatives have grown intricately with the rural India. They are particularly significant to farmers and low income groups as the hassles and hurdles in obtaining loans are pettier in this system and also loans can be availed in a timely manner.

According to data from Nabard, there are 32 state cooperative banks and 370 district central cooperative banks as on 31 March 2015. The number of primary agricultural credit societies (PACS), the smaller ones, as on 31 March 2014, stood at 93042. State cooperative banks across the country have deposits to the tune of Rs 1,02859 crore and a total loan outstanding of Rs 1,14545 crore as on 31 March 2015 with an impressive loan recovery percentage of almost 95 percent. On the profitability front too, the sector has done relatively well, of late. Of the total, 29 state cooperative banks posted total profit of Rs 1,105 crore during 2014-15. Their NPAs stood at 5.02 percent of their total loans and in absolute terms, their NPAs stood at Rs 5,746 crore during 2014-15. Also, these banks' accumulated losses decreased to Rs 617 crore as on 31 March 2015 from Rs 696 crore as on 31 March 2014. Primary agriculture credit societies (PACS) too have an impressive record of deposit-lending operations, at least in recent years. Total members of PACS as on 31 March 2014 aggregated Rs 13.01 crore of which, borrowing members at Rs 4.81 crore constituted around 39 percent. On the deposit side, these banks mobilized Rs 81,895 crore as on 31 March 2014, indicating a growth rate of 34 percent over the previous year.

In Kerala, Cooperative banks have emerged as a strong banking alternative as they commenced operations as early as fifties when the national banks haven't entered the scene. Presently, these financial institutions have garnered Rs 90,000 crore in deposits and Rs 75,000 crore in credits. The deposit-credit ratio is 80%, much higher than Kerala's largest nationalised bank, State Bank of Travancore, which is at just 52.6%. With new directives, the primary cooperative banks survive on the paltry sum of Rs. 24,000 provided by the district banks every week. 70% of agriculture loans for farmers were given by the sector. Many farmers who have loans approved by the cooperatives are therefore unable to collect money. Their agricultural needs and familial requirements are being postponed indefinitely.

The sudden 'demonization' of the cooperative banks comes from the acute mistrust the seemingly humble banks have accumulated due to certain 'unbankly' procedures. Cooperative banks do not follow KYC norms and this loophole is generously exploited by some to create 'benami' accounts to hold their unaccounted income. The whole operations lack transparency and many allege the existence of black money in the coffers of these banks. While even if it is true, the plebeians who survived on these, even for their day to day activities, are the suffering lot. In light of the recent mistrust exhibited by the Central Government and RBI on this common man's bank, there will only be few takers to this type of banking system in the future. It even signals the death of these banking mode and eventually to the closure of this once idealistic banking societies.

Dhanuka to Reap Rewards of Niche Focus, New Products

❖ The strategy of consistently adding new specialty chemicals with the help of global innovators has enabled Dhanuka Agritech, India's leading agrochemical company, to outgrow peers. Given its focus on fast-growing segment, pan-India reach and collaboration with global agrochemicals companies, the company is likely to continue the growth momentum in future. Delhi-based Dhanuka Agritech launched 16 new products in the past three fiscal years. The thrust continued with seven new launches in the first two quarters of the current fiscal. It plans to introduce two more products in the second half. The share of incremental revenue from new products reached 20% in FY16, compared with 15% in the previous fiscal. Dhanuka's product portfolio is concentrated in the fast-growing herbicide segment unlike the domestic industry which focuses on insecticides. The herbicide segment is growing at a rapid pace owing to the rising manual labour cost in India. Globally, it is the biggest category. The company's management hopes to create some blockbuster products each year. Among the recently introduced products, the sugarcane and maize herbicide 'Sempra,' co-marketed insecticide 'Cover' and fungicide 'Conika' hold the potential. Typically, one blockbuster product means incremental revenue of about Rs.100-150 crore every year. Dhanuka's new products are developed by global innovators such as Dupont, Nissan Chemical, Chemtura and Mitsui. Dhanuka has become a partner of choice for the global companies due to its extensive network of 8,600 distributors across India, ability to create a brand and confidence in the handling of intellectual property. The company's revenue grew by 13% in the first half of FY17 compared with the industry's growth of 8.6%. Analysts expect Dhanuka's revenue to grow by 16% and 22% for the current and next fiscals, respectively, on account of a strong product pipeline and focus on specialty chemicals.



Dhanuka Agritech Limited

Agriculture Processing Firms Prepone Procurement

❖ Agriculture processing firms are under pressure as the prices of agriculture commodities have crashed after the demonetisation move, forcing them to postpone their procurement season. Many of them had entered into procurement contracts with farmers at higher prices earlier. "Usually, processors enter the market in late December early January. But now, with prices crashing, it's the right time to enter the market," says



Pradipta Sahoo, business head, Safal products. Safal will be procuring 18,000 tonnes of vegetables this season. Companies say the price crash is because of good supply of the produce in the market and the inability of traders to procure produce or make payments. Export ban of Indian vegetables to Pakistan, was also another reason. Green peas price is currently 25%-30% lesser than last year.

Mahindra Agri picks 60% stake in Dutch fruit distribution company

❖ Mahindra Agri Solutions has acquired 60 per cent stake in the Netherlands-based global fruit distribution company OFD Holding BV for about Rs 36 crore (€5 million). OFD Holding owns Origin Fruit Direct, Origin Direct Asia and Origin Fruit Services South America, which are based out of the Netherlands, China and Chile, respectively. Ashok Sharma, Managing Director, Mahindra Agri Solutions, said the acquisition takes the company closer to becoming a significant global player in grapes and is in line with Mahindra's long term vision of Delivering FarmTech prosperity. The deal gives Mahindra an opportunity to tap new markets in Europe and China and strengthen its existing customer base. Cornij 1/2 van de Klundert, Managing Director, OFD Holding BV, said the deal will strengthen its position as an integrated supply chain company. India has emerged a major supplier of grapes to Europe. The deal is expected to benefit both the companies — Origin Fruits with their strong



distribution channel will open up global markets for the Indian farmers and Mahindra will contribute through its strong farmer connect, said Mahindra in statement. Origin Fruit Direct and Mahindra have a supplier-customer relationship which will be further be strengthened to address the market needs. This acquisition gives access to large sourcing base for both the companies across India, South American countries and South Africa and distribution base in Europe (accounting for 24 per cent of global imports of grapes) and China (fastest growing importer with 31 per cent CAGR). OFD Holding BV, which owns Origin Fruit Direct (based out of the Netherlands), Origin Direct Asia (China), and Origin Fruit Services South America (Chile) registered revenue of about €71 million in the year ended October 2016.

Cargill Takes Cooking Oil Hit, Flour Does Better

Food major Cargill India has seen a considerable drop in sales of cooking oils and animal feed after demonetisation, but its branded wheat flour sales have risen as rivals in the unorganised sector have taken a hit, chairman Siraj Chaudhry said. The business of animal feed for dairy, poultry and aqua has seen a 10% to 15% decline in sales. "The drop was expected because there is a shortfall in cash. We obviously sell to distributors in cheque but they go and resell it in cash, which is seeing a dip," Chaudhry added. Edible oils is one of the big commodities for Cargill, which has seen a decline of about 20% to 30%. However, the company is optimistic that the sales will come back to normal in a couple of months because it is an essential commodity. Comfort food, such as pastries, ice creams and noodles are hit by a larger proportion as consumers continue to cut down on leisure eating. On the other hand, whole wheat flour (aata) sales, under Cargill's brand Nature Fresh, have seen a spurt in demand, resulting in a larger offtake for them. "The reason is that a lot of aata production is in the unorganized sector and that sector obviously has been affected by this change." Cargill's corn-milling plant in Karnataka, which was set up earlier this year, has had its business impacted in the past three weeks. "It could be a 20% to 30% contraction, at least. The recovery there may take longer," he added. Chaudhry said he is confident that demonetisation will benefit organised players and will create a level-playing field for them. If there is a paucity of products which were earlier going outside the banking system into the market, it will create space for those channelled through the banking system, he added. As people are pushed further towards cashless transactions, it is expected that the process of agriculture market being more organised will hasten. A cashless economy, however, will take a "long time" to be realised, the Cargill India frontman added. Chaudhry maintained that consumer confidence must be held up as India is a consumption-driven economy, and a large proportion of foreign investment also depends on the same. Cargill India, being in agriculture, food, feed business touches a large section of the population, selling directly to consumers and also contributing to raw materials for other food businesses.



Insecticides India bullish on new product, says innovation pays

Insecticides India is pushing its new product — a herbicide for rice weed control named Green Label — aggressively in the market and the response has been very encouraging, according to Managing Director Rajesh Aggarwal. He said that it was a different kind of a product from the traditional ones as it worked on the weeds in the post-germination phase and it also reduced the water usage in rice cultivation. "It used to be imported from Japan at a high premium. We are now manufacturing it through reverse engineering, as it had gone off patent," he said. He said the company had tied up with the Japanese company, OAT Agrio, to set up a modern research and development centre. "We have seven plants in the country, including one in Uttar Pradesh for biologicals. We also have a network of 5,000 distributors and 60,000 retailers," he said. Aggarwal said the company was not merely focussing on reverse engineering, but also product innovation through its R&D centre. "We have also started exports in a small way to the Gulf countries and some Asian countries. We will also tap the European markets," he said.



NFL vendor development programme

National Fertilizers Limited (NFL), Panipat, in association with the Ministry of Micro, Small and Medium Enterprises (MSME), organised a state vendor development programme. SK Jindal, Executive Director, NFL, inaugurated the programme in the presence of Major Singh, Director, MSME, Karnal.

Future, LT Foods pact to sell rice

Kishore Biyani-led Future Consumer Ltd has entered into a pact with LT Foods Ltd and Genoa Rice Mills Private Ltd for sourcing, marketing and distribution of rice.



On March 8 this year, Future Consumer Ltd in-principally approved entering into a JV arrangement with LT Foods, a company undertaking the business of rice, for possible opportunities to manufacture, market and distribute rice and other products. Future Consumer and LT Foods each will hold 50 per cent of the paid-up share capital of Genoa Rice Mills.

Govt abolishes wheat import duty to encourage supply

➤ To improve the supply of wheat, the government removed a 10% import duty on the grain. Earlier, in September, the wheat import duty was brought down to 10% from 20%. The move is reported to be aimed at ensuring that retail wheat prices, which have seen an increase recently, are kept under check till the new crop arrives in the market from April 1, 2017. Around 2 million tonnes (mt) of wheat from Ukraine and Australia has been imported by private players in the current financial year. Traders say that with the abolition of import duty, another 3 mt of wheat is expected to be imported in the current financial year. Traders say that currently, the global price of wheat is around \$ 235 per tonne, which is below the domestic prices. However, the government is expected to review the import duty structure by March or April, 2017, once the new crop would start arriving in the market.



Govt hikes toria MSP by Rs 270 at Rs 3,560 per quintal



➤ The government has increased the minimum support price (MSP) of toria by Rs 270 per quintal to Rs 3,560 per quintal. The MSP of toria stood at Rs 3,290 per quintal in the 2015-16 crop year. "The Minimum Support Price (MSP) of Toria of Fair Average Quality (FAQ) for 2016-17 season to be marketed in 2017-18 has been fixed at Rs 3,560 per quintal," the Agriculture Ministry said in a statement. As per the decision of the Cabinet Committee on Economic Affairs (CCEA) regarding the Price Policy for Rabi Crops of 2016-17 season to be marketed in 2017-18, the MSP of Toria has been fixed on the basis of the normal market price differentials between toria and rapeseed/mustard.

Govt may cut subsidy to P&K fertilisers if MRP unreasonable

➤ The Centre, which is probing the cost data of fertiliser companies, said it may restrict or stop subsidy to those firms which have fixed maximum retail price (MRP) of the soil nutrients unreasonably high. The government has been implementing Nutrient Based Subsidy (NBS) policy for decontrolled phosphate and potash (P&K) fertilisers since April 2010. Under this policy, MRP is fixed by the fertiliser companies as per market dynamics. With fall in international prices of P&K fertilisers, companies in June had reduced the MRP of potash, DAP and NPK by Rs 5,000 per tonne, Rs 2,500 and Rs 1,000, respectively. "To curb the price rise of P&K fertilisers, the government is scrutinising the cost data submitted by the fertiliser companies from 2012-13 to verify the reasonableness of MRPs of the fertilisers fixed by these fertilisers companies," Minister of State for Fertilisers Mansukh L Mandaviya said in a written reply to the Lok Sabha. The government has engaged cost accountants/firms for the scrutiny of the cost data and to submit reports on the reasonableness of the MRPs fixed by the companies, he said. "In cases, where after scrutiny, unreasonableness of MRP is established or where there is no correlation between the cost of production or acquisition and the MRP printed on the bags, the subsidy may be restricted or denied even if the product is otherwise eligible for subsidy under NBS," he said.





Coromandel

We Help
GROWTH
We aid
PROTECTION
We bring
PROSPERITY

WE ARE COROMANDEL



India's No.1

Private sector company in the Phosphatics segment

Coromandel International Limited,

Coromandel House, S. P. Road, Secunderabad - 500 003. A. P. Tel: 040-27842034



GROMOR

MY GROMOR - ALWAYS WITH ME

Farming community in Maharashtra faces steep hike in power tariff

➤ The farming community in Maharashtra is expected to be crushed under the steep hike in power tariff made applicable by the Maharashtra State Electricity Distribution Company Limited 'Mahavitaran' for agro water pumps. As per the hike approved by the Maharashtra Electricity Regulatory Commission (MERC), the 'Mahavitaran' vide its order No 275 has released new tariff for the period November 2016 to April 2019, according to which the electricity rates will double by 2019. As per the new rates, the metered power consumers consuming up to three horse power, who are paying 0.55 paise per unit at present, will have to pay Rs 1.22 per unit in April 2019. Similarly, those



consuming more than 3 horse power, paying 0.85 paise per unit at present, will have to pay Rs 1.52 per unit in April 2019. Similarly, the tariff applicable to the unmetered power consumers will be increased in phases in April 2017, April 2018 and April 2019. The tariff which is Rs. 85 to Rs. 129 per month per horse power at present, will increase

to Rs.168 to Rs. 281 per horse power per month. The high-power consumers using energy for drip irrigation who are paying Rs. 0.72 per unit at present will have to pay Rs 1.13 per unit in April 2019. Whereas other consumers consuming high-power energy who are being charged at 0.92 paise per unit will be charged Rs 1.23 paise per unit in April 2019. Similarly, consumer demand charge which is Rs 5/- per KV at present, will be increased up to Rs 25 per KV in April 2019. The electricity use is metered in two ways. The first is based on the total consumption in a given month, and the second is based on the highest capacity the consumer requires, during the given billing period.

'Cash crunch', Bengal tea garden closed

➤ The Management of a tea garden in Terai region of north Bengal suspended operations citing non-availability of cash to pay wages "due to demonetisation effects", affecting the livelihood of nearly 2,500 workers. Senior officers of Tirrihannah Tea Estate, located approximately 35 km from Siliguri, are reported to have left the garden around Thursday midnight after sending a general notice to the Indian Tea Association and the Darjeeling administration. The garden employs 1,200 permanent and 1,300 casual workers. The notice states, "It is to be noted that their wages were delayed due to the demonetisation effects announced by the Government of India, and for which the banks could not arrange funds in time." While the banks were not identified in the notice, sources in the government maintained that the cash situation is serious in north Bengal, and that banks are on the brink of liquidity crisis.

Foodgrain production increases by 67 pc in Tripura

➤ The roadmap for agricultural development in Tripura which was designed way back in 1999 has started delivering bumper results in the field of State's core agriculture sector. The food grain production in the State has increased by 67 per cent since 1999-2000 financial year thanks to a well- designed plan – achieving self reliance in foodgrain production, according to latest statistics released by State Agriculture department. Rice production which was only 5.05 lakh MT in the year 1999-2000 has risen to 7.95 lakh MT while a target of producing 8.76 lakh MT for the year 2015-16 FY. Likewise, corn production has also been increased substantially during the period. Corn production has been enhanced from 0.01 lakh MT in 1999-2000 FY to 0.12 lakh MT during 2015-16. Pulse production also registered a good progress as production has increased to 0.15 lakh MT from 0.04 lakh MT although the state is still long way to achieve self sufficiency in pulses. An official release indicates timely distribution of seeds, agriculture equipments and other facilities have contributed to hike in food grain production. In the state, use of fertilizers both chemical and organic has been increased because of awareness among the farmers. The supply of fertilizer has been swelled from 24.91 lakh MT in 1999-2000 FY to 51.52 lakh MT during 2015-16 FY. Interest in using modern technique and high yielding variety seeds have played a key role in increasing food grain production in the state, said a senior Agriculture department official.



Karnataka demands bonus of Rs 700/quintal for ragi, jowar

► Karnataka Chief Minister Siddaramaiah demanded that the Centre should announce a bonus of Rs 700 per quintal over and above the support price of the millets to promote their cultivation. The central government has already declared the minimum support price (MSP) of ragi at Rs 1,725/quintal, jowar hybrid at Rs 1,625/quintal and Jowar Maldani at Rs 1,650/quintal for the 2016-17 crop year (July-June). Raising the issue in a meeting with Union Agriculture Minister Radha Mohan Singh, Siddaramaiah said: "We strongly urge an enhancement of MSP of ragi and jowar for this season. Since MSP is already announced, at this stage declaration of bonus can be considered as an option. Hence, I request the government to announce bonus of Rs 700 for ragi and jowar over and above MSP to help small and marginal farmers at one hand and benefit the poor consumers on the other." In a representation made to the Agriculture Ministry, the Karnataka Chief Minister said that the State wants to promote production of these two nutri-cereals, which are "climate smart crops" can be grown in rain-fed and drought-prone areas. Since these two millets are far superior from nutrition point of view when compared with rice and wheat, the state government has started supplying ragi and jowar through the public distribution system, he said.

