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AGRICULTURE TURNS AGRIBUSINESS

Infrastructure yet to Catch up

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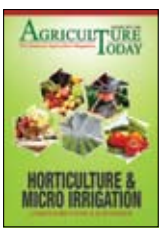

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BETTER INFRASTRUCTURE FOR BETTER AGRIBUSINESS

Agriculture is the largest private sector enterprise in India today. Agriculture which turned greener with years was the direct result of the involvement of improved technologies and their reach ensuing a very productive green revolution. The sector today sees the active participation of many industries which work coherently to make the best out of the resources. The input industries - seeds, fertilizers, machinery, credit, irrigation provides the best inputs and the output industries - post harvest handling and cold storage – presents the output in the best possible way. With the changing market dynamics and consumer demands, newer segments are getting aligned with agriculture, making it broader in its scope and reach.

Indian seed industry has played a crucial role in ensuring country's agriculture production and is the fifth largest seed market measured in value terms in the world.Also, India is the fourth largest producer of agrochemicals globally, after the US, Japan and China. This segment generated a value of USD 4.4 billion in FY15 and is expected to grow at 7.5% per annum to reach USD 6.3 billion by FY20. Owing to scarcity of farm labour and increasing farm wages, many farmers have found solace in farm mechanization.Tractors, threshers and power tillers are the most common farm machinery used in India. The tractor market is by far the largest (both in volume and value terms). Irrigation is yet another significant segment that supports agriculture.The current micro irrigation industry is estimated at around Rs. 4,500-5,000 crores and is considered to be highly competitive.

Another sector which has the tremendous potential to leverage from this immense gains in the production front is the food processing industry. Food and grocery account for around 31 per cent of India's consumption basket. The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales.The Indian food processing industry accounts for 32 per cent of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. The food processing segment is expected to propel with much vigour considering the robust demand emanating from the consumers.

Agriculture has thus moulded itself into the business model gaining momentum from the existing demand. The infrastructure needed to sustain this growth, however, hasn't developed concomitantly. There exists a considerable gap between the demand and capacity. In addition to dry storage capacity, there is an acute shortage for cold chains in India. This is a severe handicap considering our post harvest losses.Indian needs more investments in cold storage.

With the objective of increasing agriculture production, due attention should also be laid on filling the infrastructural gaps existing in the agricultural space. This will not only help in extending the life of otherwise perishable produce, but also help in fulfilling the objective of doubling farmers' income.

Anjana Nair

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Editorial Comments

Consolidation Spree

Indian agro input sector is expected to see consolidations

Concentrating power in a few hands has been the easiest route for corporates to maintain and expand their custom base. While the big players do so effectively, the smaller ones go under the wings of the others accumulating the power in the hands of the few. The phenomenon was quite common in the Indian and global corporate scene. However, quite recently, the agro input scene has become a hub of activities in this aspect. Consolidation at the global level of Monsanto-Bayer, Dow Chemical-Du Pont and ChemChina-Syngenta,essentially proves this point. A similar wave is expected to strike the Indian agricultural space as well.

Analysts are of the view that the agrochemicals and fertilisers sector is about to see consolidation over the next five years where more than a dozen deals are expected in India. The factors that might have spurred this trend in the domestic market include large mergers and acquisitions in the global market, incentives by the government for larger players and prolonged unfavourable monsoon spells affecting many firms. Companies that could see acquisitions include India's biggest private-sector phosphatic fertiliser producer Coromandel International, NagarjunaAgrichem, Bharat Rasayan, Gujarat State Fertilizers and Chemicals, Rashtriya Chemicals and Fertilizers, Deepak Fertilizers and Petrochemicals. These changes are surely significant to India considering the fact that India is the fourth-largest global producer of agrochemicals after the US, Japan and China.

The acquisitions in the global sphere has engendered a situation where the global agrochemical and seed industry is now being controlled by four big players, as against six earlier, commanding a market share of 55-60%. The seeds and fertilizer sector are research and development intensive sectors, and these consolidations have a bearing on reaping long term gains. Generating new genetic traits in seeds is a highly time consuming and capital intensive affair, and the long term benefits can only be borne by companies bigger in capital and man power. Hence the dominance of top companies currently contributing a lion's share of total private sector spending in global seeds is driven by the long-term success of their investments.

The situation of mergers and acquisitions have dawned upon the Indian segment considering certain government policies that support bigger productions. Consolidation in the fertiliser space is being caused to tap the benefits of low gas prices and other inputs provided by the Union government if a unit manufactures beyond its threshold. Also cost efficiency and access to better technology are other reasons to pursue the route of mergers.

But these consolidations, also comes with a threat of monopoly. The dominance of one company in a particular product line, makes it difficult for others to invest in the same category thereby affecting investments and innovations in that area. The growth of these giants in the long run smother smaller companies due to economies of scale and efficiency of operation. Long product development cycles and even longer product registration cycles make it challenging for the small players to survive singularly. In order to survive in this consolidation phase, the Indian companies are left with the option to develop scale to be sustainable.

On the consumer front, the consolidations are feared to cut choices for farmers, as well as raise prices. Farming will be restricted to certain varieties and certain brands of fertilizers and crop protection chemicals. This will severely constrain the agricultural diversity of the country. These consolidations will sound the death knell for innovation, crop diversification and product diversity.

Indian agriculture is confronted with challenges on a daily basis. To cater to the burgeoning Indian population from limited resources is itself a challenge. With the thrust on doubling farmers' income gaining traction, certain policies should be in place to check events that lead to rise in prices. India has to promote diversity in agriculture and products.

Editorial Comments

NFSA – Languishing in State Corridors

The Supreme Court reprimands the Centre and State for the tardy implementation of NFSA

The National Food Security Act (NFSA) which was unveiled in India in 2013 continues to languish in different states owing to political apathy. States and Centre continue to hold divergent stands and the National Food Security Bill which was passed by both Houses of Parliament has failed to deliver in some states. The situation recently received attention from the Supreme Court and the premier seat of justice, was quick to reprimand both the Centre and the State.

On a petition filed by Advocate Prashant Bhushan for Swaraj Abhiyan, the Supreme Court observed the lethargy in implementation of the Act and accordingly had issued directives to implement the same without much delay. The court remarked that the Centre cannot look the other way, passing the buck on to the states for not implementing the law. Referring to Article 256 of the Constitution, the judgment said the "Government of India cannot plead helplessness in requiring State Governments to implement parliamentary laws". Similarly, the Supreme Court had reservations the way the states were approaching the situation and said that states cannot ignore the "plight of the common man".

Many states in India are not enthusiastic about implementing the food security act. Many provisions mandated under the act have still not been implemented by the state governments. Section 16 of the NFS Act mandates the State Government to constitute a State Food Commission for the purpose of monitoring and review of implementation of the NFS Act. But some of the State Governments had appointed the Consumer Disputes Redressal Commission constituted under the provisions of the Consumer Protection Act, 1986 as the State Food Commission under Section 16 of the NFS Act. Similarly, a separate body concerning grievance redress mechanism was also not constituted.

Since there is completely a point of non-concurrence between the center and the states, a dialogue involving the states and center is needed and as the court pointed out the Secretary in the Ministry of Consumer Affairs, Food and Public Distribution of the Government of India should convene meetings with the concerned Secretaries of all the State Governments and Union Territories. Also, a grievance redressal mechanism under the provisions of the NFS Act should be developed at state level and appropriate and independent officials as the District Grievance Redressal Officer should be appointed to deal with the complaints emanating from the scheme. Lack of Food Commission at the state level has also been one reason for the delayed and sketchy implementation of the Nation Food Security Act. So the court has directed the center to settle this glitch through communication with the concerned state authorities. Other deficiencies such as Vigilance Committee as per Section 29 and social audit machinery postulated by Section 28 of the NFS Act should also be put in place.

Providing food security to one of the most populated countries in the world is not an easy task. There are certain inherent difficulties to its execution. Notwithstanding this glitch, the apathy of the state governments towards this act is not justifiable under any circumstances. Citing differences with the Centre, the States cannot shy away from their primary responsibility of ensuring the welfare of its citizens. Similarly, the Center's responsibility does not end with the framing of the rules and passing the bill. It should also find ways to implement them at the state level with regular checks and follow ups. As the court pointed out both the parties concerned – the Centre and the State- should evolve ways and means to effectively implement the provisions of the NFS Act in letter and spirit. A law enacted by Parliament as a part of its social justice obligation and hence must be given its due respect and has to be implemented faithfully and sincerely.

Editorial Comments

Agriculture – A Risky Business

Economic Survey categorizes the risks associated with agriculture

Agriculture is a risky business. This time the validation of the risks the farmers face comes officially and is quite eloquently described under the heading ' Taxonomy of risks in agriculture' in the second volume of the Economic Survey 2016-17.

Risks were inherently associated with agriculture since the time it was practised. As long as there exists a direct association between the crops cultivated and the unpredictable nature, risks are there to stay. However, the intensity of risks associated with agriculture has increased with time. With increasing pressure on agricultural lands to produce crops for meeting the demands from an increasing population, the stress on the farmers and resources have increased. Even a small aberration in nature is reflected severely on the outputs and hence on the income and profitability of the farmers.Today agriculture is agribusiness and the agricultural produce in different formats are sold beyond borders. So not just the weather of the area where cultivation is carried out, policy atmosphere of the destination countries too influence farmers' profitability. A range of factors influence today's agriculture and trade. These factors reflect as risks when constrained.

As the Economic Survey observes, today risks associated with agriculture comes under different categories and are spread among headings such as production risks, weather and disaster related risks, price risks, credit risks, market risks and policy risks. To offset the risks associated with agriculture, there should be a specific knowledge regarding the nature of the risk. For instance, low productivity and declining yield could be attributed to production risks such as pests, diseases and shortage of inputs like seeds/ irrigation. These can be addressed by pest and disease resistant seeds, free markets for inputs and/or quality seeds. Similarly, losing market/ market share can be due to changes in demand/ supply in the domestic or international market i.e., market risk, and therefore can be managed by allowing long term contracts for purchase on pre-determined prices, starting direct purchase from farmers by exempting Government purchases by PSU, Defence, Paramilitary etc.

Another interesting observation made by the Survey is the acknowledgement of risks associated with policy. Government policies have a significant impact on the farming of the country. Certain policy measures have been observed to directly interfere with profitability of agriculture. Trade or policy changes have to be therefore announced well before sowing and to stay till arrivals and procurement are over. Knee jerk reaction by the policy formulators to the domestic and international market situation has been the bane of our country. Most often farmers are unaware of the export or import policies. Their planting decisions are hardly centered around country's policies. Farmers must be made aware of the country's agricultural policies to make effective and useful decisions.

The survey's 'risk observations' are significant. Recently the country has seen several farmer protests. These are pointers to the hardships and growing resentment among farmers towards the existing situations surrounding Indian agriculture. Farmers face multifaceted risks and each one of those risks has the potential to pull down the income prospects of the farmers. Handling these risks cannot be restricted to singular actions of waiving loans or granting spectacular Minimum Support Prices. They have to be managed comprehensively taking into consideration the entire agricultural scene and the whole gamut of risks.

The country has been recording bumper production in food grains and horticulture. Yet the farmers are in distress. The heavy production provoked fall in prices. It has to be noted that farmers' income cannot be doubled by simply increasing production or productivity. There should be assured markets, dependable storage infrastructure, value addition and stable policies. Agriculture is much more complex today. There is an interplay of a host of factors that determines the profitability of agriculture.

The Tapering Trade Deficit

India's trade balance in agricultural and allied products dips

India, year after year, has managed to improve upon its agricltural production. Food grains and horticultural produciton have increased magnificiently. While the seventies had emphasized upon food grain producion, the recent decade has been triumphant on account of horticultral production. For the fifth consecutive year, horticulture prouction has surpassed the food grains. This year, on the back of good monsoon, a bumper production in food grains is also expected.

Despite the glorious production front, India's trade deficit, however has been narrowing. From a 150 per cent surplus of export over import, India's trade balance in agricultural and allied products has slipped in four years to near-equality.Data compiled by the Directorate General of Commercial Intelligence and Statistics under the Ministry of Commerce and Industry shows that India's exports of agri and allied products has declined by 25 per cent to $24.7 billion for financial year 2016-17, as against nearly $33 billion in 2013-14. In contrast, import of agri and allied products jumped in the same period to $23.2 billion, from $13.5 billion. Several domestic factors have attributed towards this plunging export import difference.

Since 2014, there was a drop in the agricultural production owing to drought. The government responded to the situation by imposing restrictions on the export of rice, wheat and maize. The consumption however, was steady. Pulses and edible oil which were already deficient in terms of domestic production, was met for domestic consumption by imports. A strengthening dollar eased their import costs. The result was narrowing of the trade surplus in agriculture and allied products.

Boosting exports is critical to the government's vision of doubling farmers' income. Meeting this objective by solely focusing on domestic market is impractical. Banning exports in response to domestic affairs has never been the hallmark of good governance. Unless the situation is alarming these kind of impulsive policy interventions may not be resorted to. Food security is definitely critical to the country. At the same time, stable overseas trade is also crucial to maintain country's dominance in world market.

A report prepared by a not-for-profit organization, Center for Environment and Agriculture (Centegro) emphasises the need to raise India's share in global agri exports to increase farmers' income automatically. The report was prepared in association with experts from Tata Strategic Management Group. The report stresses the need to quadruple India's agri and allied exports by 2022, if the farmers' income has to be doubled. Incidentally there is enough space for India to attract a fair share of global market space. The World Trade Organisation (WTO) estimates global export in agricultural products at over $1,500 billion annually of which India's share stands at less than $35 billion. By participating in the international market, India can efficiently handle excess production thereby preventing fall in domestic prices. The recent protests by farmers over lowering prices with increase in production is the classic example of production managed poorly. A stable market will add to the stability in the income earned by the farmers.

The tapering trade deficit is a worrying trend and shows the unhealthy trend that India is espousing for short term gains. Experts aver that to double farmers' income by 2022 our strategy should be to increase consumption in the domestic and foreign markets. The domestic consumption, however, is robust considering the increasing population and improving living standards. Our focus should be to develop foreign markets and increase our share in the international market. Once a wider market is established, farmers are motivated to increase their production by resorting to better inputs and technology.

The government should encourage exports and hence devise policies that would enable them to do so.

India has many firsts in the agriculture segment. It is time to use them sensibly for the welfare of the farmers.

Another Round of Consolidation Likely in Agri Input Sector

The Indian agricultural inputs sector, which includes agrochemicals and fertilisers, is heading for a fresh round of consolidation over the next five years where more than a dozen deals could be sealed, say experts and industry players. The key factors fuelling consolidation in the domestic market include large mergers and acquisitions in the global market, incentives by the government for larger players and prolonged unfavourable monsoon spells affecting many firms. Companies that could see acquisitions include India's biggest private-sector phosphatic fertiliser producer Coromandel International, NagarjunaAgrichem, Bharat Rasayan, Gujarat State Fertilizers and Chemicals, Rashtriya Chemicals and Fertilizers, Deepak Fertilizers and Petrochemicals.

Goodricke lounge in Tea Pot

Goodricke Group has chalked out an aggressive expansion plan to open tea lounges across the country after seeing a good response to its initial foray. The company is looking for space in Calcutta, where it has its headquarters, apart from metro cities Delhi, Mumbai and Bangalore. It has opened two lounges in Bhopal and one in Indore. Last year, the company opened one in Kurseong at Margaret's Hope tea garden. "The lounges serve three purpose. It helps to educate customer, promote the company's brand and make some money on the way," Arun N. Singh, managing director and chief executive officer of the company, said. The first lounge in Bhopal - called Goodricke Tea Pot - started making profit from the first year. The Margaret's Hope outlet also started off well before the political disturbances in the hills derailed its progress. In Calcutta, Goodricke has three kiosks in top clubs CC&FC, Calcutta Club and Saturday Club. Now the company wants to have lounges outside, ideally spread over 1,500-3,000 square feet. "We are looking for a good place in Calcutta. This city loves Darjeeling tea. Our idea is to open one in every metro, Mumbai, Delhi, Bangalore," Singh added.

Agri-tech start-up EM3 raises $10 mn

EM3 Agri Services, which offers farm services and machinery on rent, has raised $10 million from London-based non-profit Global Innovation Fund, top executives at the agricultural technology start-up said. The series B investment will power its expansion in Rajasthan. EM3 Agri operates under the brand name Samadhan in Madhya Pradesh and parts of Gujarat. The company offers farm equipment such as ground-levelling machines, deep-ploughing equipment and power harrows for making seed beds to farmers on rent. The company last month signed an agreement with the government of Rajasthan to expand its services in the state. "We are excited about the agreement because this gives us an opportunity to scale up faster than planned, and that has actually accelerated our fund-raise as well," said Adwitiya Mal, chief executive and co-founder of EM3 Agri. The company was founded in 2013 by Adwitiya Mal and his father Rohtash Mal, a former CEO of Bharti Airtel and most recently at the helm of heavy machinery maker Escorts Ltd. EM3 Agri said it will expand into Rajasthan in phases, beginning with districts in the south. Over the next 12-18 months the company will set up operational outposts called SamadhanKendras—which maintain the equipment and double up as customer-facing stores—across the state.

Rohtash Mal said most of India's small farmers rely on manual labour as they cannot afford capital equipment such as advanced farm implements, tractors and harvesters. EM3 Agri is pioneering a model it calls Farming-as-a-Service, where equipment and services are rented out and charged as pay-per-use (typically based on hours or area of the farm). "We cover the entire harvesting cycle for the farmer," said Rohtash Mal. "Whatever operations the farmer needs to carry out, we do it with machines that are owned by us, and operators that are on our payroll. Services go all the way from soil preparation, seeding, planting, crop protection to harvesting. Whatever the farmer needs across the crop cycle, we provide." The firm hires and trains workers who manage the equipment and carry out the services on the farm. The bulk of the back-end, which is taken care of by its engineering and support team in Noida, is engaged in mapping out usage patterns and optimizes costs of equipment and personnel. Noida-based EM3 has regional offices in Indore and Jaipur with about 160 people on the rolls, including call centre staff.

Tea drinkers may soon have more options for their morning cuppa

Bulk tea producers are looking to enter the packet tea business to improve profitability and de-risk portfolios. Two of India's largest producers of bulk tea — market leader, McLeod Russel India and the second-largest producer, Amalgamated Plantations (APPL) — are said to be exploring a possible entry into the segment. According to industry experts, packet tea accounts for roughly 50 per cent of the country's total tea consumption, pegged at one billion kg. The segment is currently dominated by brands such as Tata Tea (a product of Tata Global Beverages Ltd), Brooke Bond (Hindustan Unilever Ltd) and WaghBakri Tea. India's annual tea consumption has been growing at 2.5–3 per cent. Growth in the rural economy and demand for packaged products is also increasing. Hence, a rise in conversion from loose to packet tea is on the anvil, experts feel. According to Kaushik Das, VP and Sector Head, Corporate Sector Ratings, ICRA, in the case of a bulk tea company such as McLeod, the costs are largely fixed and usually not within their control. On the realisation side, they are dependent on packeteers, where again they have little influence. While McLeod plans to ink a joint venture agreement with Willamson Magor Group arm Eveready Industries India to develop the packet tea business through a separate entity, Tata Global's associate company APPL is looking to tie up with loose tea sellers and lend its brand name.

