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Boosting Agricultural Growth



PM inaugurates Development Projects in Silvassa



The Prime Minister, Shri Narendra Modi at the inauguration & foundation stone laying of several development projects, in Dadra & Nagar Haveli on January 19, 2019.

The Prime Minister, Shri Narendra Modi, inaugurated and laid the Foundation Stone for several development projects at Silvassa in Dadra and Nagar Haveli on 19th January, 2019. He laid foundation Stone of Medical College in Sayli, Dadra and Nagar Haveli.

Prime Minister released IT policy for Dadra and Nagar Haveli. M-Aarogya mobile app and door to door waste collection, segregation and processing of Solid Waste in Dadra & Nagar Haveli were also launched. He also distributed Gold cards to beneficiaries of Ayushman Bharat and distributed Van Adhikar Patra to the beneficiaries.

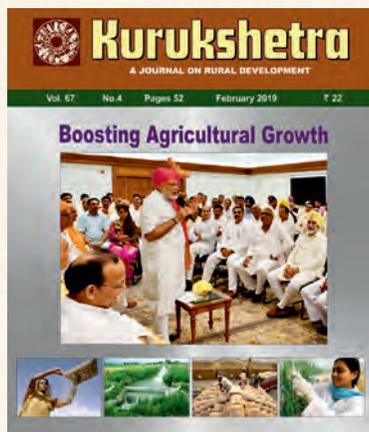
He said New Industrial policy and new IT policy has been launched to give a boost to Industries. PM reiterated his Government's commitment for the welfare of the citizens of the country. He said, 'We are working on the mantra of Sabka Saath Sabka Vikas'.

Both the UTs, Daman and Diu, and Dadra and Nagar Haveli have been declared Open Defecation Free and Kerosene Free. Every household in both the UTs has LPG connection, electricity connection and water connection.

PM mentioned that under Pradhan Mantri Awaas Yojana, poor residents of both the UTs have been allocated houses. He mentioned that over the past 3 years, Investment worth Rs 9000 crores has been made in both the UTs, which has led to a series of development projects. He said that with the foundation stone laying of Medical College, Dadra and Nagar Haveli and Daman and Diu have got its first ever Medical College. Efforts are being taken to make Medical College functional this year itself. Till date, both UTs had only 15 Medical seats in a year and with the setting up of this Medical College, 150 seats will be available now.

Prime Minister also underlined that in Dadra and Nagar Haveli alone, 13000 women have been provided Free Gas Connections. Under Van Dhan Yojana, Centres are being established for value addition in Forest Produce while several measures have been taken for preservation of tribal culture.

PM also told that Dadra and Nagar Haveli has a huge potential for tourism. Several initiatives are being taken to bring this area in the map of tourism.



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Editorial

Agriculture, as a source of livelihood, is the largest sector of the Indian economy. In order to accelerate productivity of this sector it is crucial to focus on the progress of its components such as soil, irrigation, seeds, fertilizer and pesticides, modern farm technology, allied activities like horticulture, floriculture, fisheries, animal husbandry and poultry, value addition through food processing and marketing system.

Agriculture has been one of the top priorities of the present Government. Several measures have been taken to improve productivity and enhance the incomes of farmers and bring about major transformation and growth in agriculture sector.

The Government is committed to doubling farmers' income by 2022 and for this it has increased the budgetary allocation of Agriculture and Farmers' Welfare Ministry in the budget 2018-19 to Rs 58,080 crore from 51,576 crore in 2017-18.

Realizing that the health of the soil plays a crucial role in agriculture, the Soil Health Card Scheme has been taken up in a comprehensive manner across the country with the objective to enable the farmers to apply appropriate recommended dosages of nutrients for crop production and improving soil health and its fertility.

There has been a significant increase in urea production which has tremendously helped fertilizer distribution. The implementation of 100% neem coating of Urea has not only resulted in improving the soil quality but also prevented the diversion of fertilizers to other purposes.

Pradhan Mantri Krishi Sinchai Yojana has been formulated with the vision of extending the coverage of irrigation 'Har Khet Ko Pani' and improving water use efficiency- 'More crop per drop' in a focused manner for efficient distribution, management, field application and extension activities.

Numerous steps have also been taken by the Government to increase institutional credit flow and to bring more and more farmers, particularly small and marginal farmers, within the institutional credit fold. The objective is to save farmers from being exploited in the hands of informal credit sources such as moneylenders.

To help farmers to get the right price for their produce, the Government, in July 2018, approved the historic MSP hike for Kharif crops to 1.5 times the cost. The Umbrella Scheme "Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) provides for a holistic arrangement for assurance of a remunerative and stable price environment for growers /farmers to increase agricultural production and productivity.

The electronic National Agriculture Market or e-NAM has helped facilitate better marketing of agricultural produce. This has enabled cutting down the middlemen in agriculture trading and give the farmer his due. On several occasions the Prime Minister has also emphasized the need for the creation of adequate marketing infrastructure and support mechanism.

Huge investment has been made in warehousing and cold chains to prevent post-harvest crop losses. Value addition through food processing has also given the farmers a strong foothold in the market. 'Operation Greens' is in place to address the price volatility of perishable items like tomato, potato and onion.

The focus is also on allied agriculture activities like fisheries, aquaculture and animal husbandry to supplement farmers' income. Integrated Development & Management of Fisheries and the establishment of Gokul Grams are steps in this direction.

As a result of various policy initiatives taken by the Government, the country has witnessed record foodgrain production in 2017-18.

Following Prime Minister Shri Narendra Modi's motto- *Beej se le ke Bazaar tak* government has been pursuing a holistic approach in agriculture and positive results have started showing. Numerous schemes which cover each and every aspect of agriculture sector ensure revitalization and growth of this sector thus bringing prosperity to the farmers and boosting agricultural growth which is one of the major objectives of the government.

NEW DIMENSIONS OF DEVELOPMENT IN AGRICULTURE

Narendra Singh Tomar

Agro-products such as tea, sugar, rice, tobacco and spices contribute significantly in international trade and India exports these products in a big way. The proper development of the agriculture sector leads to increase in exports and reduction in imports. As a result, it helps in balance of payments in favour of the country and also save foreign currency. These savings can be utilised in the import of more essential items, raw material, machinery, equipment and other infrastructure related items needed for the country. This accelerates the pace of economic development and strengthens the economy of the country.

Agricultural sector plays a significant role in any economy. Referring to it as the backbone of the economic system is not an exaggeration. In fact, agricultural sector not only provides food and raw material, but it also provides employment opportunities to a large segment of the population. In India, the main occupation of our working population is agriculture. About 70 per cent of our country's population is directly engaged in agriculture and allied sectors. On the contrary, the proportion of agricultural sector is very low in the economy of developed countries. On an average, it is 5 per cent in the UK, 4 per cent in the US, 14 per cent in France, 16 per cent in Australia, 21 per cent in Japan and 32 per cent in Russia. The high proportion of agriculture sector in Indian economy is due to the fact that non-agricultural sector has not been adequately developed in proportion to the requirement of rapidly growing population.

Agriculture is the main source of our national income. According to the Central Statistics Office

(CSO), the contribution of agriculture and allied sectors in national income during the year 1960-61 was 52 percent. In 2001-2002, the share of agricultural sector in national income was 32.4 percent. Agro-products such as tea, sugar, rice, tobacco and spices contribute significantly in international trade and India exports these products in a big way. The proper development of the agriculture sector leads to increase in exports and reduction in imports. As a result, it helps in balance of payments in favour of the country and also saves foreign currency. These savings can be utilised in the import of more essential items, raw material, machinery, equipment and other infrastructure related items needed for the country. This accelerates the pace of economic development and strengthens the economy of the country.

Efforts have been made, from time to time, to boost the agriculture sector as well as condition of farmers, but the sincere and committed efforts made by the present Government led by Prime Minister Shri Narendra Modi have yielded more positive and encouraging results. With a focus on the agriculture sector, the Government has made adequate budgetary provision for it. For the 5 year period, from 2009 to 2014, the previous Government had made a budgetary provision of Rs. 1,21,082 crore. At the same time, the present Government has made a budgetary provision of Rs.2,11,694 crore for agriculture sector for the period of five years, from the year 2014 to 2019 which is 74.5% more than the provision made by the previous Government. In addition, two corpus funds have also been constituted for the period from 2017 to 2020. Amount of Rs. 5 thousand crore has been allocated for 'Micro Irrigation



Fund’ and Rs. 10,881 crore for ‘Dairy Processing and Infrastructure Fund’. In 2018-19 Budget, Rs. 2000 crore have been earmarked for ‘Agricultural Market Infrastructure Development Fund’, Rs. 7550 crore for ‘Fisheries and Aquatic Science Infrastructure Development Fund’ and Rs. 2450 crore for “Animal Husbandry Infrastructure Development Fund”. In accordance with the recommendations of Prof. M.S. Swaminathan, the Father of Green Revolution in India, the Minimum Support Price has been announced for different agricultural commodities from the Kharif season of 2018-19 which is one and a half times of the cost price or more. NITI Aayog has, in collaboration with the Central and State Governments, set up a new system so that all farmers can get the benefit of this initiative. In addition to promoting pro-farmer initiatives, Government has approved a new umbrella scheme ‘Pradhan Mantri Annadata Aay Sanrakshan Abhiyan’ (PM-AASHA) keeping in mind their resolve and commitment towards the farmers, the *Annadata*. The objective of this scheme is to provide the peasants reasonable price for their produce. It was announced by the Finance Minister in the Union Budget of 2018. Under this scheme, the Government has already increased the minimum support prices of Kharif crops by adopting the principle of fixing one and a half times the cost of production. Increase in the Minimum Support Price with the co-operation of the State Governments will promote Kharif crops and will lead to an increase the income of the farmers. To improve the economic condition of the farmers, the target of doubling their earnings by 2022 has been set. NITI Aayog has also constituted a Working Group to achieve the goal of doubling the income of farmers through new business models.



To materialize this vision by the year 2022, special attention is being given on increasing productivity, reduction in cost of farming and strengthening the post-harvest management and market structure. With these aims, various market reform-oriented measures have been implemented, such as the Model Agricultural Produce and Livestock Marketing Act, 2017 and Model Contract Farming and Services Act, 2018. Various States have taken necessary steps to adopt them through law.

“Pradhan Mantri Fasal Bima Yojana” (Prime Minister’s Crop Insurance Scheme) has been launched from the Kharif season of 2016 to provide safety-shield to farmers against the losses to crops, due to natural calamities. The maximum premium for Kharif crops has been fixed at 2 percent and one and a half percent for Rabi crops. Along with the standing crops, the risks involved before sowing and after harvest, are also included in it. Not only this, payment of 25 percent of the loss claims is being made online immediately. This scheme has been very popular among the farmers. The insured amount per hectare was Rs 17,509 during the last two years of the previous Government, which got enhanced to Rs 38,496, thereby recording an increase of 120 per cent during the two years - 2016-17 and 2017-18 of the present Government. Earlier, insurance claims were being paid at the rate of Rs. 1750 per hectare, which was increased to Rs 3,084 per hectare, indicating an enhancement of 76 per cent. Important changes have also been made in the relief rules for losses due to natural disasters. Now financial assistance is also being provided for 33 per cent of the crop loss. Apart from this, the relief amount has also been increased to one and half times.

With the aim to bring transparency and improvement in the agricultural marketing sector, to provide farmers better price of their produce and to create a competitive environment, the Government has launched the electronic National Agricultural Market Scheme. The “e-NAM” platform was introduced in 21 markets of 8 States on April 14, 2016. Under the scheme, e-market platform was made available in all 585 regular markets till March 31, 2018 so that along with online trading, issuance of e-permits and

making e-payments, all the activities of the market can be encouraged to acquire digitalization. This system has helped in bringing transparency in the transaction process and provided to farmers an easy access to the markets of the entire country. This has created a conducive environment for farmers to get better price of their agricultural produce and, thus, the country has moved forward in the direction of 'One Nation-One Market'.

Organic farming is being focussed and promoted under 'Paramparagat Krishi Vikas Yojana'. The emphasis is on the maximum use of bio-chemicals, bio-pesticides and bio-fertilizers. Besides promoting expansion in irrigation facilities, horticulture development, agro-forestry, bamboo mission, bee keeping, milk, fish and egg production, special emphasis has been laid on agricultural education, research and development. More investment has been made to strengthen cooperatives. New initiatives have been taken to bring self-dependence in pulses and oilseeds. The contingency plan has been provided to all the districts of the country and by enhancing the relief amount of farmers affected by drought and hailstorms, the interests of the farmers in the economy have been protected and given priority. The emphasis is also on Integrated Farming System. Under this, special attention is given to multi-cropping system, cyclical farming and allied activities such as horticulture, livestock, fishery and bee-keeping. Due to all such initiatives, the farmer is not only able to increase the production for sustainable livelihood, but the effect of drought, flood or other severe natural calamities on him has also been reduced to an extent. Under this system, the emphasis is laid on minimum ploughing, use of crop-residue on soil surface and adoption of crop rotation. These measures have reduced the damage to the fertile soil to the minimum level.

The Government is pushing for extension of micro irrigation facilities. During the year 2017-18, 9 lakh 26 thousand hectare area was brought under the purview of micro irrigation, which is the highest ever for any calendar year. The Government is working to achieve the target of adding to it 1 to 1.5 million hectares per annum by the year 2022-23.



Today, India's Soil Health Card scheme has become a topic of wide discussion all over the world. The Government has implemented the world's largest Soil Health Card scheme to provide feedback to the farmers on the fertility of their agricultural land, on the basis of testing 12 parameters of soil-samples. Arrangements have been made for issuance of soil health cards for all land holdings in the country, in every two years. In the second phase of Soil Health Card scheme, 255.48 lakh samples of soil were collected during 2017-18 to 2018-19, 202.34 lakh samples were tested and 687.59 lakh soil health cards were distributed to the farmers. A study undertaken in this regard has revealed that as per the recommendations related to Soil Health Cards, the use of fertilizers and micro-nutrients has resulted in the reduction of the use of chemical fertilizers by 8 to 10 per cent, whereas the yield of crops has increased by 5 to 6 percent. On account of neem-coated urea being promoted, the use of urea has, itself got controlled. Its availability has increased for use in the crops and the cost of fertilizers has decreased. The entire quantity of the domestic and imported urea has become Neem coated.