Gujarat farmers expect bumper potato crop

► Sowing of potato in the state is expected to cross 12 lakh hectares this year, as compared 10.70 lakh hectares last year, say agriculture experts. In 2015, potato sowing was conducted over 5.19 lakh hectares till December 5. This year, however, 10.17 lakh hectares have been sown by the same date. Consequently, a bumper potato crop is expected. Currently, Gujarat ranks fifth in the country in production of potato. Officials said potato production in the state has been rising steadily. While 23 lakh tonnes had come to the market in 2014, in 2015, that amount went up to 31 lakh tonnes, and to 35 lakh tonnes in 2016. Sowing of the crop picked up over last month, said officials, who reported that at least 5.51 lakh hectares had been sown in the last 20 days alone. If the trend continues, sowing will cross 12 lakh hectares so far the highest area used to cultivate potato in Gujarat in any year.

AP cotton market at a standstill after demonetisation

► The cotton market in Andhra Pradesh, one of the major producers in the country, has plunged into a deep crisis in the aftermath of demonetisation, as transactions have almost come to a halt and prices have slumped by roughly Rs 1,000 per quintal. It is almost a month since the Prime Minister announced the move to scrap the high-denomination notes and one of the worst-hit commodities markets in the State is cotton. The crop is grown widely in Krishna, Guntur, Prakasam and Kurnool districts and to an extent in the two Godavari districts. The ginning mills, most of them located in Guntur district, supply cotton to textile mills in other States such as Maharashtra, Tamil Nadu, Gujarat and Karnataka. After demonetisation, ginning mills are in a crisis and have been unable to purchase cotton through brokers due to the liquidity crunch. According to trade sources, almost 70-80 per cent of the transactions have come to a halt and the market has been hit hard. A month ago, quality cotton was selling in the range of Rs 5,300-5,500 per quintal and the price has now slumped to Rs 4,300-4,500. Farmers are unwilling to sell at these rates. On the other hand, the Cotton Corporation of India (CCI) has opened more than 40 cotton purchase centres in the State, but the price offered is much lower than the prevailing market price, at Rs 4,100 per quintal. Farmers are therefore unwilling to sell the cotton at CCI purchase centres. The net result is that the cotton market is almost at a standstill after demonetisation.



Maha farmers embrace electronic payment modes

► Farmers are showing their intent to adapt to the changing economic environment. The well-off farmers who have access to technology and resources are learning to deal with the new cashless economy and embrace alternatives. Case in point are farmers who are going to visit the Kisan agri show in Pune on December 14 and 18, right in the middle of the demonetisation drive. They have to pay Rs. 100 to register and attend the show. To reduce the rush at the entry gate and deal with shortage of change, the organisers encouraged farmers to register their entry as well as pay on-line. It offered them a 50% discount if they made electronic payments. The results so far are encouraging. Though in small numbers, they are amongst the more progressive and influential farmers and what they do has a larger demonstrative effect on others around them. The Kisan show has so far received online payment from 3,086 farmers as on December 6, 2018. "Many farmers are using debit cards for the first time," says Niranjana Deshpande, convenor of the Kisan show which has used the PayU payment gateway.



Rs 11,000-crore loan for farmers

➤ Karnataka Chief Minister Siddaramaiah announced disbursement of loans to the tune of Rs 11,000 crore to farmers in the state, reports DHNS from Mudigere (Chikkamagaluru dist).

Addressing the gathering at a function, he said, "There is no need to fear in the wake of the drought as it has been decided to sanction loans to the tune of Rs 11,000 crore to help the farmers." When local MLA B B Ningaiah made an appeal to the chief minister to waive loans taken by farmers, he reiterated that the state was ready to waive 50% of the loans if the Central government set the precedent.

More than 26% of farmers covered under govt's crop insurance scheme

➤ More than 3.66 crore farmers of the estimated 14 crore in the country were enrolled with the NDA government's flagship Pradhan Mantri Fasal Bima Yojana (PMFBY) in the recently-concluded kharif season (2016-17) and overall coverage of crop insurance is set to surpass the target set for the year, an agriculture ministry statement stated. "As on date the scheme has provided coverage to 3.66 crore farmers (26.50%) and at this rate it is likely to exceed the target of 30% coverage for both kharif and rabi seasons in 2016-17," an official statement stated. The ministry has stated PMFBY's performance in Kharif 2016 in terms of total area covered has been a 'significant' achievement, amounting to a total area of 388.62 lakh hectares and sum insured of Rs 141,339 crore. The statement also noted that the performance in the kharif season was better despite the fact that there were teething issues to begin with. "For instance, many states did the bidding process for selection of the insurance companies for concerned clusters for the first time and consequently, the notification of the scheme was delayed in a number of states," according to the statement. The agriculture ministry has stated that there has been a jump

of more than six times in the coverage of non-loanee farmers from 14.88 lakh in Kharif 2015 to 102.6 lakh in Kharif 2016 under PMFBY, which indicates that 'the scheme has been well received by the non-loanee segment'. At the start of the season in June, the Centre named state-owned Agriculture Insurance Company of India (AIC) and 10 private companies, including ICICI-Lombard General Insurance, HDFC-ERGO General Insurance, IFFCO-Tokio General Insurance and SBI General Insurance, for the implementation of the mega scheme. Launched by the Modi government this January,

PMFBY stipulates a uniform premium of 2% to be paid by farmers for kharif crops, and 1.5% for rabi crops. The premium for annual commercial and horticultural crops will be capped at 5%. For PMFBY, FM Arun Jaitley had allocated Rs 5,501 crore in 2016-17 while Rs 2,995 crore was allocated for various crop insurance schemes in the last financial year. The major subsidy burden for rolling out crop insurance would be borne by both the states and the Centre. Subsidy from the government would now be 'unlimited' and grow a steep 183% to Rs 8,800 crore by FY19.



Agri Societies See Panic Withdrawals

➤ Customers of primary agriculture credit societies (PACS) in Kerala are resorting to panic withdrawals and depositing money in commercial banks after a November 14 announcement by the Reserve Bank of India banning the exchange of old Rs.500 and Rs.1,000 notes. Although the demonetisation announcement was made on November 8, a window period of one week was given to PACS customers to exchange their old notes. However, RBI imposed a restriction after a week as it suspected money laundering across the country through PACS. Despite initiating fire-fighting exercises to control the gradual run on the bank after November 14, the outbound flow to commercial banks continues unabated. PACS are at the lower end of the three-tier co-operative banking system and most of their customers include small farmers and business-

men. "There are around 1,650 PACS in the state and considering that an average of `3 crore is getting withdrawn by them (each society), the amount comes close to Rs 5,000 crore in the space of nearly three weeks," said KP Baby, director of National Federation of State Co-operative Banks (Nafscob) and president of Mookannur Service Co-operative Bank in Ernakulam district. "They come to us for two reasons: convenience and better interest rates. Thinking that PACS are no longer safe, they transfer money citing reasons like marriage and payment for gold kept in lockers," said PJ James, secretary of Thodupuzha Service Co-operative Bank. With the weekly withdrawal limit at these banks pegged to Rs 24,000 per week, PACS customers withdraw cash using cheques or use National Electronic Funds Transfer

(NEFT) or Real-time Gross Settlement Systems (RTGS) facilities to transfer funds to commercial banks in which they hold accounts. Thenhipalam Co-operative Rural bank has already seen withdrawals of Rs 4 crore, according to the bank's assistant secretary Sreejit Mullassery. "People don't even wait for their FDs (fixed deposits) to mature and move it to commercial banks," he said. Commercial banks in which these customers hold accounts are the beneficiaries. "We have received, may be Rs 25-40 lakh (since November 14). There are banks which have been canvassing aggressively and could have got more. But we don't have time for that as we are having a hard time controlling the crowd at the bank," said SBT Kottayam chief manager M I Poulose. Bank officials say there has been diversion of funds from PACS to current accounts of commercial banks.

'Ensure fair money flow to farmers for crop'



➤ The Reserve Bank of India asked banks managing currency chests to engage district co-ordinators of state-level bankers' committee to ensure fair and even flow of money to farmers for their winter crop requirements in view of cash shortage post demonetisation. To ensure adequate allocation of bank notes is made for rural branches, post offices and DCCBs, banks are advised to involve the district co-ordinators (Lead District Managers) functioning under State Level Bankers' Committee in facilitating/planning distribution of currency from currency chests, the RBI said.

When the sugarcane industry sowed the seeds of banking

➤ On the face of it, the sugar industry seems to be better prepared than its peers to face the present cash crunch in the economy. The industry has been among the first to use the banking channel to pay its farmers and traders, even before the demonetisation shock. "Cooperative banks, which gave concessional loans to sugarcane farmers, have played an important role in giving incentives

to them to open bank accounts, explains N Ramanathan, Managing Director of the Chennai-based Ponni Sugars. Sugar companies, too, realised that going cashless helps in improving fiscal discipline and governance. "But we couldn't have done it overnight. So at every stage we brought down the eligibility for cash payment. Over the years we were able to drive entire cash payment out of our system. Now all payments go by cheque," said Ramanathan. "Banking has taken deep roots in the sugar sector in the last ten years. Today there is absolutely no cash payment being made by sugar companies in Tamil Nadu," he added.



India seen facing tight wheat supply as shipments from Ukraine may get delayed

➤ India could face tight wheat supplies in the weeks ahead as 400,000 tonnes of Ukrainian cargoes, booked for December, are expected to be delayed, traders said, just when the country was boosting stockpiles. India had scrapped its 10 percent import duty on wheat after droughts in the past two years depleted stocks and raised prices, a move traders said could lift overseas purchases to their highest in a decade. India, which has been snapping up Australian and Black Sea wheat cargoes in recent weeks, was expecting the shipments from Ukraine to arrive this month, but traders now say they might reach India by January. Ukraine is in the middle of peak corn exports while wheat shipment season is nearly over.



FAO ups 2016 wheat output estimate to 749 mt

➤ The Food and Agriculture Organization of the United Nations has raised its forecast for global wheat output in 2016 to a new record high of 749.3 million tonnes from 746.7 m t estimated a month ago. The estimate was raised mainly as yield prospects in Iran and Kazakhstan have improved, the report said. The estimated output is higher than last year's production of 735.1 mln tn, the organisation said in its monthly report. The crop is expected to be higher than last year due to favourable weather conditions in the US, Russia and Ukraine. The FAO also expects wheat output in India and Pakistan to be up from last year due to improved availability of water. Output in China is also likely to rise because of good planting conditions.

Pak rejects 10,000 bales of Indian Cotton

➤ Amidst Indo-Pak tensions, Pakistan has rejected a consignment of 10,000 bales of cotton worth USD 3.3 million from India citing violation of plant quarantine rule by importers. The shipment of ginned cotton at Karachi Port was imported by seven textile mills. It was rejected by the Plant Quarantine and Certification Services Office, Ministry of National Food Security and Research Department of Plant Protection, Dawn newspaper reported. The rejection sent shock waves in the textile industry which has been striving for permission to import cotton from India, the report said. Last year, 2.7 million bales worth USD 800 million were imported from India to make up for the shortfall after cotton crop failure. The customs deputy collector informed that the consignment was imported in violation of the Pakistan Plant Quarantine Act 1976 and Rules 1967 and said the consignment would be returned to India at the expense of importers. The private sector has imported around 1.2 million cotton bales from different countries and orders for 0.3 million bales of Indian cotton have been placed, according to officials. According to the textile industry leaders the cotton imported from countries other than India was cleared by the customs authorities without any issue, the report said.



India to chair working group of ISO

➤ India has been selected to chair a working group of the International Sugar Organisation (ISO), an official statement said here. Recognising India as a major and leading player in the world sugar sector, the 50th session of the council meeting of the ISO held on December 2 decided "with full consensus of all its member countries that India become the Chair of the Working Group Committee with a mandate to study, examine and recommend the new role to be played by ISO in the Sugar economy of today and in future," a statement issued by the Indian High Commission stated. At present, the ISO has 87 countries as members and is in force in terms of the International Sugar Agreement, 1992.

Soyameal exports seen reviving as prices turn competitive

► The current uptrend in export shipments of soyameal, at the beginning of the season, has set an optimistic tone for exporters from India. Aided by a favourable currency trend and lower domestic prices, Indian soyameal exports are set to make a comeback in the world market after two years of tepidity. According to the latest export data shared by the Soyabean Processors Association of India (SOPA), soyameal (HS Code 2304) exports in November jumped by 104 per cent to 61,003 tonnes compared to 29,801 tonnes in the same month last year. In the current oil year (October 2016-September 2017), total exports in the first two months totalled 80,142 tonnes (71,905 tonnes), showing an increase of 11.45 per cent.



China opens its market for Indian rice



► China, the world's top rice consumer and importer, has granted phytosanitary clearances to 14 Indian rice exporters, including established ones like LT Foods, Kohinoor Foods and Amira Pure Foods, opening its market to the Indian grain after years of restricting such supplies through non-tariff barriers, reports Banikinkar Pattanayak in New Delhi. Official and industry sources said that in a recent communication to the Indian government, China has conveyed that 14 of the 19 rice mills its team visited in September have been cleared for exports to that country — remarkable by China's standards. The list of 14 exporters that can now ship out to China also includes KRBL, Best Foods, Sarveshwar Foods, SSA International, Ebro India, Pari India, DRRK Foods, Sunstar

Overseas, Nature Bio Foods, MR Overseas and United Exports, the sources said. China has been a major buyer of non-Basmati rice from Pakistan, a factor that might have delayed the clearance to Indian exporters, trade analysts have said.

India's oilmeal exports dip 9.75% in November

► Oilmeal exports fell by 9.75 per cent to 1,08,342 tonnes in November this year on sluggish demand, industry body SEA said. The country had shipped 1,20,059 tonnes of oilmeal -- used as an animal feed -- in November last year. During April-November of the 2016-17 fiscal, oilmeal exports fell 27 per cent to 6,62,489 tonnes from 9,03,624 tonnes in the year-ago period, according to the latest data released by the Solvent Extractors Association of India (SEA). The fall was mainly due to "lesser availability of oilseeds for crushing and continuous disparity in exporting soyabean meal in international market," it said. In November 2016, rapeseed meal export fell to 12,304 tonnes from 12,845 tonnes in the year-ago period, while rice bran extraction declined to 2,371 from 12,528 tonnes in the said period. Similarly, castor seed meal export almost halved to 41,451 tonnes from 82,777 tonnes in the said period, Mumbai-based SEA said.



A more muscular rice variety takes on wheat

➤ A rice variety that packs more protein to match wheat has been released by Karnataka's University of Agricultural Sciences - Bengaluru. The rice strain, which offers an option to those who are not comfortable switching over to wheat for supplementary protein, is now available for commercial cultivation. The high-protein variety has been under development at UAS-B for nearly 10 years, with Rs. 92 lakh in funding from the Union Department of Biotechnology. Dr. Shailaja Hittalmani, who headed the research team that worked on it, informed that the strain has 12 to 13 per cent protein content, which is higher than the 6 to 7.5 per cent in normal rice. Wheat has about 14 per cent of protein. Using conventional breeding, researchers raised the amount of lysine, an amino acid that helps synthesize proteins, by about 20 per cent, among other benefits. "The higher protein leads to a decrease in starch, benefiting diabetics," Dr. Hittalmani, who heads the Genetics and Plant Breeding Department of the University, said.

Improved technology for paddy straw management

➤ The Punjab Agricultural University, the Borlaug Institute for South Asia (BISA), Ludhawal (Ludhiana), and the Commissioner Agriculture, Punjab, Dr Balwinder Singh Sidhu, have recommended an improved technology for farmers to manage paddy straw and directly sow wheat after the harvest of paddy. "We have seen the use of the new technology at the 300-acre BISA farm and we are impressed," said Dr Balwinder Singh. "For direct sowing of wheat, the happy seeder has already been recommended by the PAU," said Dr Sidhu. Explaining how the new technology works, Dr Harminder Singh Sidhu, senior research engineer at BISA, said an additional straw management system could be fitted to any existing combine harvest. The SMS cuts the straw in small pieces and scatters it around behind the tail of the combine. There could be easy direct sowing of the wheat with happy seeder in that field. In one day, up to 15-20 acres can be sown. The scattered straw helps not only in conserving the soil moisture but is also a prerequisite to use Happy Seeder for direct drilling of wheat into the rice residue in a single pass without burning the straw or removing it.



Monsanto says next breakthrough for farmers is a friendly fungus

➤ Monsanto Co., a lightning rod for critics of modern agricultural techniques, is introducing a new feature next year for its genetically modified corn seeds that it says will not only boost yields but cut down on fertilizer use and carbon-dioxide emissions. The seed giant, together with Danish company Novozymes A/S, has developed a coating for seeds made from a friendly fungus that helps corn plants in their earliest growth stages. St. Louis-based Monsanto, which earlier this year agreed to be acquired by Germany's Bayer AG, is hailing the product as a breakthrough for microbial technology, in which scientists look to fungi and other organisms such as bacteria to help farmers. Corn crops treated with the new Monsanto-Novozymes microbial—officially known as Acceleron B-300 SAT—had better yields than those without the treatment, the companies said in a statement. The product stays on seeds longer and is compatible with other chemical treatments, unlike previous versions. It could be applied to more than 90 million acres (36 million hectares) by 2025. The seed treatment could "become one of the biggest biological products in the ag industry," said Colin Bletsky, vice-president for Novozymes' BioAg unit. "Harnessing the power of nature's microbes, farmers will be able to produce more crops." Farmers have been using synthetic chemical treatments for seeds for decades to protect plants from pests as they take root, and it's a mature industry, Monsanto spokesman John Combest said. Microbial seed treatments, in contrast, are niche products that have only boomed in the past decade, he said. The agricultural microbial market currently has about \$1.8 billion in sales, while traditional chemicals and pesticides is a market valued at about \$240 billion, Combest said. The new microbial coating, derived from a fungus called *Penicillium bilaiae*, works by growing along the roots of plants and helping them to access nitrogen and phosphorus in the soil. In trials, crops using the microbial boosted yields by more than 3 bushels an acre on average, according to the release.

Govt launches e-hub for farming sector

➤ The agriculture ministry launched an ICAR data centre -connecting 274 specialised institutions and universities -which will act as an information hub for the farm sector and eventually link the rural population with high speed internet network. The centre will cater to research institutions by providing consultancy, project management, training and other value-added services. "This data centre of ICAR will play an important role in promoting the 'Digital India Campaign' in the agriculture sector. The campaign aims at providing electronic services while reducing the requirements of paper," said agriculture minister Radha Mohan Singh. He said, "Many have expressed doubts about our production data. The new ICAR data centre will provide transparent and accurate data". His remarks came in the backdrop of doubt over the government's production data in certain quarters. Traders of farm produce have recently questioned the wheat production estimate of 93.55 million tonnes for 2015-16 crop year, saying the actual output was around 86 million tonnes. A mobile app for 'Krishi Vigyan Kendra' was also launched.