Insecticides (India) eyes 15-20% growth this fiscal on good monsoon

As monsoon gets better this year, Insecticides (India) Ltd is targeting a growth rate of 15-20 per cent this financial year against an industry growth rate of 3-4 per cent in the last two years. "The industry has been very tough for the pesticides due to unfavourable monsoon. But there seems to be a good monsoon this year despite difficulties in some parts of the country. The industry is expected to grow at 10 per cent this year. But we are looking at a growth of 15-20 per cent," said Rajesh Aggarwal, MD. The agro chemicals manufacturing company has registered sales of Rs 1,100 crore last year, with over 75 per cent of the revenues from the 15 key products. He is in the city to launch Kayakalp, a 'soil revitalizer' product in Andhra Pradesh and Telangana. Pegging the size of the agro chemical market at Rs 20,000 crore (about $3 billion), he said the industry experts saw this year as a year of recovery after two difficult years. The firm is looking at investing Rs 30 crore in the next two years to expand its capacities. "We are in the process of roping in partners to tap the markets abroad," he said.

Deepak Fert earnings

Deepak Fertilisers & Petrochemicals Corporation Ltd (DFPCL), on a standalone basis, has reported a total income of Rs 642.72 crore for the quarter ended 30 June 2017. The company's profit after tax stood at Rs 12.64 crore in the quarter, said a release issued by the company.

Food firms may de-register trademarks

The government's decision to charge an enhanced tax rate on trademark food brands is leading several rice, wheat and cereal manufacturers to consider de-registering their product trademarks. Irked by the June 28 central government notification fixing a 5 per cent goods and services tax (GST) rate on food items packaged in unit containers and bearing registered brand names, the industry has made several representations to the government to reconsider the differential tax levy, which these players say is creating an unlevel playing field within these highly-competitive and low-margin industries. Sources say that the move has affected the packaged rice industry the hardest and allowed the un-registered market leaders, India Gate and Daawat, to gain advantage as compared to other registered brands such as Kohinoor and LalQilla. Smaller players are even more worried with this enhanced rate of tax (against the otherwise 'nil' rate) on registered brands, which they claim results in a severe loss in competitiveness. Reacting to the situation, many of these manufacturers are even taking the drastic step of re-registering their trademarks to place themselves on the favourable side of the playing field, much to the dissatisfaction of the rice lobby.

Govt hikes import duty on crude, refined palm oil

The government hiked the import duty on crude palm oil to 15 per cent from 7.5 per cent and on refined to 25 per cent from 15 per cent to curb cheaper shipments and boost local prices for supporting domestic farmers and refiners. The import duties on other crude edible oils like soya and sunflower have been raised to 17.5 per cent from 12.5 per cent, according to a notification issued by the Central Board of Excise and Customs (CBEC). The hike in import duty of crude and refined palm oil will help restrict cheaper imports from Malaysia and Indonesia and benefit farmers which are in distress due to fall in prices of oilseeds below minimum support price because of bumper production. Edible oil industry body Solvent Extractors' Association (SEA) welcomed the step, saying the move would help farmers to some extent but wanted duty difference between the crude palm oil and refined palm oil to be 15 per cent to support domestic processors. India imports about 14.5 million tonnes (mt) of vegetable oils (edible and non-edible) per year to meet domestic demand. Vegetable oil imports increased by 15 per cent in June at 1.344 mt, according to industry data. In the first eight months of the current 2016-17 oil marketing year, the import of vegetable oils rose marginally at 9.863 mt compared to 9.763 mt. The move is also expected to give a boost to sowing of oil seeds in the ongoing season.

India in No Hurry to Grow GM Food Crops

The government is in no hurry to introduce genetically modified food crops in the country, three months after the sector regulator gave its nod to commercialisation of GM mustard, because of widespread opposition from different quarters. The government has decided to examine all objections raised by scientists and farmers before taking a decision on genetically engineered (GE) mustard, environment minister Harsh Vardhan has said. "Pursuant to recommendation of GE mustard by GEAC (Genetic Engineering Appraisal Committee), several representations and concerns have been raised by a wide range of stakeholders including scientists, policymakers, farmers and NGOs," Vardhan said. "The issues raised are manifold, like long-term health and environmental impact, herbicide tolerance, loss to honey bees and pollinators, outperformance of native varieties, no enhancement in yields, etc. All these issues are under examination," he said. GEAC, India's regulator for transgenic products, had given a green signal to GM mustard in early May, paving way for introduction of genetically modified food crops. After the regulator's nod, the final call is taken by the government. Developed by Delhi University-based Centre for Genetic Manipulation of Crop Plants (CGMCP), GE mustard is argued to be superior as it is resistant to pests and diseases. Supporters also claimed that its commercialisation would mean better yields, lower use of pesticides and more environment-friendly practices. But several stakeholders, including Rashtriya Swayamsevak Sangh (RSS) affiliates Swadeshi Jagran Manch and Bharatiya Kisan Sangh, have expressed opposition to GM food crops. Bharatiya Kisan Sangh has already given a representation to the environment ministry opposing the move. Though impact of these organisations on Narendra Modi government's decision making is questioned, sources believe this is one of the reasons for the government's cautious approach.

Govt to revive five fertiliser plants

The government is working to revive five fertiliser plants, having a production capacity of 65 lakh metric tonnes, to turn India from being an importer to an exporter in the field of urea and fertilisers, the Rajya Sabha was informed. During the Question Hour, Minister of Chemicals, Fertlisers and Parliamentary Affairs Ananth Kumar said the government was working to revive the fertiliser plants at Sindri, Talcher, Barauni, Ramgundam and Gorakhpur. The five plants imply an additional capacity of 65 lakh metric tonnes of urea, he said, adding that the country's requirement was 310 lakh metric tonnes and the current shortage was of 55 lakh metric tonnnes which was being imported. "In a couple of years instead of being an importing country, India would be an exporting country in the field of urea and fertilisers," Kumar said. He said that the fertiliser plant at Sindri is likely to be commissioned by September 2020, while the one at Ramgundam could be commissioned by the end of this year. Within the next three years, "we may see all the five plants commissioned and functioning," he said. Referring to the Sindri, Barauni and Gorakhpur plants, he said that the Hindustan Urvarak Rasayan Limited (HURL) was working for their revival. Congress member Jairam Ramesh said the work for the revival of these plants has been going on before the NDA regime came to power.

Government asks Basmati exporters to conform to EU pesticide standards

The government has asked rice exporters to conform to the pesticides standards of the European Union (EU) for shipments to the region. Issuing a strong warning, the government said no contract would be registered from November 1 unless accompanied by a testing report from an accredited laboratory. The European Union has rejected an Indian demand to relax the norm for another year, sources said, following which the government's agri-export promotion body, the Agricultural and Processed Food Products Export Development Authority (Apeda), has issued a notification, making testing of Tricyclazole mandatory for contract registration. Three years ago, the European Commission had reduced maximum residues level (MRL) in Tricyclazole to 0.01 parts per million (ppm) for all crops effective from January 1, 2018. Import of any agricultural product above the MRL would not be permitted in EU. The previous limit for this chemical stood at 1 ppm. An official delegation from the Union commerce ministry had last month visited the European Union and discussed the issue, the sources said. However, the Commission told India categorically that further exemptions will not be possible and like other countries, India too would have to adhere to the standards, the sources said. Following this, Apeda has issued the notification, which states that there would be now 12 conditions instead of the earlier 11 for online registration of contract for export of Basmati rice.

Centre to call EoIs for agri, food processing clusters shortly

In a bid to develop the food processing ecosystem, the Union Ministry of Food Processing Industries will soon call for expression of interest (EoI) to set up agro processing clusters, implementing backward and forward linkages and food processing units. The Ministry has finalised guidelines for selecting the candidates for these projects. "EoIs will be called for establishing agro processing clusters and food processing units shortly. EoIs for setting up backward and forward linkage projects will be invited next month," Anuradha Prasad, Joint Secretary at the Ministry, has said. The Ministry is planning to set up 100 agro processing clusters that will attract grants up to Rs 10 crore each. These clusters, which will have common facilities, should have at least five processing units each with an investment of Rs 25 crore. Besides, the Ministry will facilitate the setting up of 400 food processing units with grants of up to Rs 5 crore. With regard to backward and forward linkages, the Ministry proposes to create 50 projects with a maximum grant of Rs 5 crore. These are targeted at plugging gaps in the supply chain of perishable agriculture and horticulture produce. These were being set up under the Rs 6,000-crore Kisan Sampada Yojana launched in May.

New initiatives to boost coffee production in Nagaland

Nagaland having a favourable land for coffee farming would be undertaking plantation of 64 lakh coffee seedlings during this current year. Disclosing this during a training programme on coffee plantation, Director of Land Resources Department, HotoYeptho said as nodal department of the Government for coffee plantation in the State, the department would be giving seven lakh coffee saplings to the coffee farmers throughout the State. The coffee saplings, provided by the Coffee Board of India (CBI) to Nagaland, has increased from 300 kg to 620 kg in 2016 and 2400 kg this year, which comes to about 64 lakh seedlings. Yeptho informed that the survey conducted by Coffee Board of India has graded Nagaland soil and weather condition very favourable for coffee, while the department has entered into an agreement with South African-based coffee company 'Noble Cause' for export of all coffee produced in the State. Yeptho encouraged the local people to take up coffee farming with all earnestness in order to yield self-sustainable income and enhance economy. He also urged them not to try to demand for subsidy alone but labour hard to yield the fruit.

Paddy purchase centre opened at Kaliabor

A paddy purchase centre established under the auspices of the Kaliabor Sub-Divisional Administration in collaboration with the DhingNiyantrit Market Committee was inaugurated at Hatigaon in Assam recently by State Water Resources and IT Minister KeshabMahanta in the presence of officials concerned and others. Inaugurating the centre, Mahanta, in his speech, disclosed that the paddy purchase centre would play a significant role in the progress and development of farmers in the State. The Government has launched the Chief Minister's Samagra Gramya Unnayan Yojana, a mega project for the development of rural areas of the State, he said, adding that there would be nine mini missions under that mega project. To implement this project, the State Government would provide 26,000 tractors to farmers of 26,000 revenue villages. Further, the Government will spend more than Rs 1 crore to establish all facilities in the villages, he added.

Onion Prices Hit Rs 50kg in Kolkata

Retail onion prices rose to Rs 50 per kg in Kolkata, while rates in other metro cities also inched Rs 30-36kg due to tight supplies. The Agriculture up to and Consumer Affairs ministries are closely watching the price situation and alerted all states to keep a check on hoarding and profiteering. Onion prices at Lasalgaon in Maharasthra, Asia's biggest wholesale onion market, have risen to Rs 26.50 per kg August 10 from Rs 10.10 per kg on July 25 of this year. As per data maintained by the Consumer Affairs Ministry, onion prices in Kolkata are ruling at Rs 50kg in retail markets and Rs 40kg in wholesale markets on August 11. At present, the city's demand is met through supplies largely from Kurnool mandis, Andhra Pradesh and there too rates have increased to over Rs 32.50kg. With rise in prices in Lasalgaon, traders from Kolkata and other states are buying more from Kurnool mandis because of which rates have gone up there, a Delhi trader said. Prices are under pressure due to depleting old stock and expected less 2017-18 kharif output owing to lower sowing area in states like Karnataka and Maharashtra on account of inadequate rains, he added.

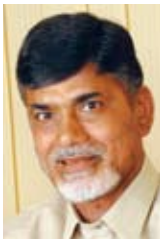
Drought-like situation in several districts of Assam

A number of districts, mostly those in lower Assam, are facing a drought-like situation even as flood waters in some areas of the State are yet to recede completely. The State Agriculture department has sought a report from the districts regarding the prevailing situation. A senior State Agriculture officer said that drought report has been received from Baksa, while district officers in the State, particularly those in Mangaldai, Nalbari, Kamrup, Chirang, etc., which have been reportedly hit due to scanty rainfall and high temperatures, have been asked to conduct surveys and report to the government on the situation. According to the report received from Baksa, around 14673.76 hectares of cropland in 302 villages have been affected by the drought-like situation. The number of farmer families affected stands at 4,820 till August 2.

UP Lagging behind in soil health card scheme

Seven states, including Uttar Pradesh, Rajasthan, Punjab and Bihar, are lagging behind in issuing soil health cards to farmers and have been asked to expedite the process, Union Agriculture Minister Radha Mohan Singh said. Against the target of 12 crore, nine crore soil health cards have been issued so far. Sixteen states have completed their target, while six are set to complete by the end of this month, he said at the Parliamentary Consultative Committee Meeting. "However, the progress is slow in seven states, which include Uttar Pradesh, Rajasthan, Bihar, Punjab, Assam, Jammu and Kashmir and Manipur," he said. He urged the members to make efforts to achieve the target in their respective states as soon as possible. Sharing about benefits of soil health card, the minister said it has helped reduce fertiliser consumption by 8-10 per cent and increase crop output by 10-12 per cent.

AP speeding up 28 irrigation projects



The Andhra Pradesh government is taking all steps to speed up as many as 28 irrigation projects in the state, with special emphasis on the mega Polavaram project on the Godavari, in an effort to tackle drought, according to Chief Minister N Chandrababu Naidu. "It will carry water to Visakhapatnam through Yeleru canal and drinking water needs of the city and industrial water requirements will be met adequately, even before the completion of the Polavaram project," he said. He expressed confidence that Polavaram project will be completed by 2019, "but the Centre will have to reimburse Rs. 3,500 crore we have already spent on the project, as it is a national project," he said.

Pink bollworm hits cotton in Gujarat, Maharashtra

The cotton crop in parts of Gujarat, Andhra Pradesh and Maharashtra has come under pink bollworm attack as there is an erosion of resistance to the pest in some transgenic varieties.

"As per report from the Central Institute for Cotton Research (CICR), Nagpur, there is a sporadic incidence of pink bollworm damage in Maharashtra, Andhra Pradesh and Gujarat," Minister for State for Agriculture Parshottam Rupala informed the Lok Sabha. The Maharashtra Government has already directed seed firms to pay a compensation of Rs. 36.83 lakh to the farmers, he said. "It is not a serious problem yet, but it can be if care is not taken," said CD Mayee, a renowned cotton scientist, who is currently associated with the South Asia Biotechnology Centre in New Delhi. Unlike the American bollworm, there is a drop in resistance to the pink bollworm in certain Bt varieties, he admitted. It normally enters the plant in November-December. If the sowing time is optimum, the problem can be checked, he said. Meanwhile, the pink bollworm attack has delivered a double blow to farmers in flood-ravaged Gujarat. Most parts of the State where cotton was sown early are experiencing a pink bollworm attack yet again.

FCI wheat worth Rs 700 crore damaged in Punjab: CAG

In a major setback, the Comptroller and Auditor General (CAG) of India has slammed the Food Corporation of India (FCI), the government's Food Security Mission implementing vehicle, for 'wasting' wheat stock worth of Rs 700 crore. In its latest report, the CAG has found that wheat stock got "deteriorated" in Punjab till March 2016 as the grain was stored in open areas due to lack of storage facility. The damaged wheat stock could not be supplied through the ration shops, the CAG said in its report which was tabled in Parliament on Friday. The CAG has audited implementation of the scheme PEG (private entrepreneur guarantee) in Punjab to create storage capacity and the way FCI managed its debt, labour and incentive payments during 2011-16. The apex auditor also found state-owned FCI selling wheat to bulk consumers at a rate below the cost in 2013-14 leading to non-recovery of Rs 38.99 crore. "The FCI incurred an excess expenditure of Rs 237.65 crore due to non-rationalisation of surplus labour and deployment of costlier labour at depots. The FCI had made fraudulent excess payment of Rs 14.73 lakh and Rs 37.89 lakh to transport contractors on account of payment of higher rates and for bills for a longer distance than actual for transportation of foodgrains," the CAG said.

Will not ease norms for farm loan waiver: RBI to Maharashtra

The Reserve Bank of India (RBI) has turned down a proposal to ease norms for farm loans that have turned bad and have been classified as non-performing assets (NPAs) besides declining to provide for a special dispensation for bad loans that were restructured in the past. This is being perceived as a setback to the Maharashtra government which announced a Rs 34,022-crore farm loan waiver scheme. According to official records, such loan accounts make up for nearly 67 per cent of the total farm loan waiver benefit. With rural banks reluctant to advance fresh crop loans to such accounts without the RBI lowering the provisioning norms, the Devendra Fadnavis government approached the banking regulator on July 10 for a special dispensation. But RBI's Executive Director Sudarshan Sen wrote back on August 7 declining this request. The RBI's refusal to ease norms would mean that rural banks, especially state-run banks and the banking cooperatives, who are already sitting on a huge pile of stressed assets, will have to bear an additional burden and make higher provisions if they were to extend fresh crop loans to such farm accounts as per the government's proposal. With debt mounting, the Maharashtra government has proposed to the State Level Bankers Committee that fresh crop loans be advanced to such defaulting borrowers pending repayments for the arrears. It has proposed to use taxpayers' money to write off arrears in three or four annual installments. The Chief Minister had earlier declared that the government's farm loan waiver scheme would benefit 89 lakh farmers in the state. Official records show that NPA accounts and the restructured loan accounts made up for 24.01 lakh farmers. Farm loans totalling Rs 12,629 crore in the state have turned bad over the years. Another Rs 10,001 crore bad loans have been restructured. Another component of the government's loan waiver scheme dealt with advancing short term loans of Rs 10,000 against the state's guarantee to farmers whose accounts were overdue or had turned into NPAs as on June 30, 2016. The government has proposed that this amount would later be adjusted against the amount of the waiver or incentive admissible to a farmer under the loan waiver scheme.

Haryana may get Rs 600 crore of NABARD irrigation funds

Haryana is expected to get Rs 600 crore from the Rs 5,000-crore irrigation efficiency fund set up by the National Bank for Agriculture and Rural Development (NABARD) for promoting micro irrigation, for which a detailed project report has been prepared. Haryana might be the first state in the country to get such assistance. Besides, the Union Ministry of Agriculture and Farmers' Welfare has selected Faridabad for peri-urban horticulture development with an allocation of about Rs 4 crore.

LS passes bill to raise Nabard's capital to Rs 30,000 crore

A bill to enable exit of RBI from Nabard and increase authorised capital of the development institution six times to Rs 30,000 crore was passed by the Lok Sabha. The National Bank for Agriculture and Rural Development (Amendment) Bill, 2017 also seeks to amend certain clauses in the light of reference of the Micro, Small and Medium Enterprises (MSMEs) Development Act, 2006 in the proposed legislation. Minister of State for Finance Santosh Kumar Gangwar said that the law is one of the "major step" towards doubling farmers' income by 2022. This is a small bill but irrespective of that, 28 members put their views on this legislation, which reflects the interest of members's on agriculture related issues, he said. members's on agriculture related issues, he said. He said that as this is a short bill, suggestions made by members would be considered when the detail bill will come. "This law would benefit farmers," he said adding the government is sensitive towards issues of farmers.

Banks to share farmers' loan details with govt

Banks have agreed to share the data on farmers' crop loans with the state government, said Finance Minister Manpreet Singh Badal after a meeting with bank executives, officials of the Finance Department and Cooperative Department, and the expert group headed by Dr T Haque. "Just as the government is taking such a big step of taking over bank loans, the banks should offer one-time settlement for the Rs 6,000-crore loan. We are hopeful that the modalities of the scheme would be finalised in a month," he said. The government wants to get a loan of over Rs 10,000 crore for settling the farmers' crop loans (Rs 3,600 crore of cooperative banks and Rs 6,500 crore taken from commercial banks). While the money to be paid to cooperative banks is almost arranged for – the National Cooperative Development Corporation has agreed to provide the loan — the state has not made much headway over commercial banks' loan. Banks have now been asked to get consent forms signed from 10.4 lakh small and marginal farmers, who will get debt relief of Rs 2 lakh, so that the loan details can be shared with the government. Thus, Aadhaar linking of these farmers' bank accounts will have to be done. PS Chauhan, convener, State level Bankers Committee, said after the meeting that some headway had been made.