At one point of time, there was a severe shortage of pulses in our country. Due to their high price, they were out of reach of the poor. Today, it is a matter of satisfaction that India has become self-reliant in the production of pulses. As a result, there is no need to import the pulses. In order to meet the requirement of edible oils in the country and enhance the production of oilseeds, activities of National Mission on Oilseeds and Oil Palm are

underway, on a large scale. Various programmes of the Mission are being implemented through State agriculture or horticulture departments.

Agriculture and food security are one of the most important areas for the Government of India. Its main objective is to ensure food and nutrition security at cost-effective prices in an environment-friendly way. Agriculture has much importance in the context of our country, as the majority of our population is still entirely dependent on it for livelihood. Agriculture also contributes significantly to our fast-growing manufacturing sector in terms of supplying raw material. Agriculture sector in India is providing entrepreneurial and employment opportunities to a large number of rural people and youth. It is noteworthy that India has achieved great success and achievement in agriculture and allied sectors as compared to earlier times. During the past decades, the Green Revolution and the White Revolution in India paved the way for self-reliance in food and milk-production. Not only that, we have now moved ahead of self-reliance stage in these areas too. Our performance in the fields of horticulture, fisheries and production of pulses has been exemplary. The goal of our policies and programs is to develop such agricultural techniques, technology and work-system which would ensure food and nutritional security to all citizens and livelihood security to the farming community. Our country, based on the agricultural economy, is currently facing challenges in the form of climate change, shrinkage of land-base, lack of water resources, low availability of agricultural labour and increased costs in national and international markets, volatility and uncertainty in production. Keeping them in view, we have to pay attention to the diversification of those crops and livestock which fetch better price. This will not only improve agricultural income, but also reduce the stress on rapidly dwindling natural resources.

A new central scheme called "Agricultural Mechanization Promotion" has been launched with the aim of decreasing the cost of farming, increasing the crop-yield and management of crop-residues. It is being implemented in Punjab, Haryana, Uttar Pradesh and National Capital Region of Delhi. The focus of this scheme is on in-place management of crop residues. This scheme was announced in the budget of the year 2018. Under this, a total amount of 1151.80 crores will be spent from the Central Fund during the year 2018-19 to 2019-2020. Farmers are

being provided 50 percent of the cost of machinery / equipment as financial assistance for the purchase of machinery on personal basis for management of crop-residues. Besides, financial assistance is also being provided to State Governments, Agricultural Science Centres, institutions affiliated to Indian Council of Agricultural Research, Central Government Institutions and Public Sector Undertakings for activities related to Information, Education and Communication (IEC).

At present, the number of livestock in India is around 30 crore, which is 18 percent of the livestock in the world. This is an important resource for our country. Keeping this in view, efforts are being made to double the productivity of livestock and to add new dimensions to the White Revolution. For this, we have to develop the native cow and buffalo breeds on a big scale. The Government has understood its importance and Rs. 1496 crore have been approved for projects related to conservation and promotion of native breeds in 28 states under the Rashtriya Gokul Mission. Through this, 41 species of native cow breeds and 13 species of buffalo breeds are being conserved and upgraded. Under Gokul Gram Yojana, Rs 196 crore have been approved for 20 Gokul villages in 13 states, out of which 3 Gokul villages have been completed. For the first time in the country, 2 National Kamdhenu Breeding Centres are being set up at the cost of Rs 50 crore for the overall development of indigenous livestock breeds and conservation and upgradation of native breeds. Under the National Livestock Productivity Mission set up at the cost of Rs 825 crore, the work of providing Nakul Swasthya Patra to 9 Million milch cattle is in progress. So far, more than one crore 8 lakh animals have been identified. In order to link breeders of native bovine breeds and farmers, 'e-Pashudhan haat portal' has been set up in November, 2016. The progress of dairy development has also been very encouraging. Today, India is at the first place in milk production and contributes 19 percent of world's total milk production. The availability of per capita milk has also increased significantly in our country. Similarly, as compared to the period from the year 2010 to 2014, the income of dairy-farmers has increased by more than 30 percent during the period from 2014 to 2018. Also, in comparison to the period from the year 2010- 2014, the average milk production has increased by 35.70 percent during the year 2017-18.

Given the abundant capabilities and potential of fishery development, 'Blue Revolution' has been announced in the fisheries sector. Through Blue Revolution, the resolution to make India the world's leading nation in the field of fishery development is being focussed upon. This revolution focuses on increasing fish production through its multi-dimensional activities and aquaculture, inland and sea fishery resources. Under the Blue Revolution, a new scheme called "Deep-Sea-Fishing" has also been initiated. To achieve the objectives related to it, a scheme at the cost of Rs 3,000 crore was announced in December 2015. Under this, efforts will be made to increase the fish production by 2019-20 to the level of 15 million tonnes. More than Rs. 1194 crore have been provided to the States / UTs for implementation of the Blue Revolution scheme during the last four financial years i.e. 2014-15 to 2017-18. The fish production was 126.14 million tonnes, during the year 2017-18, which is 42.22 percent more than the average annual production of 88.69 million tonnes during the year 2010-2014.

There has been an increase of 57% in agricultural production during the last four years of the present Government and it has reached the level of Rs. 11 lakh crore. Interest subsidy has also increased by 1.5 times to reach Rs 15,000 crore. Small Farmers' Agri Business Consortium (SFAC) has constituted 546 Farmer Producers Organizations (FPOs) to increase the income of farmers. The size of Joint Liability Group for landless farmers has increased from 6.70 lakh to 27.49 lakh.

A new export policy has been prepared to infuse competitive spirit in Indian agriculture. Due to the sincere efforts made by the present Government, export of marine products has increased by 95%, that of rice by 85%, fruits by 77%, fresh vegetables by 43% and the export of spices by 38%. The interest of farmers has been protected by imposing duty on imports of oilseeds and pulses.

Due to consistent research in agriculture, 795 new varieties of crops have been released for farmers. These varieties of crops have the ability to withstand the effects of climate change. This will enhance production and thereby increase the income of farmers. Several new colleges of agriculture-education and veterinary-education have been opened, the number of seats and scholarships have also been increased. Innovative technologies developed by the Indian Council of Agricultural

Research (ICAR) have made significant contribution in increasing the production of food-grains, horticulture-products, crops, milk, fish and eggs. Under the Entrepreneurship Development Program, Krishi Vigyan Kendras are helping farmers on various issues related to agriculture through training and technological resources. For better coordination among agricultural scientists and farmers, programs such as 'Farmer First, Mera Gaon, Mera Gaurav', and ARYA' have been started. ARYA (Attracting and Retaining Youth in Agriculture) scheme has proved to be very effective in making the farming an attractive occupation for educated rural youth. "Rural Entrepreneurship Awareness" scheme has also been launched for the students. The success of Government policies and schemes is ratified with the fact that during the year 2017-18, there has been a record production of 284.83 million tonnes of food grains and 306.82 million tonnes of horticulture produce. An increase of 40% was registered in the production of pulses which became 25.23 million tonnes.

In this way, the present Government under the able and dynamic leadership of Prime Minister Shri Narendra Modi, has made tremendous efforts to improve the economic condition of the farmers and to make farming a profitable occupation. And, this is not going to pause here. The Government is fully committed to make the farming an attractive occupation like other major vocations, so that even the highly-educated youth could be motivated/ could get attracted to adopt it as their main source of livelihood. We are confident that the day is not far when agriculture will also acquire the status of a major industry and farmers of our country will be proud of their main occupation i.e., farming. Then, farmer of the village will not migrate to the cities in search of sundry jobs. In his own villages he will get such a livelihood in agriculture or allied fields which would easily fulfil his needs. Thus, by remaining rooted to his land, he will be able to lead a prosperous life in his own village. In fact, the more the agriculture sector grows, the more prosperous will be our farmers and the village and the society will equally move forward. In such a situation, the vision of making our mother-country a developed nation will materialize to a ground reality.

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DOUBLING FARMERS' INCOME BY 2022

- "Farmers' Welfare" is the primary goal of this government's agricultural policy.
- For its implementation, increasing employment in agricultural sector and enhancing the income of farmers are the important factors.
- To achieve this, the government is trying to increase productivity, reduce cost, and prioritize crops with high value, reduce risks and make agriculture sustainable.
- In order to achieve this, the budgetary allocation to the agriculture sector has been raised by 74% and the SDRF allocation has been almost doubled.
- Corpus funds have been created like Rs 5000 crore micro irrigation fund, Rs 10,081 crore for Dairy Processing and Infrastructure Development Fund, Rs 7550 Fisheries and Aquaculture Infrastructure Development Fund (FIDF), Rs 2,450 crore for development of animal husbandry infrastructure and Rs 2,000 crore for the development of Rural Agricultural Market Infrastructure.
- For the first time, Soil Health Card is being provided to farmers on the basis of a national standard.
- e-NAM has been started to help farmers receive fair value of their produce .
- Pradhan Mantri Fasal Bima Yojana has been started to cover the maximum risk of farmers' crops based on the Scale of Finance by removing capping on minimum premium.
- Soil Health Card and Paramparagat Krishi Vikas Yojana has been started for organic farming, 'Har Medh Par Ped' for sustainable agriculture, 'Per Drop More Crop' with special emphasis on micro irrigation and restructured National Bamboo Mission.
- In the last 4 years, agricultural credit flow has increased by 57% to Rs 11 lakh crore and interest subsidy has also been increased by one and half times to Rs 15,000 crore.
- To increase the income of the farmers, 546 FPO has been constituted by the SFAC besides State Governments and FPOs of NABARD during the tenure of present Government. For landless farmers, the Joint Liability Group has been increased from 6.72 lakh to 27.49 lakh.
- There has been an unprecedented increase of upto 15 times in purchase by the government through PSS, PSF and MIS schemes.
- There has been 95% increase in export value of marine products, 84% rice, 77% fresh fruits, 43% fresh vegetables and 38% spices.
- Farmers' interests have also been protected by imposing import duty on oilseeds and pulses through quantitative restrictions.
- The new APLM Act, Land Leasing Act and the Contract Farming and Services Act have been issued to states for implementation.
- 795 new crops with bio- fortification and resilient to climate change properties have been released to the farmers thereby enabling increase in productivity and enhancing the income of farmers.
- Besides, schemes like "Farmer First", "Mera Gaon, Mera Gaurav" and "ARYA" have been started for better coordination and interaction between agricultural scientists and farmers.
- Besides crops, special attention has been paid to horticulture crops and agricultural related activities. For the promotion of indigenous breeds in the Indian climate, special emphasis is being given to Rashtriya Gokul Mission, sex-sorted semen, and the development of dairy infrastructure.
- Through the Blue Revolution, importance is being given to various dimensions of inland and maritime fisheries and also on the development of fisheries infrastructure. Simultaneously, beekeeping has been developed as additional source of income of farmers through Integrated Beekeeping Development Centers.

- There was record foodgrain production of 284.83 million tonnes, record horticulture production of 306.82 million tonnes, pulses production increased by 40% to 25.23 million tonnes.
- The Ministry of Agriculture and Farmers' Welfare is implementing the 7-point strategy developed under the leadership of the Prime Minister and also recommended by Dr. Swaminathan, like Per Drop More Crop, provision of nutrients according to the soil quality of each farm, large investments in warehouses and cold chains to prevent post-harvest losses, promotion of value addition through food processing, e-NAM, introduction of crop insurance scheme at lower costs to mitigate the risk, and promotion of allied activities such as dairy-animal husbandry, poultry, beekeeping, Har Medh Per Ped, horticulture, and fisheries.
- For agricultural processing, tomato, onion and potato clusters will be set up under the TOP scheme. New agri-start ups and agri-entrepreneurs are being encouraged. Necessary steps are being taken for creation of infrastructure of 22,000 rural haats.
- Setting up of cold chains and warehouses will be expedited.
- Focus on price and demand forecasting will enable farmers to choose which crop to sow in order to maximize benefit.

(Source: Ministry of Agriculture and Farmers' Welfare)

COOPERATIVES WILL PLAY A CRUCIAL ROLE IN DOUBLING FARMERS' INCOME

Union Minister of Agriculture & Farmers Welfare Shri Radha Mohan Singh has said that agriculture plays an important role in Indian economy. In view of this, the present government is stressing upon and working tirelessly towards the vision of "Culture of Agriculture" with an aim to double farmers' income by 2022. For the development of agriculture, more than 22,000 Gramin Haats under GrAM are being upgraded with basic needs and integrated with APMCs and e-NAM.

The Minister said that apart from specific budget allocations, the government has allocated adequate funds for the improvement and management of dairy, cooperative, fisheries, animal husbandry, agri-marketing, drip irrigation, aquaculture and many more, separately. Soil Health Card has also been launched to provide timely and real time information to the farmers regarding the proportion of nutrients in the soil. In the first phase, 10,73, 89,421 SHCs and in the second phase 6,93,62,166 SHCs have been distributed. The government has also announced several schemes to promote organic farming. He added that the current developments in agriculture have not only established India as an exporting nation, but also provided self-reliance and nutritional security in food grains.

Shri Singh said that cooperatives have also played an important role in achieving the government's goal of doubling the income of farmers by 2022. Late Vaikunth Bhai Mehta dreamt of improving the lives of farmers for which he strengthened cooperatives. The Minister hoped that through cooperatives, farmers can be made progressive. He was speaking on the occasion of the Foundation Day of VAMNICOM in Pune recently.