Centre to set up agri-production hubs near metros

➤ The Centre is working on a proposal to set up 'production hubs' for cow milk, vegetables, and other agri-produce near metro cities to boost supply, Union Agriculture Minister Radha Mohan Singh said. To start with, the agriculture ministry is in talks with the Delhi government as well as neighbouring states on this issue, he said. "The government is working towards setting up production hubs near metros for milk, eggs, fruits, vegetables, flowers and other such things as part of the online trading platform," Singh said while addressing an Assocham event. "The Chinese capital has population twice as much that of Delhi, but everything is available within a radius of 150 kilometres, while in Delhi milk comes from Andhra Pradesh and vegetables from Kolkata," a statement quoted him as saying. The ministry has conducted 3-4 meetings in NCR to make Gurugram, formerly Gurgaon, a hub for flowers while Sonapat and Panipat will be made hub for vegetables and Karnal for indigenous cow milk. The ministry is also in talks with Uttar Pradesh government on this issue, he added.

100% SOLUTION FOR ORGANIC FARMING

SEED DRESSING TO HARVESTING



TROPICAL AGRO

Biological Products



Winner of Global Agriculture Leadership Award 2016

TROPICAL AGROSYSTEM (INDIA) PVT LTD.

(AN ISO 9001:2008 CERTIFIED COMPANY)

72, Marshalls Road, Egmore, Chennai – 600 008. Tamilnadu, India. www.tropicalagro.in



2016

DEVELOPMENT SET IN MOTION

The year 2016 can be termed as monumental for agriculture. The sector could maintain a steady attention from the government both in terms of budgetary allocation and policy provisions. Agriculture sector which was languishing in the confines of prolonged spells of drought saw relief in good monsoons and the ensuing proposition of a bumper harvest. The first estimates of food grain production also reveal a promising picture in the production front. Policy wise, it was quite a happening year for agriculture, although the effects of which would be felt only in years ahead.



The year, 2016 saw some dramatic developments and held quite a few surprises in its fold. The year started with the optimism of good monsoons after prolonged spells of droughts and ended up in demonetization, the effects of which have been devastating for businesses and small entrepreneurs especially in rural areas, whereas the longterm effects on economy are pegged to be phenomenal.

Several new policies made their appearance in the agriculture sector, notable among them were the Pradhan Mantri Fasal Bima Yojana, electronic National Agriculture Market etc., which were progressive and good intentioned. So to speak of agriculture in particular, the year 2016 had set the ball rolling for many reforms to take off probably in years to follow, most of them having the potential of being revolutionary. A good monsoon also ensured a decent harvest and the first estimates emerging point to a bumper Kharif harvest, may be a record in itself. However, moves like demonetization and removal of import duty on wheat have been a real dampener to the sector.

Budget Bouquets

Essentially a pro village, pro poor and pro farmer budget, Union Budget 2016 has made significant allocations in the areas of agriculture, village infrastructure and rural development. Agriculture emerged as a clear frontrunner in the budget and the farmers the true winners.

The Union Budget 2016 presented by Union Finance Minister, Arun Jaitley on February 29, 2016 allocated Rs. 35,984 crore for Agriculture and Farmers' welfare. The government in this budget has aimed to reorient its interventions in the farm and non-farm sectors with the benign intention of doubling the income of the farmers by 2022.

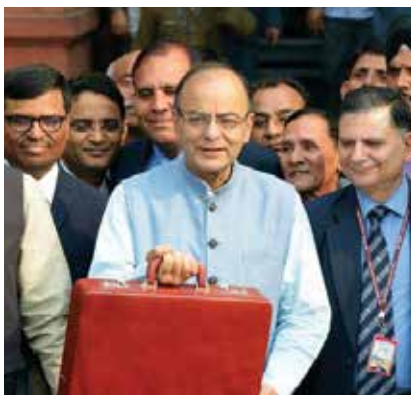
The budget this year had placed a profound impetus on irrigation which could be gauged by the magnitude of allocations marked to this sector. The 'Pradhan Mantri Krishi Sinchai Yojana' has been strengthened and is



expected to be implemented in mission mode to bring 28.5 lakh hectares under irrigation. A dedicated Long Term Irrigation Fund has been proposed to be created in NABARD with an initial corpus of about Rs. 20,000 crore. To achieve all these, a total provision of Rs.12,517 crore has been made through budgetary support and market borrowings in 2016-17. The budget has made the ambitious claim to cover all 14 crore farm holdings by March 2017 under the Soil Health Card Scheme. Rs. 368 crore has been provided for National Project on Soil Health and Fertility. Another interesting announcement came in the fertilizer sector, where the minister revealed his plans to establish 2,000 model retail outlets of Fertilizer companies with soil and seed testing facilities during the next three years. Also, fertilizer companies have been given the added responsibility of co-marketing city compost which increases the efficacy of chemical fertilizer. A policy for conversion of city waste into compost has also been approved by the Government under the Swachh Bharat Abhiyan. Earlier in 2016, it had been decided to allow urea

producers to produce neem coated urea up to 100 per cent of production and making it mandatory to produce a minimum of 75 per cent of domestic urea as neem coated, so that farmers are benefitted.

This budget has put major emphasis on Organic Farming. Towards this end, the Government has launched two important schemes - the 'Parmparagat Krishi Vikas Yojana' which aims to bring 5 lakh acres under organic farming over a three year period and "Organic Value Chain Development in North East Region" in which the emphasis would be on value addition so that organic produce grown in these parts find domestic and export markets. A total provision of Rs. 412 crore has been made for these schemes.



Another important budget allocation came in the form of announcement of the Unified Agriculture Marketing Scheme which envisages a common e-market platform that will be deployed in selected 585 regulated wholesale markets. This budget has maintained

a special focus on ensuring adequate and timely flow of credit to the farmers. Against the target of Rs. 8.5 lakh crore in 2015-16, the target for agricultural credit in 2016-17 has been kept at an all-time high of Rs.9 lakh crore. To reduce the burden of loan repayment on farmers, a provision of Rs.15,000 crore has been made in the BE 2016-17 towards interest subvention. This budget has also been responsible for another path breaking scheme - Prime Minister Fasal Bima Yojana. For effective implementation of this Scheme a sum of Rs.5,500 crore in the Budget 2016-17 has been assigned.

As the focus of this budget was on doubling the farmers income, the Finance Minister has made the allied

'Solar Energy-Driven Agriculture has a Vast Potential in Future'

Dr. O.P. Yadav, FNAAS, Director, ICAR-Central Arid Zone Research Institute (CAZRI), Jodhpur, Rajasthan

Food and energy are the two key resources for human civilization and the demands for these two are increasing day by day. Again both these resources are interlinked with each other. Foods are produced by utilizing solar energy through the photosynthesis process. The calories stored in food are consumed by human beings to accomplish work and to sustain the body metabolism. With the advancement of food production system from agrarian to a futuristic technology-driven system, there has been rapid increase in energy use in agriculture e.g. use of heavy tillage implements and machineries for different agricultural operations, pumps for lifting irrigation water, post-harvest processing units for value addition etc. Share of agricultural sector in total energy consumption is about 7-8% and further increase in energy use from its present value of 1.6 kW ha⁻¹ to 2.5 kW ha⁻¹ is expected to meet the production target of next 20 years. The rise in energy use has adverse effects on climate due to burning of fast



depleting fossil fuels and thus emitting greenhouse gasses. In this context, we need to harness and use more renewable forms of energy, especially solar energy that is plentiful on most part of the country. Also, at several locations harnessing wind power, biogas and utilizing biomass could be effective alternatives. At present, about 13% of the country's installed electricity generation capacity is contributed by renewable sources e.g. wind, solar, bioenergy, hydro etc. The

national solar mission is in progress to increase the renewable energy use share at different sectors including agriculture. Solar PV modules can be installed in agricultural field for simultaneous generation of electricity and production of food from same piece of land through agro-voltaic system in order to contribute in the national target of 100 GW on-grid PV generations by the year 2022. Off-grid target of 2000 MW may also be achieved by installing solar PV pumping system, establishing mini-grids etc. in agricultural farms. Even, the target of installing 20 million m² solar thermal collector area by the end of 2022 can be achieved through propagating solar thermal devices for post-harvest processing of agricultural produces. Considering the potential of solar energy in future, following four avenues of its utilization in agriculture may be enhanced: (i) Solar PV operated water lifting/pumping system (ii) Agri-voltaic system (iii) Solar-based processing of agricultural produces (iv) Solar-wind hybrid devices

activities that complement farmer's income more remunerative by launching four schemes in the dairying sector - 'Pashudhan Sanjivani', an animal wellness programme and provision of Animal Health Cards ('Nakul Swasthya Patra'); an Advanced breeding technology; Creation of 'E-Pashudhan Haat', an e market portal for connecting breeders and farmers; and a National Genomic Centre for indigenous breeds. An amount of Rs.850 crores over the next few years has been allocated for these projects.

Another critical announcement was made in the FDI policy. In the budget speech, the minister acknowledged that the FDI policy has to address the requirements of farmers and food processing industry. Reiterating that food processing industry and trade should be more efficient, he announced that 100% FDI will be allowed through FIPB route in marketing of food products produced and manufactured in India. This will benefit farmers, give impetus to food processing industry and create vast employment opportunities.

The Union Budget 2015-16 had a clear intention of doubling farmers' income, strengthen village infrastructure and galvanizing farmers' from market fluctuations and climatic variations. However, the budget was quiet on any investments or schemes to support research especially in areas of climate change. Interest subvention which was supposed to make a phased exit, nevertheless was made to continue. Pulses could have gotten more support.

Bt Briquettes

Monsanto suffered a major setback in their Indian operations in 2016 with the Union government's decision to control prices of cotton seeds, including the genetically modified versions by fixing a uniform

'Milk is now the Single Largest Agricultural Commodity'

Mr Dilip Rath, Chairman, NDDB

India continues to be the world's largest milk producer with an estimated milk production of about 156 million tonnes in 2015-16, growing at about 5.5% over the last 10 years. India now accounts for one-fifth of world milk production and its per capita availability of milk at 337 grams which is more than the world average of around 300 grams per day. Milk is now the single largest agricultural commodity surpassing even the combined value of output of paddy and wheat in the country.



Milk production in India is primarily a small holder activity based on family labour contributed by women and crop residue with very little cultivated fodder. About 63 million rural households are engaged in milk production, of which 90 per cent belong to the landless, marginal and small category owning about 85 per cent of the female bovines and 53 per cent of the farm land. About 80 per cent of these animal owners own about 1-3 animals. Dairying contributes close to one-third of gross income of rural households and those without land nearly half of the gross income.

Operation Flood implemented by NDDB demonstrated that a small holder dairy system linked to the Anand pattern cooperative network can help achieve self-sufficiency in milk production and augment farmers' income. India's growing demand for milk can help provide livelihood opportunities for millions of its rural households affiliated to the cooperative network.

National Dairy Plan Phase I (NDP I), is a scientifically planned multi-state initiative that is being implemented by NDDB through End Implementing Agencies (EIAs) with the objectives of i) increasing productivity of milch animals to help increase milk production to meet the rapidly growing demand for milk and ii) providing rural milk producers with greater access to the organised milk processing sector. NDP I is being implemented in 18 major milk producing States which account for more than 90 per cent of the country's milk production. NDP-1 brings in a slew of production enhancement technologies which include production of high genetic merit bulls, strengthening existing semen stations/starting new stations, improving nutrition of milch animals through Ration Balancing and Fodder Development programme and also setting up of pilot model for viable doorstep AI delivery services, which would contribute to the sustainable dairy development in the country.

With these interventions it will be possible to make our milk production system sustainable so that our country remains self sufficient in milk and be able to feed the world's most populated country in the next 2 decades.

maximum retail price (MRP) from March. It was 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. The 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.

After the center had already regulated the retail sale price of GM cotton seed, and issued a notification on capping the license fee for all new genetically modified (GM) seed technologies, the government has effectively put a notification on capping the licence fee for all new



genetically modified (GM) seed technologies in abeyance till a "wider" consultation was taken. This was apparently taking into consideration the opposition from crop biotech industry and farm experts.

The notification regarding the guideline for Bt cotton technology was issued on May 18 and remained in the public domain for the period of 90 days, in the same form for comments and suggestions of all stakeholders.

Role of tuber crops in doubling farmers' income

Swarup Kumar Chakrabarti, ICAR-Central Potato Research Institute, Shimla

The agriculture sector plays a vital role in Indian economy. It is the largest private sector providing employment to more than half of Indian population mostly residing in rural areas. According to the 2011 census of India, 68.84% of Indian population (around 83.31 crore) live in 6,40,867 different villages distributed all over India. As per the latest estimate of the National Sample Survey Office (NSSO), Ministry of Statistics and Programme Implementation, in the year 2012-13, rural India nurtured nearly 156 million households out of which 57.80% were dependent on agriculture. Therefore, India's development is intimately linked with rural development and improving income of farmers. Government of India is emphasizing on improving the productivity of crops in order to improve resilience of this sector and bolster food security in the country. A target has been kept by the Indian Govt. to double the income of farmers by 2022. Horticulture will be a key contributor in achieving the set

target. Horticulture per se has a great potential to enhance farm income. Therefore, shifting from traditional grain crops to high value horticultural crops would contribute in a big way towards doubling farmers' income in India. Among the horticultural crops, tuber crops are particularly important for achieving the goal because of their exceptionally high per unit productivity. However, to achieve the target of doubling farmers' income in an inclusive manner, the production clusters are to be well connected with the input as well as consumer markets. It is beyond any doubt that establishment of micro- mini-, small-, and medium-scale enterprises dealing with agricultural inputs and post-harvest management can effectively improve livelihood security of rural India. Tuber crops offer tremendous opportunity for establishment of such enterprises at village level. Besides, they also offer opportunity for greening rural development through healthy ecosystems support and sustainable agriculture. To realize that

potential in a comprehensive manner, greater thrust is necessary in tuber crops research, by spreading their cultivation to non-traditional areas, projecting the nutritional and food security role of tuber crops, augmenting the utilization prospects by developing value added food, feed and industrial products, developing demand assessment strategies and exploring new market options, exploring hitherto under-explored areas like developing herbal products with medicinal effects, bio-insecticides, natural food colourants, etc. The effective dissemination of the technological advancements made by Indian Council of Agricultural Research on these crops can help in a big way to further improve productivity and to unravel the utilization prospects of these crops for the benefit of rural population.



A clause requiring all existing bilateral agreements between seed license providers and licensees to adhere to the new pattern within the next 30 days or be considered void was one of the main contentious points. By the new provision, license providers wouldn't have any discretion on choosing whom to give a license; anyone fulfilling the criteria would be eligible. The fee was to be capped for the first five years from the time the technology was commercialised in India and then be lowered by 10 per cent each year. This was in addition to the retail sale price of GM cotton seed, already regulated by the government. Cotton is the only crop in which GM technology is allowed for commercial use in India.

Biotech industry body ABLE-AG, which has members like Monsanto, Mahyco, Syngenta, DuPont Pioneer and Bayer BioScience, opposed the government's notification saying that decision would be a "huge blow" to the innovators in agri-biotech industry. It is believed that Mahyco Monsanto Biotech (MMBL), a subsidiary of seed giant Monsanto, would be most highly impacted by the notification, as it is the biggest licence provider of GM seeds in India. The notification effectively meant that seed licence providers won't be able to charge any 'trait value' or 'royalty fee', irrespective of the cost at which the seed has been produced for a new technology which they want to introduce in the market. The agriculture ministry had also capped



Grasslands for quality milk and meat production

P.K. Ghosh and S.K. Mahanta, ICAR-Indian Grassland and Fodder Research Institute, Jhansi



P.K. Ghosh

Grasslands are characterized by multiple functions and values, but one of the most important one is providing forage for livestock to sustain their milk and meat productivity. Consumer demand for meat and milk is ever more influenced by consumers' concerns about the healthfulness, quality, nutritional content and safety of the foods they consume and also by growing demand for intangible attributes such as animal welfare and environmental impacts of production and marketing. As a product that responds to many of these demands, grass-fed ruminant animals including beef has gained increasing attention. The grass-fed marketing claims that grass-fed ruminant animals be fed solely with grass and forages during their lifetimes, and that with the exception of milk consumed prior to weaning. Grass-fed animals should have continuous access to pasture/forages.

Compared with animal products (like meat and milk) from cereal grain-fed animals, products from grass-fed animals are low in total fat, low in saturated fatty acids linked with coronary heart diseases, high in total omega-3 fatty acids, high in conjugated linolenic acid (CLA) that is anti-cancerous, and high in vaccenic acid (which can be transformed into CLA). Grass is rich in omega-3 and poor in omega-6 (grazed grass omega-6/omega-3 ratio = 0.4; grass or legume hay and silage ratio = 0.7), while cereals and maize silage (ratio = 14) and soybean meal (ratio = 5) have very different characteristics. Grass-fed animal meat (beef) is about 4 times lower in total fat than grain-fed meat. It is also low in saturated and omega-6 fatty acids. Studies have indicated that omega-3 fatty acid content of meat decreases during the fattening period if grains are abundant in animal diet. It is reduced by about 50 per cent in 2 months and by about 75 per cent in 3 months. Similarly many studies have indicated that milk produced from grasslands, particularly from botanically diverse pastures, have higher concentrations of those fatty acids and antioxidants which are considered to benefit human health. The grazing system affects the fatty acid composition of milk, but still more research is needed to explain the effects. Farmers or primary milk producers should be interested in improving milk quality because they are expected to obtain special benefits from the higher market value at the end of the food chain.

Recently, consumers are becoming aware of these differences and a trend of eating less, but higher quality milk/meat is emerging round the globe. Although a real market of grass-based products has still to be opened or created, such information will be useful for nutrition professionals counseling clients, consumers making purchasing decisions, and improving the accuracy of nutrient databases.

the upfront fee for the new GM trait at Rs 25 lakh, to be paid in two equal annual instalments.