Cabinet approves raising Rs 9,020 crore for Long Term Irrigation Fund

The Cabinet gave its approval for raising Extra Budgetary Resources of up to Rs 9,020 crore during the financial year 2017-18. An official statement said that the funds will be raised by the National Bank for Agriculture and Rural Development (Nabard) through the issuance of bonds at 6 per cent per annum as per requirement. These funds will be for the implementation of Accelerated Irrigation Benefits Programme (AIBP) works of 99 ongoing prioritised irrigation projects along with their command area development (CAD) works under the Prime Minister Krishi Sinchayee Yojana (PMKSY). An official statement said that a large number of major and medium irrigation projects taken up under the Accelerated Irrigation Benefit Programme (AIBP) were languishing mainly due to inadequate provision of funds.

Agri farmers have to link Aadhaar with bank a/c for crop loans in 2017-18

To ensure hassle-free benefits to farmers under Interest Subvention Scheme, the Reserve Bank of India has advised banks to make Aadhaar linkage mandatory for availing short-term crop loans up to 3 lakh in 2017-18. This move is in line with the government's increasing emphasis on linking Aadhaar to various transactions in the economy including filing Income-Tax returns and getting direct benefit transfer. In order to provide short-term crop loans to farmers at an interest rate of 7 per cent (the same as in the previous year) during the year 2017-18, the RBI said it has been decided to offer interest subvention of 2 per cent to lending institutions -- public sector banks, private sector commercial banks (in respect of loans given by their rural and semi-urban branches only) on use of their own resources. This interest subvention of 2 per cent will be calculated on the crop loan amount from the date of its disbursement/ drawal up to the date of actual repayment of the crop loan by the farmer or up to the due date of the loan fixed by the banks whichever is earlier, subject to a maximum period of one year. Further, farmers repaying in time will be provided an additional interest subvention of 3 per cent. What this means is that farmers paying promptly would get short term crop loans (for a maximum period of one year) at 4 per cent during the year 2017-18.

Farmers to get crop loans at subsidised 7%

In line with the government's policy, the RBI informed that farmers can avail of short-term crop loans of up to Rs 3 lakh at subsidised interest rate of 7 per cent that could go down to 4 per cent on prompt repayment. "To ensure hassle-free benefits to farmers under the Interest Subvention Scheme, the banks are advised to make Aadhaar linkage mandatory for availing of short-term crop loans in 2017-18," the RBI said in a notification to banks.

Darjeeling tea export alarm

McLeod Russel, the world's largest bulk tea producer, has warned that a 33-year-old situation may return to haunt Darjeeling when India had lost a major share in the international market to competitors. The company said Darjeeling tea going into blend might be replaced by tea from other countries such as Kenya, Sri Lanka or Nepal. "The worry that we're having as an industry is that Darjeeling tea is bought overseas. They (foreign buyers) are not bothered about the strike. They need the tea. If they don't get it, they will change the blend and start replacing it with Kenyan or Sri Lankan tea," Aditya Khaitan, vice-chairman and managing director of McLeod Russel, said. He said the situation was similar to 1984 when there was complete ban on CTC export and India lost a huge market for Assam tea to Africa and never quite recovered from that. "That was the biggest entry point Africa got. If you look at the UK, which was the real bread earner for Assam at one point, we never recovered the market share we had. Then the Africans came in and started to put in more tea and Assam's share came down. I hope we don't lose the Darjeeling market," he added. Darjeeling tea, being protected by geographical indication (GI), may not be affected massively, planters from the hills said, even as they admitted some loss of market share.

Farm exports dip to $33.87 billion in FY17

India's agricultural exports have declined to $33.87 billion in 2016-17 from $43.23 billion in 2013-14. The primary reasons for decline in export of agricultural commodities are low commodity prices in the international market, "which has made our exports uncompetitive," Commerce and Industry Minister Nirmala Sitharaman said in a written reply to the Rajya Sabha. However, import of agricultural commodities (including plantation and marine products) in 2016-17 rose to $25.09 billion from $15.03 billion in 2013-14. India's agricultural exports have declined to $33.87 billion in 2016-17 from $43.23 billion in 2013-14, Parliament was informed. The primary reasons for decline in export of agricultural commodities are low commodity prices in the international market, "which has made our exports uncompetitive," Commerce and Industry Minister Nirmala Sitharaman said in a written reply to the Rajya Sabha. However, import of agricultural commodities (including plantation and marine products) in 2016-17 rose to $25.09 billion from $15.03 billion in 2013-14. She added that export and import of agricultural products depend on various factors such as availability, international and domestic demand and supply situation and quality concerns. "Edible oils and pulses, which are in short supply in India, account for the bulk of India s import of agricultural products," the minister said. In a separate reply, Sitharaman said the share of agricultural exports in total exports of the country has declined marginally during the past three years.

Stronger rupee slows non-basmati rice export

India's non-basmati rice exports are likely to slow over the next few months as its shipments of the grain have become too expensive on the world market due to a rally in the rupee and an increase in local paddy prices. Lower shipments from the world's biggest rice exporter will give rivals Vietnam, Thailand and Cambodia a chance to raise their share of the global market. The rupee has risen more than 6.5 percent so far in 2017, reaching its highest in more than two years. A stronger rupee means rice shippers have to raise their dollar-denominated export prices to cover their purchases and other costs. Key buyers of Indian rice in Africa – such as Benin, Senegal and Guinea – were not comfortable buying at the current level.

10th Global Agriculture Leadership Awards declared

The much awaited 10th Global Agriculture Leadership Awards 2017 have been declared in International categories. **Ambassador Kenneth Quinn, President, World Food Prize Foundation** has been selected for the International Leadership Award, while **Dr. Ibrahim Mayaki, chief of African Union agency, NEPAD and former Prime Minister of Niger** for African Development Award. Releasing the list, Dr. MJ Khan, Chairman, Indian Council of Food and Agriculture said that these two were possibly the most deserving names on the globe for these categories of awards. Ambassador Quinn is the most admired name in the global agriculture community, who single handedly had raised the status of World Food Prizes equal to Noble Prizes. The World Food Summit and Normal Borlaug Global Dialogue that the Ambassador organizes are the most important global events in the world. Dr. Ibrahim Mayaki, as the Prime Minister of Niger launched many schemes with far reaching implications towards agriculture growth and food security of the nation. He introduced economic reforms and innovative legislative measures that brought out a sizeable Niger population out of poverty. Currently as the Chief of African Union agency, NEPAD (New Partnership for Africa Development), Dr. Mayaki is playing critical role in mobilizing global resources and partnerships towards the development of Africa and making it food secure continent. The Global Leadership Award 2017 has been conferred upon Dr. Mayaki in recognition of his visionary leadership, deep commitment and inspiring efforts in promoting understanding on issues concerning farmers, food and nutrition security and climate change towards setting policy and growth agenda and furthering the cause of agriculture globally, which positively touched the lives and livelihoods of millions of people. Global Agriculture Leadership Awards were instituted in 2008 under the Chairmanship of Prof. MS Swaminathan. The Awards are presented annually in the areas of Policy, Research, Farming, Industry, Environment, Innovations, Livelihood, Entrepreneurship, CSR, Development and State, Regional and Global Leaderships. The Awards will be presented on Sept 5, 2017 in New Delhi during the 10th Agriculture Leadership Summit.

Ambassador Kenneth Quinn

Dr. Ibrahim Mayaki

Tie-up for Indian rice farming in Ghana

After successfully cultivating desi tomatoes on its soil, Ghana is set to grow Indian rice varieties and medicinal and aromatic plants. Goodearth Global Ltd, based in Accra, Ghana, has inked an agreement with the National Research and Development Corporation (NRDC) in this regard. Goodearth is owned by Hyderabad-based international commodity trader ChGopal. As per the agreement signed between him and H Purushotham, Chairman and Managing Director of NRDC, the rice and medicinal and aromatic plants will be grown on 3,000 acres, which the company has leased for 50 years. Goodearth has been present in Ghana for the past five years and is expanding operations. "We have leased virgin land near the town of Ho in the Volta (river) region, which is fertile. The climate is also suitable for growing these crops. Access to the US and European markets is easier from there," Gopal said. The company plans to grow short-duration (125 days), fine-grained blast-resistant paddy variety called 'Telangana Sona'. This variety can be grown both during rainy and winter seasons. Though rice is a staple food for Ghana, where significant quantities are imported, especially from Thailand, Vietnam and India. This offers good scope and opportunity for growing rice in the African nation itself.

Basmati becomes top agri-export product

Basmati emerged as the top exporting agri item in the Indian commodity basket, surpassing buffalo meat, in the first quarter of the current fiscal. Reasons: An increased buying from Iran and higher per unit realisation. During the April-June period, basmati contributed 29% to the country's agricultural and processed food product exports value-wise, followed by buffalo meat (19.33%). According to Agricultural and Processed Food Products Export Development Authority data, basmati exports for the Q1 stood at 12.56 lakh tonnes compared to 11.86 lakh tonnes during the corresponding period of the last year. Though it witnessed a 6% rise volume-wise, thanks to better realisation, the value-wise growth was 32%. The total value of the exports stood at Rs 8,168 crore during the period compared to Rs 6,196 crore during the previous period. As against per tonnerealisation of around $787 during the previous year, basmati has commanded an average price of $1,009 per tonne in the Q1 this year.

Indian scientists produce clove oil from tulsi

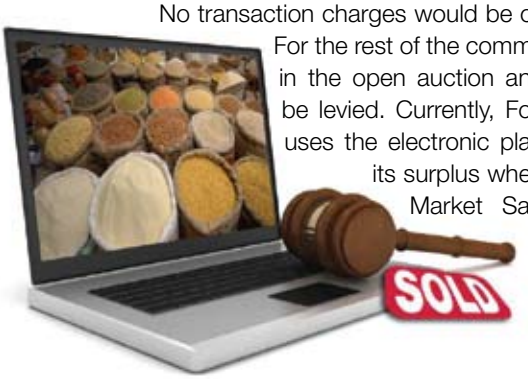
Tulsi may be able to replace expensive clove and cinnamon as a cheaper source of eugenol, a natural substance found to be effective in fighting everything from tooth ache and food spoilage to stomach ache. Popularly known as clove oil, eugenol, which gives clove its distinct flavour, has a host of medicinal and industrial applications. It is widely used in perfumery, aromatherapy as well as in the processed food industry, as flavouring agent and preservative. Anti-microbial and antiseptic, it is an inevitable part of a dentist's cabinet. Currently, eugenol is highly priced in the global market (the purest quality of eugenol costs around $40 for 100 ml). Now, a team of researchers at Indian Council of Agricultural Research's (ICAR) Directorate of Medicinal and Aromatic Plants Research (DMAPR) at Anand in Gujarat, may have found a better and cheaper way of producing eugenol. DMAPR researchers, led by ParmeshwarLal Saran, who tested 10 different accessions of tulsi collected from different parts of the country for two seasons, have been to able to identify a particular variety of tulsi (Holy Basil), codenamed DOS-1, that has very high eugenol content. "We have been able to extract 73 kg of essential oil per hectare on a tulsi farm, of which 67 kg was eugenol," said Saran, the lead author of a study that appeared in the journal Industrial Crops and Products.

Foodgrain yield to surpass last year's record

Despite floods in over dozen of States such as Gujarat, Uttrakhand, Assam, Rajasthan, Bihar and Odisha, foodgrain output in the ongoing 2017-18 kharif season is set to surpass last year's record of 138.04 million tonnes due to higher acreage and good monsoon for the second straight year. According to the Ministry of Agriculture data released recently, farmers have sown kharif crops in 878.23 lakh hectare as against 855.85 lakh hectare in the year-ago period. The main kharif (summer) crop — was sown in 280.03 lakh hectare, as against 266.93 lakh hectare, while pulses covered 121.28 lakh hectare as against 116.95 lakh hectare in the said period. However, oilseeds acreage was down at 148.88 lakh hectare till last week of the kharif season from 165.49 lakh hectare in the same period last year. As per the data, cotton acreage has increased to 114.34 lakh hectare so far in the 2017-18 kharif season from 96.48 lakh hectare in the year-ago period on account of good rains and better prices. It is estimated that at least 30 percent cotton sowing damaged in the current flood. Similarly, acreage under sugarcane has gone up to 49.71 lakh hectare from 45.64 lakh hectare in the said period because of good monsoon and timely payment of cane arrears by sugar mills.

Nafed to launch e-auction platform for pulses trade

In a bid to dispose huge stocks piled since last one year, agri-cooperative Nafed, also the nodal agency for the government's pulses procurement drive for creation of buffer stocks, would launch an e-auction platform shortly where traders could sell and buy other agricultural commodities as well. The dedicated portal – www.nafed.agribazaar.com would also facilitate sale and purchase of various agricultural commodities including pulses by registered traders who would bid for the prices through an open auction system. According to Sanjeev Kumar Chadha, managing director, Nafed, the portal where more than 200 traders have already been registered, would go live by the later part of this month. "Although we have been disposing of pulses procured on behalf of the government for buffer stocks to states and paramilitary forces, we are still left with huge stocks from the last year's Kharif procurement," Chadha told FE. Nafed is currently preparing customised guidelines for procurement, disposal, and processing of contracts for all the agricultural commodities and food products to be sold through e-platform. For the auction of pulses procured for buffer stocks through the portal, the base price would be fixed by Department of Consumer Affairs. No transaction charges would be charged from the government. For the rest of the commodities, traders will participate in the open auction and transaction charges would be levied. Currently, Food Corporation of India (FCI) uses the electronic platform of mjunction for selling its surplus wheat to bulk buyers under Open Market Sale Scheme. Although base price for the OMSS for wheat is fixed by the corporation.



Handholding scheme for agri entrepreneurs

The Hyderabad-based ICAR-National Academy of Agricultural Research Management (NAARM) has announced the launch of a second edition of a food and agribusiness accelerator programme for incubating and mentoring selected agri startups. Called AgriUdaan, it will be managed by ICAR-NAARM's technology incubator, a-IDEA along with IIM Ahmedabad's Centre for Innovation. "Anybody from an innovative farmer to agricultural graduate to a person with minimal educational qualification can apply for the scheme called AgriUdaan, provided he or she has a powerful idea that can turn them into an agri-based entrepreneur," said Narendra Singh Rathore, Deputy Director General of ICAR. As part of Agri-Udaan, road shows will be conducted in six cities, including Chandigarh, Pune, Kolkata and Bengaluru to reach out to agri startups through August and September. Eight to 12 startups that will be selected eventually will be mentored and guided to scale up their operations. The entrepreneurs will get to spend 6 months at the ICAR-NAARM's Hyderabad campus where they will be trained in different aspects of technology commercialisation, product validation, business plan preparation and fund raising, among other things. The accelerator programme is funded mainly through the Department of Science and Technology. K Srinivas, CEO of a-IDEA, said three starups that were chosen as part of the earlier AgriUdaan in 2015 are doing very well and they have been able to go to the next level of business and have been able to raise additional funds subsequently.

When silver 'grows' in paddy fields

Garib-sal, one of 505 types of rice plants tested by scientists, is capable of absorbing silver found naturally in soil and accumulating it in the grain to unusually high levels of 15 mg per kg. The rice was able to accumulate high quantities of silver even when the soil contained only about 0.15 mg per kg. The unusual accumulation of silver in the grain and other parts of the plant, researchers say, throws open the possibility of commercial extraction of the metal through farming. The maximum concentration of silver in the plant is in the grains. Silver accumulation is largely in the bran of the rice grain, and once polished, the silver in the grain is reduced significantly. It is not, however, for consumption as food.Silver is not known to accumulate in the reproductive tissues of any cereal, and in agricultural crops the amount of silver that gets accumulated is less than 1 mg per kg of dry weight of the plant. Only nine showed high silver accumulation, with Garib-sal the highest.

Agri Ministry, Philippines-based Rice Research Institute sign MOA

The Ministry of Agriculture on Wednesday signed a Memorandum of Association (MoA) with Philippines-based International Rice Research Institute (IRRI) for setting up a regional centre of the International Rice Research Institute (IRRI) in Varanasi, the Prime Minister's constituency, to develop high- yielding rice varieties. The IRRI, which has offices in 17 countries, is known for its work in developing rice varieties that contributed to the green revolution in 1960s. IRRI's South Asia Regional Centre will be set up at the campus of National Seed Research and Training Centre (NSRTC) in Varanasi. The MoA was signed between Agriculture Secretary Shobhana K Patnaik and IRRI Director General Matthew Morell. Speaking on the occasion, Union Agriculture Minister Radha Mohan Singh said: "The rich biodiversity of India can be utilised to develop special rice varieties. This will help India achieve higher per hectare yields and improved nutritional contents." Country's food and nutritional security issues will also be addressed, he said in a statement.

Punjab academics develop drip irrigation tech for wheat

Early wheat sowing and adopting drip irrigation technology could result in a 50 per cent reduction in water usage and improved yields, researchers at the Punjab Agricultural University (PAU) in Ludhiana have found. The technique was successfully tried out by researchers led by AS Brar of the Department of Agronomy at PAU on the university's experimental farms. It could emerge as a major boon for Punjab, where 110 of 138 water blocks were found to be overexploited, with groundwater tables dipping steeply. According to the scientists, it is one of the first attempts to develop a drip irrigation protocol for wheat crop and they perfected after carrying out trials across two crop cycles — in 2014-15 and 2015-16. In a paper published in the journal Agriculture, Ecosystems & Environment last week, Brar and his doctoral student Eajaz Ahmad Dar showed that this could yield great savings in water budget, if widely adopted. The third author of the paper is KB Singh, a scientist at PAU's University Seed Farms in Ladhowal.

AGRICULTURE TURNS AGRIBUSINESS

Infrastructure yet to Catch up

Agriculture is today no more the simple art of sowing crops and reaping them. It has metamorphosed into a complex activity intertwined with the activities of many allied industries and sectors. The scope, therefore of this sector has immensely broadened and therefore 'agribusiness' would be the apt word to better describe this sector. However, this rapid expansion of the sector has left certain gaps unfilled. The more important one is the mismatch between the existing capacity and demand in the storage segment. To fully explore the agriculture potential of the country these gaps must be filled.

Indian agriculture, the life line of more than half of India's population is no longer a proposition for eking out a livelihood but has become grander and magnificent. The story of hapless souls trapped in the vicious cycle of poverty and indebtedness has taken a back seat and the story of entrepreneurs stretching their limits and borders of their 'agribusiness' are taking center stage. Agriculture has transformed from the mere activity of growing crops to that of a production process with a series of industries lined up in the upstream and downstream side of the cultivation activity. Agribusiness has over the time emerged into a multisegmented industry working in unison to provide food and business to the country.

Agriculture or Agribusiness?

Agriculture is a very important segment for India. Agriculture is the largest private sector enterprise and millions of rural families earn their livelihoods from agriculture. The sector contributes 18 percent to the GDP. At 157.35 million hectares, India cultivates the second largest agricultural land in the world. With 20 agri-climatic regions, all 15 major climates in the world exist in India. India is the largest producer of spices, pulses, milk, tea, cashew and jute; and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds. Further, India is second in global production of fruits and vegetables, and is the largest producer of mango and banana. It also has the highest productivity of grapes in the world. India is among the 15 leading exporters of agricultural products in the world. Global exports in agricultural products were $1,745 billion in 2013 (Source: WTO-International Trade Statistics 2014). India is counted as the fifth largest exporter of agricultural products after the US, Brazil, China and Canada. While the US earned only $30 billion from agricultural trade in 2013, India earned as high as $23 billion, thanks to low imports.

Agriculture which turned greener with years was the direct result of the involvement of improved technologies and their reach. The sector today sees the active participation of many industries which work coherently to make the best out of the resources. The input industries - seeds, fertilizers, machinery, credit, irrigation provides the best inputs and the output

The input industries - seeds, fertilizers, machinery, credit, irrigation provides the best inputs and the output industries - post harvest handling and cold storage – presents the output in the best possible way

industries - post harvest handling and cold storage – presents the output in the best possible way. With the changing market dynamics and consumer demands, newer segments are getting aligned with agriculture making it broader in its scope and reach.