NEW PROCUREMENT POLICY FOR ENHANCING FARMERS' INCOME

Dr S.S. Chhina

As the New Procurement Policy would be adopted with the partnership of the States, so the States must identify the various zones even in the same States on the basis of the yield of the crop in the respective zone. The new procurement policy would prove much useful for enhancing the farm income, reducing the imports of pulses and oilseeds, saving of the foreign exchange and moreover for the best utilization of the limited sources for the best interest of the country.

Albeit, it is an annual exercise that the commission for Agricultural Costs and Prices announces the minimum support prices of two dozen of crops, prior to their sowing, but only four are being procured by the Government, at those announced prices. Wheat and paddy are procured by Food Corporation of India along with the State Agencies to maintain the buffer food stocks at the central level. The cotton is procured by Cotton Corporation of India and Sugarcane by the Sugar Mills of the State. Ushering of the Green Revolution was largely dependent on the assured marketing, that proved a big gladiator to enhance the area and production of wheat and paddy, the staple crops of the country. The total production of food grains that was only 82.02 million tonnes in 1960-61 thrived to 129.59 million tonnes in 1980-81 and further rose to 271.96 million tonnes in 2016-17 that includes 163.29 million tonnes of Paddy and 96.64 million tonnes of wheat. The production of paddy was only 51.87 million tonnes and wheat was just 11.00 million tonnes in 1960-61.

By 1970, the country that was heavily dependent on food imports. At present, it is the top exporter of

paddy. In 2015-16, it exported 10.50 million tonnes of paddy and surpassed much ahead to the other rice exporting countries like Thailand, Vietnam, Pakistan, U.S.A. and Myanmar.

The new high yielding varieties of wheat and paddy were developed by the research Institutes and Agricultural Universities. As Paddy and wheat, both require adequate quantity of water for irrigation, so the area under those crops escalated much higher in Punjab, Haryana and U.P. which had abundant water and particularly the ground water on which, 60 per cent of the irrigation was dependent. The farmers of those states diverted towards the cropping pattern of wheat and paddy. The Punjab and Haryana saw the staggering results in the output of these crops that is why these two states had been contributing about 80 per cent in the total food stocks of the country.

It is quite evident that the escalation of area under wheat and paddy was mainly because of assured marketing as it was available to these two crops, whereas the area under other crops kept on depleting. India is the largest producer, largest consumer and largest importer of pulses. As the states



where the assured marketing was provided to wheat and paddy, the area under pulses remained stagnant and the Import bills for pulses went on rising. The announcement of higher and higher minimum support prices was a big allurement to the farmers so again after 2006-07 the area started rising gradually. In 2007-08 it was again 23.63 million hectares with output of 14.76 million tonnes. In 2016-17, the total area under pulses increased to 28.86 million hectares with output to 22.14 million tonnes. It vindicated the fact that assured marketing is much more important than the allurement of higher but volatile and uncertain prices. The same happened with oil seeds production. The country went on importing more and more quantity of oil seeds at the hefty prices in the International market, though area under oil seeds thrived perpetually from 1960-61, but the demand exceeded supply. So the surge in output of oil was not commensurate with the demand of the country. In 1960-61, there were 13.77 million hectares under oil seeds with total production of 6.98 million tonnes. The area further increased to 17.60 million hectares with 9.37 million tonnes of production in 1980-81. In 2016-17, area under oil seeds thrived to 26.63 million hectares with production of 33.60 million tonnes. But the area under groundnut that was 6.46 million hectares in 1960-61 declined to 5.32 million hectares in 2016-2017 similarly the area under sunflower that was 2.34 million hectares depleted to only 0.37 million hectares in the same period.

Pulses and oilseeds are the high valued crops those could be helpful to enhance the income of the farmers, but as shown by data concerned with these crops where the area under pulses had increased marginally. Since the inception of the minimum support price policy in Agriculture, when the minimum support price (MSP) of both the pulses and oilseeds were enhanced significantly, the area and output must have increased accordingly. The new crop procurement policy announced by the Central Government looks as a most prudent policy that would mitigate the uncertainty as well as the fear of volatile and unfavourable prices of those crops.

In this new Procurement Policy, the government has envisaged the three alternatives. In first, the additional crops would be procured by the Central Government with partnership of the concerned State Government. In second case, the seller of those crops would be paid the balance of M.S.P. and the market price by the government, but the farmers would have to register themselves with the regulated market of the area. In the third option, the private traders can procure those



products but those traders would have to pay the minimum support prices as announced by the Central Government. While analysing the probable impact of these three options, the first one looks as the most prudent and appropriate to enhance the confidence of the farmers because the Government either Central or State, would be responsible to pay the announced minimum support price. Definitely it would have a very favourable impact. The area as well as output of those high value crops that includes the pulses and oil seeds in the country would escalate.

Already, the country is producing enough food grains, and the rice is being exported. The wheat prices in the International Markets are not attractive that is why the export of wheat is not economical. But once the area under pulses, oilseeds and other high value crops would increase, it would reduce the import of those crops. It would not only save the precious foreign exchange, but even the consumers would be secured to purchase adequate quantity at the reasonable prices.

The sugarcane output of 30 million tonnes that is much higher than the required sugarcane for the demand of sugar of the country that is estimated to be 25 million tonnes. The area under paddy can be diverted for high value crops without impacting the food stocks of the country.

India is a country of small farmers, the large number of holdings belongs to marginal and small farmers below 2 hectares, those are 85.01 percent of the total holdings and holdings below 4 hectares are 95.05 percent of the total. Any agricultural policy must address the problems of this large number of farmers where the assured marketing is a significant imperative. As these farmers are to eke out their living by their farm income, they can't adopt the crops those are involving even an iota of risk. That is why all such farmers are opting for the wheat and paddy for their assured marketing at the announced prices.

For diversion of their cropping pattern towards the high value crops, the assurance of the sale of their crops at the remunerative prices would be the most significant factor.

While looking on the minimum support prices and per hectare yield of such crops, it is quite discernable that they are equally beneficial. The M.S.P. price of sunflower was only Rs.600 in 1990-91, but it was raised to Rs.4100 in 2017-18, similarly price of maize was raised to Rs.1425 from Rs.180 per quintal in the same period. Minimum support price of gram was raised to Rs.4000 per quintal in 2016-17 and that of soybean to Rs.3050, the price of moong was raised to Rs.5575 and similarly, the prices of other high value crops of pulses and oil seeds were raised.

There are certain other high value crops which are being used for medicines and for other necessities. The fruits and vegetables are also in the list of high value crops, but those are affected by the big volatility in their prices. Apart from minimising the post-harvest losses, it is imperative to explore the Export potential, but assured marketing is the well tested gladiator to enhance the production of these products. Only in one year of 2017-18, the vegetables worth Rs.5182 crores and fruits of Rs.4229 crores had been exported from the country. It had been observed that the daily use items like potatoes and onions had much volatility in their prices that is why their production had been affected. So many times the onions had been imported from other countries to meet the demand of the masses but at the other time, those had been exported. 'Operation Green' is now in place to address such price volatility and thereby increase their production.

Now when the new policy of procurement is announced, some of the high value crops of daily use including vegetables and fruits must be included in the list of state procurement on the basis of the high yielding crops of that area. The diversification of crops with the growing of other crops along with the traditional crops would promote the level of employment, adequate and regular use of machinery, proper use of inputs including water and enhancing of income through new policy of assured marketing.

It has been observed that a few agro-processing units are operating for value addition of agricultural products but availability of raw material is an issue. Such impediments can be removed by encouraging

the contract farming between agro-processing unit and the farmers with the prudent and suitable legal frame work in the state. The rules to obtain the material from the farmers and the disposal of their product to the processing units must be justified, safe guarding the interest of the farmers as well the processors for the smooth functioning of Agro Processing Industry. It is never desirable that the nation may waste its precious sources. The sources must be utilized to the maximum for the welfare and uplift of the farmers and the general public. The contract farming, a sort of assured procurement could be the best option. The new procurement policy with the objective of assured marketing must boost the area under high value crops.

The farm size is the most important factor of production, but area cannot be enhanced rather the size of the holdings would further deplete by division of land among family members. The yield of the crop is already at its saturation point particularly those of the principal crops, because of the application of the law of diminishing marginal returns. But yield of high value crops can be enhanced being the new crops. Even the new varieties of those crops can be evolved. The efforts of the government in this direction is yielding positive results.

While analysing the overall situation of cropping pattern in the country, it can be concluded that state procurement of some other high value crops must have its favourable impact in the enhancement of the income of the farmers particularly the small farmers, those are below 5 acres but precautions to mitigate the challenges must be adopted, while implementing this new procurement policy. The main among them is that the cropping pattern may not get drifted towards the high value crops, jeopardizing the food crops and food stocks of the country. As the new procurement policy would be adopted with the partnership of the states, so the states must identify the various zones even in the same states on the basis of the yield of the crop in the respective zone. The new procurement policy would prove much useful for enhancing the farm income, reducing the imports of pulses and oilseeds, saving of the foreign exchange and moreover for the best utilization of the limited sources for the best interest of the country.

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PM Dedicates Several Projects in Solapur, Maharashtra

The Prime Minister launched several development projects and laid foundation stone for various Projects in Solapur, Maharashtra recently.

Giving a boost to road transport and connectivity, the Prime Minister dedicated to the nation Four Laned Section of Solapur - Tuljapur - Osmanabad of NH-211 (New NH-52). The four laning of Solapur - Osmanabad highway will help improve the connectivity of Solapur, with the important Marathwada region of Maharashtra.

Highlighting the Government's vision for expansion of highways for better connectivity and ease of living, the Prime Minister said, "Over the past 4 years, nearly 40 thousand kilometers of national highways have been added; at a cost of around 5.5 lakh crore around 52 thousand kilometers of national highways are under construction."

Prime Minister also laid the foundation stone for 30,000 houses under Pradhan Mantri Awas Yojana. These will primarily benefit poor homeless people like rag pickers, rickshaw drivers, textile workers, beedi workers, etc. The total cost of the project is ₹1811.33 crores, out of which a total of ₹750 crores will be provided by Central & State Government as assistance.

Speaking on the occasion the PM said, "Today, we have inaugurated a project of 30000 homes meant for the family of poor, labourers. The beneficiaries of this project are those who work in factories, pull rickshaws, drive auto, etc." The Prime Minister added that efforts have been made to make housing affordable for middle class families. Now they can save up to Rs. 6 lakhs on home loans over a period of 20 years which is a reflection of the measures undertaken by the Government for Ease of Living.

In keeping with his vision of Swachh Bharat, the Prime Minister further dedicated to the nation, 'Underground Sewerage System', and three Sewage Treatment Plants in Solapur. This will increase the sewer coverage of the town and improve sanitation in the city. It will replace the existing system and also connect to the trunk sewers being implemented under AMRUT Mission.

He also laid the foundation stone of the Combined Project of Improvement in Water Supply and Sewerage System, as part of Area Based Development in Solapur Smart City, Augmentation of Drinking Water Supply from Ujani Dam to Solapur City and Underground Sewerage System under AMRUT Mission. The sanctioned cost of the project is Rs. 244 Crore under Smart City Mission. This project is expected to bring significant improvement in service delivery and improve public health enabled by technology as a means to create smart outcomes for citizens.

It is expected that these measures will go a long way towards giving a major push to road and transport connectivity, water supply, sanitation, employment generation etc. for the people in Solapur and the adjoining areas.



The Prime Minister, Shri Narendra Modi dedicates the Solapur-Tuljapur-Osmanabad section of New NH-52 to the nation and unveils foundation stone plaque of multiple development projects in Solapur, Maharashtra on January 09, 2019. The Governor of Maharashtra, Shri C. Vidyasagar Rao, the Union Minister for Road Transport & Highways, Shipping and Water Resources, River Development & Ganga Rejuvenation, Shri Nitin Gadkari, the Chief Minister of Maharashtra, Shri Devendra Fadnavis are also seen.

INSTITUTIONAL CREDIT FOR AGRICULTURE

TS Raji Gain, Manikumar S

Availability of Credit is the *sine qua non* for progress and growth of any sector, particularly agriculture, since most of those who are engaged in this sector belong to marginal and small farmer categories. Availability of timely and affordable credit facilitates the farmer to gain access to quality inputs and other support services. The strategy has, therefore, been to strengthen the role of institutional sources of credit to agriculture so as to replace informal sources of credit such as money lenders.

Agriculture including crop husbandry, animal husbandry (dairy, poultry, etc.), fisheries, forestry, agro processing, etc., provide the underpinning for our food and livelihood security. Agriculture provides significant support for economic growth and social transformation in the country. As one of the world's largest agrarian economies, agriculture sector (including allied activities) in India accounted for 14.8% of the GDP (at 2011-12 prices) in 2017-18, compared to 18.9% in 2004-05 and around 30% in 1990-91. Its role remains critical as it provides employment to around 50% of the workforce.

Production of major agricultural crops

The total food-grain production in India has witnessed a phenomenal increase, especially over the last decade. It has increased from 234.50 million tonnes in 2008-09 to a record 284.83 million tonnes in 2017-18. [Table 1]

Production of commercial crops like Oilseeds, Cotton, Jute and Sugarcane and horticulture crops like Tomato, Onion and Potato also witnessed steady growth, during the same period.

Investments in Agriculture

The increase in production seen above pre-supposes flow of investment, both public and private, for agriculture and allied activities. Besides production, such investments also helps in

increasing agricultural incomes, mitigating poverty and enhancing food security. In 2014-15, the private Gross Capital Formation in Agriculture [GCFA] accounted for 83% share, while that of public GCFA was 15%. Further, a push in public GCFA was seen to induce higher private GCFA.

Role of institutional credit in private GCFA

Availability of Credit is the *sine qua non* for progress and growth of any sector, particularly agriculture, since most of those who are engaged in this sector belong to marginal and small farmer categories¹. Availability of timely and affordable credit facilitates the farmer to gain access to quality inputs and other support services. The strategy has, therefore, been to strengthen the role of institutional sources of credit to agriculture so as to replace informal sources of credit such as money lenders.