Nailing NAM

Prime Minister, Narendra Modi launched India's National Agriculture Market (NAM) on April 14, 2016 coinciding with Ambedkar Jayanthi. The NAM offers to be a single platform to carry out marketing activities between farmers and traders. The market offers the spectacular possibility of the farmers and traders being separated geographically by several thousand miles whilst favouring the possibility of unhindered trade between farmers and traders of different states, different market areas, different languages through a common e



marketing platform. The middle men who formed the core of the mandis and their hefty commissions which was the norm of the mandi markets will be a foregone phenomenon, and the complete bargaining power would therefore rest with the farmers. They can meet up electronically via a kiosk or their phones, fix the trade and materialize it with the click of a button.

The e-NAM platform is a key

initiative of the National Democratic Alliance government's promise to double farm incomes by 2022. It is proposed to connect 21 mandis from eight states in the first phase. The centre with this project aims to bring 585 mandis across India on to the platform by March 2018. The eight states that were slated to be part of the platform in the first phase include Gujarat, Telangana, Rajasthan, Madhya Pradesh, Uttar Pradesh, Haryana, Jharkhand and Himachal Pradesh.

Beyond the obvious advantages of doubling farm incomes, the prospects offers the picture of real time availability of farm produce in the country which would allow the planners the knowledge surplus and deficit regions thereby planning

'The Supply of wheat in 2017 is expected to Increase'

Dr. GP Singh, Director, ICAR-IIWBR

Wheat (*Triticum* spp.) is being cultivated across 120 countries in around 222 million hectares (mha) and occupy the first position in terms of acreage. This nutri-rich cereal production is around 735 million tonnes (mt) across countries and provides around 21 per cent of the total calorie intake as well as 20 per cent of the protein requirement for more than 4.5 billion people living in 94 developing nations. In India, this staple cereal covers about 30mha and accounts approximately 38 per cent of the country's total foodgrains production with annual production hovering around 94 mt. In the ongoing Rabi season (2016-17), the crop has covered 22.56 mha as on December 09, 2016 (11.52% increase) against 20.23 mha for the same period in the previous season. The 2016-17 sowing season was delayed by a couple of days in a few pockets of rice-wheat and sugarcane belts due to lack of sufficient soil



moisture for germination owing to warm temperature coupled with late harvesting of PUSA 44, a widely cultivated rice variety (app 160 days duration) and sugarcane late harvest particularly in Western Uttar Pradesh. However, it is expected that by the end of December, 2016, the country would cover the targeted area of 31.89 mha aiming for 96.50 mt output. With the recent removal of import duty, the supply in 2017 is expected to increase by encouraging imports by

the private traders and millers which will lower the domestic prices and will benefit the consumers. The recent call by the Honorable Prime Minister Shri. Narendra Modi for "Doubling the income by 2022" has encouraged the researchers to increase the per day productivity of wheat to cater to the needs of farmers across different wheat growing regions of the country and consequently, eight high yielding wheat varieties (HD3171, K1317, HI8759(d), MACS3949(d), HI1605, PBW723, WB2 and HPBW02) have been identified in 2016 and recommended for release by the Central Varietal Release Committee. The ICAR-Indian Institute of Wheat and Barley Research, Karnal is proactive in pests and diseases monitoring and surveillance including the blast incidence in Bangladesh during the past season. The institute has taken all research and advisory efforts to combat any unforeseen situation in the coming days.

movement of commodities accordingly.

GST & Agriculture

Another major reform going to materialize shortly would be the GST tax regime. Goods and Services Tax (GST) proposes to introduce a single tax on supply of goods and services or both, by amalgamating all the central indirect taxes (excise duty, countervailing duty and service tax) and state indirect taxes (VAT, luxury tax, entry tax, etc). A welcome move considering the differences existing in tax structures and rates across the nation.

The benefits of such a unified tax regime would be a Unified market across the country which would mean the confluence of various taxes, increase in tax revenue, increase in exports due to cost effective production and an expected increase of GDP in the range of 0.9 – 1.7 percent annually.

In the agri sector, implementation of GST can expedite another equally progressive reform, NAM. With GST on the anvil, things can become smoother for NAM. As GST advocates uniform tax structure across the states, it would ease interstate movement of agricultural commodities which would improve marketing efficiency, facilitate development of virtual markets through warehouses and reduce overhead marketing cost.

The present system many times, makes it difficult to implement tax support provided by the centre for an agri-commodity due to heterogeneous policies adopted by the different states. The implementation of GST is expected to bring uniformity across states and centre which would make tax support policy of a particular commodity effective. The ease of availing tax credit under GST regime is expected to boost inter-state trade leading to achieving the objectives of National Agricultural Market, avers many experts.

But on the cost front, food items can be pricier under GST regime. Given the exemption of food from central Value Added Tax and 4 per cent Value Added Tax on food item, the GST under a



PRODUCTION PROFUSION

The first Advance Estimates of total production of Kharif Foodgrains is estimated at 135.03 million tonnes, a new record. This year production is expected to be higher by 11.02 million tonnes as compared to last year's Kharif foodgrains production of 124.01 million tonnes. Further, Kharif foodgrains production is also higher by 7.65 million tonnes than the last five years' (2010-11 to 2014-15) average production of 127.38 million tonnes.

Total production of Kharif rice is estimated at 93.88 million tonnes which is a new record. This year rice production is higher by 1.1 million tonnes than previous record production of 92.78 million tonnes achieved during 2011-12. Production of Kharif rice is also higher by 4.16 million tonnes and 2.57 million tonnes over the average production of the last five years and the last year's Kharif rice production respectively.

Total production of coarse cereals in the country is estimated at 32.45 million tonnes as compared to 27.17 million tonnes during 2015-16 (4th Advance Estimates). Production of Maize is estimated at record level of 19.30 million tonnes. This year production of Kharif maize is higher by 4.05 million tonnes than that the last year's production.

As a result of significant increase in the area coverage and productivity of tur and urad, total production of Kharif pulses estimated at record level of 8.70 million tonnes which is higher by 3.16 million tonnes than the last year's production of 5.54 million tonnes. The production of kharif pulses is also higher by 2.54 million tonnes than their last five years' average production.

Total production of kharif oilseeds in the country is estimated at 23.36 million tonnes which is significantly higher than the production of 16.59 million tonnes during 2015-16. This year production of Kharif oilseed is also higher by 2.33 million tonnes than the average production of last five years.

Production of Sugarcane is estimated at 305.25 million tonnes which is lower by 46.92 million tonnes than the last year's production of 352.16 million tonnes. Despite lower area coverage, higher productivity of Cotton has resulted in to higher production of 32.12 million bales (of 170 kg each) as compared to 30.15 million bales during 2015-16. Production of Jute & Mesta estimated at 10.41 million bales (of 180 kg each) is marginally lower than their production of 10.47 million bales during the last year.



single rate would lead to a doubling of tax burden on food. For instance, under the current regime, tea trade, which is classified as plantation industry, is exempted from various taxes and only pays the state value added tax (VAT) at 5-6 per cent, apart from mandated central taxes like road cess, educational cess, etc. However, a minimum levy of 12 per cent GST will increase the cost, which will ultimately be passed on to consumers.

The terms of trade can also be expected to improve in favour of agriculture vis-a-vis manufactured goods. The prices of agricultural goods would increase between 0.61 percent and 1.18 percent whereas the overall prices of all manufacturing sector would decline between 1.22 percent and 2.53 percent.

The implementation of GST is inevitably linked to successful implementation of NAM as it aims at unified tax structure of goods and services which would eventually include agricultural produce. The National Agricultural Market

envisages smooth flow of goods across states leading to competitive and transparent prices with likelihood of increased share to the farmer in the value created in agricultural commodities. This will ultimately benefit the farmers who are looking at a massive market where his products are not bound by heterogeneous taxation or boundaries. A unified common agricultural market will definitely get a boost if the GST manages to win the confidence of the legislature.

Coping through Crop Insurance

The year 2016 saw the launch of an improved version of crop insurance scheme. The new scheme christened as Pradhan Mantri Fasal Bima Yojana (Prime Minister's Crop Insurance Scheme) sheds the hefty premiums of the previous crop insurance scheme and supposedly offers the lowest premium rate. The scheme has an ambitious agenda to cover fifty per cent of the farmer population in two years, entailing an expenditure of Rs. 8,800 crore to the government

exchequer.

The prevalent Modified National Agricultural Insurance Scheme (MNAIS) and Weather Based Crop Insurance Scheme (WBCIS) covered only around 20 per cent of India's 130-million farmer families. The hefty premiums which went as high as 15 per cent and the protracted claim settlement period had made the erstwhile schemes unpopular.

The recurring bad monsoon and other climate vagaries necessitated a more farmer friendly scheme that gave them enough financial security post a calamity. In that aspect, the new scheme presents a promising outlook. This social security scheme will charge a uniform premium of only two per cent of the sum insured from farmers for all kharif crops and 1.5 per cent for rabi crops. For horticulture crops, the annual premium will be five per cent of the sum insured. The balance premium would be paid by the government to the insurance companies. This would be shared equally by the Centre and state governments. For the Centre,

there would be no upper limit on the subsidy and even if the balance premium is 90 per cent, it would provide for the same. Unlike earlier, where there was a claim subsidy, this scheme would offer premium subsidy and would be more affordable to farmers.

The new insurance scheme would cost the government Rs 8,800 crore over the next three years, assuming that 50 per cent of farmers are covered. At present, with 23 per cent insurance cover, the Centre spends Rs 3,100 crore a year on crop insurance. The insurance amount covered will also not be capped and so also the premium rates.

Another striking feature of this scheme is that it also covers pre harvest losses i.e., if the damage occurs while seeds have been planted. The post-harvest losses are also insured under this scheme. What makes the scheme more welcoming is that the data for crop cutting experiments could be uploaded through smartphones, mobiles, drones etc. to speed up the claim process. The unit of assessment would be individual farms, against villages in the current insurance schemes. However, manmade calamities like fire, theft, burglary, etc., won't be covered under the scheme.

Plantation sector also received a boost in the previous year, as they were linked to a market-linked insurance scheme. The scheme consisted of fiscal concessions, developmental assistance and regulatory simplification. Initially implemented on a pilot basis in seven districts, the scheme intends to provide insurance cover against fluctuation in prices and yield. The scheme will be funded from the price stabilisation fund for plantation crops.

Reportedly grown in about 16 lakh hectares and providing direct employment to about 17.10 lakh workers, this high value segment of

'Cohesive and Concerted Efforts Needed to Augment Oilseed Production'

Dr. Vishnuvardhan Reddy

ICAR-Indian Institute of Oilseeds Research,
Rajendranagar, Hyderabad



Currently, the vegetable oil needs of the country is being met from more than 50% imports (14 million tonnes) at a cost of Rs.69717 crores on import bill (2015-16) and with additional demand on vegetable oils for bio-fuel, the situation is quite alarming. This calls for cohesive and concerted efforts from all the stake holders of vegetable oil production, processing and value addition in a mission mode to achieve the much needed jump in oilseed production. The main reasons for low productivity of oilseeds in the country are the sub-optimal agro-ecological growing conditions characterized by predominantly rainfed (64%) situation, inadequate and imbalanced nutrition, persistent biotic stresses, and mostly grown by small and marginal farmers with low investment and management capacity. Besides, the production economics of oilseeds is discouraging against other profitable competing crops. Oilseeds production technologies have been continuously upgraded for realizing higher yields and profits with emphasis on increasing input use efficiency and reducing the cost of cultivation. To circumvent the problems of rainfed cultivation, efficient utilization of rain through conservation of soil and water by adopting proven recommended measures as per soil type, slope and rainfall both in situ and rain water harvesting has to be relied on. Next driver for realizing higher oilseeds production is the availability of improved varieties/hybrids. Many improved varieties and hybrids with clear advantage of higher seed yield, oil content, earliness, resistance to major biotic stresses have been developed and released in all oilseed crops and they need to be adopted in large scale for achieving quantum jump in oilseeds production. While the seed replacement rate (SRR) for crops sunflower and castor with hybrids is satisfactory due to the participation by private sector in producing the seeds, the low SRR in groundnut, soybean, sesame and safflower crops need aggressive technological and operational backstopping through "seed villages" for meeting the needs locally. Site specific crop management technologies of proper land configuration, time of sowing, maintenance of optimum plant population, adequate and balanced nutrition with emphasis on sulphur and limiting micronutrients, proper and timely weeding, critical stages of irrigation, need based plant protection and timely harvesting have been continuously upgraded and demonstrated across the country that shows a clear potential of increasing the yields to the tune of 40 to >100% over farmers' practices. Desired policy support of ensured MSP, liberal support for expanding irrigation facility (Return on Investment [ROI] on irrigation to oilseeds being highest), small holding mechanization, and oil content based premium pricing would provide fillip for higher technology adoption.

agriculture occupies only about one per cent of the total cropped area. But the returns from the sector is significantly high. They generate about 15 per cent of the total agricultural export earnings.

Pulse Paranoia

Pulse production remains to be a sore point in Indian agriculture. Despite the persistent and perennial demand for pulses in Indian market, Indian farm lands have been unable to yield to that demand, forcing the nation to depend on expensive imports. While reasons of poor pulse production stretch from the non interest of farmers to the absence of better varieties of pulses, India has poorly fared in exploring the option of self sufficiency in pulses.

Last year, India had revealed its plan of contract farming of pulses in African countries -- Mozambique, Tanzania and Malawi -- as it looked for a long-term solution to domestic shortage and high prices. These countries grow tur and arhar similar to our domestic varieties. So India has signed a contract to import 100,000 tonnes of pulses from Mozambique in 2016-17, doubling to two lakh tonnes by 2020-21.

In another bid to promote indigenous pulse production, the Minimum Support Price (MSP) of pulses were increased in 2016 with



'The Potential of Agriculture to Combat Undernutrition'

Barbara H. Wells, Ph.D., Director General,
International Potato Center

The 2016 Al-Sumait award for Food Security in Africa and the 2016 World Food Prize shared by three CIP scientists and one HarvestPlus scientist for their work on Biofortified staple crops, are strong endorsements of the potential that agriculture has to combat undernutrition. The case of orange fleshed sweet potato, rich in vitamin A proves that it is possible to introduce nutrient-rich crops into food systems of Africa. There is concrete evidence that the consumption of only about 125g of orange sweet potato per day is enough to satisfy the daily vitamin A requirement of a child under five. We see governments, policy makers, donors and the international agricultural research and development community continuing this movement towards improving the nutritional value of agricultural products, increasing the nutritional value of new crop cultivars, and taking a food basket approach to combine different food sources to achieve a balanced diet.

There is a particular opportunity for impact in different states of India where rice is still the dominant food crop. The potato case, like sweetpotato, shows great potential for biofortification since the content of iron and zinc can be doubled through conventional breeding methods. There is other compelling evidence that shows that iron from potato is more bioavailable as compared to other crops. Current agricultural trends also favor short cycle crops such as potato and sweet potato that can produce more nutritious food per unit of land, using fewer



inputs like water and thereby are also less exposed to climate risks. Further, potato can be integrated into rice-based systems during winter seasons further diversifying the cropping system and providing additional income to farmers. Adding potato and sweet potato to a country's food basket has the potential to improve its food security, nutrition, and resilience to extreme climate events.

The International Potato Center, known by its Spanish acronym CIP, was founded in 1971 as a root and tuber research-for-development institution delivering sustainable solutions to the pressing world problems of hunger, poverty, and the degradation of natural resources. CIP is truly a global center, with headquarters in Lima, Peru and offices in 18 developing countries across Asia, Africa, and Latin America. Working closely with our partners, CIP seeks to achieve food security, increased well-being, and gender equity for poor people in the developing world. CIP furthers its mission through rigorous research, innovation in science and technology, and capacity strengthening regarding root and tuber farming and food systems.

'The Eastern Region has Tremendous Potential to Sustain the Food Security of the Nation'

Dr. B.P. Bhatt, ICAR Research Complex for Eastern Region, Patna, Bihar

The growing demand for food grains, vegetable, fruits, milk, poultry, fish and meat as well as cash crops is posing newer challenges to agriculture. There are variable estimates projecting the future demand for cereal commodities. The projected growth in incomes, urbanization and change in consumption pattern are likely to have a great impact on food security. The demand for food grains production for 2050 in the eastern region is estimated to be 84.42 million tonnes. Decline in rice-wheat production is expected by 2050 due to climate change. However, there is scope for improving the productivity through adoption of improved varieties tolerant to abiotic stresses, adjustment in time of planting, duration and methods of planting etc.

The projected production of pulses and oilseeds is estimated to be 4.84 and 2.12 million tonnes, respectively, by the year 2050 compared to 2.77 million tonnes of



pulses and 2.12 million tonnes of oilseeds during the year 2011 implying that production and productivity of pulses are expected to increase nearly by 75% from eastern states. Likewise, the projected fruit and vegetable production would be 22.6 and 90.4 million tonnes, respectively.

In case of milk, the projected demand would be 60.41 million tonnes as against the supply of 48.92 million tonnes by 2050. Demand for meat products is likely to be 6.08 million tonnes against the likely supply of 3.12 million tonnes. Demand for eggs would be 99.32

billion against a likely supply of 37.81 billion. Total fish requirement is projected to be 6.06 million tonnes by 2050 as against the current production of 2.71 million tonnes.

Eastern region faces multiple challenges. But to meet the future requirements, well thought strategies must be adopted like Management of rice-fallow. Natural resource management, System mode production, Conservation and sustainable use of floodplain wetlands, Conservation agriculture and harnessing green energy and Secondary agriculture, value addition and marketing. Counting in the Government initiatives for Bringing Second Green Revolution in Eastern States, the Eastern region has tremendous potential to sustain the food security of the nation. Holistic management of land, water, crops, biomass, horticultural, livestock, fishery and human resources is, therefore, required in the region, which was untouched from the benefits of first Green Revolution.

the hope that the higher MSPs would increase investment and production through assured remunerative prices to farmers. Government has sharply hiked the MSP of pulses by up to Rs 425 per quintal for this year to boost output and check price rise, while making a modest raise of Rs 60 in paddy MSP to Rs 1,470 per quintal. The government also approved a bonus of Rs 425 for pulses and Rs 100-200 per quintal for oilseeds growers over and above the MSP to encourage domestic production and check prices.