India has witnessed voluminous increase in horticulture production over the last few years. Significant progress has been made in area expansion resulting in higher production. Over the last decade, the area under horticulture grew by about 2.7 per cent per annum and annual production increased by 7.0 per cent. This year, India is likely to record highest ever production of horticulture produce, including fruits and vegetables. The total production is estimated at 295 million tonnes which is 3.2 % higher than the production a year earlier. The second advance estimate of horticulture production shows that the current year will be the fifth straight year when horticulture production in the country will outstrip the production of food grains. The agriculture ministry has also noted that there has been a concomitant increase in area under the horticulture crops - from 245 lakh hectares in 2015-16 to 249 lakh hectares in 2016-17.Globally, India is the second largest producer of fruits and vegetables. India is also the largest producer and exporter of spices. In productivity, India ranks first in grapes, banana, cassava, peas, papaya etc. The Export growth of fresh fruits and vegetables in term of value is 14% and of processed fruits and vegetables is 16.27%.

Indian Seed industry has played a crucial role in ensuring country's agriculture production. The journey from farm saved seeds to the GM seeds, Indian farmers' dependence on seed companies and corporations have been increasing. India constitutes the fifth largest seed market measured in value terms in the world. The share of Indian seed industry in the global

seed production is 4.7 percent preceded by the US (28.1 percent), China (21.2 percent), France (8.4 percent), and Brazil (6.2 percent). With a turnover of over Rs.15,000 crore, the Indian seed industry ranks fifth in the world. India produces four million tonnes of seeds every year. The domestic seed industry is expected to grow at a double-digit growth rate in the medium-term driven by improved seed replacement ratio (SRR) and rising adoption of improved hybrid seeds according to ratings agency ICRA. The profitability of private seed companies will remain healthy while investments in R&D and working capital to maintain a strong product pipeline will keep private sector's indebtedness at moderately high levels. The favourable policy environment aimed at supporting the usage of seeds through National Seeds Plan and boosting agricultural productivity through National Food Security Mission (NFSM) augur well for the industry. According to the report, the Indian seeds industry grew at a Compound Growth Rate (CAGR) of 8.4 percent in volume terms from FY 2009 to FY 2015 to reach 3.5 million tonnes in consumption. On an average, private sector companies saw operating margin of about 15.5 percent between Financial Year 2011 - FY 14 vis-a-vis 9.3 percent for state run companies.

Green revolution which spurred India's agriculture production relied heavily on agrochemicals. Fertilizers and crop protection chemicals were the trusted companions of the farmers. Today the agrochemicals industry in India has assumed an important position and dictates the success of the country's farm production. India is the fourth largest producer of agrochemicals globally, after the US, Japan and China. This segment generated a value of USD 4.4 billion in FY15 and is expected to grow at 7.5% per annum to reach USD 6.3 billion by FY20. Approximately 50% of the demand comes from domestic consumers while the rest goes towards exports. While the domestic demand is expected to grow at 6.5% per annum, exports are estimated to grow at 9% per annum during the same period. However, the usage of agrochemicals in India is one of the lowest in the world at just 0.58 kg per hectare against 4.5 kg per hectare in the US and 10.8 kg per hectare in Japan. It is no where near the world's average consumption of 3 kg per hectare. This shows there is clearly a large scope of growth in usage and demand. With limited availability of fertile land to cultivate food and feed an ever growing population,

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Insecticides dominate Indian crop protection market and they constitute around 60% of domestic crop protection chemicals market. Fungicides and Herbicides are the largest growing segments accounting for 18% and 16% respectively of total crop protection chemicals market

the only alternative we have is to increase productivity per hectare. Besides, it is proven that protection chemicals can increase crop productivity by 25-50%, by mitigating crop loss due to pest attacks. Crop protection chemicals are therefore very crucial to ensure food and nutritional security. Insecticides dominate Indian crop protection market and they constitute around 60% of domestic crop protection chemicals market. Fungicides and Herbicides are the largest growing segments accounting for 18% and 16% respectively of total crop protection chemicals market. India has been slowly emerging as a strong exporter of pesticides. Currently, India occupies the thirteenth position in terms of export of pesticides. India exports to Brazil, USA, France and Netherlands. Low cost manufacturing, availability of technically trained manpower, seasonal domestic demand, overcapacity, better price realization globally and strong presence in generic pesticide manufacturing (India has process technologies for more than 60 generic molecules) are the drivers of this new trend. Contract manufacturing of agrochemicals also presents good opportunities for Indian companies. By 2020, agrochemicals worth USD 4.1 billion are expected to go off-patent providing significant export opportunities for Indian companies which have expertise in generic segment. Top 6 importing nations constitute only 44% of India's agrochemical exports. This also indicates export potential for Indian companies. The herbicide consumption in India stood at 0.4 USD billion in FY15 and is expected to grow at a CAGR of 15% over the next five years to reach ~0.8 USD billion by FY20. On the other hand the fungicide industry in India has grown due to the growth in Indian horticulture industry, which has grown at a CAGR of 7.5% over the last five years.

Indian agriculture still heavily relies on manual labour than farm machines for carrying out agricultural operations. However, owing to scarcity of farm labour and increasing farm wages, many farmers have found solace in farm mechanization. Rise in smaller machines, group farming and custom hiring have increased the scope of farm mechanization in India. Tractors, threshers and power tillers are the most common farm machinery used in India. Among these, the biggest market in terms of annual sales is that of tractors (around 6 lakh units annually), threshers (around 1 lakh units annually) and power tillers (around 56,000 units annually).

The tractor market is by far the largest (both in volume and value terms). Among farm machinery, tractors are most widely used by domestic farmers with the total market size estimated at Rs. 34,000 crore annually. Tractors and power tillers have been at the forefront of driving the mechanisation wave in India. Tractor sales have grown at a CAGR of 9.0% in FY05-15 to approximately 5.5 lakh tractors in FY15 (around 2.3 lakh in FY05) while sales of power tillers have grown at a CAGR of 10.6% in FY05-15 to 48,000 power tillers in FY15 (17481 in FY05). Penetration of tractors in India is higher in northern India, mainly Punjab and Haryana. On the other hand, the penetration of power tillers in India is higher in southern and eastern India. This is on account of the small size of land holdings per farmer in these respective regions.

Irrigation is yet another significant segment that supports agriculture. Although the tracts under rainfed irrigation is more in India, irrigation especially Micro Irrigation Systems (MIS) are catching the fancy of Indian farmers. The current domestic industry is estimated at around Rs. 4,500-5,000 crores and is considered to be highly competitive. There are more than 100 large and small scale drip and sprinkler irrigation systems producers and marketers across different states. Major players include Jain Irrigation, Netafim India, Finolex and EPC Industries Ltd. Jain Irrigation commands a market share of more than 30% and Netafim India has a market share of about 18%. The industry has been growing at a CAGR of 5-7%. However, given the increasing requirement of water management, according to some estimates, the total market in India is expected to be more than Rs. 8,000 crores by 2020.

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The Burgeoning Food Industry

The increasing population has added tremendous responsibility on the food making industry, agriculture. The sector has so far responded well to the demands of the population. According to the 3rd Advance Estimates of production for 2016-17, food grains production has been estimated to reach the record level of 273.38 million tonnes, 8% higher than the 251.6 million tonnes last year, and surpassing the previous record of 265 million tonnes in 2013-14. The estimates show that production of key crops like rice, wheat and pulses will be at record levels during the year. While wheat production is estimated to rise by 4.7% to 96.6 million tonnes in 2016-17 (compared to 92.3 million tonnes in 2015-16), production of pulses is likely to rise 35% from 16.4 million tonnes last year to 22.1 million tonnes in 2016-17. Other than foodgrain, the estimates show that production of oil seeds is likely to rise 25% year-on-year, from 25.2 million tonnes last year to 33.6 million tonnes in 2016-17. This too is higher than the previous record production of 32.7 million tonnes in 2013-14. Production of horticulture crops such as fruits and vegetable is also estimated to create new record of 295 million tonnes (mt) in 2016-17.

Another sector which has the tremendous potential to leverage from this immense gains in the production front is the food processing industry. Food and grocery account for around 31 per cent of India's consumption basket. The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales. The Indian food retail market is expected to reach Rs 61 lakh crore (US$ 915 billion) by 2020.The government expects the processing in this sector to grow by 25 per cent of the total produce by 2025.

The Indian food processing industry

accounts for 32 per cent of the country's total food market. It is one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. It contributes around 14 per cent of manufacturing Gross Domestic Product (GDP), 13 per cent of India's exports and six per cent of total industrial investment. Indian food service industry is expected to reach US$ 78 billion by 2018. The Indian gourmet food market is currently valued at US$ 1.3 billion and is growing at a Compound Annual Growth Rate (CAGR) of 20 per cent. India's organic food market is expected to increase by three times by 2020.

India's exports of processed food and related items rose at a CAGR of 21.5 per cent during FY11–16, accounting for USD19,337.4 million in FY16. During FY11–16, India's exports of processed food and related products (inclusive of animal products) grew at a CAGR of 11.74 per cent, reaching USD16.2 billion. Main export destinations for food products have been the Middle East and Southeast Asia. In FY17, India's exports stood at USD1.3 billion.

The online food ordering business in India is in its nascent stage, but witnessing exponential growth. The organised food business in India is worth US$ 48 billion, of which food delivery is valued at US$ 15 billion. With online food delivery players like FoodPanda, Zomato, TinyOwl and Swiggy building scale through partnerships, the organised food business has a huge potential and a promising future. The online food delivery industry grew at 150 per cent year-on-year with an estimated Gross Merchandise Value (GMV) of US$ 300 million in 2016.

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The food processing segment is expected to propel with much vigour considering the robust demand emanating from the consumers. According to a 2017 report by the Associated Chambers of Commerce and Industry of India (ASSOCHAM), the country's food processing industry is expected to reach US$482 billion by 2020, driven by growth in organized retail, changing consumer behaviour, and increasing consumerism in tier II and tier III cities.

Increasing Infrastructure

Agriculture has thus moulded itself into the business model gaining momentum from the existing demand. The infrastructure needed to sustain this growth, however, hasn't developed concomitantly. Bumper production often is trumpeted with much fanfare. But most of the time the produce produced extra lies in the open due to lack of proper storage infrastructure.

Warehousing is crucial to Indian agriculture. They serve as transit places for the agriculture produce between harvest and market. The duration of the transit varies depending upon a host of factors. Warehousing helps to maintain food security in the country through uninterrupted supply of agricultural commodities throughout the year irrespective of harvest season. The issues of glut and scarcity are thereby kept at bay. Beyond the traditional functions of warehousing, today warehouses have become financial instruments as well which help the food producers access credit from financial institutions.Warehouse receipt financing has been primarily developed to provide liquidity for depositors while allowing them to hold on to their goods till they receive a better price. It also allows farmers to use this system to avoid a distress sale and obtain working capital. WR finance is estimated to

be $3.0- $3.5 billion in India, quite far from its potential of $60 billion.

The total agri warehousing capacity in India is about 109 million tonnes as against the total demand of about 180 million tonnes. Agricultural warehousing accounts for fifteen percent of the warehousing market in India and is estimated to be worth Rs. 8,500 crore. However, there exists a gap between the demand and existing capacity. As on May, 2015, the cumulative storage capacity of various agencies such as Food Corporation of India, Central Warehousing Corporation, state warehousing corporations, cooperatives and private parties stood at just 121.11 million metric tonnes (mt), while the marketable surplus of food grains in 2013-14 alone was approximately 159 million metric tonnes.

To tackle the situation, the central government is implementing a host of schemes to augment India's storage capabilities. The government is implementing the Integrated Scheme for Agricultural Marketing (ISAM) — a sub-scheme of which, the Agricultural Marketing Infrastructure (AMI) facilitates construction and renovation of warehouses in rural areas of various states. Between April 2001 and June 2015, 35,226 godowns with a capacity of 555.13 lakh mt have been sanctioned for construction and renovation, for which a subsidy of Rs 1908.50 crore was released. Of this, a total of 28,694 godowns with a capacity of 480.59 lakh mt have been constructed and 1,743 godowns with a capacity of 22.13 lakh mt have been renovated.

Agricultural warehousing accounts for fifteen percent of the warehousing market in India and is estimated to be worth Rs. 8,500 crore

The widening gap has attracted many private players to invest in this space. Agri-commodity warehousing firms have witnessed strong growth in their businesses adding just more than warehousing services. Apart from stocking a range of commodities and issuing receipts against them,

modern commodity warehouses provide allied services such as procurement, maintenance, collateral management and financing. These new services have provided firms with more revenue lines and higher margins, attracting private equity investors to the space. Recently, Canadian investment firm Fairfax bought a majority stake in National Collateral Management Services Ltd for Rs.800 crore. In 2014, Temasek invested Rs.250 crore in Star Agri warehousing. Agri-warehousing firm SohanLal Commodity Management Pvt. Ltd had lately raised Rs.100 crore in private equity funding led by Chicago-based Creation Investments Capital Management Llc and existing investor Everstone Capital. Additionally, the shortage of agri-warehousing capacity and the low-level of private sector participation in the sector too has been an attraction for investors. Even the existing storage infrastructure has become outdated and would soon be required to be replaced by modern ones.

In addition to dry storage capacity, there is an acute shortage for cold chains in India. This is a severe handicap considering our post harvest losses. Cold Chain, a chain of logistics activities that ensure market connectivity of perishable produce from harvest to consumers, is still in a nascent stage in India despite its immense potential in an agriculturally significant nation like India. India's cold chain sector is a combination of surface storage and refrigerated transport.

Currently, India has 6,300 cold storage facilities unevenly spread across the country, with an installed capacity of 30.11 million metric tonnes. These are mostly used for storing potatoes. However, the market is gradually getting organised and focussing towards multi-purpose cold storages. More than 50% of the cold storage facilities in India are currently concentrated in Uttar

Pradesh and West Bengal, while other states still face a challenge with investments from the government and private operators.

Recently in a bid to expand the cold storage capacity of the country, the Centre has sanctioned 101 new integrated cold chain projects that will leverage a total investment of Rs.3,100 crore. The projects, which will be developed by companies including BalmerLawrie, Sterling Agro and Haldiram Snacks, are aimed at doubling farmers' income, reducing wastage in the agri-supply chain and creating huge employment opportunities. In May 2015, the Ministry announced the sanctioning of 30 cold chain projects. The total expected grant-in-aid to be released to these projects is Rs.838 crore. The balance funds is expected to be raised from the private sector. The 101 new projects – which are for fruits and vegetables (53 projects), dairy (33), fish, meat, marine, poultry, ready-to-eat/ready-to-cook sectors – will create additional capacity of 2.76 lakh MT of cold storage/controlled atmosphere / frozen storage. Maharashtra cornered the maximum number (21) of the projects followed by Uttar Pradesh (14), Gujarat (12), Andhra Pradesh (eight) and Punjab and Madhya Pradesh (six each).

Indian needs more investments in cold storage considering the heavy losses the country incurs by way of wastage of fruits and vegetables which was pegged at Rs. 92,000 crore on the basis of the wholesale prices of 2014. The government has also plans for building National Cold Chain Grid in the country so that all food producing hubs are connected to cold storage and processing industries.

Thus agriculture has transformed from an activity limited to fields and has encompassed many industries that are catering to the needs and demands of the farmers and fields. This tie up has raised the status and output from the industry towards the nation's income. With the objective of increasing agriculture production, due attention should also be laid on filling the infrastructural gaps existing in the agricultural space. This will not only help in extending the life of otherwise perishable produce, but also help in fulfilling the objective of doubling farmers' income.

'FARM TO FORK' SUPPLY CHAIN AND COLD-CHAIN MANAGEMENT

Agriculture is one of the major occupations in India and it is the largest producers of agricultural products in the world. Regardless of the fact that India is a worldwide leader of agricultural products, there is dearth of modern post harvest storage network, which causes large losses both in quantitative and qualitative terms. Almost $8 to$15 billion losses have been estimated per annum from the agricultural sector alone.

Cold chains and ambient temperature warehouses, play a vital role in the food industry for the maintenance of the quality of produce and in value enhancement. It is also essential for extending the shelf life, period marketing, avoiding over capacity and reducing transport bottleneck during peak period of production. The development of cold chain industry has an important role to play in reducing the wastage of the perishable commodities and thus providing remunerative prices to the growers. It can serve as a back bone to all interested players – the farmer, the trader and the agriculture industry and help to maintain the freshness of the products by providing temperature controlled environment.

With the growth in the domestic manufacturing and retail segments, the demand for efficient warehouse management service has improved and this is only the start. Over last ten years some investment has moved in the warehousing and cold storage space, however much more is needed. Current spending on organised warehousing in India constitutes 9 percent of total logistics spending, as against 25 percent in the US.

A very large role is played by the government, being the largest user and also owner of capacity, through CWC and SWC. With a large gap, the government should rather pay Rs 30 per Qtl per year extra to ensure proper storage, instead of ruining a bag worth Rs 1500 and incurring losses.

India stands in the 54th Position in world ranking the Logistics Performance Index (LPI) according to a survey conducted by World Bank 2014. It is behind countries like Japan, the United States, Germany and China. Almost 6-10 percent of logistics costs contribute to the retail prices in India as compared to the global average of 4-5 percent. This proves that there is a lot of room for reducing prices by 3-5 percent by improving the efficiency of the supply chain and logistics processes. Developing an integrated supply chain, including cold chain save up to 300 billion Rs) annually and at the same time reducing the wastage of perishable horticulture produce. It is worth noting that the price of vegetables, fruits, milks and eggs, meat and fish have been rising faster in spite of the fact that India is the second highest producer of fruits and vegetables. This is caused by inadequate supply chain and logistics infrastructure and management.

In the last three years, India's integrated cold chain Industry has grown at a CAGR of 20 percent for the last three years and it is a combination of surface storage and refrigerated transport.

Cold chain infrastructure includes cold storage infrastructure, transport infrastructure and point of production infrastructure. There are approximately 6300 cold storages in India designed originally for single commodity storage – Potatoes, though we have seen them being used for Carrots / Tamarind / Pulses / Chick Pea etc. Refrigerated transport or cold chain distribution is still in its nascent stage in India and is way behind if compared to world standards for cargo movement. Presently reefer transport business in India is estimated at INR 10-

12 billion which includes demand for both exports and domestic purposes.

Various industries covered under cold chain are agriculture, horticulture & floriculture, dairy, confectionery, pharmaceuticals, chemicals, poultry, etc. India has around 6300 cold storage units, but can only store less than 11 percent of the country's total produce. While 105mn MT of perishable produce is transported across India annually, only 4mn MT is transported via reefers.

India is bestowed with varied agro climatic conditions which is highly favourable for growing a large number of horticulture crops such as vegetables, fruits, aromatic plants, herbs and spices, etc. It is among the foremost countries in horticulture production, just behind China. However, despite the rise, India is way behind its nearest rival in per-hectare yield and processing of horticulture products. It stores only two percent of its horticulture products in temperature-controlled conditions, while China stores 15 percent, and Europe and North America stores 85 percent of their products in such conditions. Adequate cold storage facilities are available for just about 10 percent of the country's horticulture production. Of the total annual production, 30-40 percent is wasted before consumption. During the peak production period, the gap between the demand and supply of cold storage capacity is approximately 25 million tonnes.

Another important factor that touches the agriculture industry of India is the supply chains. Supply chains are principally concerned with the flow of products and information between supply chain member organisations—procurement of materials, transformation of materials into finished products, and distribution of those products to end customers. Today's information-driven, integrated supply chains are enabling organisations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers.