As per AIDIS 2012-13, nearly 86% of the farm capital investment in India is undertaken with institutional/non-institutional sources of funds. While the farmers' dependence on borrowings for investment is more than 50% across all States, it is relatively higher and in excess of 90% in developed States like Andhra Pradesh, Kerala, Tamil Nadu, Punjab, Karnataka, Maharashtra and Madhya Pradesh. Further, at the all-India level, the share of such borrowings from institutional sources is estimated to be around 63%. (Table 2)

Table 1: Production of food grains [mn. tonnes]

Particulars	2008-09	2010-11	2013-14	2016-17	2017-18 ¹
Rice	99.20	96.00	106.70	109.70	112.91
Wheat	80.70	86.90	95.90	98.50	99.70
Coarse Cereals	40.00	43.40	43.30	43.80	46.99
Pulses	14.60	18.20	19.30	23.10	25.23
Total Food grains	234.50	244.50	265.20	275.10	284.83

(Source: Annual Report 2017-18, NABARD)

Table 2: Percentage of Farm Investment from Borrowings and share of Institutional Credit in total Borrowings in 2012-13

State	% of farm investment from Borrowings	Of which, % of Borrowing from institutional sources
Andhra Pradesh	98.9	44.6
Assam	49.9	61.4
Bihar	70.2	53.2
Chhattisgarh	76.9	58.3
Gujarat	84.4	78.8
Haryana	65.7	61.1
Himachal Pradesh	42.6	64.2
Jammu & Kashmir	36.9	43.8
Jharkhand	65.3	47.1
Karnataka	89.2	58.4
Kerala	95.5	82.7
Madhya Pradesh	90.5	79.8
Maharashtra	91.7	71.3
Odisha	66.1	70.9
Punjab	95.4	77.7
Rajasthan	86.6	55.9
Tamil Nadu	95.5	46.6
Telangana	98.8	41.8
Uttar Pradesh	83.5	47.2
Uttarakhand	85.5	64.3
West Bengal	79.2	69.4
All India	85.9	63.4

(Source: AIDIS, 2012-13 [Schedule 18.2])

However, it is also an accepted fact that in most of the States of the country, the marginal and small farmers are more dependent on the informal sources for meeting their credit needs. The percentage of credit that is met from informal sources is 40.6%, 52.1% and 30.8%, for the landless, marginal and small farmers, respectively.

Flow of Institutional Credit for Agriculture

India had adopted the multi-agency approach to purvey rural credit, since nationalization in the late 1960s. A large number of formal agencies like the Co-operative Banks, Commercial Banks and the Regional Rural Banks were actively involved in providing bank credit for agriculture and its allied activities. Even Non-Banking Financial Institutions [NBFCs], Micro Finance Institutions [MFIs] and Self

Help Groups [SHGs] were also involved in purveying agricultural credit.

Agricultural Credit Flow vis-à-vis Gol targets

In 2004, the Gol had announced a Farm Credit Package for doubling credit to agriculture sector in three years: 2004-07. The concerted efforts of all banks resulted in credit flow to agriculture doubling in two years from Rs.86,981 crore in 2003-04 to Rs.180,486 crore in 2005-06.

In the subsequent annual budgets, Gol set targets for institutional credit to agriculture to ensure flow of adequate bank funds to this sector. Since then, all banks, put together, have been consistently surpassing the targets set by Gol insofar as credit flow to agricultural sector is concerned. (Table 3)

Table 3: Agricultural Credit: Target Vs. Achievement [Rs. cr]

Year	Golagri credit flow target	Achievement by Banks	% Achievement
2010-11	375,000	468,291	125
2011-12	475,000	511,029	108
2012-13	575,000	607,375	105
2013-14	700,000	730,123	104
2014-15	800,000	845,328	106
2015-16	850,000	915,509	108
2016-17	900,000	10,65,755	118
2017-18	10,00,000	11,79,428	118

(Source: IBA, SLBC & NABARD)

Since March 2011, the agricultural credit flow has grown at a CAGR in excess of 14%! Further, it may also be observed from the above table that the credit flow has more than doubled since March 2012, which is quite remarkable. It may also be a reasonable assumption that this increase in credit flow had a more than direct impact in production of food grains touching record levels over the last decade, as already indicated in Table 1.

Further analysis of the agricultural credit flow based on tenure of loans [short-term availed mainly for crop cultivation, a.k.a. Crop Loans; and medium/long term mainly for investment activities in agriculture] reveals an interesting picture. (Table 4)

The decreasing trend observed in share of MT/LT agricultural loans till 2012-13 has seen a

welcome reversal and its share has steadily gone up to a high of 35.60% in 2017-18. This is encouraging, especially from the point of view of private capital investments in agriculture and allied activities like farm mechanization, minor irrigation structures including pump-sets, land development works, orchards, farm ponds and other water harvesting structures, animal husbandry, fisheries, etc. In short, quite a few of these investments go towards making permanent improvement in land quality, which will help in improving productivity of crops, which are financed out of ST Crop Loans. Further, States that have a high % of borrowing from institutional sources

(see Table 2) are also the States which account for a higher share in flow of MT/LT agricultural credit.

In fact, this reversal has not happened by itself. It was the result of concerted efforts to improve productive capacity of farms by institutions like Govt. Depts., NABARD and other stakeholders, working closely with one another. These efforts bore fruit, as the sub-targets for MT/LT agricultural loans was surpassed for the first time in 2016-17. (Table 5)

These long-term investments in agriculture has definitely contributed to production of various commercial and horticultural crops. (Table 6)

Table 4: Agricultural Loans: Short Term Vs. MT/LT Loans [Rs. cr]

Year	ST Crop Loans	MT/LT Agri Loans	% share of ST Crop Loans	% share of MT/LT Loans
2010-11	335,550	132,741	71.65	28.35
2011-12	396,158	114,871	77.52	22.48
2012-13	473,500	133,875	77.96	22.04
2013-14	548,435	181,687	75.12	24.88
2014-15	635,412	209,916	75.17	24.83
2015-16	665,313	250,197	72.67	27.33
2016-17	689,457	376,298	64.69	35.31
2017-18	759,552	419,876	64.40	35.60

(Source: IBA, SLBC & NABARD)

Table 5: Target Vs. Achievement of MT/LT Agricultural Loans [Rs. cr]

Year	MT/LT Agri Loan Target	Achievement by Banks	% Achievement
2010-11	155,000	132,741	86
2011-12	195,000	114,871	59
2012-13	230,000	133,875	58
2013-14	200,000	181,687	91
2014-15	225,000	209,916	93
2015-16	255,000	250,197	98
2016-17	285,000	376,298	132
2017-18	320,000	419,876	132

(Source: IBA, SLBC & NABARD)

Table 6: Production of Commercial & Horticulture Crops

Crops	2013-14	2014-15	2015-16	2016-17	2017-18*
Commercial Crops					
Oilseeds [MT]	32.8	27.5	25.3	31.3	30.6
Cotton [mn. bales of 170 kg each]	35.9	34.8	30.0	32.6	34.9
Jute and Mesta [mn. bales of 180 kg each]	11.7	11.1	10.5	11.0	10.6
Sugarcane [MT]	352.1	362.3	348.5	306.1	355.1
Horticulture Crops [MT]					
Tomato	18.7	16.4	18.7	20.7	22.3
Onion	19.4	18.9	20.9	22.4	21.4
Potato	41.6	48.0	43.4	48.6	49.3

(*3rd Advance Estimates of Production of Commercial Crops [2017-18], DoAC&FW, GoI)

How the different agencies contributed to agricultural credit flow

The *inter se* share of various agencies in flow of agriculture credit indicates a mixed trend. (Table 7)

Amongst the agencies, RRBs exhibited the highest CAGR, while the Co-operative Banks reported CAGR of nearly 10%. On analyzing *inter-se* share, it is seen that Commercial Banks have consistently maintained a share of more than 70%, while the share of Co-operative Banks at 13% has witnessed a steady slide from as high as 40% during 1999-2000. The Share of RRBs is slowly inching upwards and stands at 12% during 2017-18.

Widening Access to Agricultural Credit

To correlate the growth in agricultural production vis-à-vis no. of persons accessing institutional credit, one needs to look at the data on number of agricultural loan accounts financed by Banks. On this count also, there has been a steady and appreciable growth, across agencies, except Co-operative Banks. (Table 8)

The Commercial Banks, as a group, have exhibited phenomenal growth in number of borrowers financed, with a CAGR of nearly 20%. Co-operative Banks, which had a greater number

of agricultural loan accounts among all agencies until 2012-13, have witnessed a steady fall in their number of agricultural borrowers, while the RRBs have shown a growth of around 10%.

Coverage of Small and Marginal Farmers

Land holdings in our country are getting fragmented by the day. The share of land holdings less than 2 ha. (SF/MF holdings) are on the increase: from 70% in 1970-71 to 85% in 2011-12. Within this, what is more worrying is the increase in the number of marginal farm holdings (upto 1 ha.) which went up from around 3.56 crore to nearly 9.30 crore, now constituting two-thirds of the total agricultural land holdings. This fragmentation of land has serious consequences in terms of owning and using modern technology and farm equipments, and also in provision of inputs including agricultural credit and extension as also marketing.

Providing timely and affordable credit to this resource-constrained group is the key to attaining inclusive growth. The good news is that the share of small and marginal farmers in loan accounts as well as credit flow have improved, of late. Small and Marginal Farmers accounted for about 72% of agricultural loan accounts and 50% of the

Table 7: Agency-wise share in flow of Agricultural Credit [Rs. cr]

Year	Commercial Banks	Co-operative Banks	Regional Rural Banks	Total
2010-11	345,877	78,121	44,293	468,291
2011-12	368,616	87,963	54,450	511,029
2012-13	432,490	111,203	63,682	607,375
2013-14	527,506	119,964	82,653	730,123
2014-15	604,376	138,469	102,483	845,328
2015-16	642,954	153,295	119,260	915,509
2016-17	799,781	142,758	123,216	10,65,755
2017-18	886,771	150,242	142,415	11,79,428
CAGR [%]	14.40	9.79	18.16	14.11

(Source: IBA, SLBC & NABARD)

Table 8: Agency-wise No. of Agricultural Loan Accounts [No. in lakh]

Year	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	CAGR [%]
Commercial Banks	255	307	385	426	442	664	733	19.24
Co-op. Banks	309	311	321	306	324	269	256	(3.09)
Regional Rural Banks	82	85	99	121	133	137	145	9.97

(Source: IBA, SLBC & NABARD)



agricultural credit flow in 2016-17, up from 63% and 44% earlier. Loan amount per account has also seen improvement, across all categories of farm holdings. It means that there has been both widening (more people getting credit) and deepening (same people getting more credit) of institutional credit flow for agriculture, in recent years.

The Way Forward

Over the last so many years, key indicators like agricultural land use, area under cultivation and production of various crops, production and use of agricultural inputs, all have shown an impressive growth, contributing to increase in production of food grains and flow of institutional credit.

However, while our Net Sown Area[NSA], which was about 123 million hectares [mha] in 1950-51, increased to around 140ha during 1970-71 after the Green Revolution campaign, the NSA has remained almost stable thereafter, as competing pressures on land did not allow any new land to be brought under cultivation.

Our Gross Cropped Area (GCA) which was only 138 mha in the early 1950s [meaning only about 15 mha were double cropped then], steadily increased to about 185 mha by 1991, and has reached around 198 mha in the last few years. In other words, about 58 mha are multiple-cropped now, primarily due to availability of public or private irrigation. It is understood, however, that even if all irrigation sources are fully developed, almost half the cultivated land will remain unirrigated and will have to depend on the monsoons.

Further, increase in production will have to, therefore, come from improved

productivity. The productivity issues can be improved by ensuring better irrigation - through public or privately owned modes, better use of farm equipments, and timely availability and use of better seeds, fertilisers (bio or chemical) and other inputs. Availability and use of all these would depend a lot on availability of timely agricultural credit, extension services, better models of credit delivery and the like.

In order to realise the Vision of GoI to double the farmers' income by 2022, many new initiatives have been taken up and are being implemented by the Govt. of India, RBI, NABARD and the various stakeholders in this regard. The Kisan Credit Card [KCC] Scheme was envisaged to provide easy and hassle-free credit to the farmer. It has met with admirable success and with the launch of RuPay KCC, became more cost-effective. Policy enablers in the form of interest subvention on crop loans and credit-linked capital subsidy schemes have also contributed in providing a fillip to agricultural financing by banks. Financing to Self Help Groups and Joint Liability Groups [JLGs] are attempts to leverage on group collateral to provide credit to rural poor women and small and marginal farmers. Volunteers of Farmers' Clubs are encouraged to form JLGs for accessing institutional credit. Cooperative farming, collective farming, Farmer Producers Organizations [FPOs], JLGs, leasing out land or contract farming are some possible ways of aggregation, both for input supplies to reduce costs as also for marketing to ensure better prices.



Recent amendments to the Priority Sector guidelines by the RBI providing for specific sub-targets in flow of credit to SF/MF is also a welcome step. Financial products aimed at supporting more climate resilient and adaptive farming practices is the need of the hour. Credit flow for agro processing units, storage facilities, marketing infrastructure, etc., will facilitate in providing last-mile connect to enhance post-harvest value of agricultural produce. Simple insurance products that provides for hassle-free cover will also help improve resilience of the average Indian farmer and make agriculture a risk worth taking. A robust Negotiable Warehouse Receipt [NWR] system will enable farmers to monetize their produce early and avoid distress sale. The Union Budget 2018-19 also provides special focus for marketing of agricultural produce through electronically-linked *Gram in* agricultural markets. Riding on the achievements thus far, the Budget also envisages enhanced flow of institutional credit for agriculture of Rs. 11 lakh crore during 2018-19. Higher investments in agricultural infrastructure from out of the dedicated Long Term Irrigation Fund [LTIF] and the Rural Infrastructure Development Fund [RIDF] will further boost credit flow to this sector, thereby ensuring realization of

the mission to double farmers' income, in a manner ideally envisaged. Lot of change is happening, for sure. What is needed is to further speed up the pace of change. That will help in realizing the desired outcomes faster, and in full measure.