The Indian government, in another move has also lifted a fifty year old ban on a type of lentil that has been linked to nerve damage and paralysis, in a desperate attempt by Prime Minister Narendra Modi to cut legume imports and make the nation self sufficient in pulses. The new move to allow cultivation of khesari lentil which can grow in dry or wet conditions, after a hiatus of five decade is supposed to bring in the much needed pulse sufficiency. The same pulse species was banned back in 1961 owing to the increased incidence of lathyrism,

a neurological disease in the population consuming legumes of the genus "lathyrus" to which khesari belongs. Lathyrism is a crippling motor-neuron disease of the lower limbs.

Demonetization Demon

On 8 November, 2016 Prime Minister Narendra Modi





announced the biggest-ever demonetisation exercise India has ever seen by abruptly withdrawing Rs 500 and Rs 1,000 notes from public use with the intention to flush out illegitimately accumulated Indian money. Lauded as a bold move, the current devaluation of highest denominations of the Indian currency system to nothingness has however sent tremors of anxiety and concern among Indian farmers.

Long sinuous queues of harried people with bundles of unworthy currency notes may qualify as a reason for discomfort for the banks and the common man, but it is more than a mere cause of uneasiness for farmers. For them, it is a matter of existence. For farmers, availability of timely cash is crucial for sustenance of their farms. Particularly the case in point is this time when they are sitting on the cash obtained after selling their Kharif crops, of course in denominations of Rs.500 and Rs. 1000.

Unlike the last couple of years when drought seemed to have ruined the farmers' prospect of earning a decent return from his crop, this year the rains have been benevolent on the farmers and as a result many regions across India recorded bumper harvest. Conventionally, the money thus acquired are usually ploughed back into agriculture by buying inputs for the next season - Rabi. However, this time the currency ban

seems to have slowed or brought the process to a halt. They are in a peculiar situation. They have got the money but in denominations that are banned and hence cannot be used to stock up the agro inputs. Banks in rural areas are also not equipped at this season to convert their cash into denominations of any worth, at least not in a time bound manner.

Trade in Mandis or Agriculture Produce Market Committees (APMC) in many parts of the country has come to a standstill because of spiralling effects of demonetisation move. Farmers, who were used to accepting money only in the form of cash, resist money in any other

form and traders don't have cash with them to buy farm products. It is only in those Mandis that are computerised and where payment is made electronically, is trade going on smoothly. There are about 200 Mandis that are integrated with the electronic national agriculture market. However, trade on the electronic platform is very small. Many of the APMCs have closed down in the wake of sudden demonetization.

Prices of agri commodities and their sales have also dropped considerably. At Azadpur Mandi, the largest wholesale market in Asia, sales reportedly dropped by 20-30% as traders and farmers refused to accept notes of high denominations. In Vashi, trade has fallen 90 per cent due to liquidity issues.

The bigger worry came from traders and farmers of perishable commodities like fruits and vegetables, which needed to be traded immediately. The farmers were reluctant to accept higher denominations and the traders were unable to meet the amount in smaller changes. So the farmers either risked devalued currencies or payment at a later date. The perishable nature of



'2016 was finally a good year for the agriculture sector'



Mr. Ashok Sharma
President - Agri Business
MD & CEO – Mahindra
Agri Solutions Ltd.

After two years of drought, 2016 was finally a good year for the agriculture sector. Owing to normal monsoon, Kharif output exceeded the government target of 132 million tonnes. While

demonetization and the subsequent cash crunch has had an impact on the Rabi sowing which is lower than normal, situation is expected to ease out in the coming days. The positive side is that the sector is slowly moving towards online payments, which will pave a strong path for the future. With the current government's growing focus on Doubling Farm Income, a lot of developments are happening to provide good market linkages, improve productivity and thereby to ensure fairer returns to the farmers. e-NAM, More Crop per Drop are some of the key initiatives that the government is driving to achieve this target. We at Mahindra Agri business are also constantly working towards Delivering FarmTech Prosperity. Our businesses work with the farmers, help them adopt the best practices & latest technologies like micro irrigation and enables them to increase their productivity and earn better returns. Our flagship initiative, Samriddhi provides a host of services like soil testing, agri advisory, demonstrations and over the years, we have impacted the lives of lakhs of farmers. Another significant trend in the industry is the digital drive, with both government as well as private sector leveraging this shift to bring in efficiencies by serving the farmers and customers in a more disintermediated way. Given the potential of the sector, we are seeing a lot of young entrepreneurs coming up with start-ups with path-breaking ideas, challenging the traditional way of operating. We have recently invested in such an entrepreneurial venture called MeraKisan, which ensures benefits both to the farmer and consumers by removing the middleman. We are also leveraging the digital medium to provide advisory services to the farmers and have successfully piloted our agri advisory app, MyAgriGuru in two districts. Through this app, we provide services like crop calendar, crop protection, budget tracker, market prices, discussion forums etc. After a very encouraging pilot, we would be launching the app in the new year.

All of these trends are expected to continue in the coming year, making agriculture sector more robust and ensuring prosperity for the farmers.



the veggies and fruits also did not allow them the leeway to wait. Some conducted the trade at lower prices.

Growers of plantation commodities such as tea and coffee are facing a different challenge: arranging cash to pay salaries. According to Payment of Wages Act, Wages have to be paid in cash. The Association of Planters of Kerala has approached the State government as well as trade unions for a solution assuring that the wages would be paid once normalcy is restored in the banking system.

Demonetization overnight has made the life of farmers unexpectedly miserable. No sector in agriculture was insulated from the effects of this sudden move. Although higher authorities claim that the effect is temporary and normalcy would be restored within a matter of few days, for farmers the effect will sustain at least until next season. Rabi sowings will fall, type of crop may be changed and unfortunately whatever gains they have accomplished due to a bumper Kharif crops had been devalued.

Wheat Whammy

The Government of India in a big blow to farmers has decided to scrap the import duty on wheat. The import duty, which was 25 percent till September 2016, was earlier reduced to mere 10 percent. Now, it has been slashed to zero percent thus allowing foreign wheat to flood Indian markets even though the country is the world's second-biggest wheat producer.

Year 2016 could be termed as unlucky for agriculture. Many reforms have been initiated, alas the effects of which can only be expected in years to come.

‘India has made considerable progress in food grain production’

Dr. K C Ravi, Vice President, Commercial Acceptance and Public Policy, South Asia, Syngenta India Limited.

It is imperative that agriculture sector attains a consistent growth of a minimum 4 per cent year on year for India to sustain double digit growth and make a significant dent on poverty. Also, while India has made considerable progress in food grain production over the years to ensure food security, there is still a long way to go as far as aspects like nutritional security of the country is concerned. Having said this, I must say that the present government is acutely aware of the issues and has been taking several initiatives in the last two and a half years to make Indian agriculture more productive, competitive and profitable. Not only have the allocations been increased, the government is addressing several core issues affecting this sector. Water and soil being the building blocks for agriculture to achieve higher growth, the government is not only making large investments in augmenting irrigation in the country but also undertaking a huge exercise to help farmers to determine their soil health. Over and above, the Prime Minister has embarked upon a multipronged ambitious program on doubling farmers' income by 2022 by not only helping the farmers with quality inputs but also through providing adequate safety nets through insurance and other measures.

The critical game changer I believe is the setting up of 585 e-marketing platforms under National Agriculture Marketing initiative as it would help in

linking the farmers with markets to sell their produce.

The Department of Agriculture and Cooperation and the Department of Agriculture Research and Education (DARE) have entered into agreements with over 50 countries including the US in areas such as R&D, capacity building, germ-plasm exchange, post-harvest management, value addition/food processing, plant protection, animal husbandry, dairy and fisheries.

As a spin-off of these developments, I see growth prospects in many segments including expansion in the food processing sector and increase in agricultural exports besides bilateral trade. I also expect more Public Private Partnerships in the years to come. The private sector has great potential to drive India's crop productivity and improve grower profitability through accelerated infusion of scale neutral technologies. I also expect that the Union Budget would give a further boost to take agriculture into a higher growth trajectory. The key of course would be implementation and coordination with state governments.



‘It's time for country to focus more on “ More from Less’

Dr. Manish Patel, Executive Director, Incotec India Pvt Ltd., Lead Founder of Gujarat Seed Valley

While comparing Global seed scenario, Indian Seed sector is at the bottom currently in term of it's seed selling price as well seed procurement price resulting in low affordability of new technology as well poor implementation of seed quality amendments scheme. Market trend and farmer demand for better seeds are increasing, which demands better technologies to be commercialized in Indian seed sector and it's only possible when Indian growers have better purchasing power with improved Agril commodity sales price in country. It's time for country to focus more on “ More from Less” and this can be achieved through use of biotech in agriculture, introduction of novel genetics along with innovative seed enhancement techniques. In recent years, Indian growers have already experienced power of biotechnology in Cotton and power of Seed enhancement technology mainly in Hot Pepper, Tomato and other crops like water melon and Cucumber. A lot more technology will get introduced in Indian agriculture with improvement in purchasing power of farmers. In nut shell, technology revolution in all sector of Agriculture need to happen in order to achieve ‘More from Less’ . India is one of the best destinations for outsourcing all the need of seed manufacturing in global domain, and this will get realized in better way with improved seed policy by Govt in years to come.



Farm mechanization in the Years to Come

Mr. Jay Singh, Managing Director, CLAAS Agricultural Machinery Pvt. Ltd

In the recent past, the importance of farm mechanization is being recognized and has made a niche for itself as a critical sector of the agriculture industry. With a normal monsoon after years, the rental model gaining momentum through custom hiring centers, farmers recognizing the efficiency and effectiveness of using machinery other than tractors, there is an optimistic outlook for the future of the sector in the years to come.

However, the sector has now hit a small speed bump due to the latest policy decision of the government-demonetization. For transactions such as procuring seeds or fertilizers, renting machinery, or selling their produce, the farming community is largely dependent on cash and have been hit hard due to demonetization. If the trend continues, the rental model which was gaining momentum would suffer a blow as farmers are still not comfortable with digital means of payment. The impact of this is likely to affect the crop cycle as timely purchase of inputs especially during sowing, proves to be a crucial aspect to determine productivity at the end of the cycle. The impact of this would also be seen on the agricultural mechanization sector, and an average decline of 10-15% in sales is expected.

Another important aspect which may have an impact on the agriculture mechanization sector in the near future, is the excessive stubble burning in Punjab and Haryana, which is leading to ever-increasing levels of pollution. Considering the severity of the issue, central and state governments are now working towards identifying solutions to curb stubble burning. One of the solutions to this is the use of agricultural machinery such as balers. Balers can convert the leftover straw into bales, which can either be converted into silage and used as fodder for cattle, or can be used as biomass. Considering



that mechanization has a pivotal role to play when it comes to curbing the issue of stubble burning, we hope to see the government give impetus to this sector, especially during the harvest of kharif crop.

The third aspect where a change is long overdue is the income of farmers. Incomes of farmers have been stagnant for long, with the minimum support prices not being sufficient to improve their standard of living or productivity. This ecosystem has led to farmers focussing on crops such as wheat and paddy, since they are not offered any incentives to produce other crops. Also, since the procurement of crops is largely operated by the government through APMCs, farmers' incomes remain stagnant. Thus, intervention by the private sector is crucial to ensure that the entire focus is not only on wheat and rice, and farmers are given an opportunity to improve productivity of their land.

To conclude, it can be said that though the agricultural mechanization sector has come a long way, changes in the ecosystem are required to increase penetration of mechanization in agriculture and improve productivity and farmer welfare.

Year 2017 will be a game-changer for Indian Agriculture

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

I believe agriculture is the backbone of Indian economy. After many ups & downs, Indian agriculture is taking their speedy growth towards achieving the national goal of food security. According to CRISIL, agriculture income growth "at an above-trend 4 per cent", India's real gross domestic product (GDP) is expected to grow at 7.9 per cent in 2017 but this expected GDP growth may come down due to demonetization and for agricultural business transactions cash system are preferred and hence demonetization will also affect much, but in short term. The distribution of monsoon this season has been the best in the last three years, so overall an astonishing growth in agricultural GDP it is expected in this fiscal 2017, compared with the last fiscal 2016.

There are some challenges like water management, yield gap, intractable poverty, low farmer income, crop losses due to pest etc., but on another side we are having inherent strengths to overcome these challenges. Hybrid seed, farmer friendly technology, government policy and industry initiatives are the main factors for bridging this yield gap for making agriculture profitable and farmers happy. Pradhan Mantri Krishi Bima Yojana (PMKBY), more crop – per drop, Pradhan Mantri Krishi Sichayi Yojana (PMKSY), E-NAM etc., are the remarkable initiatives by Government for farmers' welfare.

In the same line, Dhanuka's low dose molecules are playing a major role in maximizing farmer's profit by reducing losses due to pests, weeds, insect etc like our SEMPRA is the only solution for *Cyprus Rotundus* in Sugarcane and increase farmers income by 15-20% and various such molecules and technology are in pipeline. Agri input dealers are playing major role in technology transfer from lab to land, and their importance have been discussed at various platforms too. Recognizing the important role played by agri-input dealers in transfer of agri-technology to the farmers and need for their



capacity building, we have launched out-campus one-year Diploma (DAESI) in public - private partnership (PPP) with Junagadh Agricultural University (JAU), Anand Agriculture University and Navsari Agricultural Universities. This year for DAESI program we are taking in partnership with MANAGE, a ministry of agriculture and farmer welfare institute in large scale. Our 'Save Water' initiative is well recognized by Government agencies, NGOs, rural community and farmers as well.

New Year is coming with lots of opportunities and commitment to overcome the challenges. Most important New Year resolution, which we all should take, is to use water according to the need and requirement in appropriate way. We need to work more on educating and motivating human being towards rain water harvesting and save water in coming years too. We look ahead into the New Year with confidence, hope and resilience. We know that there are vast challenges ahead but we also know that we have the right resources to meet those challenges.

'A very bright picture for the irrigation sector in 2017'

Mr. Randhir Chauhan – MD, Netafim India

Agriculture has for long been the backbone of Indian economy. But over the years, Indian farmers have been facing more and more challenges in terms of decreasing productivity, resource crunch and erratic weather, all of these translating into lower returns. Amongst these, one of the most challenging issues for the farming community is availability of one of the most precious resource – Water. Fresh water withdrawals are highest by the Agricultural sector, and accounts for nearly 84-85 percent of water withdrawal in India, which is well above the global average.

Farmers in India traditionally have been using flood irrigation method for growing crops. The indiscriminate use of water for irrigation has led to rapid decrease in groundwater table all across the country. However, we do have a technology in place to overcome these challenges and ensure assured income to farmers.

Drip irrigation is the method that not only saves water but also increases the efficiency of other farm inputs like fertilizers, pesticides, labour, etc. Drip irrigation, manages how much water and fertilizer goes to each plant and helps the farmers Grow More with Less resources.

Drip technology has been around in India since more than two decades now. States like Gujarat, Maharashtra, Andhra Pradesh, Telangana and Karnataka have been the early adopters of the technology. Drip irrigation is widely used and accepted in these states, with farmers reaping the ultimate benefit in crops like cotton, potato, sugarcane, banana, groundnut, fruits & vegetables. Other states are also gradually accepting the benefits of this proven technology and farmers are taking a step towards modernizing the face of



agriculture.

Drip technology is known for its precision – water and fertilizers being delivered right to the root zone of the plants. With automation easily possible with drip, it is becoming more and more intelligent, wherein drip system can be remotely controlled & operated according to the water & fertilizer requirement of the plants!

The prevailing pain points in agriculture call for farmer friendly policies, especially in the irrigation space. Govt. has been extending subsidy through special programs like Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), erstwhile National Mission on Micro Irrigation (NMMI), to encourage mass adoption of drip technology. State run SPVs are also adequately supporting this endeavor by helping promote drip technology in their respective states by organizing awareness campaigns & trainings in rural areas.

We, as the Global leader in Smart Irrigation Solutions, foresee a very bright picture for the irrigation sector in 2017. Taking our legacy ahead, Netafim will continue to work towards betterment of the farming community and help ensure sustainability in agriculture.

'Agriculture Progressing Steadily In India'

Mr. SN Gupta, Chairman & Managing Director, Bharat Rasayan Ltd.

Agriculture holds utmost importance in the socio-economic sector of India. With more than 15% contribution to country's GDP, nearly 58% of households still rely on agriculture as main source of livelihood. With almost 1.32 billion people, India currently supports nearly 17.84% of the world population, with 2.4% land resources and 4 % of water resources. At 190 million hectares, India holds second largest agricultural land in the world. Although yield per hectare has doubled in the past years, Indian agriculture is still facing challenges like low awareness among farmers, high monsoon dependency, unpredictable weather patterns, reduction in arable land, low per hectare yield and increase in pest attacks.

As fourth largest producer of agrochemicals globally, Indian agrochemical market is expected to reach USD 6.3 billion by FY 20 with exports contributing to around 50% of revenue. Indian agrochemical market was steadier this year compared to last two years majorly due to normal monsoon. There was good product demand in domestic market particularly in Kharif season. Also, inventory levels are not much as of now except for few products. We foresee good product demand in first two quarters of 2017.

As far as major markets are concerned, Andhra Pradesh (including Telangana & Seemandhra), Maharashtra and Punjab are top three states contributing to 45% of pesticide consumption in India. Andhra Pradesh is the leading consumer with 24% share. The top seven states together account for more than

70% of crop protection chemicals usage in India. We foresee that in coming year also they will continue to be major market for pesticide consumption.

Also export of agrochemicals from India has seen good growth over the last few years and will continue to increase in coming year as India is becoming strong base for contract manufacturing. Today, India is 13th largest exporter of pesticides. Availability of technically skilled labour and low processing costs offers opportunity for MNCs to setup their manufacturing hubs in India or do contract manufacturing for their export markets.