The supply chains of different agricultural commodities in India are fraught with challenges stemming from inherent problems of the agricultural sector. The agri-supply chain system of the country is set back by different niggling issues like dominance of small marginal farmers, fragmented supply chain, absence of scale economies, low level of processing, inadequacy of marketing infrastructure, APMC laws – which some states have tweaked a little but on reading the fine print, it is clear that the policy has no heart and is not serious. For a company intending to set up multiple locations – there are no set of guidelines, incentives and at times not recognized as an Industry, as such supply chain infrastructure, is service oriented in nature and not an industrial, manufacturing or processing unit.

Farm gate integration and efficiency cannot happen without meaningful development of infrastructure - close to producers. The future market is assisting in price discovery and hedging for traders therefore the farmers need accredited warehouses, where they can store produce and have access to finance against the commodity. Indian farmer is still very emotional about his produce and needs to see his bags and touch them, so paper trading of commodities is still far off. Access to warehouses accredited to exchanges where he can store and if he feels like – sell through futures / spot market, the duplication of labour and transport will definitely be avoided and also losses in transport that happen every time.

With accredited warehouses for delivery limited to 50 km radius of few major towns, a high percentage of the farming community is unable to participate – the idea is inclusiveness!! It is not an easy task for the exchanges to cover a country the size of India, they have been doing a good job and they need to build more alliances with organized and credible players. With a country the size of India – more delivery centers need to be identified, and there are at least 3 locations within 5 KM radius of major delivery centers. Warehouse rental rates offered by the Government are not commercially attractive compared to that being charged by future accredited warehouses. Besides this, the APMC rules are so strict that one even after having the will to invest – is not offered any incentives from the government. He remains still exposed and at the mercy of the same Mandi Inspectors. On the other hand, lack of financial availability is another factor that is hampering the growth of the farmers because not all warehouses are approved by WRDA (Warehousing Development and Regulatory Authority), and without the WRDA regulation, warehouse owner face difficulty in funding farmers, if the warehouses have onward lending capacity, they are used by the warehouse owners or associate traders.

Currently, the Indian farmer realises only 1/3rd of the total price paid by the final consumer. A complex chain of middlemen and lack of storage facilities and free-market dynamics currently results in extremely low farm produce income for the farmers. Gramco Infratech's efforts will increase the farm yield and the overall income of farmers. It is investing in modern back-end infrastructure complete with cleaning/grading/packing and warehousing facilities close to growing areas that will help lower logistic costs, reduce wastage of farm produce, improve the livelihood of farmers, lower prices of products and ease supply-side inflation.

Mr. Raman Singh Saluja, MD and Founder, GramcoInfratech

Cultivation of Wheat under dryland condition of India

Indian agriculture is predominantly a dryland agriculture under which both dry farming and dry land agriculture is included. Dry farming was the earlier concept for which amount of rainfall (less then 500 mm annually) remained the deciding factor for more than 50 years. In modern concept, dry land areas are those where the balance of moisture is always on the deficit side. In other words, annual evapotranspiration exceeds precipitation. In dry land agriculture, there is no consideration of the amount of rainfall. It may appear quiet strange to a layman that even those areas which receive 1100 mm or more rainfall annually fall in the category of dry land agriculture under this concept. To be more specific, the average annual rainfall of Varanasi is around 1100 mm and the annual potential evapotranspiration is 1500 mm. Thus the average moisture deficit so created comes to 400 mm. This deficit in moisture is bound to affect the crop production under dry land situation ultimately resulting into total or partial failure of the crops. Accordingly the production is either low or extremely uncertain and unstable which are the real problems of dry land in India.

Wheat is the second most important crop after rice and is widely cultivated in India mainly under irrigated condition; however a large area is covered under dryland.Wheat production in these regions can be enhanced by adopting certain management practices that includes infiltrating and conserving moisture into the soil, selecting suitable cultivars, timely sowing by recommended method, judicious use of fertilizers,controlling pests and weeds and proper harvesting of the crop.

CONSERVING SOIL MOISTURE

Soil moisture is an important factor affecting wheat crop at various stages of its growth. Crop management practices such as tillage and crop rotation are also helpful in improving theyield. Water storage in the root zone can be achieved by controlling runoff, improving infiltration and adopting different water harvesting methods.

- To conserve more water, the soil can be loosened by tillage up to a depth of morethan 20 cm using a chisel plough before the advent of rainy season to enhance water permeation capacity of the soil.
- Primary tillage with mould-board plough in the dryland areas should be avoided as it turns the land upside down bringing salts at the surface layer hampering wheat germination and growth.
- When the rains stop, the land should be planked tightly to withhold maximum moisture. The moisture magnitude retained in the soil depends upon the extent of precipitation, temperature, degree of management and soil properties like depth,texture and organic matter status.
- Drylands may be left unsown during the summer/ kharif season to provide all moisture contents conserved in the soil for successful wheat production.
- Water losses during crop growth period can be reduced by mulching that could be natural mulch including straw, leaves, farm residues, compost etc. or artificial including plastic sheet, rock, gravel etc.

SELECTION OF VARIETY

Selection of a suitable variety is a crucial step for harvesting good crop under dryland conditions. The zone wise recommended wheat cultivars for dryland conditions of India are:

1. Northern Hills Zone (NHZ)- VL 907, VL 738, HPW 349, HS 365, VL 829, VL 616
2. North Western Plains Zone (NWPZ)- WH 1080, PBW 175, PBW 396, PBW 644
3. North Eastern Plains Zone (NEPZ)- K 8962, K 9465, K 8027, HD 2888, MACS 6145
4. Central Zone (CZ)- HW 2007, HI 1500, HI 1531, Sujata, MP 3288
5. Peninsular Zone (PZ)- K 9644, HD 2781, PBW 596, NIAW 1415

SOWING TIME AND SEED RATE

Sowing time for wheat in dryland areas is very important. Early sowing during last week of October and first week of November allows seeds to imbibe more water for germination due to sufficient

moisture in the seeding zone. Moreover, temperature of approximately 25 degree celsius during this period supports rapid germination for a vigorous crop stand.

Seed rate for dryland crop is variable depending upon the time of sowing. Timely sowing of wheat helps in harvesting the stored moisture and therefore delayed sowing should be avoided.For instance, the seed rate for sowing up to 15 November is 125kg per hectare (ha) while late sowing between 16 November and 15 December requires 150kg per ha. Germination percentage of the seed must be equal to or more than 90 per cent.Seed can be soaked in water for 10-12 hours before sowing so that it may absorb sufficient moisture to support germination. Precaution must be taken while selecting seed as poor seed quality may lead to poor germination and hence poor crop stand.

TILLAGE AND FIELD PREPARATION

It is suggested that fields in dryland areas be sown using a drill without any preparatory tillage. Eventually the zero tillage drills have proved to be better for wheat cultivation in dryland areas. Although, tillage plays significant role in managing weeds, moisture conservation is more critical while weeds germinated before sowing can be controlled using a non-selective herbicide like Gramaxone (3.0 L per ha) or Round-up (2.5 L per ha) with 600litres of water. For uniform germination, an optimum seeding depth should be maintained. Normally the seed is placed 5-6 cm deep in soil. Seed placed deeper than 8 cm results in reduced emergence leading to poor crop stand, while seeds placed in near surface are unable to acquire enough moisture for germination. Drill sowing places the seed at adjusted depth. 125 kg seed/ha with a spacing of 20 cm between the rows results in higher yields.

FERTILIZER MANAGEMENT

Fertilizers, if managed properly, contribute more or less 50 per cent to total production of a crop. Moreover, fertilizers enhance the 1000-grain weight, protein content, gluten quality and bread making quality of the wheat. All fertilizers in dryland sown

wheat are drilled along with seed and placed 5-10 cm below the seed to maximise its utilisation. Fertilizer rates must be decided on the basis of soil type and the amount of rainfall received during the season. In case soil analysis facilities/result are not available, a basal dose of fertilizer @ 60:30:20 kg N:P:K should be placed 5-10 cm below the seed for one hectare area. For restricted irrigated conditions farmers should apply NPK at 90:60:40 Kg/ha. Foliar application of 5% urea and KCl solution at 50, 70 and 85 days intervals after sowing is advantageous to improve dry matter accumulation and net assimilation rate in wheat. Moreover, spray of 5% Zinc Sulphate at 60 days after sowing activates certain enzymes, promotes plant growth and boosts flowering and seed setting. Take short duration green gram before wheat in rotation to improve the physico-chemical properties of soil.

WEED MANAGEMENT

Weeds compete with wheat for moisture, nutrients, space and other inputs. Therefore, these should be controlled from the very beginning. Pre-emergence application of Stomp 25EC (Pendimethalin) at 1.5 L per ha effectively controls weeds in dryland wheat. On the other hand sanitary measures and other cultural practices help minimise weed flora.

INSECTS

Termites severely threaten the dryland cultivated wheat by attacking the plant roots usually inpatches causing the yellowing of plants and death. In the termite prone areas, seed treatment with Chlorpyriphos @ 0.9g a.i /kg seed, be taken up for their management. Seed treatment with Thiamethoxam 70WS (Cruiser 70WS) @ 0.7 g a.i./kg seed or Fipronil (Regent 5FS @ 0.3 g a.i./kg seed) is also very effective. In the standing crop, the broadcasting of the insecticide treated soil 15 DAS may be practiced. For this, Chloropyriphos @ 3 Litre mixed in 50 Kg soil be used for one hectare field.

DISEASES

Diseases like rusts, smuts, ear cockle and foot rot etc. can gravely diminish wheat output. Pre-sowing seed treatment with fungicides like Vitavax, Carbendazim, Benlate (each at 2gram per kg of wheat seed) depresses the disease infestation. Rouging to eradicate infected plants prevent further dispersal of diseases. Spray the crop with Propiconazole (Tilt 25 EC@ 0.1 per cent), or Tebuconazole (Folicur 250EC @ 0.1%) or Triademefon (Bayleton 25WP@ 0.1%) at yellow rust initiation. Usually, it is required in the first half of February. This spray will also help in the control of powdery mildew and Karnal bunt diseases.

HARVESTING

In dryland areas wheat crop matures little earlier than the irrigated ones. Grain hardening, turning of leaves to light golden yellow and drying of straw are the signs of maturity. Field maturity should be distinguished with the physiological maturity. Moisture status of wheatgrains at maturity is 18-22 per cent which should be reduced by drying to less than 12 percent for safe storage.

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VETERINARY SECTOR IN INDIA
EMERGING CONCERNS AND WAY FORWARD

Livestock has remained a major contributor to agrarian economy of India, endowed with the largest number of animals in the world. Nevertheless, management of health and productivity of such huge animal wealth remains an overwhelmingly challenging task. The livestock development strategy in India primarily relies on the public provision of subsidized or free animal health services to millions of farmers across the country. However, the number of state-run veterinary institutions has grown from about 2,000 in 1951 to only 59,159 at the end 2013-14 for providing these services. Moreover, the quality of service provided continues to be poor for the want of necessary support in terms of trained manpower, infrastructure and facilities, as most of these are very old and very few are equipped with enough clinical diagnostic facilities. Further, the public health services, such as zoonotic and food-borne disease control, hygiene, food safety and environmental control remain insignificant and in many regions non-existent. Many of the states are severely crippled by acute shortage of doctors contrary to the National agricultural commission's recommendation of one veterinary doctor for every 4,000 animals. Moreover, lesser jobs in government sector, poor pay and service structure has been forcing emigration of veterinary professionals. The market for veterinary services in India remains small at less than 0.1% of GDP although it showed 48% increase over 2007-2012. Despite these limitations, successful control and eradication of important livestock diseases like Dourine (1920-21), achieving Rinderpest-free (2006) and CBPP-free (2007) status for the country, global

Rinderpest eradication (2011), and recent freedom from African Horse Sickness (2014) are some of the commendable achievements of the profession. In present context, with ever-increasing human population in India, the demand for crop and livestock foods is also increasing and likely to double in 2050. On an encouraging note, the Livestock Sector expanded by 5.5% during 2013-14 against the total agriculture, forestry and fishing sectors' growth of 3.7% during the same period. The milk production also peaked at 137.69 MT, thereby making it an important secondary source of income for 70 million rural households engaged in dairying. Likewise, meat production and exports increased tremendously during last decade, with a total value of buffalo meat export recorded over Rs 25000 crores.

Since women are important resource persons for livestock production, their empowerment and skill development could be achieved by imparting them relevant training in cost-effective techniques and technologies viz., production of low-cost feeds from crop residues and bio-mass, formulation of concentrate mixtures from locally available or leftover byproducts, efficient value addition and strategic supplementation of macro and micro-nutrients to available fodder resources, and adoption of mitigation strategies to cope up with negative impact of climate change on livestock; and thereby, influencing their effective participation and decision making.

Feed and fodder is one of the most important contributing factors for the growth of livestock sector. It is estimated that the 60-70% of total cost in livestock production is due to feed and fodder

Presently, livestock sector accounts for only 4% of total institutional credit in agricultural sector and about only 6% of the animal head (excluding poultry) are covered with insurance. Even at the turn of the century, over 50% of farm level credit for smallholder dairy production in India comes from traditional moneylenders. Therefore, improving the quality and access to farm level credit will enable the lower 30% among the smallholder spectrum to move up from subsistence farming to progressively viable crop–livestock farming with higher outputs and farm incomes. Feed and fodder is one of the most important contributing factors for the growth of livestock sector. It is estimated that the 60-70% of total cost in livestock production is due to feed and fodder. As per the estimates, the deficit of dry fodder, concentrates and green fodder by 2020 is likely to be 11%, 35% and 45%. Adequate availability of livestock feed and fodder both quantitatively as well as qualitatively would be one of the key inputs in the growth of livestock sector in future, which can increase milk production by at least 20% with the current genetic resources available.

In the current era of liberalized global trade policies, livestock products are increasingly being accepted as an important factor in the strategy to mitigate and reduce poverty; however, the quality assurance of livestock and their products has become need of the hour. Accordingly, privatization in animal health delivery system is being widely advocated on account of public finance rationalization, economic efficiency, equitable social distribution of services and domestic resource mobilization. Therefore, there is an urgent need to strengthen and implement improved veterinary services as per international norms so as to address the pertinent issues related to core domains of food security and one-health.

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AQUAPONICS

ORGANIC ALL THE WAY

Aquaponics refers to a system that integrates aquaculture and hydroponics in a symbiotic environment. The fish waste provides an organic food source for the plants, and the plants naturally filter the water for the fish.In normal aquaculture, excretions from the animals being raised can accumulate in the water, increasing toxicity.In an aquaponic system, water from an aquaculture system is fed to a hydroponic system where the by-products are broken down by nitrifying bacteria initially into nitrites and subsequently into nitrates, which are utilized by the plants as nutrients, and the water is then recirculated back to the aquaculture system.

Fish naturally produce the nutrients that plants need to thrive. In an aquaponic system, fish are kept in tanks and their waste is collected at the bottom. This waste is then pumped through a filter to make it into ready food for plants. The plants are set up in 'grow beds', which allow the roots of the plants to reach the water absorbing nutrients from the fish waste.It essentially consists of a flood tank, grow bed and a fish tank. The three compartments are interlinked by pipes and a pump is required to keep a continuous flow of water between them.

Mr Manual in Thumboor, Thrissur, Kerala started aquaponics and has successfully experimented in his own land of 3 cents. He heard about aquaponics and attended the class of Mr. Vijayakumar Narayanan at Palakkad with his family. Within next few months had amassed a lot of information from the internet and other reading materials and started the project on January 2015.

First the pond with an dimension of 7(m) lengthX4(m) breadthX2(m) width was dug. Fish was brought from Rajiv Gandhi Biotech Malampuzha, Palakkad. All the four sides were set with grow bed. The most commonly built grow trays are wooden tray tables filled and covered with pond liners which helps to save 15% to 20% of overall cost. The Plants are grown on sheets of gravel laid on the banks of the pond.They also have slightly lower operating expenses because they are easier to heat and cool. The method is more organic in nature and doesn't involve the use of chemical nutrients.

Aquaponics provides a double guarantee for a farmer — income through fish and vegetables. Two submersible pumps of 120 watts, Generator of 1600 watts, blower, PVC pipe and Bio- filter were also used. The ideal Pond and grow tray proportion is in the ratio of 1:3. The power required to run the whole process is 17 units/day which costs Rs 70/day in subsidy scheme. By

growing vertically, you can produce about twice the amount of vegetable as we can with a hydroponic system of the same area.

First nutrient-rich water is pumped from the fish tank through Bio- filter to the tops of the vertical columns. The system puts fish waste to work as fertilizer for crops. The water trickles down through the roots of the plants, gathering oxygen from the air as it falls back into the tank. The whole process is free from waste and pesticides because it's soil free. It's better to circulate the water every hour to get better results and this eliminates the need to clean the fish tank very often. We have to replace the lost 10 % water as needed, power the pump and feed the fish.

The food used to feed the fish is Virdhi; Godrej products and Azolla as natural food. The food given to the fish is 5% of the body weight for first 4 months and 2 % for next months. If we increase the quantity of Azolla we will able to reduce the quantity of Virdhi. The cost of Virdhi approximately comes to around Rs 1700 for 35 kg bag.

Though aquaponics was practiced by the Aztecs in Mexico thousands of years ago, serious research began only about 20 years ago. At the global level, it has started on a commercial scale only in the last five years. There are few instances of commercial operations in India and particularly in Kerala.

Manual started with 2250 fishes in a pond with 10,000 litres of water in about .75cent in the backyard. He used Gift Tilapia as the fish component as it is best suited for aquaponics. In the system, fish feed will account for a significant part of the cost. The total expense to set pond and grow tray was 2.10 and Rain shelter at Rs 1.50 lakhs (I,e 3.6 lakhs). Manual says the investment can be recovered in the first year from the fish and vegetable harvests.In six months, one can get one harvests of fish and two harvests of leafy green vegetables. Herbs and green leafy vegetables are the most common aquaponic plants grown in an aquaponics system.

Manual has got bigger dreams. He wants to make more clusters in his Panchayat and popularize aquaponics, if he gets support from Krishi Bhavan and respective authority. Through cluster he wants to promote and support local community to increase the incomes and promote organic methods of food habits. The benefits to the group are fish seed produced by smallholder farmer or exchanged with other farmer; Handling of fish and feeds for transport and logistics; commercial fish production through clusters of farmers for maximized competitiveness and Technical assistance from NGO & Krishibhavan and Kerala Agriculture University. Improved production techniques and better management practices can increase the production of fish from Farm ponds and livelihoods from small farm ponds. Fish ponds in irrigation schemes add value to the scheme and serve as a back-up source of water when water shortage occurs or supply is temporarily cut off. It is one time investment and thus fish production and related activities are carried out by family members. At initial stage the formal employment is small. But when the clusters are formed and their productions are linked to market which require more inputs than are available from the farm, more economic activities and jobs are generated in the community.

The famers in cluster can harvest regularly a volume of marketable fish that buyers find worthwhile to collect or which farmers themselves can bring to market by avoiding all kinds of Post-harvest loss such as warm climate, shortage of ice or lack of cold storage facilities, and poor handling and processing techniques. The farmers in cluster get better price and buyer get fresh fish.