Endnotes

- 1 Marginal Farmers: having land holdings upto 1 ha.; Small Farmers: between 1 ha. and 2 ha.

Footnotes

- 1 As per 4th Advanced Estimates of Ministry of Agriculture and Farmers' Welfare, Govt. of India: released on 28th Aug. 2018

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National Youth Parliament Festival 2019

The National Youth Parliament Festival 2019 was launched on 12th January 2019 by the Minister of State (I/C) for Youth Affairs and Sports Col Rajyavardhan Rathore thereby beginning the celebration of the National Youth Day 2019.

The Prime Minister Shri Narendra Modi, in his Mann Ki Baat address on 31st December 2017, had shared his idea of organizing Youth Parliaments for young people in every district of the country. It is to provide a chance to the youth to brainstorm about new India and to find ways and chalk out plans to realize our resolves before 2022. He reiterated his idea to capture the voice of the youth in his address to the youth.

Ministry of Youth Affairs and Sports proposes to take the Youth Festival to each district of the country and celebrate it as the "National Youth Parliament Festival". National Youth Parliament Festival 2019 is organised on the theme of "Be The Voice of New India" and "Find solutions and contribute to policy". Youth in the age bracket of 18-25 years are invited to participate in the District Youth Parliaments. The National Youth Parliament Festival will also encourage the youth to engage with public issues, understand the common man's point of view, form their opinion and express these in an articulate manner. It is expected that more than 50 thousand youth will participate through Youth Parliaments at all levels and the narrative will be strengthened and made more vibrant by their voices and ideas and suggestions.





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NEW INITIATIVES IN RESEARCH AND EXTENSION

Dr Jagdeep Saxena

After the globally acclaimed Green Revolution during 1960s, Science-led synergistic extension approach led the agricultural sector towards white, blue, golden and pink revolutions. Further, a strong extension support is also imperative to disseminate emerging technologies at grass root level for quick adoption and practice. The interface between research and technology transfer is indeed very critical for converting research outputs into farming outcomes. Hence, Government of India, with its commitment to double farmers' income by 2022, launched several new and innovative initiatives to accelerate agriculture growth rate sustainably.

Research and extension are among the core activities identified for accelerating agricultural growth and prosperity of farmers. And there are sound reasons for it. National Academy of Agricultural Sciences observed, 'Investment in agricultural research in India has been a win-win option as it was the largest contributor to the agricultural total factor productivity, which in turn significantly contributed to reducing rural and urban poverty. During 1980-81 to 2006-07, the average internal rate of return to the investment in agricultural research was about 46 per cent, which is comparable to that obtained internationally. After the globally acclaimed green revolution during 1960s, science-led synergistic extension approach led the agricultural sector towards white, blue, golden and pink revolutions. Further, a strong extension support is also imperative to disseminate emerging technologies at grass root level for quick adoption and practice. The interface between research and technology transfer is indeed very critical for converting research outputs into farming outcomes. Hence, Government of India, with its commitment to double farmers' income by 2022, launched several new and innovative initiatives to accelerate agriculture growth rate sustainably.

New Varieties, New Hopes

To address the core concern of productivity in Indian farming, research efforts were focused on development of new varieties that give higher yield and show resistance/tolerance to pest and diseases. Studies indicated that by using high-yielding varieties, the yield increases in the range of 15-20 per cent depending upon the crop. It can be further be raised up to 45 per cent with efficient management of other inputs. Responding to the call, ICAR developed and released a total of 795 new crop varieties during last four years and 136 varieties of horticultural crops. Most of the varieties exhibit the most desired

trait of high-yield, but few are specialized varieties, with specific attribute such as wheat variety HD CSW-18, which is the first variety specifically bred for conservation agriculture. It will reduce water requirement and will help in residue management. Similarly, to boost up production of pulses, an extra-early (52-55 days) high-protein variety of Mungbean, called Virat, was released along with short duration (100 days) and iron rich variety of Lentil (Pusa Ageti Masoor). These varieties are first of their kind in respective crops.

Considering the high cost of seeds of Bt cotton hybrids, eight GM Bt cotton varieties were developed for the first time in India for commercial cultivation. These varieties are tolerant to devastating cotton bollworm and its seeds can be used by farmers for 2-3 years in contrast to Bt cotton hybrids in which costly seeds have to be purchased every year. Waging a war against malnutrition through agricultural research, an array of biofortified varieties of field crops and horticultural crops have been developed. For example, the rice variety CR Dhan 310 is protein rich, whereas wheat HPBW01 carries extraordinarily high iron and zinc content; among fruit crops pomegranate 'Solapur Lal' has iron, zinc and vitamin C, and Medika grape is full of anti-oxidants that help fight cancer.

Improved Livestock for Livelihood security

Livestock (including poultry and fisheries) play a central role in livelihood of farmers by assuring additional income with low investment, and also an 'insurance' against climatic distress. Hence, breeds of popular livestock species were developed through systematic research mainly for higher production. In this context, four backyard poultry varieties were developed and released having more than double the egg production as compared to native/local breeds (50-70 eggs/annum). 'Jharsim' poultry bird released

for Jharkhand and Bihar has a capacity of producing 120-130 eggs per annum; 'Narmada Nidhi' for Madhya Pradesh (180 eggs/annum), 'Kamrupa' (118-130 eggs/annum) for Assam and 'Himsamridhi' for Himachal Pradesh (140-150 eggs/annum) are other poultry varieties showing promise in their respective region. A new advanced breed of sheep 'Abhishan' has been developed for dry areas of the country which has shown the promise of raising the income of sheep farmers. Nine improved cross bred varieties of pig were developed and released for north-east and south region where pig farming is popular and a remunerative enterprise for farmers.

To improve livestock health, an ambitious research program to develop indigenous vaccines and diagnostic kits was launched in ICAR institutes. Vaccines developed against PPR, sheep pox, equine influenza, classical swine fever and Johne's disease have been found effective against respective diseases. Diagnostic kits developed for Japanese Encephalitis, Brucellosis, FMD and Avian influenza are performing with equal accuracy as that of their imported counterparts, but at a much lower cost.

In fisheries sector, the technology of marine cage culture of high-value Cobia and Silver Pompano fishes is proving a game-changer technology in coastal regions. It has demonstrated impressive average production levels of 3.0 tonnes in six months, that is, 25-30 kg per cubic metre. During 2017-18, 1095 cages have been installed all along the coast line of India. Research has also propelled India into an era of new-generation fishing vessels that are fuel-efficient, multi-purpose and cost-effective. State-of-art fishing vessel has been commissioned and is being used for trawling, gill-netting and long-lining. Innovative fishing crafts and gears have been developed to increase efficiency and output.

More nutritious and low-cost fish feeds developed by modern research are gaining popularity among aquaculturists. Under an innovative research pathway, high value compounds and nutraceuticals have been developed for human health and have been commercialized also. Green mussel and green algae extract for pain and arthritis; seaweed anti-diabetic extract for type-2 diabetes; seaweed anti-obesity extract to combat obesity/dyslipidemia; and seaweed nutraceutical drink for enhancing micronutrients level are some of the popular green remedies gaining ground in pharma sector.

Integrated Farming for Improved Income

Recently, integrated farming system (IFS) approach has become a core research activity due to its potential to increase farmers' income and site-specific employment to small land holders. Additionally, it cuts-down cultivation cost through multiple use of resources and provides desired resilience to climate change scenario. IFS involves synergic blending of crops, horticulture, dairy, fisheries, poultry etc. to optimize use of by-products, residues and wastes generated in each system in compatible and sustainable manner. Integrated rice-fish-poultry farming system and rice-fish-vegetable model have successfully increased net income of farmers in southern and east region respectively. In the latter model, rice production increased from 2.97 tonne/hectare to 4.6 tonne/hectare with additional benefit of 41kg fish and 1.7 tonnes vegetable from 2,800 square meter rice fields. Integration of Makhana with fish and water chestnut not only increased farmers' income, but also generated employment at site. Scientists have also developed a unique system where farmers can grow three different vegetables on the same piece of land at a time. Called 'three-tier' system, this intervention has made a big impact in and around Vaishali district of Bihar, and is gaining popularity in north Bengal and north-east region.

Development of agri-voltaic system for fields is a breakthrough research, where electricity is generated by installing solar PV modules in fields and crops are cultivated in inter space area. Rain water is also harvested from top surface of PV modules. Annual income from PV generated electricity is estimated as Rs. seven lakh per hectare in addition to income from field crops. Rainwater harvested from PV modules can be used as supplemental irrigation to crops.

Lab to Land

Farmers, being the end-users of agricultural research, are at the centre-stage of out-reach systems designed for speedy dissemination of agricultural technologies. A vast and pan-India network of 692 Krishi Vigyan Kendras are extending training and technology support to the farmers for quality seed, planting material and animal/fish seed production. Additionally, on-farm trials and front-line demonstrations of latest technologies are convincing farmers to adopt new package of practices in their fields. Analysis of soil nutrient status and water samples at field level is helping farmers to achieve nutrient efficiency and water use efficiency. Recently, 35 KVKs launched a massive campaign to motivate

farmers against burning of straws and stover's in fields mainly in Haryana and Punjab. A total of 1200 live demonstrations of relevant machineries and residue management practices were conducted in over 4,700 hectare area to minimize this malpractice among farmers.

To address the challenge of climate change at village level, ICAR and Department of Agriculture Co-operation and Farmers Welfare are working collaboratively to demonstrate 100 climate resilient and integrated farming technologies at farmers' fields. So far, 151 climate resilient villages have been established in most climate sensitive regions. In this context, contingency crop plans have been developed for 623 districts which include technology solutions to overcome weather disasters in crops, horticulture, animal husbandry, poultry farming, fisheries and other fields. Contingency planning provides information on alternate crop varieties and agronomic measures to be taken up in case of weather related extreme events. During last four years, scientists have developed over 490 crop varieties with significant climate resilience characteristics. Recently, Honorable Prime Minister dedicated the Nanaji Deshmukh National Phenomics facility to the nation that is located at the Indian

Agricultural Research Institute, New Delhi. This state-of-art research facility will prove a boon to overcome the adverse effects of the changing climate on various agricultural crops.

In a novel extension scheme named 'Mera Gaon Mera Gaurav', four agricultural scientists work with five identified villages and share their experiences on agriculture and allied enterprises to solve the issues and problems of farmers at field level. Scientists have started working in 13,500 identified villages. 'Attracting and Retaining Youth in Agriculture' (ARYA) is another extension program which emphasizes entrepreneurship development and value chain management to attract and empower the youth in rural areas. The program is being implemented in 25 states through 25 KVKs. A unique "FARMER first" scheme is an enriching Farmers-scientists interface through which scientists are working with more than 48,000 farm families to increase their income. An effective alliance between agricultural research and extension is paving way for higher agricultural growth and prosperity of farmers.

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ICAR-Driver of Agricultural Research and Extension in India

The Indian Council of Agricultural Research (ICAR), established in 1929 is dedicatedly serving the nation as an apex body of agricultural research, education and extension under Ministry of Agriculture and Farmers' Welfare, Government of India. ICAR has successfully harnessed the power of science, technology and innovation for food security, farmer's prosperity and has catalyzed sustainable growth in agriculture sector. Scientific interventions developed by ICAR have enabled the country to increase the production of food grains by 5.4 times, horticultural crops by 10.1 times, fish by 15.2 times, milk 9.7 times and eggs 98.1 times since 1951 to 2017.

With 101 national level research institutes, national research centres, national bureau, directorates/project directorates; 60 All India Co-ordinated Research Projects; 19 Network Projects; and 71 Agricultural Universities spread across the country, ICAR is one of the largest national agricultural systems in the world. Mandate of ICAR is comprehensive and vast dealing with agriculture and food spanning across crops, natural resources, livestock and fisheries. Indian farmers, livestock owners, fishers and village-based entrepreneurs are its main client and benefactor, hence, ICAR has adopted the 'farmer first' approach which is part of its motto also.

On the extension front, ICAR operates an innovative and robust system through its 692 Krishi Vigyan Kendras (Farm Science Centres) located in every nook and corner of the country. KVKs provide last mile connectivity to farmers and minimize the time lag between technology generation and adoption. With concerted and dedicated efforts, ICAR has evolved a number of innovative pathways for disseminating breakthroughs in technology to farmers and agripreneurs.

ICAR is leading the nation towards attaining sustainable food, nutritional and livelihood security through agricultural research and extension. ICAR is also striving to enhance natural resources base to promote inclusive growth and sustainable development.

PM Launches Several Infrastructure Projects

Gangajal Project to Provide Better and More Assured Water Supply to Agra

Giving a major push to develop and enhance tourism infrastructure in Agra, the Prime Minister launched a series of development projects worth Rs. 2900 crores for Agra city and the adjoining areas on 9th January 2019. The Prime Minister dedicated to the nation, Gangajal project, which will provide Agra with better and more assured water supply, at an estimated cost of Rs.2880 crores. Gangajal project aims to bring 140 cusecs of Ganga water to Agra. This will help meet the drinking water demands in the city.

The Prime Minister also laid the foundation stone of Integrated Command and Control Centre for Agra Smart City. In this project CCTVs will be installed throughout Agra City for monitoring and surveillance for the purpose of safety and security. This will help to develop Agra as a modern world class smart city, befitting its stature as a premium tourist destination, at a total cost of Rs.285 crores.