Various technology and policy development initiatives have been spearheaded by the government and private companies to address various problems faced by Indian agriculture. In coming years more aggressive work will be done on: Integrated pest management (IPM) for judicious use of pesticides, Soil Health Card scheme for improving soil health and reducing input cost to farmer, Paramparagat Krishi Vikas Yojna to support and promote organic farming, National e-Governance Plan – Agriculture (NeGP-A) as a part of agricultural extension and M-Kisan a mobile based agriculture advisory services. Based on huge geographic stretch of India, solutions based on digital technology could be right choice to reach the farmers and give them real time information for arriving at right farming related decision. However, it will take some time for these technologies / policies to be embedded into everyday farming practices.



'Active support for upholding ease of doing business in letter and spirit is necessary'

Srikumar Misra, Founder, MD & CEO, Milk Mantra

There is an extremely positive policy framework & narrative being shaped by the government. Now it is crucial to develop an efficient implementation agenda. Single window approvals must work not just in policy, but in execution too. The singular challenge of navigating the framework of licenses and compliances, not just at the beginning but every periodic renewal, creates operational stresses for start-ups and here active support for upholding ease of doing business in letter & spirit is necessary. Further, providing a secure environment for businesses where the legal framework is also supportive in running businesses smoothly is key. Start-ups and early stage businesses can then compete against big corporations and build scalable, sustainable, inclusive businesses."



"Nutrition and innovation are the cornerstones of the evolving needs of consumers – most so in Dairy. It is imperative for the policy framework of the Government to give impetus to companies that have invested in these 'real and tangible' consumption growth drivers. At Milk Mantra we have a DNA level capability in sourcing the best milk through our Ethical Milk Sourcing and we will continue to strengthen our capability in sourcing directly from farmers and maintaining the 60% growth in farmer income levels."

Anil Burman, Sourcing Head, Milk Mantra

"Product, Processing & Packaging technology has a wider and larger impact on our lives but is the least celebrated. I believe that with consumer food habits evolving, the use of technology to bring about functional innovation will have a wider platform. We developed unique TRIPAK for keeping milk fresh and followed that with the world's first commercial shelf stable milkshake with curcumin(haldi) in 2016 and have patents pending in US and India – this is revolutionary innovation from Milk Mantra, a 'little company' based out of Odisha. We hope this will inspire many others to relook at agricultural linkages through leveraging technology of a different kind".

Biswajeet Acharya, Production Head, Milk Mantra

PAHWA GROUP
Innovation is life

MOISTURE

is the hidden enemy of
Seed Industry



You need **dry air** to
**preserve seeds, retain
germination potential and
prevent fungal growth**

Bry-Air®

Tray Dryers

Remove moisture most efficiently



ECODRY
Desiccant Wheel
At the heart of it all

Backed by
Brycare Service

Experience
the Magic of
DRY AIR

Call today

BRY-AIR (ASIA) PVT. LTD.

ISO 9001:2008 & 14001:2004 CERTIFIED

Phone: +91 11 23906666 • E-Mail: bryairmarketing@pahwa.com

www.bryair.com

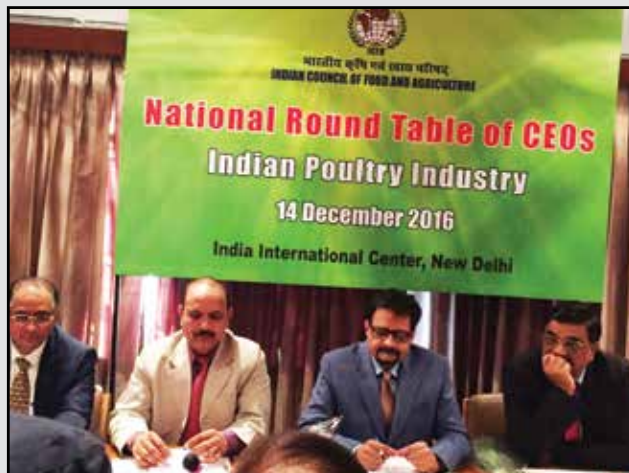
Leaders in Dehumidification ... Worldwide

RB/BA/1613/HVCA1



ICFA in UAE

ICFA conducted four day long visit to UAE where discussions were held regarding agro trade opportunities in seeds, agchem, machinery, irrigation, green houses, bio products, food, meat, spices and horticulture products with business delegations from Zambia, Morocco, Egypt, Kenya, Algeria and Azerbaijan. ICFA will be soon mounting delegations with CEOs from above sectors to Gulf and African countries.



ICFA hosts poultry industry CEOs Round Table

Poultry sector has tremendous potential for nutritional security and doubling farm incomes in India. ICFA hosted poultry industry CEOs Round Table in New Delhi. Seated from left to right are: Harish Garware, Chairman, Poultry India; Dr MJ Khan, Chairman ICFA; Dr OP Chaudhary, IAS Joint Secretary and Dr. KML Pathak, Vice Chancellor, PDDU Mathura



ICFA hands over ICFA Lifetime Achievements Award 2016 to Ratan Tata

ICFA met Iconic Ratan Tata at his office in Mumbai where long conversation on policy issues, farmers welfare agenda, health and nutrition, National and global food security and how ICFA and Tata Group can work together towards empowering farmers were held. ICFA presented Tata Group Chairman, Mr. Ratan Tata with ICFA Lifetime Achievements Award 2016 in Mumbai. Dr. MJ Khan, Chairman; Mr. Alok Sinha, DG and Board Members Mr. Kapil Mehan and Dr. WS Lakra were also present.



ICFA received German Trade Counsellor

ICFA received German Trade Counsellor, Ms. Ursula Holzhauser and Director, German Agribusiness Alliance from Hamburg, Ms. Alina Gumpert at its HQ in New Delhi and discussed broad range of issues in food and agriculture and agreed to work on policy and trade issues by creating an institutional mechanism of Indo German Joint Business Council. ICFA meeting was attended by the Chairman, Dr. MJ Khan; DG, Mr Alok Sinha, ED; Mr. NS Randhawa, CEO; Mr. V Rathore, Director; Ms. Mamta Jain and ICFA - WG Chairmen; Mr. PL Thanga and Dr. M Moni.



**Greetings from Greenstar
Manufacturers of quality products
for bumper yield**

The GreenStar logo, featuring a stylized green leaf inside a circular emblem followed by the text "GREENSTAR" in a bold, sans-serif font.**Greenstar Fertilizers Limited**

PRINCIPAL OFFICE : SPIC House, 88, Mount Road, Guindy, Chennai-600032. Tel +91 44 2230 0010 Fax +91 44 2235 2039.
REGISTERED OFFICE : Muthiapurampost, Tuticorin-628005. Tel +91 461 235 5411 Fax +91 461 235 7001. www.greenstarfertilizers.com



APPLICATION OF BIOTECHNOLOGY FOR LIVESTOCK IMPROVEMENT

Livestock Production

Livestock husbandry is an important source of food security and livelihood for over 117 million marginal and small holders in India. Being an important source of protein in Indian diet, the demand for milk and meat is growing at a faster rate, with the improving economy. However, meeting this growing demand will be a major challenge in the near future. Therefore, there is an urgent need to improve the productivity of the livestock sector through increase in efficiency in production, while making optimum use of the resources.

Scope for Introducing Biotechnology

Biotechnology has the potential to respond to this pressure to produce more food from animals without

increasing the animal population or exerting pressure on the eco-system and environment. Biotechnology is application of biological principles in manipulating living organisms or their derivatives to either improve or multiply a product. The main impediments to the successful application of biotechnology are cost of adoption and its acceptability. Fortunately, biotechnology offers many opportunities to improve livestock productivity, without any controversy and adverse impact on the nature.

Biotechnology in livestock production can be categorised as the biological, chemical and physical techniques that influence animal breeding and reproduction, animal health (survival) and nutrition. These include animal breeding and reproductive technologies for

selection and faster multiplication of genetically superior cattle and buffalo germplasm, adoption of improved animal management practices, animal health care and milk procurement, processing and marketing. Many of these technologies are already in practice since several decades and these have led to significant increase in milk production. However, there is scope to increase the productivity of the low yielding animals further at a faster rate, to benefit small farmers within a shorter period. Even though we have several recognised breeds of cattle and buffaloes, with a concrete breeding policy, incorporation of advanced biotechnological tools can help to improve the economic traits like milk production, reproductive performance as well as disease resistance of these breeds.

Biotechnology for Improving Reproduction

- has been the first technique developed for making use of superior bulls for producing improved progeny on a large scale. This technology was adopted in dairy cattle for over 65 years. This was soon adopted in buffaloes, sheep and goats. Initially, semen collected from bulls was diluted and sent in cold storage at 2-4°C, which had a short life span of 24-36 hours. Hence, new technology was developed for storing in liquid nitrogen at -196°C, packed in thin plastic tube, which served very handy in storage, transportation and for carrying out the insemination in the field. This was the beginning of a successful livestock development programme in India, initiated in early 70's.

- **Embryo Transfer Technology:** Multiple ovulation and embryo transfer, popularly known as Embryo transfer Technology, includes hormonal manipulation of the females (both donor and recipient). Using this technology, several embryos can be flushed from outstanding cows and buffaloes, several times a year. Thus, many calves of very high yielding cows can be produced using low yielding cows as surrogate mothers. This technology is very helpful to produce superior bull mothers and bull calves for supplying to breed improvement

programme. It is prohibitive to adopt this technology for production of dairy cows for farmers due to high cost. Technologies that have increased the efficiency of ET include micromanipulation of gametes and embryos for splitting, sexing, cloning, gene transfer, cryo-preservation of embryos, invitro maturation, fertilisation and culture (IVFMC) as well as genome analysis. This technology is very useful to multiply the endangered species of livestock and wild life.

- **Reproductive hormones** have been the most rewarding for commercial livestock production. Progesterone and pregnant mare's serum gonadotropin (PMSG) treatments and immunisation against androstenedione have been reported to increase ovulation in sheep. During ET procedures, embryo flushing from superior dams is entirely a function of exogenous oestrogen hormone. Even endogenous hormones can be induced to increase the rate of oestrus by manipulating the environment of animals. Oestrus synchronisation, induced by injecting certain hormones to bring the females in heat for carrying out artificial insemination, is one of the most beneficial biotechnologies applied in reproduction, especially for dairy cattle production.

Cloning Technology: This technique of multiplying the embryos is useful

The main impediments to the successful application of biotechnology are cost of adoption and its acceptability. Fortunately, biotechnology offers many opportunities to improve livestock productivity



for increasing the population of superior progeny, by embryo splitting or nuclear transfer. Technology is also available for determination of the sex of the embryos. Technology is not yet ready for wider replication on commercial scale. Modern biotechnology to produce transgenic animals and cloning will probably have low rates of adoption in both large scale and small scale farms even in future.

- **Sexed semen:** This is the most modern technology, having wider use in the developing countries where farmers are interested in producing superior quality females for milk production. In normal situation, 50% calves born are males, which are not useful to small farmers engaged in dairy husbandry. With the use of segregated semen, the male sperms are separated from the semen. This semen with female sperms is used for breeding the cows owned by farmers to produce only female calves (Over 90%). Thus, farmers can easily increase the population of good quality cows and thereby increase their milk production, without bothering about the unwanted male population. Presently, sexed semen imported from USA is already available in India and efforts are being made to produce such sexed semen in India soon.

Genetic Improvement:

Biotechnological interventions for genetic improvement include, Marker Assisted Selection, identification of genes of economic importance or unique genes, gene expression profiling and functional annotation of gene, gene introgression and genomic selection.

- **Marker Assisted Selection of Elite Breeding Livestock (MAS):** MAS is a selection approach in which the relative breeding value of a parent is predicted using genotypes of markers associated with the trait. Technology is available to identify the genes which are responsible for different economic traits. With the advancement in gene mapping, better understanding of the complex

livestock genome is possible which can be utilised in finding the economic traits (Quantitative Trait Loci). MAS also facilitates increased rate of genetic gain by allowing measurement in young stock thereby reducing generation interval.

Further, genomic selection technology has been developed to overcome the drawbacks of MAS, where the DNA markers covering the whole genome are used so that potentially all the genetic variance is explained by markers. This approach has great importance in economic traits in livestock where the traits are influenced by large number of genes. The genomic selection can be incorporated with traditional selection method by combining the DNA marker data, phenotype and pedigree to estimate the improvement. With this technology, it should be possible to produce livestock with all the economic traits, eliminating all the genetic drawbacks of livestock.

Various molecular tools like transcriptome profiling of cells for characterisation of gene expression signatures that contribute in defining biological and physiological process in the cells. RNA Sequencing (RNA-Seq) is a recently developed technique with higher resolution than Sanger sequencing and microarray-based methods.

- **Gene Introgression:** This involves

introduction of new alleles (genes) into a population to address the challenges faced by current breeding goals. It has been used successfully in sheep for introgression of Booroola (FecB) gene for producing twins instead of single kid. There is potential to extend this technology to large animal species as well.

Biotechnology for Animal health

There are various applications of biotechnology in animal health, which include transgenesis, disease prevention, diagnosis, treatment and control.

- **Vaccines** that are widely used are either attenuated or inactivated and have proved very efficient in establishing resistance. Vectored vaccines have also been developed to circumvent the limitations of traditional attenuated vaccines. New technologies have also been developed to produce thermostable vaccines, which can be stored at room temperature. Vaccines to be consumed in liquid form or inhaled, have made the service easy and efficient.

- **Disease diagnosis** has also benefitted from the application of biotechnology to enhance speedy identification of disease in the early stages to facilitate treatment. Technology has enabled the application of enzyme-linked



immunosorbent assay (ELISA) for detection of antibodies. Diagnostic tools have greatly been enhanced by the development of basic DNA detection techniques, the most significant being the development of polymerase chain reaction (PCR) methodology. Antibody (monoclonal and polyclonal) and DNA/RNA probes are efficient means of improving disease detection tests.

- **Treatment** of animal diseases has for a long time been based on antibiotics extracted from various bacteria and fungi. However, other molecules extracted from the Ivermectine family have proved efficient in disease control. Passive immunisation of farm animals using monoclonal antibodies offers a potential alternative for disease treatment which is costly.

Animal health is potentially the most important aspect of animal production and any development in the area of biotechnology will greatly benefit the industry. Biotechnology can offer alternatives to replace the use of antibiotics or chemical therapy that are costly and have residual effects on animal and consumers of animal products.

Biotechnology for Animal Nutrition

- **Digestion of high Fibre Fodder:** Animal nutrition has a direct influence on animal production, but availability of good quality fodder is a major challenge. Major proportion of animal feeds is fibrous dry fodder with varying levels of digestibility and nutritive values. Presence of higher fibre content is also the cause of higher volume of methane emission by the livestock. Lignin has been identified as the main cause of difficult digestion for fibrous material. With the application of biotechnology, it is now possible to produce lignase enzyme, produced by the soft-rot fungus (*Phanerochaete chrysosporium*) to digest lignin easily, for improving nutritive value of fibrous fodder.

- **Manipulation of rumen microbes** through alkali treatment, microbial balancing and genetic modification,



are the other technologies for improving the quality of feeds. Technology has also been developed for removal of anti-nutritive elements present in certain feeds. Anti-nutritive factors such as protease inhibitors, tannins, phytohaemagglutinins and cynogens, mainly present in legumes, have been tackled via plant breeding to either reduce or eliminate them. Inactivation as well as detoxification of anti-nutritive factors can also be done using transgenic bacteria. Use of goat rumen inoculum containing a particular species of bacteria in cattle to detoxify a breakdown product of non-protein amino acid mimosine in *Leucaena* forage, is an example.

- **Feed preservation:** Conserved feeds also suffer the risk of being of low nutritive quality if poorly fermented. Sterile conditions are normally necessary to allow for rapid growth of lactic acid bacteria that influence the anaerobic fermentation of sugars. Additives such as chloroform, toluene and cresol are still being used to inhibit bacterial growth while appropriate pH levels are achieved through addition of acids such as sulphuric acid, hydrochloric acid and formic acid. Obviously, the hazardous nature of acids has led to the search for alternative compounds for fermentation that include molasses, enzymes and inoculum of lactic acid

bacteria.

The model, biotechnology offers good support to improve livestock production through use of sexed semen for breeding embryos, sexing, multiplication and transfer, cloning and marker assisted gene for improving the economic traits. Presently, all the economic traits of the genes have been identified. As a result, it should be possible to produce most productive animals through introduction of all economic genes in the new progeny. Biotechnology has a greater role in disease diagnosis and disease control through production of high quality vaccine. With the manipulation of rumen microbes, it should be possible to improve the nutrient value of dry feeds and energy efficiency of all feed resources. Efforts are also being made to reduce the release of methane by manipulating rumen microbes in large and small ruminants. These technologies have wider replication because of reduction in pressure on livestock population as the concept is to produce more with less inputs. Wider replication of the technology will bring down the cost and thereby make it accessible to small farmers to a great extent.

Dr. Suresh Gokhale, Director, Research, BAIF and Dr. Narayan G. Hegde, Trustee and Principal Adviser, BAIF Development Research Foundation

'MECHANIZATION IN INDIA IS GROWING'



The VDMA Agricultural Machinery Association, a service and information provider for the manufacturers of agricultural machinery, gives information about current market developments or aspects concerning market access. VDMA's core competence has been to create networks, to make and maintain contacts and to earmark the industry's image. Moreover, VDMA Agricultural Machinery acts as a reliable and dependable partner: for members and their customers, science and universities, affiliated associations and customer associations, for press and exhibition partners and all those looking for and needing information about the industry. In doing so, the association is internationally orientated. In an interview with Agriculture Today, Mr. Rajesh Nath, Managing Director, German Engineering Federation (VDMA) discusses the role that VDMA played in Indian agriculture.

What is the role played by VDMA in Indian agriculture?

VDMA Agricultural Machinery delivers a large range of services for its member companies. In the field of economics, we provide specialized information about current developments of markets according to product groups based on own statistics. Consequently, we have key data about agriculture and agricultural machinery for German, European and international markets. As a strong advocacy of free market policies, VDMA pleads for free market access and against protectionism worldwide. Another important field of work is technology and standardization. Together with internationally renowned experts, our working groups meet on topical issues such as directives for machinery, noise emission or harmonization of road traffic regulations for mobile engines. Furthermore, we force international standards like nomenclature, test procedures, safety, operation and maintenance. Networking is a core competence of our association. Meetings of entrepreneurs, road shows and symposium enable our

members to stay in touch with recent developments on an international level.

Which are the segments in Indian agriculture in which VDMA is involved?