Sreeni K.R

SUSTAINABLE DEVELOPMENT GOALS & ZERO HUNGER

As a signatory to the historic Millennium Declaration adopted at the United Nations General Assembly in September 2000, India is committed to end the hunger. India has reduced the proportion of the hungry by about 35% since 1990, but nevertheless India has 190 million hungry people. India still remains home to one quarter of world's undernourished population, over a third of world's underweight children and nearly a third of world's food-insecure people. Not getting enough food or not getting the right kind of food causes malnutrition. India continues to have one of every three malnourished children in the world. According to the latest Global Hunger Report, India continues to be among nations where hunger is "alarming". According to the Global Hunger Index [GHI], though country's GHI improved from 32.6 in 1990 to 21.3 in 2013, India ranks 63 out of 78 countries having the worst GHI. Most disappointing fact is that India ranks much below some South Asian countries, viz. Sri Lanka (43), Nepal (49), Pakistan (57) and Bangladesh (58). The persisting low level of anthropometric indicators of nutrition in India, for both adults and children even in the midst of intensified interventions for poverty-alleviation, is a cause of serious concern.

Dismal Agricultural Growth

The government of India has enacted in 2013 the National Food Security Act which aims to provide subsidized foodgrains, to 75% the rural and 50% of urban households. Besides, other measures including food-based social safety nets are being reviewed to make them effective and result-oriented viz., the Public Distribution System; the Antodaya Anna Rozgar Yojana, the Mid-day Meal Scheme; the Mahatma Gandhi National Rural Employment Guarantee Act. In last two decades, India recorded [i] negative farm growth during five years which were drought years and [ii] 42% increase in the population as compared to 32% increase in food output. Between 1994-95 and 2013-14, availability of food grains per capita increased marginally from 471 grams to 511 grams. There are several factors that contribute to low agricultural production.

Despite India having the largest irrigated land and ranking second in terms of arable land, the yield of crops is only 20%-40% of the world's best levels. The ICAR study showed that the yield gap between the yield of demonstration plots in farmers' fields and the average yield of the area varied by a factor 3 to 6. Integrating agricultural credit with technology and production inputs, farmers can increase wheat production by around 40% and double paddy production at current levels of technology. Efficient agricultural extension agency and support service providers can bridge the existing gap between the actual crop yields at field level and the potential yields.

Indian agriculture has been characterized as farms of "small and marginal" size. Small and marginal farmers owning less than two hectares constitute 85.9% of the total. Though small farmers are efficient in production their increasing number and shrinking farm size raises questions about their economic viability, sustainability and

producing marketable surplus. Small farmers are concentrated in rain-fed areas and cultivate crops under a high risk environment, often confronted by frequent droughts, floods and soil erosion.

Only 63 million hectares [45%] of net cropped area is irrigated. Consequently, some parts of the country experience drought or flood almost every year. In past, country experienced 24 large-scale droughts in 1891,1896, 1899, 1905, 1911, 1915, 1918, 1920, 1941, 1951, 1965,1966, 1972,1974, 1979, 1982, 1986, 1987,1988, 1999, 2000, 2002, 2009 and 2012. About 49.8 million hectares [15.2% of geographical area] is flood-prone and 10 to 12 million hectares are actually flooded each year.

Intensive agriculture for increasing food production has caused problems of nutrient imbalance, greater mining of soil nutrients to the extent of 10 million tonnes annually depleting soil fertility, emerging deficiencies of secondary and micronutrients, declining water table level and its quality, decreasing organic carbon content, increasing soil erosion and degradation leading to overall deterioration of soil health. According to ICAR [2010], out of total geographical area of 328.7 million hectare in India about 120.4 million hectares (37%) are affected by various kinds of land degradation. Frequent droughts, floods and climatic variability/aberrations, also, impact soil fertility and cause land degradation, thereby, affecting/threatening crop production across the country..

According to "Situation Assessment of Indian Farmers", only about 28% of all farmers use any kind of agriculture-related information that is available rather than what they need. While about 72% of farmers do not have any source of information that can help them adopt latest technology, most farmers are unable to access credit, insurance and marketing services from the established institutions. The post-harvest losses exceed 25% annually. For marketing, small farmers have to deal with multiple layers of middlemen. On an average, Indian farmers realize only 20% to 25% of the value paid for by consumers.

Need for focused attention

For "zero hunger", India will have to ensure 100% access to adequate food all year round, all food systems are sustainable, 100% increase in smallholder productivity and income, zero loss or waste of food and zero stunted children of less than 2 years. To combat the challenge of zero hunger successfully the government should develop state-of-the-art technologies and put in place effective mechanism to implement the national food security program; focus should shift from mere access to enough food to enough of the right kind of food and efficient implementation of safety-net programs to prevent disease, provide safe drinking water, adequate sanitation and education. Stronger political will needs to be demonstrated right from policy-making to commitment for result-oriented implementation to make hunger and malnutrition a reality of the past.

A modern and professional agricultural sector embodying following components can boost farm productivity [crops, livestock, fish] and make India "zero hunger".

➢ **Research:** While the first Green Revolution had its genesis in the Seed-Fertilizer-Irrigation technology, the second Green Revolution should originate from radiation-induced mutation technique and Biotechnology along with integrated nutrient, pest & water management technology. This technique has been in use since 1920s and more than 3000 varieties of 170 different plant species have been released for cultivation. Similarly, biotechnology in recent years has created unprecedented opportunities and revolutionized research activities in the area of agriculture viz. plant tissue culture and Genetic engineering leading to transgenic plants carrying desirable traits. India should, therefore, concentrate on inventing new seeds and planting material of various field crops through application of new technology. Research should focus on food crops, pulses, oilseeds, vegetables, fruits, milk, fish, eggs, broilers and meat so that people can access nutritional and balanced food.

➢ **Potential of ICT** By Information and Communication Technology (ICT) has the potential to revolutionize Indian agriculture in terms of raising crop productivity and profitability per unit area and resources. Several apps are

now available and many more can be developed which can help farmers access authentic, accurate and timely information related to high-yielding variety seeds, production-enhancing and cost-minimizing farming practices, efficient use of water including micro-irrigation system, integrated nutrient and pest management, post-harvest management practices, measures to mitigate adverse impact of climate change and marketing of farm produce in domestic and international markets.In public-private-partnership mode following farmer-friendlyfarm portals can be developed and farmers incentivized for their use.

- **Technology:** Production-enhancing proven crop-specific technologies [from pre-sowing to harvesting and post-harvest management] based on soil & water analysis. Separate for dry land & irrigated farming focusing efficient use of seeds, fertilizers, water, pesticides, farm equipment & labour; and reclamation of degraded, saline & alkaline land.

- **Production inputs & farm equipment:** Crop-specific reasonably priced standard quality production inputs [seeds, fertilizers, pesticides, etc.] and farm equipment and machinery along with sources of availability

- **Post-harvest services:** Storage, transport, processing, packaging,

- **Institutional services:** Land records, farm credit, insurance, marketing, weather, farmer-producers' organizations, market yards, procurement centres

- **Irrigation:** Initiate strategic actions to resolve serious issues plaguing this sector in order to ensure that share of food output under irrigated farming increases to 75% from 56%. There has been an increase in the number of incomplete projects awaiting completion since the end of IV Plan. The backlog has remained between 500 and 600 projects since then. Currently, there are 557 irrigation projects yet to be completed. Andhra Pradesh has completed only 17 projects out of the allotted 105 projects, followed by Karnataka [33/305], Maharashtra [94/186] and Madhya Pradesh [90/242] projects. Worst part of the inordinate delay in completion of projects has been the time and cost overruns. A study by the Planning Commission on cost overruns found that for a representative 12 projects, there was an escalation of the order of 138% over the original cost. There was a very high cost escalation of 1,000% and more for 24 out of the 151 major projects taken up earlier than 1980 and the average escalation is around 200% for major projects starting from 1985. In the case of medium projects, there are 24 projects with a cost escalation of 500% or more. The gap between the irrigation potential created [IPC] and the irrigation potential utilized [IPU] is steadily increasing from the First Plan. Currently IPU is 80 million hectares [73.39%] as against IPC of 109 million hectares. Over the years, there has been a manifested lack of attention to water legislation, water conservation, water use efficiency, water harvesting and recycling and infrastructure. India has a weak framework for sustainable irrigation management. States can consider policy, regulatory and institutional framework for the efficient, sustainable and equitable allocation of water. Most States have yet to enact Act to facilitate participation of stakeholders in Participative Irrigation Management [PIM] program. Other key priorities include [i] reorganization, strengthening and capacity building of irrigation and drainage departments that can successfully seek participation of farmers and other agencies in PIM [ii] improving cost delivery [iii] allocating sufficient resources for operations and maintenance, sustainability of investments and arresting rapidly deteriorating existing irrigation infrastructure.The study of nine promising States in 2010 revealed that area covered under Drip and Sprinkler was 14,28,460 hectares[12,25%] and 24,42,430 hectares [7.99%] as against potential of 1,16,59,000 hectares and 3,05,78,000 hectares respectively. A campaign should be launched to create awareness among farmers about the importance of micro-irrigation system through effective demonstrations to make them believe what they see themselves and learn from other farmers who have successfully adopted and benefited.

Currently, there are 557 irrigation projects yet to be completed. Andhra Pradesh has completed only 17 projects out of the allotted 105 projects, followed by Karnataka [33/305], Maharashtra [94/186] and Madhya Pradesh [90/242] projects

➢ **Food Management:** Farm output in India increased from 208 million tonnes in 2005-06 to an estimated 263 million tonnes in 2013-14. However, a significant percentage of food produced never reaches the consumers for a plethora of reasons. The former minister of agriculture, Sharad Pawar once said that India is wasting food products worth Rs.50,000 crore each year, i.e. nearly 40% value of total production. These figures of economic costs of wastage do not, however,reflect the quantity of food wasted annually. For example, meat accounting for about 4% of food wastage accounts for 20% of the wastage costs whereas fruit and vegetable losses accounting for 70%, account for about 40% of economic costs. High wastage rates are often responsible for doubling prices of fruits and vegetables. Apart from wastages ofperishable food, wheat and rice are also abundantly wasted as annually around estimated 21 million tonnes of wheat rots and is infested by insects and pests because of inadequate /inappropriate storage facilities accompanied by inefficient management practices of the Government-managed Food Corporation of India [FCI] with no accountability. The solution to the country's future hunger problem lies in formulating a strategic action plan to minimize losses by 90% by 2016-17 of the currently estimated wastage of 33% to 50% of all food produced.

The high food prices/ food inflation in the country can partly be attributed to these high wastage rates. High food inflation impacts considerably the poor since food accounts for 31% of their average monthly household expenditure. Major factors responsible for wastage of perishable food include, inter alia, viz. absence of modern supply chains that can efficiently link the food grown by farmers to consumers, lack of adequate financial investments in cold storages and refrigerated vans, erratic electric supply, poor road connectivity and lack of investment-friendly policies that discourage the private sector to invest in creating this infrastructure. According to the IIM, Kolkata, country

has estimated cold storage facilities for only about 10% perishable food products and the pressing need is for another 370 million tonnes of cold storage facilities for perishable products. Gross mismanagement of the FCI to store wheat and rice has rendered FCI itself a part of the problem rather than a solution. The Government spends nearly 1% of its GDP for its totally mismanaged public food distribution system. While cost of food production, procurement, transport, storage and distribution has significantly increased, inefficient food management system has resulted in huge wastage, pilferages and deterioration in food quality, not even acceptable as cattle-feed. The Independent Evaluation Office reveals that Government spends Rs.3.65 to deliver Re 1 of food while 57% of subsidized food-grains do not reach the intended beneficiaries and close to 36% of food-grains are siphoned off in the supply chain.

It is, therefore, necessary to develop effective food production, procurement, storage and management system, methods and procedure through policy intervention and programs that can [i] produce food grains as expected/targeted annually even under frequent unpredictable weather conditions, drought and floods in some parts of the country[ii] formulate a strategic action plan to minimize food wastages/ losses by 90% by 2016-17 [iii] facilitate the estimated level of only need-based procurement preferably district-wise in each State with complete safe storage [iv] create additional facilities for quick and cost-efficient transport, processing and storage and [v] redesign the public distribution system and transparent grievance redress mechanism.

➢ **Investment:** To accelerate the agricultural growth rate, which has significant influence on country's GDP and reduction in hunger and poverty, significant amount of capital formation in agriculture supported by public and private sectors is a sine qua non in specific areas viz. [i] development of irrigation [exploiting potential surface irrigation and groundwater resources, generation of electricity/power to draw groundwater] [ii] intensifying soil and moisture conservation measures and land improvement [iii] improving drainage system [iv] strengthening flood control measures [v] all weather roads connecting all villages and towns to facilitate easy and timely transport [vi] storage, warehousing, preservation and processing facilities[vii] value chains system and integrated marketing infrastructure [viii]developing sound information, communication and market intelligence system [ix] building integrated agricultural research, extension and education system [x] soil and water testing facilities [xi] production, quality control and pricing system to facilitate competitively and timely availability of farm inputs [seeds, fertilizers, pesticides, fuel, farm equipment and machinery etc.][xii] establishing in each agro-ecological region the state-of-the-art agricultural meteorology.

Dr Amrit Patel

ICFA launches District Agriculture Council at Lakhimpur in UP

ICFA launched its 1st 70 member District Agriculture Council (DAC) at Lakhimpur in UP. Launching the DAC, Dr RB Singh, Chancellor, Central Agriculture University said that the congruence of policies, trade and technologies is required to make farming profitable. He said DAC will be a power platform to bring all the stakeholders and deliver for farmers. Chairing the function, District Collector, Sh Akash Deep, IAS said that connecting farmers with schemes and markets hold the key to agrarian prosperity. Dr. MJ Khan, Chairman, ICFA said that such a platform was critically needed, and in next 24 months, ICFA will create 500 DACs, which will make vision documents and execute various farmers services.

ICFA convenes a National Round Table on 'Role of Women in Doubling Farmers Income and Eco Village Development for Sustainability'

ICFA convened a National Round Table on 'Role of Women in Doubling Farmers Income and Eco Village Development for Sustainability'. The session, chaired by Dr. Shashi Singh, CWEI brainstormed on the challenges of small women farmers and deliberated upon a blue print to promote women entrepreneurship and get their achievements recognized. Various schemes, initiatives and support systems introduced by the Ministry of Agriculture to help small women farmers were also shared. Ms.Neerja Suneja, Director Extension and Ms.MamtaSaxena, Advisor Horticulture underscored the significance of ICFA in bridging the gap between government and farmers, and promised support in getting the recommendations implemented. Ms. Zareen Myles (WAFD), Dr. PVSM Gouri, Dr. Nutan Kaushik (TERI), Ms. Uma Swaminathan (SEWA), Dr.Premlata Singh (IARI), Dr. Sumathi S (SFAC), Ms.Poornima Sahni (Dupont), Ms.Ranjita Sood (Abbott), Dr. Shikha Chaudhry (Mother Dairy), Ms.Anupama Singh (RUDSETI) and other prominent names from the agriculture fraternity addressed critical issues of small women farmer participants from the states of Uttarakhand, Uttar Pradesh, Haryana, Punjab, Rajasthan and Bihar.

ICFA to conduct Agriculture Leadership Summit and Global Leadership Awards event

The prestigious flagship annual event of ICFA, the 10th Agriculture Leadership Summit and Global Leadership Awards event is being organised on 5-6 Sept, 2017 at Hotel TAJ Palace, New Delhi. The Leadership Summit seeks to address the issues related to national and global food and nutrition security challenges, access, equity and employment, global trade, technology, climate change and agriculture sustainability, partnerships and policy issues. The Leadership Summit brings on one platform over 300 policy makers, national and international experts, officials, industry, investors, farmers, development institutions and all the major stake-holders to deliberate upon policy issues, development strategies, investments and partnership opportunities; and to prepare a roadmap for addressing the major issues concerning environmental challenge, global food security, sustainability of agriculture and empowerment of farmers. The event is held annually and followed by launching of the Agriculture Today Year Book.

ICFA to launch US-India Joint Business Council (USIJBC) and US-India-Africa Partnership Platform (USIAP)

Indian Council of Food and Agriculture is launching US-India Joint Business Council (USIJBC) and US-India-Africa Partnership Platform (USIAP) on 18 Oct 2017 at Des Moines, US during World Food Summit. ICFA invites eminent experts and business leaders from US, India and Africa to join as Board Members.

ICFA bags Zambia land deal for agriculture

ICFA has signed an agreement with the Ministry of Defence, Republic of Zambia, wherein the African country will offer 5,00,000 hectares in each of its 10 provinces on 99 years of lease to the former. The ICFA will be developing agricultural projects on the land provided in collaboration with Indian companies and institutions. In the first stage, ICFA will be doing pilot at 10,000 hectares of land in Shibuyunji District near Lusaka, the Zambian capital. According to M J Khan, Chairman ICFA, there are tremendous business opportunities in agriculture and animal husbandry, particularly agro-processing, Livestock and Fisheries, Floriculture in Zambia. This investment in agriculture can secure food for Zambian people and also boost agribusiness opportunities and agro-food trade for Indian companies and entrepreneurs. The investors can also export the agriculture produce to other neighbouring African countries and Middle East, Dr Khan said, adding that Zambian government is committed to offer investor friendly environment to carry out business. He said this is first time that the Defence ministry of any country has offered land blocks under its control to any foreign organisation. The deal will be jointly executed by these two agencies on behalf of the ICFA. The Zambian Ministry of Defense and ICFA will be jointly responsible to commercialise the land provided and exploit it to its full potential, using relevant expertise.

Restructuring and Revitalization of India's Agriculture: A National Priority

With 1.2 billion people, India is now the World's fourth largest economy – a significant achievement of our time. India has witnessed a landmark revolution in agriculture transforming the nation from its chronic dependence on grain imports during fifties and sixties, to a net exporter of food, especially certain types of grains. During the past over five decades, with the adoption of green revolution technology,India's food production increased 3.7 times while the population increased by 2.55 times. The net result was 45% increase in per person food production.

During 1960s and 70s, the decisive push for green revolution – through introduction of hybrids, use of chemical fertilizers and pesticides, farm mechanization and expanded irrigation -- did result in notable increases in cereal production. 1980s witnessed a sustained growth in agriculture as the green revolution technology spread to other parts of the country – beyond Punjab and Haryana. Early 1990s saw the diversification in agriculture with growth rates reaching 3.5%.

However, there was a prolonged slowdown in agriculture during 1996-97 through 2004-05. Agricultural growth remained positive since then but slowed down progressively to 2% in 2011.Since 2011-12 to 2015-16, agriculture grew at an average rate of about 2 to 3%, with as low at about 1% during 2012-13 and 1.2% 2015-16, and negative during 2014-15 at -0.2%, which was due to wide spread drought conditions. During 2016-17, thanks to good monsoon, agriculture grew by about 4.1%.

Overall, agricultural growth in India has led to an impressive progress in human development indices, particularly with life expectancy doubled, literacy rate quadrupled, health conditions notably improved and rural poverty rates significantly declined. Malnutrition particularly among the rural poor and children, however, remains a matter of concern. Looking ahead, massive investments will be needed to improve agricultural productivity, rural infrastructure and value addition and making agriculture climate smart using NRM technologies.

Constraints to India's Agricultural Growth

Maintaining India's hard-won food security and achieving shared food prosperity is however, still a challenge. On the one hand, there exists widespread under nourishment and on the other, the agricultural production has reached record levels with stocks of grain overflowing warehouses. There is also an urgent need to modify green revolution technologies which result in deterioration of soil and water quality and environmental hazards by promoting sustainable agriculture based NRM technologies. Concurrently, it is important to reform and upgrade India's agricultural education, research and extension strategies and institutions. Across India, diversification of higher value crops and livestock products has proceeded too slowly – which has adversely affected overall growth in agriculture; the lack of value addition and supply of high value products has not kept pace with growing demand generated by increasing incomes in urban sector.

Land fragmentation is becoming a major issue – with too many people— about 50% of India's workforce --dependent on small farms. There is also a need to reform the policy and regulatory framework governing land leases, rental markets and contract farming across states to sustain agricultural productivity and

growth. More efficient land lease/ rental markets can help to consolidate land in the hands of more productive farmers – improving access to land for younger and more productive, educated, farmers. This will happen gradually but an enabling environment to accelerate this process needs to be rapidly created and deepened.