Under Ayushman Bharat Yojana, the Prime Minister laid the foundation stone of the upgradation of SN Medical College in Agra. It will result in creation of a 100 bed maternity wing in the Women's hospital, at an estimated cost of Rs.200 crore and add to the health and maternity care for the weaker sections of the society. The Prime Minister further laid the foundation stone of a sewerage network project for the western part of Agra under AMRUT scheme. The project will lead to improved sanitation facility in over 50000 houses.

Infrastructure Development Projects in Odisha

The Prime Minister launched several development projects worth Rs. 1500 crores and laid foundation stones of various projects in Balangir in Odisha on 14 January, 2019. He dedicated Multi-Modal Logistics Park (MMLP) Jharsuguda to the Nation. Giving a boost to rail projects, the PM inaugurated the Balangir-Bichhupali railway line built at an estimated cost of Rs. 115 crores. The PM also dedicated to the nation, the new bridge over Nagavali River, doubling of railway lines between Barpali-Dungaripali and Balangir-Deogaon and electrification of 813 km of Jharsuguda-Vizinagaram and Sambalpur-Angul lines. He also laid the foundation stone of Kendriya Vidyalaya in Sonepur at an estimated cost of Rs.15.81crore. The Multi-Modal Logistics Park (MMLP) at Jharsuguda is built at a cost of Rs 100 crores and will facilitate EXIM and domestic cargo including private freight traffic. Many important industries like steel, cement, paper etc are located around the facility and will benefit from it. The Multi-Modal Logistics Park will establish Jharsuguda as a prime logistics hub in Odisha and boost ease of doing business in the State.

The 15 km Balangir-Bichhupali New Railway Line would connect coastal Odisha with western Odisha synchronising development across the State. It will reduce travel time from Bhubaneswar and Puri to major cities like New Delhi and Mumbai. The line would benefit many MSME and cottage industries in Odisha and open up opportunities for the mining sector in Odisha.

Speaking on the occasion and highlighting the importance of connectivity and education, he said, "Education leads to human resource development. But, it is connectivity that transforms such resources into opportunity. Inauguration of 6 railway projects is an effort of our endeavour to enhance connectivity. It will facilitate movement of people, make mineral resources more accessible to industry and help farmers to take their produce to far-off markets, furthering 'Ease of Living' for Odisha's citizens".

PM Dedicates Kollam Bypass on NH-66 to the Nation

The Prime Minister dedicated the 13 km, 2-lane Kollam bypass on NH-66 to the nation on 15 January 2019. Addressing a gathering, Prime Minister said that infrastructure development has been the priority of his Government and the Kollam bypass is an example. Kollam Bypass will reduce travel time between Alappuzha and Thiruvananthapuram and decongest the traffic in Kollam town.

The Prime Minister said that the government is committed to ensure timely completion of all the projects. He said that through PRAGATI, more than 250 projects worth Rs.12 lakh crores have been reviewed at his end.

Highlighting the progress in road connectivity, the PM expressed hope that the government will reach the target of 100 per cent rural road connectivity soon. Regional air connectivity and expansion of railway lines have shown marked improvement resulting in creation of job opportunities. The Prime Minister said, "When we construct roads and bridges, we do not only connect towns and villages. We also connect aspirations with achievements, optimism with opportunities and hope with happiness."

MICRO-IRRIGATION FOR AGRICULTURAL GROWTH

Dr. Khadeeja Priyan

Micro irrigation leads to substantial increase in farm income, larger area of cultivation, low cost of cultivation especially irrigation cost and weeding cost, increased yield of produce, enhanced quality of crops with optimum water use efficiency. It is possible to control water application rate and fertilizer application dosage. Farmers can judiciously adopt the cropping pattern and crop intensity due to improved water availability situation. High valued cash crops can be cultivated easily. Moreover, micro irrigation can be applied to all kinds of lands.

India accommodates more than 17% of world's population, but the country has only 4% water resources and 2.5% land resources of the world. Water is a scarce natural resource and there is a huge demand-supply gap to meet the requirements of various sectors. The highest water demand is from irrigation, a critical input for agriculture production and its current demand in the country is around 80%. Since the demand from agriculture sector and other sectors (industrial demand, public water supply etc) are ever increasing and it is difficult to identify additional sources of water, optimal use of available water is essential. Demand management is the most appropriate strategy to manage the scarce resources and according to National Water Policy (2012) by Ministry of Water Resources, Government of India, water saving in irrigation has been given vital importance to achieve water use efficiency.

Hence, efficient irrigation technologies are inevitable for enhancing water productivity. Micro irrigation is an innovative water saving technology in which water is directly supplied to the crops with very less conveyance and evaporation losses. Saved water can thus, be used more efficiently for meeting other economical or ecological needs. The major advantage of this technology compared to traditional surface flooding method is that micro irrigation reduces non-beneficial evaporation and non-recoverable percolation of water. Hence, this technology boosts up overall water use efficiency.

Micro-irrigation is considered as a prudent irrigation technology promoted nationally and internationally to achieve higher cropping intensity and irrigation intensity through more focussed application of water to crops. Different types of



systems are drip irrigation, sprinkler irrigation, micro-sprinkler, porous pipe system, rain gun etc., where drip irrigation and sprinkler irrigation dominate among all these systems. The major crops cultivated under drip irrigation are sugarcane, banana, cotton, lemon, grapes, oranges, mangoes and wide variety of vegetables. Sprinkler irrigation is mainly used for groundnut, wheat, millet, sorghum, mustard etc.

Benefits of Micro Irrigation

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), launched by Government of India in the year 2015, considered micro irrigation as its integral part due to enhanced water productivity and water use efficiency through its proximity and focussed water application. As per the survey conducted for Government of India by IAI et al (2016), across 13 states consists of 5892 beneficiaries of National Mission on Micro Irrigation (NMMI), the following advantages are listed as compared to traditional surface flooding method.

- i) **Increase in water use efficiency:** Micro irrigation helps in significant reduction of water conveyance losses, runoff, evaporation losses, and seepage & deep percolation losses. This ensures higher water use efficiency up to 50-90%.
- ii) **Energy Efficiency:** Micro irrigation requires minimum pressure and low flow rate only. Hence, this ensures energy consumption saving up to 30.5%. Even small wells and tanks can also be used as a source of water. Since this system requires very low pressure, off-grid farmers can use solar pumps or diesel pumps.
- iii) **Fertilizer Use Efficiency:** Proper mixing of fertilizers and water, control of optimum dosage and direct application of fertilizers to the root zone result in the saving in fertilizer consumption up to 28.5%.
- iv) **Productivity increase:** The crop yield (quantity and quality) is increased and the enhancement in productivity is estimated for fruits / crops up to 42.4 % and for vegetables up to 52.7%. This ensures good economic return for the better yields.
- v) **Irrigation cost saving:** This technology reduces the overall cost of irrigation due to decrease in labour requirement for irrigation, weeding and

fertilizer application. Irrigation cost saving is up to 31.9%.

- vi) **New crop introduction:** Farmers can judiciously add more new crops due to improved water scenario and it was estimated that as many as 30.4% farmers have done it. Some of the farmers have tried intercropping and crop rotation also.
- vii) **Increase in farmers' income:** The average income of all beneficiaries in all 13 districts was found to be increased up to 42%. More focussed and judicious use of water & nutrients result in good quality produce and increase in farmers' income. Moreover, the reduction in spacing between the plants can accommodate more number of plants.

There are many other benefits of micro irrigation adoption. Mixing of nutrients & water is possible in the drip irrigation system itself and the solution can be directly supplied to the root zone of the plants. Water and fertilizer application efficiency are improved significantly. This has a long term impact to regain land fertility and ultimately increase in land productivity. Crop yield depends upon water availability at the root zone and soil nutrients at different stages of plant life.

Farmers are motivated to use this technology due to various reasons. Pre-monsoon cultivation and early harvest are possible. Hence, the crop will not be affected even if the monsoon withdraws early or an insufficient monsoon. Micro irrigation leads to substantial increase in farm income, larger area of cultivation, low cost of cultivation especially irrigation cost and weeding cost, increased yield of produce, enhanced quality of crops with optimum water use efficiency. It is possible to control water application rate and fertilizer application dosage. Farmers can judiciously adopt the cropping pattern and crop intensity due to improved water availability situation. High valued cash crops can be cultivated easily. Moreover, micro irrigation can be applied to all kinds of lands.

Recently, drip irrigation with mulching is used to prevent evaporation, maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions. Mulching can help to improve crop yield and optimize water use. Different materials for mulching can be organic (eg:-straw, shredded bark, wood chips etc) or inorganic (eg:-plastic sheets, gravel etc). Biswas et al. (2015) show that the yield

and yield contributing characters of Tomato in drip irrigation with mulching are much higher than that for only drip irrigation.

Technology Promotion

Micro-irrigation is suitably applied to irrigated agriculture of water scarce regions of developing countries. Government has initiated micro irrigation in the Tenth Five Year Plan (2002-2007). Since then, keen initiatives are being taken by Central Government, State Governments, some NGOs and some business firms to promote and propagate this new technology. Micro-irrigation has been given special importance in Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) with the aim of extending irrigation cover ('Har Khet Ko Pani') and improving water use efficiency ('Per Drop More Crop') to improve various water development and management activities. These initiatives are in terms of financial support, technical support and institutional supports. Initially, this technology was highly capital intensive and could be afforded by only rich farmers for their large farm holdings. Though it was economically viable, the awareness was also very less. Aga Khan Rural Support program (AKRSP), an NGO is actively working in Gujarat and International Development Enterprises (IDE), a non-profit voluntary organization is actively working in Maharashtra and Gujarat to innovate low cost micro irrigation systems for small and marginal farms and create awareness among poor farmers.

Gujarat is one of the high performing states in India and this State has established 'Gujarat Green Revolution Company (GGRC) Limited' in 2005 for successful implementation of Government schemes for micro-irrigation. GGRC provides all necessary

infrastructures for crop cultivation, facilitates cultivation under adverse climatic conditions, and helps to develop market linkage for the produces and to enhance economic conditions of the small and marginal farmers.

Various subsidies are also available from the Government. Small and marginal farmers in India are entitled to get a subsidy up to 55% of the total cost of the system and the same for other farmers up to 45%. Tribal farmers and farmers from dark zone areas are given additional benefits. Region wise benefits are also available. It has been observed that highest adoption of this technology is from medium category farms (2-10 Ha), followed by small farms (1-2 Ha). Farmers of marginal farms (less than 1 Ha) and large farms (>10 Ha) have so far not appreciated it due to subsidy regulations.

Effective Implementation of Technology

Some reports state that micro irrigation programme implementation is facing some problems. Harsha (2017) reveals that it may be due to the following reasons. (i) Energy crisis due to power outages and unscheduled interruptions across rural and urban India. This problem may be solved by integrated drip irrigation with solar panel system which is considered as the best option for off-grid farmers. In one of the banana fields in Gujarat (Figure), it was estimated that the pressure requirement was only 1-1.5 kg/cm² for in line dripper. A solar pump system in this field consists of 12 solar panels each of capacity 250 Watt, can operate a pump of 3 Horse Power (HP) capacity. (ii) Expensive micro irrigation: Most of the adopters are wealthier farmers and poor farmers cannot afford it. This problem is resolved by inventing low cost systems by different agencies. International Development Enterprises (IDE), an NGO is actively working in Maharashtra and Gujarat innovate low cost micro irrigation systems and create awareness among poor farmers. There are two types of micro irrigation systems: (i) Low cost micro irrigation technologies and (ii) Commercialised state-of-the-art micro irrigation systems. The low cost irrigation technology consists of various affordable designs for poor farmers such as "pepsee", easy drip, micro sprinkler, micro



tube drip systems and different designs by IDE. Second category includes conventional drip and sprinkler systems. (iii) Declining landholdings and farm income: In the Banana field in Gujarat, the spacing required for traditional irrigation (TI) is 6 ft x 6 ft whereas in drip irrigation, it can be reduced up to 5 ft x 5 ft. The area required per plant is approximately 25-30 sq.ft in drip irrigation which is less than the area required in TI (36 sq. ft). It has been estimated that both quality and weight of bananas are increased by 10%. The payback period for the entire system is estimated to be 1-4 cropping seasons. Earlier, grid connected farmers had to pay electricity charges to operate the pumps. Now, farmers can earn money by creating their own micro-grid to sell power. This can be achieved by directing the extra power generated by solar panels to the main grids. (iv) "Per Drop More Crop" Fallacy: This explains whether the real water saving happens through reduction in evapo-transpiration or not. There are additional benefits of optimum irrigation frequency. Proper irrigation frequency and fertilizer dosage can be adjusted at different stages of plant growth. For each plant in the banana field, water is to be supplied on alternate days at a rate of 4 litres per day and it should be increased to 4-6 litres per day during summer months.

The major disadvantage of solar panel enabled micro irrigation system is that farmers have to schedule irrigation during sunshine hours only, which otherwise they would be using the time for other productive works. However, this problem may be solved by constructing large storage tanks and connecting with the system. On the other hand, some of the grid connected farmers are getting electricity alternatively one week during day time and the following week during night time.

Conclusion

Total water demand from agriculture sector is around 80%, any effort for saving irrigation water will contribute to water use efficiency. There are many benefits of micro irrigation which can be listed as increase in water use efficiency, optimum dosage of fertilizer and proper mixing, reduction in the cost of cultivation, reduce drudgery, conserve water resources etc. Increase in the quantity and quality of crop yield is another notable benefit. Proper mixing and the direct application of fertilizers to the root zone results in the saving in fertilizer consumption. This has a long term positive impact to achieve land productivity. Various research studies show that micro-irrigation is

economically viable. In addition to this, use of solar panels for working of pumps will be more helpful to farmers. More focussed and judicious use of water has resulted in increase in farmers' income. Hence, micro-irrigation has been considered as an innovative technology to accelerate sustainable agricultural growth.