We are involved in product segments such as Tractors, Trailers and transporters, Tillage equipment, Seeding and crop protection, Harvesting machines, Combine harvesters, Equipment for animal production and Supplied parts, components and spare parts.

Please share with us the collaboration/transfer of technology/other association that has been forged at the behest of the VDMA in India?

We organize a number of Road shows with the member companies and also with other associations with the objective of imparting information related to business functioning. Also we encourage members to share their views regarding new developments happening in their respective sector. Every year, we have our Annual

VDMA Engineering summit where around 175 member companies attend a full one day program. In 2016 we had this event at Pune on 23rd Sept in presence of VDMA President Dr. Reinhold Festge and Shri Girish Shankar, Secretary, Dept. of Heavy Industry, Govt. of India. We had one technical session in which the topic covered was from Current Scenario of Indian Economy to Financial policies and its implications on German companies and GST. We also had a panel discussion Topic : Half tenure completion of Govt: Promise vs. Reality in which eminent panelist participated including the Secretary from the Department of Heavy Industries.

What are the challenges of working in the Indian conditions?

Small size and scattered holdings of the farmers stand in the way of mechanization. As a result of this, farm machinery generally remains underutilized. Majority of small cultivators are poor who are not in a position to purchase the costly

machinery like tractors, combine harvesters etc. The use of tractor operated machinery may render some of the draft cattle population surplus. Studies under AICRP on Energy Requirement indicate that tractor owning farms do use draft animals for certain jobs. Like-wise farms using animate sources of farm power, use tractor on custom service for certain jobs. The farm machinery have large turning radius and thus require comparatively larger farm for economical use. Mechanization may lead to structural change in agriculture in respect of the occupational distribution in the rural economy. No doubt, the increasing farm mechanization is going to increase employment in secondary and tertiary sectors but it does displace labour in farm operations. Lack of proper knowledge of farmer to purchase farm machinery, operate and maintain it properly leads to wrong choice, making it uneconomical and risky too. There is great shortage of diesel in the country as a whole. Thus, using extensive oil based farm machinery is not desirable. The lack of repair and replacement facilities especially in the remote rural areas is another hindrance in efficient small farm mechanization. Due to the seasonal nature of the agriculture, the farm machinery remains idle for much of the time. Idle machinery means unnecessary high costs unless proper alternate use of such machinery in the off-season is made.

In the event of India ratifying the Paris agreement, what changes do you foresee in the Indian conditions? Is the move going to be detrimental for popularizing farm mechanization?

India will become the 62nd country to ratify the Paris Agreement. The agreement, once it is ratified, will have a significant bearing on the energy sector and will have a huge impact on the industrial output. Firstly, India will have to reduce the greenhouse gas emissions by 33-35 per cent from the levels on 2005. This goal has to be achieved by 2030. While India is nearly a third of the way through, this target, according to climatologists, looks feasible. Secondly reduction in emission intensity targets. To achieve that, India will also need a 175 Gigawatt power production capacity from renewable energy sources by 2025. India's solar power projects have been given a boost by the government with several foreign governments partnering on its solar energy projects. It appears to be on a fruitful growth trajectory. Third most important commitment will be a massive increase in green cover. India will need to increase the forest cover by five million hectares and also improve the quality of green cover of an

equal measure. This will be used to achieve the targeted absorption of 2.5-3 tonnes of carbon from the atmosphere. This move will certainly help to popularize farm mechanization in India as there is a shift from traditional agriculture process to a more mechanized process like using of fossil fuel in place of diesel.

What is the potential of farm mechanization in India?

The agriculture sector in India has witnessed a considerable decline in the use of animal and human power in agriculture related activities. The trend has paved a way for a range of agricultural tools. A large number of these are driven by fossil fuel operated vehicles such as tractors, diesel engines. This has resulted in a shift from the traditional agriculture process to a more mechanised process. Though the level of mechanisation in India is lower as compared to other developed countries, it is certainly on growing. Custom hiring of farm equipment is a prevalent practice in India, especially among small landowners who find ownership of large farm machines expensive and uneconomical. The government is therefore promoting farm mechanisation by subsidising purchase of equipment as well as supporting bulk buying through front-end agencies. The government also provides credit and financial assistance to support local manufacturing of farm mechanisation equipment. Given the labour scarcity and the government's subsidy programs, adoption of farm mechanisation is set to increase. Indegeniously developed agricultural hand tools and implements have also evolved over time and despite the strides agricultural machinery has made, continue to play a critical role in agriculture. This is on account of the small and irregular farm sizes, lack of machinery available for smaller land holdings, lack of awareness and skills among farmers and inability of farmers to afford more advanced technologies.

What were the significant breakthroughs achieved by VDMA?

The VDMA has been successful in bringing the German Machinery companies and the State Agriculture Department together and discussing the different ways of enhancing business and also increasing agricultural productivity. Recently, the Gujarat government invited VDMA and German agricultural machinery companies at Gandhinagar to discuss how the Gujarat government is prepared to help existing German companies to increase the scope of business in India and also contribute to the overall development of agriculture.

SIGNIFICANCE OF R & D AND TECHNOLOGY IN INDIAN AGRICULTURE

Agriculture and allied sectors account for approximately 14% of India's GDP, and 50% of our entire workforce is involved in these sectors. India is now the second largest producer of wheat and rice, the major food staples in the world. In the last few years, our country has shown a steady annual increase in productivity for certain agricultural items. As a matter of fact, Indian agriculture has transformed significantly over the last few decades. Multiple factors such as growth in household income, expansion in food processing, and increase in agricultural exports have facilitated double digit growth in this sector. The green revolution was a major technological breakthrough which created a lasting impact on Indian agriculture. However, when it comes to investments on Research & Development (R&D) infrastructure and technology implementation, a lot more needs to be done.

R&D in Agriculture: The Ground Reality

With ever-increasing supply-side constraints, the role of R&D has become increasingly important and has the potential to offer long-term solutions for Indian agriculture. Farmers' access to latest researches can help in overcoming issues such as seed problems, pest and disease problems, crop sustainability, climate change, irrigation problems, soil erosion, and so on.

Earlier, research institutions, agricultural universities, and public sector corporations were important stakeholders in the R&D ecosystem for sustainable agricultural practices. Today, even multinationals and private sector firms (including agrochemical like Crystal Crop Protection Pvt. Ltd.) are investing



heavily on R&D. The R&D team of Crystal is revolutionizing the agricultural industry through the promotion and adoption of scientific farming practices.

Benefits of R&D and Technology

Here are some of the significant aspects of R&D and technology in agriculture and the potential benefits that farmers can reap with their implementation.

Genetic Modification of Seeds and Crops

Genetic modification of seeds promises high productivity with minimal use of agricultural resources and agrochemicals, both on a seasonal and long-term basis. The most significant example of this technology in India is the introduction of BT cotton with prior R&D.

Cross-breeding and genetically modified crops are aligned to well-researched genetic engineering and agri-biotechnology, and introduce a new trait to the crop which does not occur naturally in the species,

thereby helping in increasing productivity and pest resistance at times. Genetically modified (GM) high yield seeds have gained increasing acceptance among farmers around the world. Nowadays, transgenic and hybrid seeds are dominating the rural market in India, especially when it comes to cereals, vegetables, and oilseeds.

Testing and Research on Pesticides and Fertilizers

The importance of understanding the judicious use of fertilizers and pesticides cannot be overemphasized. The use of low dosage, high potency agrochemicals that suit local agricultural conditions need to be stressed. It is important to ensure the right amount of agrochemical and fertilizer at the right time to reap maximum benefits. The right approach is to strike a balance between marketing generic agrochemicals that are already in the market and inventing new molecules that will bring about an 'evergreen revolution'. To ensure quality of the

agrochemicals used in agriculture, the Indian government has recently set up 71 pesticides testing laboratories across the country. Several private firms are also investing on quality assurance research for appropriate use of agrochemicals and fertilizers. Crystal's quality control laboratory is ISO certified and accredited by National Accreditation Board for Testing and Calibration Laboratories. Crystal's R&D team emphasizes on good manufacturing processes to ensure quality production of agrochemicals.

Efficient Water Management

Water is indispensable for all agricultural activities. The unpredictable monsoon rains coupled with increasing demand for food production has made smart irrigation imperative for Indian agriculture. Water management must be designed to augment local water resources and effective wastewater treatment. Area-specific R&D on irrigation technologies can play an important role in this regard. In India, electric and diesel pumps are generally used to extract groundwater.

New age water lifting devices such as treadle pumps and efficient water management systems such as

drip irrigation allow regular release of water directly to the roots of the plants through a network of economically designed plastic pipes. With the efficient use of the above mentioned technologies and further R&D, small farmers can cultivate year round and increase crop productivity.

Environment - Friendly Agriculture

Use of biotechnology in agriculture can reduce vulnerability of crops to environmental impact and over dependence on chemical fertilizers to improve yield. Off late, technologies with respect to bio-formulations have been found effective against soil borne pathogens to maintain the productive capacity of agro-ecosystems. Research shows that adoption of zero-tillage agriculture can save water by as much as 11% as against the conventional sowing techniques.

R & D units (both at private and government level) conduct in-house field research and process development for environment-friendly agricultural practices and for educating farmers on land use patterns. Adopting eco-friendly agricultural practices can improve agricultural production, and at

the same time, work towards biodiversity conservation to improve livelihoods of rural communities. Crystal is a member of Gujarat Enviro Protection and Infrastructure Ltd for remarkable Integrated Common Hazardous Waste Management.

The Road Ahead

Technology integration has the potential to transform the entire agribusiness value chain, from agricultural production and origination to trading, and also helps farmers to take informed decisions. With the application of Internet of Things, mitigating risks and tracking crop from field to farm is now much easier. There is no doubt that agri-tech will play an important role in aiding sustainable agriculture for tomorrow. Technology and R&D combined has emerged as critical differentiator of the Indian agro industry, be it at the primary (production), secondary (processing) or tertiary (marketing and packaging) level.

R&D generates new technologies and passes them to farmers. In the coming years, agricultural technology will play a vital role in addressing their concerns related to conservation and management of rural resources. Crystal has been continuously associated with Indian Agricultural Research Institutes (IARI), Central Potato Research Institute (CPRI), Central Rice Research Institute (CRRRI), and Directorate of Rice Research (DRR) which are all affiliated to Indian Council of Agricultural Research (ICAR) for various R&D related trials.

In spite of successful R&D initiatives around crop cultivation and crop protection and huge investments from the private sector, a majority of farmers in India are not able to get optimum yield in the absence of expert scientific advice. The need of the hour is to bridge the gap between research and practice.

Mr. Nand Kishore Aggarwal,
Chairman, Crystal Crop
Protection Pvt. Ltd



LASER LEVELING

AN EFFECTIVE LOW-COST SOLUTION FOR SAVING WATER IN AGRICULTURE

Irrigation dependence on groundwater increased with the onset of the Green Revolution in India, which was characterised by an intensive use of inputs such as water and fertilizers to boost farm production. Since 1960, the area irrigated with groundwater increased by 500 percent, prompting a fast depletion of groundwater reserves. Approximately, 91 percent of groundwater in India is withdrawn for irrigation and livestock, and the gap between the consumption and supply of groundwater continues to widen. This calls for serious action to improve irrigation efficiency in the country. Irrigation efficiency in India is often found to be quite low compared to global standards due to the use of conventional

flood irrigation techniques. The overall efficiency of major and medium irrigation projects in India is estimated at around 38 percent. With effective management of water in agriculture, the efficiency of groundwater use can be improved from 65–70 to 75 percent.

In the past decade, government efforts have covered only 3.9 mh (9.2 percent) of land under micro-irrigation as against the total potential of 42.2 mh. The adoption rate of micro-irrigation in India is still minimal, and it is apparent that for now the remaining 38.3 mh will continue using flood irrigation. Therefore, the pressing need is to provide technology-based solutions to farmers that can supplement water-saving in flood irrigation. Laser land leveling is one such

technology that flattens agricultural fields with high precision. This is an “add-on” technology in the sense that it improves upon the traditional method of leveling. Traditionally, farmers leveled their land using wooden planks drawn by draft animals or with tractor-operated soil scrapers. These crude leveling practices kept a 4–5 staggered slope in the field. The laser leveler maintains a precise 1–2 percent slope that allows water to spread uniformly. A research study done in Punjab illustrates that farmers get multiple advantages by using laser leveling. The major advantages are the saving of 22–33 percent water in irrigation and a 9–12 percent increase in crop productivity. The study further found that laser leveling of 50 percent of the area





under the rice and wheat cropping systems in Haryana and Punjab would provide additional production of 699 million kg of rice and 987 million kg of wheat, amounting to USD 385 million/year. Thus, laser leveling on farms can support and enhance food and water security in the country.

S M Sehgal Foundation (Sehgal Foundation) is working on improving water-use efficiency in agriculture in the semiarid Mewat district of Haryana where groundwater availability is limited. The majority of farmers practice flood irrigation and their fields are not precisely leveled. Water usage is high due to the cultivation of water-intensive crops such as wheat, onion, cotton, tomato, and eggplant. To improve water security in the district, Sehgal Foundation started a pilot project in 2016 on the use of the laser leveler to assess its impact on water-saving and other potential benefits.

The potential for using laser leveling is very high in Mewat as the majority of the agricultural land is leveled using traditional methods that require a medium-to-high level of correction. A considerable

Crop	Average water requirement (cm/acre)	Water quantity ('000 liter/acre)	Water saving potential by laser leveler ('000 liter/acre)
Rice	75	3,000	750–900
Cotton	28	1,120	280–336
Wheat	35	1,400	350–420
Mustard	15	600	150–180
Onion*	45	1,800	450–540
Tomato*	70	2,800	700–840

*<http://agropedia.iitk.ac.in/content/water-requirement-different-crops>

amount of water can be saved if the land is precisely leveled.

The figures in the table reveal that an average 1.8 million literS of water is required to grow one acre of crop. The precise leveling of land can save 0.5–0.6 million liters of water for the same crop. The large-scale adoption of laser leveling in villages can attain water security in the long run.

Along with water-saving, crop yields increase by 7 percent in rice and 7–9 percent in wheat, and with good management practices, the yield can increase up to 12 percent in both crops. Other advantages farmers observed included a

The major advantages are the saving of 22–33 percent water in irrigation and a 9–12 percent increase in crop productivity

reduction in irrigation time and labor cost, less weed germination, etc. Further research is required to assess the overall monetary benefits of the technology and its impact on overall farm economics.

So far Sehgal Foundation has

covered 147 acres in Mewat with laser leveling. In a focus group discussion to assess the benefits of the technology, farmers shared the advantages they saw in laser leveling such as uniform germination, decrease in labor requirements,

decrease in seed rate, and reduction in the overall cost of cultivation. The outcomes of discussions with farmers are summarised below.

**Pawan Kumar,
S M Sehgal Foundation. Gurgaon**

Field Activity	Issue	Before leveling	After leveling	Remarks /explanation
Field preparation	<ul style="list-style-type: none"> • Soil erosion • Increased cost of field preparation 	<ul style="list-style-type: none"> • Land was sloppy and frequent water overflow from lower side of the field during monsoon caused soil erosion. • More ploughing sessions were needed. (4–5) 	<ul style="list-style-type: none"> • No overflow was observed and no soil erosion occurred. • Ploughing was reduced to 2–3 sessions. 	<ul style="list-style-type: none"> • Leveled fields hold the most rain-water within a plot boundary. No overflow and soil erosion occur due to increased capacity of the field to hold more water. • Water stagnates at many places or waterlogging on one side of the field makes upside ready for ploughing. Farmer must wait 3–5 days for deeper points to get ready for ploughing which increasing the cost of ploughing and making it difficult for farmers to hire a tractor for ploughing in small patches.
Sowing and germination	<ul style="list-style-type: none"> • Poor or heterogeneous germination 	<ul style="list-style-type: none"> • Corners of the field were left without sowing due to lack of moisture. • Germination was poor due to uneven moisture conditions. • Higher seed rate was needed. 	<ul style="list-style-type: none"> • Sowing was possible in maximum field space. • Germination was good and uniform. • Less seed quantity was used. 	<ul style="list-style-type: none"> • Plant population is reduced due to poor or no germination. • Germination is affected due to uneven spread of moisture. • Reduced seed rate is due to increased germination percentage. (Previous seed rate was high, expecting 25 percent of seeds will not germinate due to insufficient moisture.
Irrigation	<ul style="list-style-type: none"> • More time and labor required for irrigation 	<ul style="list-style-type: none"> • More time was needed to irrigate (15–16 hours) one acre. • Extra labor was required. • More water was required. • Cost of irrigation increased. 	<ul style="list-style-type: none"> • Less time was required (10–12 hours) for one acre. • Less labor was required. • Less water was needed for irrigation. • Cost of irrigation was reduced. 	<ul style="list-style-type: none"> • In sloppy land, the field is divided into many plots (8–10) and individual plots are irrigated. After leveling, the entire field is divided into few (2–3) plots. This takes less labor, time, and water. • Reduced cost due to hiring less labor and using less fuel and water.
Plant protection	<ul style="list-style-type: none"> • Reduced crop loss and lower cost of chemicals and pesticides 	<ul style="list-style-type: none"> • High disease and insect attack occurred. 	<ul style="list-style-type: none"> • Incidences of disease and insect attack were less. 	<ul style="list-style-type: none"> • High moisture/waterlogging attract insects and more diseases, particularly in vegetables. Farmers use more plant protection chemicals that increase expenditures, and quality of produce is poor. In a leveled field, these issues are less likely to occur.
Crop maturity	<ul style="list-style-type: none"> • Irregular crop maturity and yield variation 	<ul style="list-style-type: none"> • Crop maturity time is longer. • More time and labor was needed for harvesting • Yield was decreased due to late/early maturity. 	<ul style="list-style-type: none"> • Crop matured at same time. • Timely harvesting was possible. • High yield was due to uniform maturity. 	<ul style="list-style-type: none"> • Crop doesn't mature at the same time and takes longer for the entire field to mature. This could lead to over- and under-maturity and require more labor. Over- and under-maturity affects crop yields. Uniform germination and optimum plant population, even maturity, and reduced insect and pests can lead to increase in crop yields by 10–12 percent.