Risk Management in India's Agriculture

It is common knowledge that rainfall anomalies cause serious deviations from the trend in agricultural production and productivity. In India, rainfall shocks result in significant negative consequences —in total production, productivity and relative differences between cereal and non-cereal crops. Cereal crops are better able to withstand rainfall shocks than non-cereal crops, so risk-averse households often go for cereals in their crop portfolios. While cereals may be the less risky choice – these are less remunerative than non-cereal crops, so producers' incomes grow more slowly.

The very long term (100-year) predictions by the Intergovernmental Panel on Climate Change suggest that precipitation may likely increase for South Asia but also that spatial and inter-annual variability will intensify (IPCC 2013).Over the short and medium term, the more immediate need will be to tackle the shifting trend in weather anomalies, with the 2000s being the worst period for anomalies in the past century. This underscores the urgency of addressing critical policy issues in anticipation of the highly uncertain outcomes of climate change.

While India's agricultural performance continues to be dependent on timely and adequate monsoon and access to surface and ground water – with about 60% of the cultivable area still under rainfed conditions, the relatively slow growth in the country's agriculture is also attributed to number of other factors including the following: Slow generation of new technologies – after the stabilization of green revolution technologies; Poor dissemination of existing technologies; Weak and inefficient institutions serving agriculture; Poor governance or management of the sector both at the macro and micro level; and the Lack of access to short to longer-term credit and above all budgetary constraints. While Indian agriculture faces multiple risks, unfortunately there did not exist until recently a systematic approach or a well-coordinated framework for managing these risks adequatelyboth at the farmer and society levels. The emerging risk management framework for agriculture also needs to be augmented significantly by appropriate policy and program changes and strengthening their implementation across the country.

Some of the recently introduced programs ---such as the Prime Minister's Fasal Bima Yojana; Krishi Sinchai Yojana; Issue of Soil Health Cards (Analysis) to individual farms and improved soil nutrient management; Paramparagat Krishi Visas Yojana; JLG Financing; supply of neem urea; and mobile Aps for farmers -- will go a long way for farmers to manage risks in agriculture. There is a need though for continuous monitoring of these programs from local to national levels to remedy any gaps and ensure implementation that is well funded, inclusive, and efficient.

The risk management in India's agriculture, if it must be efficient, calls for coordinated actions at the national and state levels, on a range of fronts as follows: (a) Improving resilience to the likelihood of cyclical and random rainfall shocks -- a matter of high and continuing priority – which needs to be done through sustained improvement in efficient use of water resources; (b) Promoting public and private sector investments in rural infrastructure such as rural roads, warehouses and value addition, (c) Greater openness in introducing suitable technologies (including GMOs) to mitigate and potentially adapt to climate variability; (c) Improving markets and marketing to allow real-time risk management in response to market signals; (d) Improving access to short-term and longer term credit; (e) Diversifying and stabilizing sources of income (outside the crop sector), both on-farm (through livestock development) and off-farm (through productive nonfarm employment), and (e) Improving effectiveness of safety net programs for farmers --such as the Public Distribution System.

Hon. Prime Minister, Shri Narendra Modi, has placed much emphasis on managing risks in agriculture through following major themes: (a) Per Drop More Crop or more efficient use of water, water conservation and micro irrigation;(b) Efficient supply and use of three critical inputs: seeds, fertilizers and pesticides; (c) Ensuring access to power – at concessional rates, (d) Adoption of new technologies (use of GM technologies still under consideration); (e) R&D in Agriculture; (f) Shift into High Value Commodities;(g) Increasing share of Animal Husbandry in value addition – which already constitutes over 35% of gross value added in agriculture;(h) Bringing Green Revolution to Eastern States; and (h) Ensuring Remunerative Prices to Farmers through MSP. As for MSPs, there is however a concern that farmers in states where there is no government procurement using MSPs do not benefit from this facility. At the policy level, the Government of India continues to pursue trade policies that, by and large, insulate domestic prices and ensure food availability– particularly in grains and pulses by providing farmers subsidized inputs (seeds, fertilizers, water, electricity, and credit) and technical support through research and extension (or advisory services). These policies need to be continuously reviewed and adapted to ensure sustained growth in agriculture.

Where India's Agriculture Should Go?

In the context of Hon. Prime Minister's Vision to Double Farmer Incomes by 2022, various government institutions and committees have come up with multiple recommendations which must be prioritized with reference to local situations with a focus on improving the overall management of the agriculture sector at the state, district and taluk levels that lead to increase in farmer incomes.

The priority should be to ensure farmers' timely access to relevant inputs including seed, water, credit, markets and technical advice. All institutions and functionaries at the state level and below must own this challenge and be accountable for its accomplishment. At the national level, central ministries dealing with agriculture should ensure that all states have well-defined programs and implementation frameworks to assist farmers in doubling incomes and monitor progress. Doubling Farmer Income should become a local program – not only of Hon. Prime Minister.

This approach is intended to address serious gaps that India faces in effective implementation of agricultural policies and programs at the national and state levels. Most departments and agencies seem to work in "silos" and do not effectively coordinate or converge in planning and implementing state and local development policies and programs. They also do not seem to be accountable for delivering the desired outcomes – may be due to the lack of desired levels of autonomy. As required by India's Constitution, the state governments should become fully accountable for performance of the local agricultural sector including local agricultural research, education and extension, with Central Government providing only guidance and support to ensure the states' compliance with national policies and priorities. This also calls for a thorough review of ICAR's mandates in agricultural research, education and extension organization which is currently underway through a Review Committee appointed by the Ministry of Agriculture.

Three specific areas need reforms on a priority basis.

- **Agricultural Research:** While public expenditure on agricultural research is increasing, it is critical to reconfigure the national agricultural research system to meet current needs and challenges –it must become relevant, cost-effective, and efficient.
- **Agricultural Education:** The State Agricultural Universities (SAUs) across India face multiple crisis in fulfilling their mandates to build needed human capacity for technical innovation and undertake crucial adaptive research and extension activities in the context of national priorities. Crisisareas are in SAUs' governance, resource effectiveness, and ethics.
- **Agricultural Extension:** ICAR-established Krishi Vigyan Kendras (KVKs) and state level Agricultural Technology Management Agencies, based as these are on decentralized, demand driven, approach to advisory and extension resources, face many constraints that affect their efficiency. Lack of skilled, dedicated, personnel; weak research-extension linkages, limited outreach to farmers and limited operational flexibility are the key areas of concern. This has yielded disappointing outcomes. There is also a need to improve community awareness and outreach; reinforce organizational autonomy, improve quality of staff and service delivery.

While India is expected to grow faster than any other country over the next 25 years – which is critical to improve farmer incomes and reduce or eliminate currently excessive disparities in rural and urban areas. Agriculture sector is at present heavily distorted due to a range of subsidies and use of MSPs in government procurement of grains and other commodities. These subsidies need to be gradually phased out to make agriculture market-based –backed by a comprehensive framework for risk management in agriculture, and a social safety net to farm families that will ensure acceptable levels of livelihood, health cover and education for children. Subsidies to agriculture have become unsustainable and must be reversed in a phased manner ensuring that interests of all farmers including small and marginal farmers are protected.

Additionally, rural credit policies and programs must be thoroughly reviewed and reformed to make rural financial intermediation a "bankable" or a "viable" proposition for financial institutions, if greater flow of production and investments credit to farmers must materialize to finance growth in agriculture. Mounting NPAs in agricultural (and nonagricultural) loans have weakened India's financial system and have placed huge burden on the national Exchequer, exacerbated by interest rate subsidies and loan write-offswhich tend to dilute the lending discipline. Such subsidies which are intended to reduce farmers' financial burden will not be necessary as the agricultural productivity and incomes increase, and could be gradually replaced by comprehensive social safety net support to farm families. The Reserve Bank of India and NABARD need to work on these issues in conjunction with the central and state governments and make rural financial intermediation market-oriented and profitable.

Finally, the key issue is whether future agricultural growth can come with environmental sustainability with no ecosystem degradation or much reduced incidence of natural disasters, and ensuring optimal development outcomes. Key areas that would need increased focus include: Agricultural productivity Improvement (through new technologies and more efficient use of land and other inputs); Introduction of a Farming Systems Approach, Biofortification and/or fortification of grain and non-grain produce, Value Addition; Modernization of storages and cold chains; Market Development -- both domestic and global; and Climate Change Adaptation and Mitigation strategy to minimize adverse impacts of natural resource degradation (soils, energy, watersheds and forestry) on development outcomes! If India's agriculture sector must revitalize, the country must begin to restructure the sector through policy and program reforms. Farmers and farmer organizations will have a major role in implementing the proposed agricultural restructuring and revitalization. There would then be no reason for farmers to commit suicides because financial distress – a social stigma for which India must have zero tolerance.

Ramesh Deshpande
India Agriculture Group,
Washington DC, USA

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AGRICULTURE TODAY

GLOBAL FOOD SITUATION: WHAT THE REALITY REFLECTS?

It is well known fact now that humans are depleting vital groundwater resources across the globe. But a new study points out that one of the biggest causes of disappearing groundwater as the international food trade. About 70 percent of freshwater around the globe goes towards irrigation. Researchers from the University College London and NASA's Goddard Institute of Space Studies have reported that a third of that freshwater is drawn from the world's aquifers—non renewable underground pockets of groundwater—and 11 percent of that non renewable groundwater is used to irrigate internationally-traded crops. That means in time, the current type of food that's grown will not be produced, or we'll not have the same productivity – showing and indicating that prices will increase.

As per latest assessments, global food production has been expected to

rise by 70 per cent by 2050 to cater to the growth in the world's population of more than 30 per cent. Can we achieve the target? Global food security is one of the most pressing societal issues of our time. Though advances in agricultural technology and expertise will significantly increase the food production potential of many countries / regions, these advances, however, will not increase production fast enough to meet the demands of the planet's even faster-growing human population.

A recent report portrays a chilling scenario, the cumulative impact of three disasters driven by climate change. The possible consequences are: global food shock, resulting in food riots; the ballooning price of basic crops; and significant losses in stock markets.

The risk assessment report, produced by insurer Lloyd's of London - with support from the UK Foreign and Commonwealth Office and vetted by academics from a number of institutions - shows how close humanity might be to a catastrophic collapse by the mid-century unless significant changes are made to curb global warming.

The scenario presented in the report examines what would happen if there were three simultaneous disasters - specifically a heat wave in South America, an explosion of wind blown wheat stem rust pathogen across Russia, and a particularly strong

El Niño southern oscillation cycle - all perfectly plausible phenomena given current climate trends. The impact of this would be enough to cripple global food security.

A model crafted by the Anglia Ruskin University's Global Sustainability Institute in the context of the report concludes that "In this scenario, global society essentially collapses [in 2040] as food production falls permanently short of consumption." But this forecast is based on a "business as usual" approach, one in which man-made climate change leads to a combination of increased flooding and extensive drought, with agriculture facing the prospect of functioning under water-stress conditions as early as 2025. However, if carbon emissions are slashed and agriculture adapts, this scenario does not have to play out.

A timely warning indeed!

What is the situation right now? Are we in the safe zone? Certainly not, and there is no question of complacency. What are the options and alternatives? Tinkering with the prevalent models can to an extent be effective... leaving the gaps uncovered.

Assistance to fight hunger has a vital humanitarian role to play in countries which require help, yet this is not a sustainable solution. One has to go deeper to explore how a food deficit country [e.g. Ethiopia, with more than 10 million people dependent on food assistance] can address its problems by relieving the food insecurity of other such countries.

It is a fact that population pressures will continue to tip the balance against proper land and water management in many developing countries. While agricultural production is critical for any form of sustainable future, focusing on the agricultural sector alone without regard for other important factors which influence food production is not the right course of action. But here lies the problem with the developing block. Population programmes require to be integrated with the overall development objectives and then be linked to other resources so that comprehensive development turns into reality.

With declining food production and resource degradation, the strategic plan has to be incorporated with population concerns [viz. population growth, distribution and rural-urban migration patterns incorporate population]. For that matter, the community development strategy, which integrates essential social services as well as production resources, is welcome.

In parallel, sustainable development strategies [encompassing soil erosion and impoverishment, deforestation, falling agricultural output, and poor water management] need to be streamlined and implemented. This needs to be coupled with rural agricultural extension schemes which provide credit, seeds, fertilisers and advice to poorer farmers. Adequate support has to be provided to research on the integration of traditional and emerging technologies for food production. Local knowledge ought not to be ignored.

The question of integration with external markets is important in order to encourage farmers to form cooperatives as a recognised means of accessing urban and export markets - a balance between marketable surplus and marketed surplus.

Countries need to prepare a realistic and achievable action plan to deal with the volatile behaviour of food commodity markets and decision has to be taken as to whether biofuels (being a key driver of rising food prices) targets and incentives are to be revised in a balanced manner and whether food export restrictions that destabilise markets should be permitted only as the last resort.

It is, in a word, optimal resource management that is capable of increasing crop yields, preventing land degradation, while providing sustainable livelihoods for millions of rural poor. National population programmes, on the other hand, should include comprehensive and accessible maternal and child health care programmes and family planning services not only to reduce the size of families and improve the health and well-being of the entire community, but also increasing food production.

There is need to ensure protection of the environment while easing the burden on the poor.

The FAO has rightly noted that it is not only financial resources that are needed. Beyond the factors that exacerbate the current crisis, there is a whole series of fundamental problems that need to be resolved, in particular how aid is channeled and how to make it reach small farmers effectively, as well as reform of the world food security governance system towards greater coherence in the action of governments and development partners, the share of national budgets dedicated to agriculture and private sector investment. "It is vital, particularly in times of crisis, that support to agriculture is not reduced. Only a healthy agricultural sector, combined with a growing non-farm economy and effective safety nets and social protection programmes will be sufficient to face the global recession as well as eradicate food insecurity and poverty."

In order to avoid the disastrous consequences of widespread hunger and even starvation in the years and decades to come , a firm commitment is needed to increase crop yields of land area, the nutrients applied, and the quantity of water used. The positive impact of such efforts will considerably lessen the severity of the food shortage and lift hundreds of millions of people out of a state of hunger and malnutrition, thereby preventing widespread starvation, premature death and social unrest.

So, when about 870 million people currently suffer from hunger and chronic malnutrition, economic and financial crisis, the consequences of climate change, and the decrease in the amount of usable agricultural land worldwide, the situation is bound to worsen.

It is time to be realistic while planning for tomorrow.

Dr. Mukhopadhyay, Management Economist, an International Commentator, Business and Economic Affairs and Professor, ICFAI UNIVERSITY FACULTY OF MANAGEMENT, Tripura

LASER LABELLING

THE BRANDING REVOLUTION MAKING ITS MARK ACROSS EUROPE

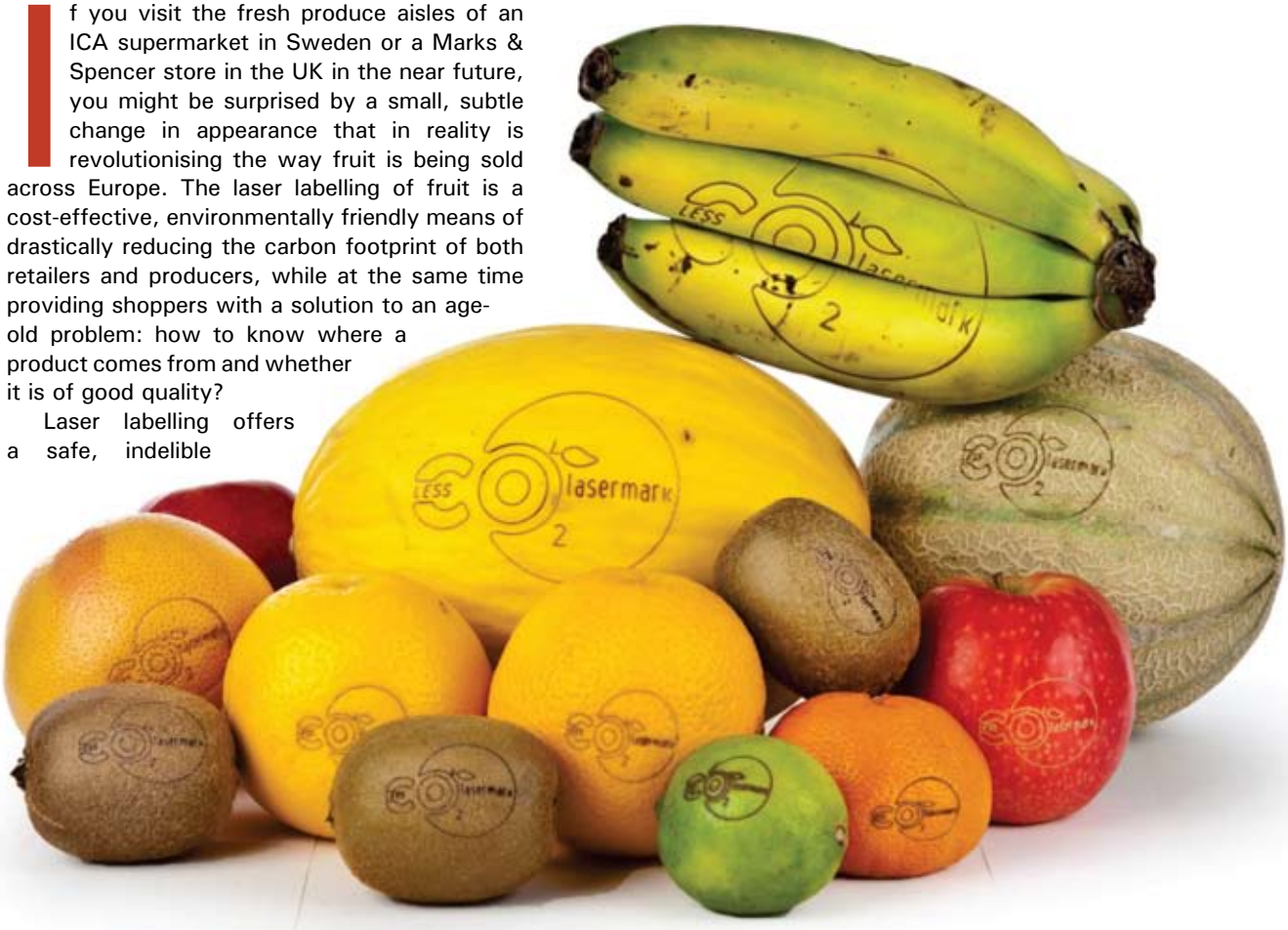
If you visit the fresh produce aisles of an ICA supermarket in Sweden or a Marks & Spencer store in the UK in the near future, you might be surprised by a small, subtle change in appearance that in reality is revolutionising the way fruit is being sold across Europe. The laser labelling of fruit is a cost-effective, environmentally friendly means of drastically reducing the carbon footprint of both retailers and producers, while at the same time providing shoppers with a solution to an age-old problem: how to know where a product comes from and whether it is of good quality?

Laser labelling offers a safe, indelible means of adding a brand name or product origin to fruit skin without damaging the contents in any way whatsoever. Perhaps more importantly, the introduction of laser labelling means wasteful, costly paper labels and increasingly needless plastic packaging can be effectively eliminated, enabling retailers and producers to make substantial material savings to say nothing of the resulting environmental benefits.

Innovative Solution

Laser Food – the company behind the system being used across Europe – was started in late 2006 on realizing the difficulties that the non-labelling or mislabelling of fruit presented to supermarkets.