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Constitution (103rd) Amendment Act, 2019

The President has given his assent to the Constitution (One Hundred and Twenty Fourth Amendment) Bill, 2019. The Act providing 10 per cent reservation in government jobs and educational institutions to Economically Weaker Sections (EWS) among upper castes has come into effect. The Government notified 14th January as the date on which the provisions of Constitution (103rd) Amendment Act, 2019 will be effective. The Act amends Articles 15 and 16 of the Constitution by adding a clause which allows States to make special provision for the advancement of economically weaker sections in the general category.

STREAMLINING STORAGE AND MARKETING

Dr. Rekha Dhanai

Government has invested Rs 45,000 crore for creation of warehousing facilities across the country between 2018 and 2020. Different categories of warehousing are expected to create during the period which generates around 20,000 jobs during these years at different levels of specification and specialization. Two prominent changes that have created a significant growth prospects in warehousing are the implementation of GST in India and creating a unified taxation, and the rapid growth of e-commerce necessitating building of large scale warehousing across various locations. Peripheral locations of tier 1 and tier 2 cities are expected to be the prime beneficiaries of the new wave of growth in warehousing.

The Government is focussing on efficient functioning of agriculture sector both in terms of its productivity and marketing. While productivity, storage and transportation are supply side factors, markets provide an intermediate link between producers and final consumers. Efficient functioning of market provides welfare of producers as well as consumers. Better storage and transportation facilities for agricultural products can add to the productivity of farm resources thus making domestic agricultural sector more competitive in international markets.

The challenges posed by present and future global food supply will continue to push the agro & food sector towards technological innovations and interventions. At the same time, new technological developments in agro-sector also pose new

challenges. Therefore, the focus is mainly on technological developments in agriculture sector, which in turn are assessed within the context of social, economic and political developments around the globe.

An uneven supply of agricultural products or agricultural output is characterised by irregularity due to the annual and multi-annual seasons of biological processes and their subordination to disease and climatic change. Generally, the supplies of agricultural produce are dependent on weather and climate, the time period of biological growth process and the perishable nature of numerous agricultural products. Therefore, the supply of agricultural products is characterised by instability, both quantitative and qualitative. This leads to an absence of spontaneous adjustment of supply to



meet demand for agricultural products. Some studies reveal that less-than-optimal market mechanisms that strongly shape the poor adjustment between supply and demand for agricultural products are failing infrastructure for warehousing and transportation, weakness in the banking system with the absence of credit and insurance markets, non-competitive situations (a limited number of buyers in dominant positions), asymmetries in access to and quality of information, rules and norms applied in a discriminatory fashion, formal and informal taxation leading to higher costs due to lack of transparency in pricing and the factors that govern it. Agriculture is not merely only about agricultural products, but it also involves all the socio-economic processes and organisations that drive it.

Agricultural and horticultural produce are very important parts of human diet. The agricultural and horticultural crops production has been steadily increasing due to advancement in production technology and high yielding varieties development, but improper handling and storage of these commodities results in high losses before reaching to the consumers. Storage and proper transportation is the most important aspect of food supply chain that ensures food security and round-the-year quality food supply of a country. According to World Bank Report, the food grains and perishables which are wasted due to improper storage could be sufficient to feed the one-third of world's poor population. Quantitative as well as qualitative losses occur during storage due to physiological changes, insects, rodents, and micro-organisms. Storage conditions, environmental factors, gas composition, management practices etc. affect the shelf life and quality of agricultural produce to a great extent.

Strengthening Cold Storage/Warehousing

Cold storage technology is an integral part of post-harvest management of many fruits, vegetables and processed products. Cold storage plays a vital role in reducing post-harvest losses of edible commodities by increasing their storability and shelf-life. Timely storage of perishable commodities in required temperature also makes their supply continuous. Realizing the significance of proper and timely storage, a strong growth is being predicted for cold storage. As per a recent report by ASSOCHAM, it is reported that Indian cold-chain industry, which stood at Rs. 102 billion in 2009 is expected to register a compound annual growth rate of 25.8% and it will touch to Rs 640 billion by 2017. At present, 6227 cold stores are available in India with a storage capacity

up to 3000 million tonnes. Present requirement of cold storage capacity for food products (fruits and vegetables) is around 61 million tonnes in India. Lack of cold storage space, is one of the major reasons behind higher post-harvest losses of fruits and vegetables in India which reach up to 25 to 40 % of the total production on an annual basis. Shortage of adequate storage space with associated infrastructure and transportation facilities, gluts are very common at the time of harvest for many edible commodities.

Government has invested Rs 45,000 crore for creation of warehousing facilities across the country between 2018 and 2020. Different categories of warehousing are expected to create during the period which generates around 20,000 jobs during these years at different levels of specification and specialization. Two prominent changes that have created a significant growth prospects in warehousing are the implementation of GST in India and creating a unified taxation, and the rapid growth of e-commerce necessitating building of large scale warehousing across various locations. Peripheral locations of tier 1 and tier 2 cities are expected to be the prime beneficiaries of the new wave of growth in warehousing. Of all the categories, warehousing will be witnessing the highest investment of over Rs 35,000 crore in the next 3 years, mostly in asset creating.

Agricultural Marketing in India

Marketing is as important as production of agricultural crops. So, marketing reforms should be an integral part of any policy for agricultural development. Agricultural Marketing is a process that starts with a decision to produce a saleable farm commodity, and it involves all aspects of market system (functional and institutional), based on technical and economic considerations. It includes pre and post-harvest operations, assembling, grading, storage, transportation and distribution or marketing. Besides the physical and facilitating functions of transferring the goods from producers to consumers, the marketing system also performs the function of discovering the prices at different stages of marketing and transmitting the price signals in the marketing chain.

Agriculture Marketing in India promotes the efficient use of resources in the production and distribution systems. Therefore, agricultural market policies are treated as an integral part of development policies and their functioning has remained an important part of public policy in India.

Government Initiatives for improving Agricultural Marketing

Policy interventions in agricultural markets in India till the mid-1960s was mainly meant to facilitate the smooth functioning of markets and to check on hoarding activities that were considered unfriendly to producers and/or consumers.

Consequently, the country has adopted a package of direct and indirect interventions in agricultural markets and prices. Initially targeted at procuring and distributing wheat and paddy, it has gradually expanded to cover a number of other crops/products and aspects of domestic trade in agriculture. The present policy framework for intervention in agricultural markets and prices can be broadly grouped under three categories— Regulatory measures; Market infrastructure and institutions; and Agricultural price policy.

Regulatory Measures for Development of Agricultural Marketing

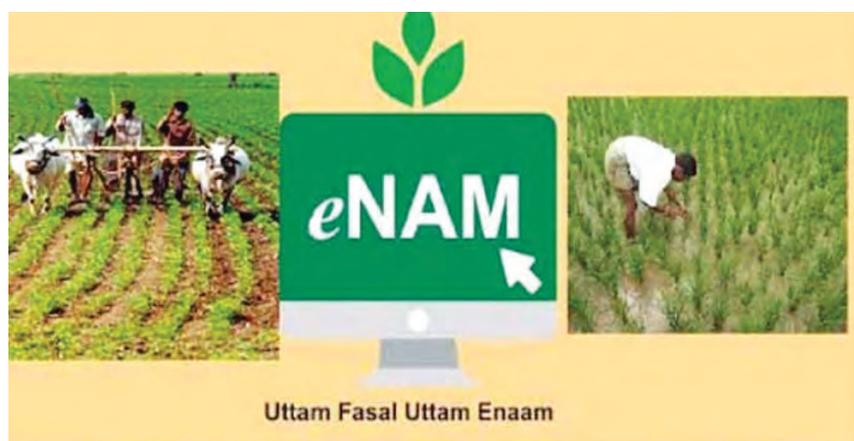
Regulatory measures include development and regulation of wholesale markets in India; and, adoption of legal instruments for regulation of agriculture marketing and trade.

Agriculture Produce Marketing Committee Regulation (APMC) Act

All the wholesale markets for agricultural produce that adopted the Agricultural Produce Market Regulation Act (APMRA) are termed as “regulated markets”. All the states of India have enacted APMC Act except Kerala, J&K and Manipur. The Act is implemented and enforced by APMCs established under it.

The Act mandates that the sale or purchase of agricultural commodities, notified under the Act, is to be carried out in specified market areas, yards or sub-yards. These markets are required to have the proper infrastructure for sale of farmers’ produce. Prices in regulated markets are to be determined by open auction, conducted in a transparent manner in the presence of an official of the market committee.

Market charges for various agencies, such as commissions for commission agents, statutory charges such as market fees and taxes and produce-handling charges, such as for cleaning of produce,



loading and unloading, are clearly defined, and no other deduction can be made from the sale proceeds of farmers. Market charges, costs, and taxes vary across states and commodities.

The Advantages of APMC Act

- Removal of several malpractices and imperfections from agricultural markets.
- Creation of transparent marketing conditions.
- Ensuring a fair price to the farmers to sell their produce.

With improving the market functioning, the Act also created an environment that freed producers/sellers from exploitation by traders and mercantile capital and in turn enhance the income of farmers.

As per the needs of the prevailing situations, the Inter-Ministerial Task Force on Agricultural Marketing Reforms (2002) recommended that the APMC Acts be amended to allow for direct marketing and the establishment of agricultural markets in the private and cooperative sectors. The rationale behind direct marketing is that farmers should have the option to sell their produce directly to agri-business firms, such as processors or bulk buyers, at a lower transaction cost and in the quality/form required by the buyers. On the recommendation of the committee, the government had come up with a Model APMC Act in 2003.

Model APMC Act, 2003

Under the model APMC Act, the private sector and cooperatives can be licensed to set up markets. This act also has provision for contract farming and direct marketing by the private players. Except for few states, all the States and UTs have either fully or partly adopted the model APMC Act. As a result of model act, the proportion of private trade and contract farming had increased manifold in some

part of the country which benefited the both private sector as well as farmers.

E-NAM-An Electronic Portal for Agriculture Marketing

The electronic National Agriculture Market (e-NAM) was launched in April 2016. National Agriculture Market or e-NAM is an electronic trading portal which networks the existing Agricultural Produce Market Committees (APMC) mandis to create a unified national market for agricultural commodities. Small Farmers Agri-business Consortium (SFAC) is the leading agency for implementation of e-NAM under the guidance of Ministry of Agriculture and Farmers' Welfare, Government of India. The main purpose of establishing e-NAM is to promote uniformity in agriculture marketing by streamlining of procedures across the integrated markets, removing information asymmetry between buyers and sellers and promoting real time price discovery based on actual demand and supply.

Integration of APMCs across the country through a common online market platform facilitates pan-India trade in agriculture commodities and provides better price discovery through transparent auction process based on quality of produce along with timely online payment. It also provides access to a nationwide market for the farmer and availability of better quality produce at more reasonable prices to the consumer. At present, 585 regulated mandis in 14 states are linked with the electronic National Agriculture Market (e-NAM), which helps farmers/producers to discover real time price in a transparent manner. There are about 2,700 APMC mandis and 4,000 sub-market yards in India. Government also plans to enable trade among states' agriculture markets to enhance transparency in the sale and purchase of agricultural produce which enhances competition among the trade and leads to better prices for farmers.

Paramparagat Krishi Vikas Yojana (PKVY)

The Paramparagat Krishi Vikas Yojana (PKVY) was launched in April, 2015 as an elaborated component of Soil Health Management (SHM) under the Centrally Sponsored Scheme, National Mission on Sustainable Agriculture (NMSA). PKVY aims at supporting and promoting organic farming through adoption of organic village by cluster approach and PGS (Participatory Guarantee System) certification. The scheme promotes PGS for India (PGS- India), form of organic certification that is built on mutual trust, locally relevant and mandates the involvement

of producers and consumers in the process of certification. This scheme encourages the farmers to adopt eco-friendly concept of cultivation and reduce their dependence on fertilizers and agricultural chemicals. Funding pattern under the scheme is in the ratio of 60:40 by the Central and State Governments respectively. In case of North Eastern and Himalayan States, Central Assistance is provided in the ratio of 90:10 (Centre: State), for Union Territories, the central assistance is 100%.

The scheme envisages the promotion of commercial organic production through certified organic farming which provides more income to the farmers. The cultivated produce under organic farming will be pesticide free and will contribute to improve the consumer's health. It will raise farmer's income and create potential market for traders and also motivate the farmers for natural resource mobilization for input production. For implementation of Paramparagat Krishi Vikas Yojana (PKVY) Groups of farmers would be motivated to take up organic farming. Fifty or more farmers will form a cluster having 50 acre land to take up the organic farming under the scheme. In this way, during three years, 10,000 clusters will be formed covering an area of 5.0 lakh acre under organic farming.

There is no liability on the farmers for expenditure on certification. Every farmer has been provided Rs. 20,000 per acre in three years for seed to harvesting of crops and to transport produce to the market. Organic farming is promoted by using traditional resources and the organic products will be linked with the market. It will increase domestic production and certification of organic produce by involving farmers

The electronic National Agriculture Market initiative has so far linked 585 regulated mandis. Further, a Model PMC Act 2017 has been circulated to all the states for improving marketing system in the agriculture sector. Paramparagat Krishi Vikas Yojana motivates the farmers to take up organic farming. A Model Act for promoting contract farming is also being worked out. The main purpose of implementation of these schemes is to give extensive strategic growth in agriculture sector for doubling the farmers income by 2022.

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BOOSTING AGRICULTURE THROUGH AGRI-BUSINESS

Dr. Mahi Pal

Government has initiated a number of measures not only to augment the income of farmers, but also to put agriculture on sound footing in the country. Farmers and other stakeholders involved in agri-business activities need to be made aware about these initiatives. Further, effective convergence in between and among various programmes may also be operationalised in a time bound manner. Among others, two important programmes are Mahatma Gandhi National Employment Guarantee Scheme and National Rural Livelihood Mission so that efforts of different programmes are optimized.

It has been noticed over a period of time, share of processing, distribution and trade is going up.