Zinc in Fertilizers

Immediate Results...Long-term Benefits.

Zinc deficiency takes an enormous toll on both humans and crop productivity. Adding zinc fertilizer to soils and crops can significantly increase crop yield, boost nutrition in humans and improve farmers incomes.



Zinc fertilizer increases crop yield and reduces the impact of drought, resulting in healthier, stronger crops.



Zinc fertilizer increases the nutritional value of crops, resulting in increased zinc nutrition in the diet.



Zinc fertilizer increases the yield and quality of crops, resulting in increased income for farmers.

Zinc has emerged as the most widespread micronutrient deficiency in soils and crops worldwide, resulting in severe yield losses and deterioration in nutritional quality. About 40% of Indian soils are deficient in zinc, leading to decreased crop productivity and nutritional value.



GET INVOLVED

International Zinc Association,
ZNI - India
P: +91-11-2996 0040
E: sdas@zinc.org
W: zinc.org/zni



POLICY PARALYSIS HAMPERING POULTRY SECTOR PERFORMANCE



Poultry industry is one of the fastest growing segments of the agriculture sector and has undergone a paradigm shift in structure and operations during the last few decades. However, serious threats like rising feed prices, taxation issues, emerging poultry diseases, competition from imports etc., have restricted the prospects of this industry.

Coinciding with Hon'ble Prime Minister's vision of doubling farmers' incomes in the country by 2022, the Indian Council of Food and Agriculture (ICFA) organized a National Round Table of CEOs from the Poultry sector on 14th of December 2016 at India International Centre, Lodi Estate, New Delhi. The brain storming session was attended by forty most prominent

corporate heads from the Indian poultry industry and executive members of important poultry associations for deliberations with policy makers from the government. Dr OP Chaudhary, Joint Secretary Poultry, Government of India, presided over the session as Chairman. Hon'ble Member of Parliament, Mr Anand Bhaskar Rapolu and Agriculture Commissioner Dr SK Malhotra also graced the occasion. The symposium was earnestly attended by the who's who of Poultry industry including executive body members of Poultry Federation of India (PFI), Compound Feed Manufacturers Association (CLFMA), Poultry India and Indian Council of Agricultural Research (ICAR) along with distinguished luminaries from the sector.

Dr. MJ Khan, Chairman, ICFA,

welcoming the guests addressed the agenda and highlighted its importance in the current scenario. He also put forward the suggestion to start a poultry mission on big scale and to look forward in grabbing the opportunities in launching large numbers of start-ups for poultry.

Rapid growth of the poultry sector was highlighted by Shri O.P. Chaudhary in his address. He stressed on the need to understand the viewpoint of stakeholders in taking the poultry sector forward. He was of the view that a synergy between the organized and the unorganized sectors is crucial to increase the productivity scale of poultry farms. He voiced the need for focusing on the fundamentals and assured that cooperation from the government is necessary and would be



definitely provided wherever the need arises.

Poultry industry faces several issues in India which was brought to focus by R.C. Khatri, Poultry Federation of India. He said that is a difference of opinions regarding poultry as an industry or a sector. "It lies between these two and hence is often not able to reap and fully optimize the true prospective benefits and hence there is a need to recognize it as an independent industry," said Mr. Khatri. He noted that the poultry farms were cessed at a high rate which leads to increase in the cost of production and hence should be looked into. He also mentioned the efforts made by various NGOs pressurizing FMCGs to procure cessed free eggs. "This move if successful would be a step towards minimizing costs to the poultry sector," he opined. The main focus of Mr Khatri was on establishing poultry as an independent sector and giving it its deserved credit.

The demand for eggs is expected to increase to 57 million tonnes by 2030 and of the total non-vegetarian consumption in India, chicken accounts for around 90%. Mr. Vijay Sardana, Chairman, ICFA Working Group on Agro Trade stressed on the huge potential the poultry sector has to offer. Although India is the fastest growing non-vegetarian market in the world, he lamented that we are not capitalizing on this. Listing out the advantages of poultry sector he mentioned that Poultry is the most acceptable meat in all terms in our country and it is easy to cook and the nutritional aspects related to it are well accepted. He observed that Poultry sector has a

very high multiplier effect on other sectors such as corn and soyabean industry. Further, it requires low cost capital investment and it is considered to be the shortest duration crop. Mr. Sardana preceded the discussion by pointing out the problems faced by this sector and was quite critical about the negative competition in the sense that illogical cutting of production is done to stabilise prices instead of developing the market for it. He also exhorted the sector to utilize the burgeoning snacking industry. To strengthen the sector, he urged to increase global competitiveness of India in various markets like corn, soya, meat, poultry etc.; Build a national strategy for increasing the export market of poultry sector; Hitting the foreign market with efficient policy making and strategy; Create awareness among the consumer regarding the food safety; Balancing between buyer security and value chain; Focussing on convenience

and consumption; Innovation and R&D requirements; Input cost consideration; Value addition; Formation of a separate committee for poultry; Promoting Consumption; Media campaigning for consumer education and Reviewing the state's policy and transaction cost.

Dr. RS Gandhi, Assistant DG, Animal Nutrition & Poultry, ICAR in the conference dealt on issues in poultry sector research and development. He pitched in for Mega seed project; Germplasm chicken production; Characterisation of maximum number of breeds; Exploring better genes for disease resistant birds; Optimisation of nutritional aspects; Developing bio-security sources; Finding alternates to anti-microbial; Effective poultry waste management; Upgradation to nanotechnology; Efficient usage of frozen semen; Developing value added products; Realising issues regarding animal welfare; Capacity building by enhancing women entrepreneurship





and Adopting eco-friendly technology.

Dr. AK Rajput, ED, All India Poultry Breeders Association noted that there is a lack of proper training schools which could aid in the better productivity as well as competitiveness of poultry products in the world market. He mainly focused on the financial constraints faced by the sector. Emphasizing on export competitiveness, Dr. Rajput said that financing should be made easily available to the small and marginal farmers. He pointed out that at present, there is no relevant scheme in India for providing funds for upgradation. He suggested that the APMC should be exempt farmers from the cess and poultry be provided the same status as that of agriculture. He noted that there is no priority sector for poultry sector. Processing of meat industries is quite untimely and need to be worked on and exports by US should be allowed keeping in mind that it does not overpower our export sector.

Dr. PG Phalke, Managing Director, ICC Impex India took the discussion forward by re-emphasizing all the points made by earlier speakers and stating the spectrum of food security should be widened and nutritional sector and its security should be addressed specifically. He also pointed out that there is a huge need to develop skills among labor and to exempt the sector from custom duties.

Aman Bhatnagar from National Centre for Cold Chain Development meanwhile drew the attention of the gathering to the growing vitality of cold chain. He viewed cold chain as enhancing in terms of energy efficiency. He emphasized on making the policies while keeping in mind the MIDH guidelines. He stressed on the importance of such a discussion in order to understand different ideas and viewpoints

which should be considered for the betterment of the sector and resolving various issues related to poultry and allied units.

Mr. Harish Garware, President, Poultry India addressed the development issues in poultry sector. He laid emphasis on increasing production of poultry products, promoting information, proper information dissemination channels. He underlined the importance of nutrition and said, "We talk of hunger, but what is more important is the nutrition. Milk and eggs are the major supplier of protein and calcium. One and a half eggs provide the same amount of protein as 6 cups of porridge". "There is a need to change traditional and cultural mindsets. A healthy child means a healthy family which in turn implies a healthy nation". Mr. Garware emphasized on identifying the core areas and working on them on a priority basis and extend our vision to trebling the farmer's income instead of doubling it.

Mr. OP Singh, Managing Director, Advanced Bio-Agro Tech Ltd talked of increasing consumption of chicken and eggs and pressed on enabling resources of the quality capable of competing in the world market. He stressed on the fact that the cost of production should be efficient and competitive with the rivals. Progress models need to be properly evaluated. Price procurement procedures are not easily accessible to the farmers and hence should be enabled so that they get fair prices for their produce. According to him in order to survive in the open market system, it is important to enable farmers to a lower price investment. Farmers need to be categorized and facilities should be provided according to these categories. Another point to be noted is that vitamins and amino acids are not adequately produced.

Complete auditability of the system is required as well as minimum quality standards need to be implemented. He concluded by stating that production could only be trebled, if we increase consumption by ½ %.

Dr. T. Kotaiah, Managing Director, IndBro R&B Farm pointed at the presence of middlemen who increase the cost by 30-40% by hoarding. He observed that the banks were reluctant to provide working capital limits to farmers. He suggested to provide loans at a cheaper rate at least around 3% which is necessary for poultry farms to maintain efficiency and reduce cost of production. He concluded by affirming the need for encouraging manufacture of amino acids which account for around 20% of the cost in India.

Mr Ricky Thaper Managing Director, IB Group said that protein consumption in India is far less than the required level. He was of the view that in order to increase consumption, we need to increase the selling points and outlets.

Anup Kalra, Executive Director, Ayurvet reaffirmed the need for addressing protein security as a separate unit instead of using it synonymously with food security. He emphasized on the importance of efficiency index. According to him herbal products are necessary for increasing the market of this sector and so is skill development. Mr. Kalra mentioned SAATHI, an organization working under the PPP mode, specializing in the propagation for consumption of chicken and eggs. He also mentioned the sustainability issues regarding various biogas sources.

Jasvir Jaglan, MD, Vijay Breeding Farm & Hatcheries spoke in economic terms of increasing income through increasing production. He also mentioned that by reducing input costs, output rates could be increased and was of the view that income could also be increased by introducing and establishing good and efficient markets to sell the produce. His concluding remarks included providing subsidies to the farmers and compensation to be paid in case of bird flu outbreaks.

Mr. Ashok Kumar, President, Karnataka Poultry Federation explained

the lack of facilities in the sector. India is looked as a prospective market for trade in chicken and eggs. "Often policymakers are pressurized to reformulate policies in order to suit their markets. There are certain internal factors such as avian influenza involved as well. There is not enough focus given to the sector and he pressed on the need to provide a thrust to it", he said. He pressed on making education a priority and recycling waste from poultry and also suggested a proper mechanism for regular processing of the sector and proper storage facilities.

Dr. Fernando Ciscerno, DSM Nutritional Products mentioned how the world needs India to be successful and sustainable. "Poultry is not only food for India but the planet as well. The waste produced by animals reduce CO2 emissions by about 60%," he said. He further explained that countries become profitable first by the natural conditions bestowed on them and second by realizing their product of specialization working towards its betterment. He cited the examples of countries like Thailand and Mexico who had no specialization in corn and therefore diversified their production and became the lead producers of products like cucumber, zucchini and avocado and gained comparative advantage in these products as well.

Dr. Shirish Nigam, Director, INFAH was critical on the lack of proper information dissemination channels. He pressed on the requirement to upgrade the status of poultry farmers to that of farmers in general. A need for radical evaluation of the land holding reforms was also highlighted. "Cost of capital should be made at par with the world market. The policies need to be reformulated and made in sync with the present poultry sector", he suggested.

Mr. Anand Bhaskar Rapolu, MP (RS), Chairman, ICFA WG on Farmers Distress spoke shortly on how the FDIs are often not directed towards proper and deserving receivers and how poultry which is one of the most important sectors of the Indian economy is often not given its due recognition.

Mr. Vipin Malhotra, CEO, Kegg

Farms Ltd. emphasized on geographical production as bird flu is quite prevalent in India. "If the bird flu affects the northern region, then production should be placed on the other regions so as to maintain productivity and market and to stabilize prices and gains. Unity of the stakeholders is of utmost importance," maintains Mr. Malhotra. He also suggested teaming up with airlines such as Air India which could provide various hubs and centers for storing and marketing the products to make overseas trade easier and cheaper.

Mr. Ajit Singh, Chief Executive, NECC spoke on the need for proper monitoring of schemes as well as correcting various implementation stages. He appreciated the success of Aarogya Bharat, a successful initiative by the Govt. and urged the stakeholders to cooperate with the Govt. and work on the same lines. He stated that since Maharashtra, Karnataka, Kerala and Bihar are major poultry producers, great emphasis should be laid on their betterment and rightful support and aid should be provided by the Govt. as well.

Mr. Anil Dhumal, Founder President- Poultry India, MD- Dhumal Industries talked of incorporating better schemes for poultry sector under Make in India initiative. Incentives should be provided to farmers in lieu of their contribution to building the economy as well as to modernize their approach towards work. Firms facilitating in the marketing of the products should also be incentivized. Better equipment and technology is needed in order to ensure and increase the durability of the product. He concluded by pressing on the requirement of a healthy interaction between the Government and the industry.

In the concluding remarks, Dr. Malhotra, Agriculture Commissioner, GOI, spoke of issues related to production and allied aspects. He mentioned that production sector has given satisfactory results. He informed that more than 70% production has been done in the Kharif season and area covered under the sector is expected to increase. He also stressed on enhancing MSP policies.

HELMING THE RURAL AFFAIRS

Shri Narendra Singh Tomar, the current Minister for Rural Development, Panchayati Raj, Drinking Water and Sanitation is hoped to carry on with the responsibilities of the new portfolio effortlessly. His previous stint in the same portfolio in the state of Madhya Pradesh and his own zeal to work for the hinterlands of the country has amassed immense responsibility and pressure on him. Nicknamed 'Munna Bhaiya,' Shri Tomar, is a man of few words and more of action.



Narendra Singh Tomar, the trusted aide of Narendra Modi, in the recent cabinet reshuffle assumed the portfolio of Rural Development, Panchayati Raj, Drinking Water and Sanitation.

Born on 12 June 1957, in a Tomar Rajput family to Munshi Singh Tomar and Sharda Devi Tomar in Morar village of Gwalior in Madhya Pradesh, Tomar graduated from Jiwaji University. His political career took off as early as 1980. From getting appointed as the President of BJP Youth Forum in Gwalior to being the BJP head of Madhya Pradesh, the political career of Tomar has always been in a natural progression. He has served in positions as limited as a municipal councilor, to the vastness of a Cabinet Minister.

Tomar has occupied various positions in the BJP and also played a key role in the party's victory in the Lok Sabha elections. His dedication and hard work led the party win 27 Lok Sabha seats out of 29. He was elected as the Member of legislative Assembly (MLA) of Madhya Pradesh twice between 1998 and 2008. He won the assembly elections from Morena constituency. Tomar became the union minister in 2003 and held portfolio of rural development. In 2006 he was appointed as the party president of Madhya Pradesh. In 2007, Tomar was elected to the Rajya Sabha. He won the 2014 General Elections from Gwalior and took over as the Union Minister (Cabinet rank) of Steel, Mines, Labour and Employment. He was administered the oath of office and sworn in as Union Minister on 26 May 2014 by Pranab Mukherjee, the President of India. On 5 July 2016, during the second cabinet reshuffle of the Narendra Modi ministry, Chaudhary Birender Singh replaced Narendra Singh Tomar as the Steel Minister and Narendra Singh Tomar replaced Chaudhary Birender Singh as the Minister of Panchayati Raj, Rural Development and Drinking Water and Sanitation.

The new assignment of Tomar is believed to be his niche area. Having served in the same portfolio in Madhya Pradesh and credited with starting several new programmes for the rural sector in the state, Tomar is looked upon with lot of hopes and optimism. It is believed that Tomar's on-the-ground experience in handling

matters related to Panchayats and their working and his deep understanding of the rural sector might have clinched the case in his favour. With the recent budget giving heavy emphasis on rural development, the relevance of this ministry has further increased, and so this posting assumes significance. Projects such as Gramuday Se Bharat Uday, Swachh Bharat, Pradhan Mantri Grameen Sadak Yojana, Rural Housing Scheme, and Deendayal Upadhyaya Grameen Kaushal Yojana under the rural development ministry, carries the massive responsibility of transforming rural India and hence the man at the helm of affairs is in for a big challenge.

Quite aware of his duty, Shri Narendra Singh Tomar said that the real development of India is closely linked to the development of rural India. Talking to the media after taking charge of the new ministries Shri Tomar said, he will make all efforts to give concrete shape to Prime Minister's dream of inclusive development. He said, even the last general budget embodied the philosophy of rural re-generation and the budget allocation for rural schemes were testimony for the same. In reply to a question that he had been assigned a high profile ministry, Shri Tomar said, whatever role the party would assign to him, he will try to do justice to that as a simple party worker. Praising the outgoing Minister, Shri Birender Singh for the dynamism imparted to implementation of schemes like MGNREGA and PMGSY, Shri Tomar said, the positive spirit was quite visible during the campaign of Gramoday se Bharat Uday".

A sport's enthusiast, Tomar also held the position of the President of Darpan Sports Sansthan. Apart from his fascination in sports, his literary interests are also quite evident. To encourage artists, Tomar organizes poetic symposiums. He is also involved in many social and cultural activities.



Tomar became the union minister in 2003 and held portfolio of rural development. In 2006 he was appointed as the party president of Madhya Pradesh. In 2007, Tomar was elected to the Rajya Sabha. He won the 2014 General Elections from Gwalior and took over as the Union Minister (Cabinet rank) of Steel, Mines, Labour and Employment

“Demonetisation is in fact to monetise and unlock the locked black economy, so that liquidity falls in the hands of consumers, industries and farmers. This is the first major genuine and revolutionary step taken by our Prime Minister, which shall change the course of India and this course correction was long overdue”

HARSIMRAT KAUR BADAL
Food Processing Minister



“India’s wheat revolution lead ultimately to the coining of the term Green Revolution by William Gaud of USA. This achievement was possible through synergy between technology and public policy. Technology creates the potential for high yield, while public policy helps to realise the potential”

PROF. M.S. SWAMINATHAN



“The farmer has no cash for pesticides, the farmer has no cash for fertiliser, and you are telling that farmer that you are going to import wheat. This is videshi jagaran; this is videshi utthan (uplift of foreign countries)”

JAIRAM RAMESH
Indian National Congress



“Since the farmer is not getting cash, he can neither buy seeds nor sell foodgrain on the minimum support price. The government’s step (import duty slash) is against the nation, against the farmers”

SITARAM YECHURY
CPI(M) Member



“Soil is the fundamental basis of human survival. The soil conservation department should prepare a roadmap to fulfil its mandate and generate public interest and opinion in favour of the conservation initiatives”

SARBANANDA SONOWAL
Chief Minister, Assam