Although we live in the age of ever more packaged and pre-prepared snacking options, the bulk of fruits and vegetables are still sold loose in boxes, whether that be oranges, melons or apples. But while the box label might give one origin, there are often few guarantees that this is indeed the case. In fact, there is often a risk that a consumer might not only be buying a product from a completely different origin to that advertised, but also one of



a different – sometimes inferior – quality.

The only way to overcome this problem was by adding some form of indelible marking to the fruit surface without – most importantly – risking damaging the contents. With this in mind, towards the end of that same year I approached researchers at the University of Valencia with a view to finding a solution. Over the next three years, using my own funds, I worked closely with the researchers studying the effectiveness of different possible systems. Labelling using a laser emerged as by far the most promising.

Regulatory breakthrough

Fast forward a few years and the next major step in Laser Food's development arrived with confirmation of European Union funding for the project in 2010 for what was by now known as the 'Laser Mark' machine. But while we had already begun to promote the system, one major challenge remained – that of securing EU regulatory approval for the all-important contrasting liquid applied once the laser did its work; vital for making the brand stand out. If receiving funding in 2010 was a big step forward for Laser Food, being awarded regulatory approval in June 2013 represented a significant breakthrough. Amendments to EU legislation meant that the materials used for fruit labelling – including iron oxides and hydroxides – could now be used to mark fruit surfaces using depigmentation, crucially without harming the product in any way.

As well as now being able to add brand names directly onto fruit, the legal change has enabled retailers to offer greater product traceability through QR matrix codes, while also being able to deliver considerable cost savings by eliminating wasteful paper labels.Laser Food built on this achievement by receiving certification for the application of the technology with organic fruits and vegetables.

A significant advance for Laser Food was the signing of a marketing agreement with JBT Corporation in November 2014. JBT, a leading multinational food sector solutions specialist with a presence in 25 countries, provides Laser Food access to new markets and an unprecedented global reach.Under our agreement JBT now builds and markets Laser Food's laser labelling system on a global level, which will make it available – and more financially accessible – to fruit producers from South America to the Far East. Laser Food will also benefit from JBT's global research and development, sourcing, manufacturing, in addition to their global sales and service network.

"From Scandinavia, to Germany, to the UK, the laser labelling of fresh fruits and vegetables is a phenomenon whose time has arrived"
Jaime Sanfelix, Founder, Laser Food

Consumer-led demand

The latest success story for Laser Food began with Swedish grocery retailer ICA who approached us in 2016 after learning about the laser marking technology. We reached an agreement with ICA and one of their suppliers – Dutch organic fresh produce specialist, Nature & More – to trial laser labelling on organic avocados and sweet potatoes going into their stores. The trial proved so successful that Laser Food has been working in an uninterrupted form with ICA and Nature & More since, with the laser labelled products being supplied not just into Sweden, but also into supermarket outlets in Germany, the Netherlands and Belgium. Retailers from other countries have also expressed an interest in the system, while ICA itself plans to soon expand the laser labelled range into other fruit and vegetable products.

Why is this happening? Quite simply, consumer reaction to the marking technique has been overwhelmingly positive. Increasing awareness of environmental issues has also played a major part. ICA itself estimates that it will save the equivalent of 200km of 30cm-wide plastic over a 12 month period that would previously have been used in packaging those same products.

Laser labelling effectively presents a real, proven alternative to plastic packaging and paper labelling that is gaining ever greater acceptance with environmentally conscious consumers.

Encouraged by ICA's successful trial, Marks & Spencer in the UK became the next retailer to invest in the technology, this time starting with avocados in June this year that display a best-before date and origin. In this case, by replacing traditional paper stickers, the company estimates it will save 10 tonnes of paper and five tonnes of glue a year.

Until now, consumers have had no other alternative but to accept the traditional form of packaging fresh produce despite increasing awareness of the need to protect the environment. Laser Food's laser labelling system offers just this – a viable alternative that is beneficial to the environment, while – most importantly of all – doing nothing to damage the interior, shelf-life or taste of those same fruits and vegetables.

Jaime Sanfelix,
Founder and MD of Laser Food

VALUE OF A FARMER FOR NATIONAL DEVELOPMENT

Farmers are confronted with multiple problems in their pursuit to produce food and fodder. Besides the constraints on availability of inputs like seeds in time and in adequate quantities, fertilizers, pesticides, irrigation facilities, farmers face problems of either drought or floods in some or other parts of India. These adversely affect overall yield of crops. Then the problems of harvest, storage, marketing, minimum support price, fluctuations in sale prices all leads to economic instability. Then he is forced to take loans to make both ends meet for maintenance of family. Failure to pay the debts lead to suicide tendencies.

National Commission for Farmers

The National Commission for Farmers, constituted by the then UPA Government was headed by the eminent agriculture scientist and ex Rajya Sabha member Dr. M. S. Swaminathan with other experts. After thoroughly investigating the problems of suicide by farmers, the commission submitted its report with valuable recommendations to curb the malady. Unfortunately, the then Government did not place the report in the Parliament for discussion. It was pushed into cold storage. The present Government also is not keen to end the tragedy of farmers. Although farmers are the backbone of the Nation, their life is in danger. The political will to save the life of farmers is not in sight although it must be the priority.

Value of a farmer

The economic value of a farmer is pretty high if one considers carefully his contribution. The values are personal, social and National. The suicide of a middle aged farmer, the bread winner of the family, is a great loss. His productive years of life cut short is a great economic loss to the family. At social level, his loss will be a great impediment for agriculture production. At National level, a farmer's life adversely affects overall growth. Mostly, it is the small land holding farmers and tenant farmers who are victims of suicide tragedy

caused by various reasons, either directly related to farm operation or indirectly such as farm based income, education and health problems. A rough estimate is given below.

If a farmer was producing, say, 10 tonnes of food material per year, his death at the age of say 40, might impact over 300 tonnes, considering he would have lived upto 70 years and above with active field work. When we extrapolate this with thousands and lakhs of farmers who ended life due to farm distress, this would amount to several thousand/lakh tonnes of food lost to the Nation. Granting that all farmers who committed suicide did not involve in essential food crops, still the loss is enormous to the overall food production in the country. If year wise food production was plotted against the suicide rate, perhaps that would indicate the real worth of farmers, lost by the Nation.

Production loss

If in any year between 1995 to 2015, the food production was ranging from, say 200 to 260 million tonnes, then the during the same period farmers suicides was rampant, which means that the production could have touched over 300 million tonnes, had the farmers lived their normal life. If food productivity is calculated not on per unit area of land but on per farmer in tonnes, then we may be able to understand the huge loss as an impact of suicides by farmers. So that is the value of Annadhata in the country, which many may not realize, recognize nor visualize in true perspective. Generally crop loss due to drought, floods or pests is calculated, but seldom due to farmer's life.

Food crisis

We are proud of the value of wealth of politicians, Forbes based millionaires, corporate magnets, celebrities in sports, games, cinema, but are blind to the fact that all our mouths are fed, stomach filled by the valuable service of farmers. The country seems ungrateful to them. The food crisis will be a reality if we allow five thousand farmers to commit suicide every year and in ten years our food production

might show a fast declining trend, with population explosion unchecked. With the percentage of farmers engaged in farming already declining, suicide rate would further aggravate agriculture sector in the country.

Way forward

The officials in the Ministry of Agriculture must pressurize the Government to look into the problem and examine the NCF report, get the recommendations implemented without any further delay. Since the causes for depression among the farmers are known, all efforts must be directed towards solving problems. Livelihood and economic situations must be improved to ensure that farmers do not lose interest in farming but continue the field work with vigor to help agriculture production to feed millions of people. Policies must be framed to ensure zero farmer suicide in the shortest time frame. The personal interest and intervention by the Hon'ble Prime Minister is bound to instill confidence among farmers to avoid suicide tendencies but to focus on their hard field work. This is the only way to sustain food production to feed the projected population in the ensuing decades. 'Everything else can wait but not agriculture' said Pandit Jawaharlal Nehru, so too farmers.

Dr. V. Rajagopal, Former Director, CPCRI (ICAR)

RICE CUM FISH FARMING
A SUSTAINABLE WAY OF AGRICULTURE

As a socio-economic activity, fisheries rank second in the world to agriculture sector. Fishery as one of the major sub-sectors has been playing a significant role in terms of nutrition, employment, foreign exchange earnings, good supply and more importantly socio-economic stability in the rural areas. India is very rich in natural water resources in the form of rivers, reservoirs, ditches, lakes, ponds, flood plains and large areas of rice fields etc.

The Rice-cum-fish farming culture involves the simultaneous production of rice and fish in irrigated paddy fields so as to obtain an added production of fish with rice. Fish production from different aquaculture systems has been identified as a means of boosting fish production in the country and hence can address the dwindling fish supply from capture fisheries and to bridge the increasing gap between fish demand and supply in India.In poly-culture, fast growing compatible fish species are grown together in rice fields to increase total production of both commodities from the same body of water and land. This can also help to alleviate poverty and food security by adopting sustainable agriculture practices for increased rice and fish production in the nation.Paddy-cum-fish culture is an old practice in several countries as Japan, Malaysia, Italy, China and India. In some north eastern states of India, it is practiced to an appreciable extent. As paddy fields remain flooded with water for several months, fish can be grown there at low cost in addition to rice. Over 80 million ha of land produce the world supply of rice, and in favorable situations at the end of the season, paddy-cum fish culture yields 3 Kg. or more of fish per ha for an inundation period of 3 to 8 months. The fish species which could be cultured in rice fields must be capable of tolerating shallow water (15 cm), high temperatures (up to 35°C), low dissolved oxygen and high turbidity. Species such as, *Chanoschanos, Oreochromismossambicus, Anabas testudineus, Mugil spp., ClariasLabeorohita, Catlacatla, Cirrhinusmrigala, Hypophthalamichthysmolitrix, Cyprinuscarpio, Labeogonius, L. calbasu, L. batabatrachus, C. macrocephalus, Latescalcarifer, Channastriatus* and *C. marulius* and *Puntius sp.*have been widely cultured in rice fields.

The integration of fish with rice farming improves diversification, intensification, productivity, profitability, and sustainability. It can also optimize resource utilization through the complementary use of land and water. It is suggested that integrated rice cum fish farming is ecologically sound because fish improve soil fertility by increasing the availability of nitrogen and phosphorus. The natural aggregation of fish in rice fields inspired the combination of rice farming with fish to increase productivity. It is found in several studies that rice-cum-fish culture is able to enhance net benefit by 64.4% and yield by 5%. So, it has been proved that the integration of rice and fish farming is quite attractive both in environmental and economic point of view. The main objectives/ or the aims of this sustainable farming practice is_

- To assess the relative profitability of using rice-cum-fish culture compare to rice monoculture;
- To determine the effects of the rice-cum-fish culture in changing yields, total costs, fish consumptionand labour employment as compared to the monoculture.
- To identify the major problems in conducting integrated rice-fish farming and
- To determine the effect of different fish combinations on fish yield in Rice-cum-fish

culture system, with a view to recommending the outcome to prospective rice/ fish farmers.

Practices / or technology engaged in rice cum fish farming

The site selected for rice cum fish farming is low lying area where water flows easily and available at any time in needs.The soil of the paddy field should be fertile and rich in organic manure with high water holding capacity. Usually medium textured soils like silty clay or silty clay loam are most suitable for paddy cum fish farming/ or shrimp culture. The plots selected for paddy cum fish culture are normally prepared in the month of February by raising their embankment all along the plots. The paddy fields are suitable for fish culture because of strong bund, which prevent leakage of water and retain water upto desired depth. It also guards the escape of cultivated fingerlings/ or fishes during the floods. Once the dressing work of paddy fields are over, rice seedling are transplanted and fish seed stocking. However, the stocking of fish seed is done after 10-15 days of transplantation of rice seedling from its nursery bed.

The most promising deep water rice varieties chosen for different states are PLA-2 (Andhra Pradesh) ,

Benefits of Integrated Farming/ or rice cum fish culture system:

- Improves the soil fertility & soil health.
- Increases economic yield per unit area.
- Reduction in production costs.
- Decreases farm input requirements.
- Multiple income sources.
- Family income support.
- Efficient utilization of family labour.
- Reduction in animal feeding requirements.
- Minimal use of chemical fertilizers
- Balanced nutritious food for the farmers.
- Solves the energy problems with biogas.
- Avoids degradation of forests.
- Employment generation.
- Pollution free environment.
- Recycling of resources.
- Improves the status & livelihood of the farmer.

IB-1, IB-2 , AR-1, 353-146 (Assam), BR-14, Jisurya (Punjab), AR 61-25B, PTB-16 (Kerala) , TNR-1, TNR (Tamil nadu), Jalamagan (Uttar Pradesh), Jaladhi-1, Jaladhi-2 (West Bengal) and Thoddabi (Manipur). Manoharsali rice variety seeds are used in rice fields where the fishes are reared.

The paddy plots should be renovated suitably for the purpose of paddy cum brackish water aquaculture. Construction of an earthen dyke surrounding the paddy plot is essential for retaining water and also for holding the fish and shrimp during aquaculture.

The plots utilized for rice-cum-fish culture is mainly based on organic fertilization with a varieties of animal excreta such as poultry dropping, pig excerta, cow dung and waste of plants such as rice husks, waste product of local beer and ashes from household and remains of burnt straws after the harvest and compost fertilizer like decomposed straws, weeds and rice stalks etc.

The progressive fish farmers who normally produce adequate size of fish seeds by rearing in small size ponds for a period of about 1-2 months and sell it to the farmers who grow them directly in paddy fields and farms.

Before releasing fish seed to paddy field, the paddy transplantation from rice seed beds to main paddy fields is done in the month of April, and there after paddy is left for two weeks for strengthening of paddy roots. Fish seed @ 2500 nos./ha area is released. The fish rearing period varied from 3-6 months and the paddy rearing period is 5-7 months.

The rice- cum-fish culture is an innovative farming system in which, rice is the main enterprise and fish fingerlings are taken as additional means to secure extra income. Rice-cum- fish culture can not onlyreduce poverty of the farmers but can also improve the yield of paddy, create employment opportunity, and increase nutrient intake which brings food security for them. The farm-specific variables used to explain income indicate that farmers, who are of young aged, with larger farm size and better infrastructural facility – are able to earn more income. Despite some problems existing in rice cum-fish farming, Proper policy and planning, positive attitude of administrators and extension workers, free access to information/ training facilities for the farmers, required size of fingerlings at reasonable prices at the appropriate time will encourage the farmers to practice rice-cum-fish culture.

Nusrat Jan, Ph. D. Research Scholar and Deepak Lall, Former Product Development Executive &amp, Former (SRF- Horticulture), SHUATS (Agriculture University), Allahabad

THE VERSATILE MINISTER

Dr. Jitendra Singh, the Minister of State (MoS) with Independent charge for the Ministry of Development of North Eastern Region, Prime Minister Office, Personnel, Public Grievances and Pensions, Department of Atomic Energy and Department of Space, dons many role with ease. An author, doctor, columnist and a politician, Dr. Singh has proved his versatility across several fields. His adaptability in different roles has provided with him the opportunity to serve diverse sectors in his role as the minister.

Dr. Jitendra Singh heading the significant Ministry of Development of North Eastern Region (DoNER)represents Udhampur constituency in the Lok Sabha. Currently, he is the Minister of State (MoS) with Independent charge for the Ministry of Development of North Eastern Region, Prime Minister Office, Personnel, Public Grievances and Pensions, Department of Atomic Energy and Department of Space. A Bharatiya Janata Party (BJP) National Executive member and the chief spokesperson for the State of Jammu and Kashmir, he won the Udhampur seat in Indian general election, 2014 for the 16th Lok Sabha.

Born on 6 November 1956 in a Rajput family, Singh is professionally a doctor. An alumnus of Stanley Medical College, Chennai, Singh is one of the best diabetologists who has carved a niche in and outside Jammu and Kashmir. He was a professor of diabetes and endocrinology, a consultant and clinical practitioner. He is the ex-Chairman, National Scientific Committee Diabetes, Research Society for Study of Diabetes in India.

He became the face of Amarnath land agitation in 2008, which paved the way for Singh's entry into politics. He became the spokesman of Shri Amarnath Sangarsh Simiti (SASS), which spearheaded the two month

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agitation in Jammu for restoration of forest land to the Shri Amarnath Shrine Board (SASB).The 2008 Amarnath land agitation had polarised Jammu and Kashmir on religious and regional lines with people in both Jammu and the Kashmir valley launching agitations for and against the transfer of 39.88 hectares of forest land to the Board.He took premature retirement as professor of Endocrinology at Government Medical College Jammu to join the BJP.In 2009, Mr Singh joined BJP and became a member of the party's National Executive Committee. Singh's involvement in SASB became the reason for US denying him a visa in 2011, thus him becoming the only other leader after Modi to have been refused entry into the US. Dr Singh, contested Lok Sabha election from Udhampur and defeated former Union Minister and veteran Congress leader Ghulam Nabi Azad.

Dr. Singh strongly believes in the potential of youth in transforming India. He considers youth aspiration to determine India's future, as also the pace and pedestal of India's ascent as a frontline world nation within next few years." In a country like India, which has more than 70 percent population below the age of 40, any future programme will have to be youth- centric to be successful. The various contours of future entrepreneurship will also have to be seen through the eyes of the youth," emphasizes the minister. He completely trusts the potential of agriculture in North Eastern Region of India in doubling farmers' income. "The country is yet to be introduced to the rich and healthy organic produce of the North-Eastern Region and once this happens, they would spontaneously come looking for it. This will not only give a boost to trade and business, but also help in enhancing Farmer's income of NER," remarked Dr. Singh.

He has contributed over five thousand published articles in the press including a widely read syndicated column "Tales of Travesty". Author of five books, Elsvier published monograms and over a dozen chapters in various text books of Diabetes and Medicine for MD students. He was first ever medical professional to be conferred the coveted "Jamna Devi Gian Devi" award for journalism. He has authored five books and three Monograms included three All-India popular books on Diabetes awareness, one of which titled "Diabetes Made Easy" was included in Best-seller section of "World Book Fair" held at Pragati Maidan in 2002. He was Awarded Gold Medal for "Oration" at Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER), Pondicherry. He received the "Award of outstanding personality" from former union Health Minister, Mr. Ghulam Nabi Azad in 2009. He has pioneered work on "Stress Diabetes in Kashmiri Migrants" published in "International Journal of Diabetes in Developing Countries" and hailed by World Health Organization (WHO).

"We want to build an India where the farmer can sleep without worry and in peace… (knowing) they will earn double their current incomes by 2022 (the 75th year of India's independence)"

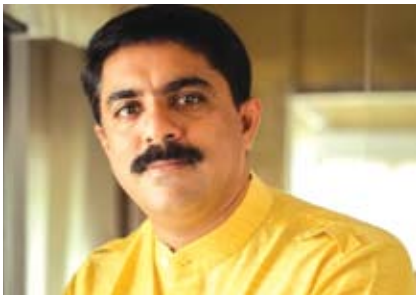
NARENDRA MODI
Prime Minister

"My priority is to help small farmer become an entrepreneur in his own right by adding value to farm produce. Keeping this in mind, I have started from the base level by helping farmers or clusters of farmers to make Farmer Producer Organisations (FPO). A company has been specially hired for this purpose. The company will not only help in filling up various applications but also hand-hold the farmer organisations for two years to enable them to produce and market their products effectively"

HARSIMRAT KAUR BADAL
Food Processing Minister

"India needs to increase agricultural exports globally through agricultural trade ambassadors in its embassies and greater emphasis on marketing"

RAJJU SHROFF
Chairman, Center for Environment and Agriculture (CENTEGRO) and Crop Care Federation of India (CCFI)



"Our Prime Minister's mission is to double the farmer's income by 2022. For the same, we have to launch a revolution. For Goa the time has come where we need to take our farmers forward"

VIJAI SARDESAI
Agriculture Minister, Goa