In other words, with the increase in backward and forward linkages, the distinction between agriculture and agro-industry is getting disappeared and the word supply chain, which includes transformation of raw material and components into finished products and marketed and then delivered to consumers. In a nutshell, agribusiness sector involves four different sub-sectors. These are:

- i) Agricultural inputs;
- ii) Agricultural production;
- iii) Agro-processing; and
- iv) Marketing and Trade.

Put above four together, it may be said that agribusiness covers crop production, distribution, agrichemicals, fodder, breeding, farm equipments, seed supply, raw and processed commodities of food and fibre, storage, transportation, packing, soil testing, marketing, retail sales, and more.

Government efforts to Promote Agri-business

Following efforts have been made by the Government to promote agribusiness in the country

in order to fulfill the goal of doubling income of farmers.

i) The Indian Council of Agricultural Research (ICAR) has taken a lead to initiate a network of 25 Agri-business Incubation (ABI) Centers in different states of the country under the National Agriculture Innovation Fund (NAIF) Scheme. These ABIs act as an effective platform for fostering the growth of sustainable business endeavour and nurturing the techno-entrepreneurs. The ABI centers provide a wide range of services such as research support; business planning; office space; access to information and communication technologies; and advice on management, marketing, technical, legal, and financial issues. Following are the technologies available for the Start-Ups, Entrepreneurs and Innovators:

1. Eco-friendly preparation of absorbent cotton for medical & hygiene products, which are Antimicrobial and provide UV protection.
2. Water repellency Nano-finishing Technologies for Cotton Textiles.
3. Cotton rich blends for functional textile applications.
4. Innovative Finishing processes for garments &



- home textiles: Mosquito repellent, pesticide protection cloths & denim.
5. Software module for non-metameric color matching in textiles.
 6. Central Institute for Research on Cotton Technology (CIRCOT) Calibration Cotton for global outreach.
 7. Sustainable business model for cotton at village level:
 - Quality based trading.
 - Supply chain logistics (custom hiring) for chipped cotton stalk supply.
 - Value addition to cotton biomass.
 - CIRCOT mini card for sliver preparation.
 8. Microbial Degossypolisation of cottonseed meal for poultry, fish & piggery sectors
 9. Enhancing farmers and other stakeholders income by Cotton value chain through startup & entrepreneurship development.
 10. Cotton Trading based on Quality Parameters for better price & remuneration to Farmers.

In addition, ICAR is planning to establish 25 more ABI centers in different ICAR institutes, keeping in view the spectrum of technologies, available infrastructure and the core competency of the institutes. Establishment of ABI Centers at District level is beyond the scope of the National Agriculture Innovative Fund (NAIF) Scheme. Farmers have been getting benefits from these centres.

- ii) Realising the importance of agri-business and motivating youth towards agriculture, a programme entitled “ Attracting and Retaining Youth in Agriculture” (ARYA) was started during 12th Plan period. It is being implemented in 25 States through KVKs, one district from each State. Both individual or group-based activities/enterprises are being encouraged under it based on the nature of the enterprise. Between 100 and 200 rural youths are identified in a district, for their skill development in entrepreneurial activities and establishment of related micro-enterprise units in the different areas of enterprises. The major enterprises being considered in the project include Apiary, Mushroom, Seed Processing, Poultry, Dairy, Goatry, Carp-hatchery, Vermi-compost etc., Under this project, operational costs to support critical inputs like seeds, fertilizers, small equipment are being provided to farm youth. This provides additional opportunities to the unemployed rural youth in primary and secondary agriculture and related enterprises. As far as progress is concerned, under the project, as many as 9595 youths in various groups have been oriented for establishing micro-entrepreneurial units upto 2017-18. To further expand the project, it being extended to additional 75 KVKs year 2018-19.
- iii) In order to give more focus on the engagement of youth in agricultural activities, another programme named as Student Rural Entrepreneurship Awareness Development Yojana (READY) programme was started in 2015-16. Student READY is an essential course module for the award of degree at Bachelors level to ensure hands on training and practical experience depending on the requirements of respective discipline in agricultural Universities. The Student READY programme includes five components viz., Experiential Learning, Rural Awareness Works Experience (RAWEX), In Plant Training/Industrial attachment, Hands-on training, and Student Project. This is step forward for articulating education into entrepreneurship and employability. A financial support of Rs 3000/- per student per month for maximum six months is also provided to the students.
- iv) Several concrete initiatives have been started by the Government to link the farmers with the markets with the purpose to help the farmers in trading of their food grain. Agricultural marketing is done by the network of 6630 regulated wholesale markets, set up under the provision of respective State Agricultural Produce Market Committee (APMC) Act. To provide better marketing facilities to the farmers, the Government has come out with a new model named as “The Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017” in April 2017 for its adoption by States/Union Territories (UTs). It provides for alternative marketing channels in addition to APMCs to farmers in marketing their produce at competitive & remunerative prices.

Further, to get better results by the use of scarce resources by farmers and reduce the uncertainty

in price and marketing, the Government has come out with a progressive and facilitative Model Act “The State/ UT Agricultural Produce & Livestock Contract Farming and Services (Promotion & Facilitation) Act, 2018” in May, 2018 for its adoption by the states/Union Territories (UTs). This Model Contract Farming Act encompasses the entire value and supply chain from pre-production to post-harvest marketing including services contract for the agricultural produce and livestock. The Government has implemented electronic National Agriculture Market (e-NAM) scheme an online virtual trading platform to provide farmers with opportunity for transparent price discovery for remunerative prices for their produce through competitive online bidding system and so far, 585 wholesale regulated markets of 16 States and two UTs have been integrated with e-NAM platform.

Beside above initiatives, in the Union Budget Announcement, (2018-19), Government has decided to develop and upgrade existing 22,000 rural haats into Gramin Agricultural Markets (GrAMs) to work as centers of aggregation and to provide farmers with facility near to farm gate for making direct sale to consumers and bulk purchasers while improving their market access. The Government is implementing Market Research and Information Network (MRIN) Scheme covering 3355 wholesale mandies across the country linked to Agmarknet portal, wherein Agricultural Produce Market Committees (APMCs) markets are reporting data on mandi arrivals and prices of their traded agricultural commodities on daily basis. The farmers have free access to

the Agmarknet portal for getting market price information easily.

In addition to above, the Government has launched an umbrella scheme ‘Pradhan Mantri Annadata Aay SanraksHan Abhiyan’ (PM-AASHA). Under PM-AASHA, the Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW), Ministry of Agriculture & Farmers Welfare, Government of India, implements the Price Support Scheme (PSS) for procurement of pulses, oilseeds and copra. For oilseeds, DAC&FW also implements the Price Deficiency Payment Scheme (PDPS).

Minimum Support Price (MSP) is notified by the Government for certain crops primarily for procurement. Giving a major boost for the farmers income, the Government has approved the increase in the MSPs for all Rabi crops for 2018-19 at a level of at least 150 per cent of the cost of production. Further, under PM-AASHA, procurement for paddy, wheat and coarse grains at MSP are done 1:7, Department of Food & Public Distribution (DFPD) through Food Corporation of India (FCI). Cotton and Jute are procured by the Ministry of Textiles through Cotton Corporation of India (CCI) and Jute Corporation of India (JCI) respectively.

Government is providing financial assistance to APMCs for upgrading their infrastructure and improving their forward and backward linkages through various schemes such as Agricultural Marketing Infrastructure (AMI), Mission for Integrated Development of Horticulture (MIDH) and Rashtriya Krishi Vikas Yojana- Remunerative Approaches for Agriculture and Allied Sector



Rejuvenation (RKVY-RAFTAAR) etc. In 2019, e-NAM has achieved another milestone by starting inter-state trade between mandis of two different states. Before this initiative, trading could take place either within the APMC or between two APMCs situated within same state.

- v) Mega Food Park and Cold Chain schemes for setting up of food processing infrastructure have been in operation since 2008. Now under 'Pradhan Mantri Kisan Sampada Yojana (PMKSY) promotion, modernisation and capacity enhancement of food processing industries in the country has been initiated with a total allocation of Rs.6000 crores. It has seven planks namely (i) Mega Food Parks (ii) Integrated Cold Chain and Value Addition Infrastructure (iii) Infrastructure for Agro-Processing Clusters (iv) Creation of Backward and Forward Linkages, (v) Creation/Expansion of Food Processing & Preservation Capacities, (vi) Food Safety and Quality Assurance Infrastructure and (vii) Human Resources and Institutions. Further, a new Central Sector Scheme named as "Operation Green" for integrated development of Tomato, Onion and Potato (TOP) crops value chain, with an outlay of Rs. 500 crore has been launched on 5.11.2018.

In the end of last month of last year, Government has approved setting up of 40 Mega Food Parks. Further, 304 proposals for establishing cold chain projects in 24 States and one UT with the financial assistance of MoFPI under the Scheme for Integrated Cold Chain and Value Addition Infrastructure has also been initiated to promote food industry to create additional employment avenues in the country.

- vi) In order to provide credit at reasonable rate of interest at 7 per cent to farmers, the Government of India is implementing an interest subvention scheme of 2 per cent for short term crop loans up to Rs. 3.00 lakh through public sector banks and private sector banks (reimbursement through Reserve Bank of India (RBI), Regional Rural Banks and Cooperatives {reimbursement through National Bank for Agriculture and Rural Development (NABARD). Currently, besides 2 per cent interest subvention, the farmers, on prompt repayment of crop loans on or before the due date, are also provided 3% additional interest subvention. Thus, in case of prompt payee farmers, the short term crop loans are provided

at an effective interest rate of 4% per annum. The benefit of interest subvention is extended for a period of up to six months (post-harvest) to small and marginal farmers having KCC on loan against negotiable warehouse receipts with the purpose of preventing distress sale of produce.

Conclusion

It is clear from above that Government has initiated a number of measures not only to augment the income of farmers, but also to put agriculture on a sound footing in the country. Farmers and other stakeholders involved in agri-business activities need to be made aware about these initiatives. Further, effective convergence between and among various programmes may also be operationalised in a time bound manner. Among others, two important programmes are Mahatma Gandhi National Employment Guarantee Scheme and National Rural Livelihood Mission so that efforts of different programmes are optimized. For this, proper leadership at grassroots level with adequate trained manpower is required. Here, extension is the corner stone of the success of agribusiness.

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RURAL PAN - THE THEME OF SIWAN'S SANITATION PARK



Flower Pots designed in the shape of a Rural Pan

A rural toilet pan is the central design theme of the Sanitation Park set up within the campus of the Collectorate of Siwan district in Bihar. Seeing it on a regular basis by passersby and those who visit the park from other villages would help them associate the toilet pan as a tool for hygiene and sanitation and not something that is unclean and impure.

Explaining his concept, Deputy Development Commissioner (DDC), Mr. Sunil Kumar said that each time he went to the villages, he saw that the temples or places where people kept their deities were within the house or situated close to the house. However, the toilet was a good 20-30 feet away, an indication that people considered the toilet as something filthy.

Given that people use the toilet several times a day, it should be viewed as a vital facility that promotes hygiene and sanitation. "I wanted them to think of a rural pan in a positive light, and as a swachh object," the DDC added.

So he got flower pots designed in the shape of a rural pan, painted them with colourful designs and planted flowering plants and other leafy shrubs in them. These uniquely shaped pots were placed in the park and near temples.

Previously, the Collectorate campus was quite messy with trash, it was a place where damaged vehicles were kept, making the whole area look cluttered and unkempt. This has now been transformed into a sanitation park in the shape of a rural pan with a boundary wall, and beautified with pots in the shape of a rural pan, together with foot prints, so there is no mistake that it is a rural pan, a toilet where people perform their ablutions each day, and that it promotes good health and hygiene is made clear.

The highlight of the park is a sculpture of 'the Thinker' similar to that created by French artist Auguste Rodin, but he is seated on a rural pan. Close-by is a fountain. The idea for this came from actor Vidya Balan's advertisement that said – *Jahan Souch, Vahan Shouchalay*, the DDC explained.

People who visit the park should look at toilet pan in a positive way. The DDC also informed that at special events held in the district, guests are given toilet pan shaped potted plants, and people took it positively.

On the walls of the park are various sanitation messages, graphically represented, and promoting safe sanitation practices, with a view to bring about sustained behaviour change.

All the 19 blocks in Siwan are currently open defecation free (ODF) and the district was declared ODF before 31st December, 2018.



INTERFAITH WORKSHOP ON SANITATION IN SITAPUR



A one-day interfaith and media workshop was organised in Sitapur district of Uttar Pradesh to spread the message of total sanitation and hygienic practices that witnessed participation of more than 100 religious leaders of different faiths under one roof.

The programme was jointly organised by the District Mission in collaboration with UNICEF, World Vision and Sarathi Foundation on 11th December, 2018 in Sitapur. The inter-religious platform provided an opportunity to discuss ways to sustain behavior of the communities to ensure ODF (open defecation free) sustainability.

On the objectives of such a workshop, District Project Coordinator, Ms. Ritu Tiwari said that the district SBM team had tried to convey the message of sanitation and generate awareness among the masses through different mediums. However, "Through an interfaith workshop, we can try to generate a kind of faith among the community that cleanliness is close to godliness," she said. Thereby, faith leaders can act as strong building blocks to bring about behavioural change among the communities, promoting a sustainable, clean and hygienic environment.

Sitapur that had sanitation coverage of 1.3% prior to October 2014 now has achieved 99.98% coverage. The district will soon be declared ODF.

IRRIGATION: KEY INPUTS FOR AGRICULTURE

Naleen Kumar

Increase in agricultural production and productivity depends a lot on the availability of water, and so irrigation plays an important role in this regard. It has been corroborated by various studies that irrigation facility makes significant difference in crop output. According to the Food and Agriculture Organization of the United Nations (FAO), the highest yields that can be obtained from irrigation are more than double the highest yields that can be obtained from rainfed agriculture. Even low input irrigation is more productive than high-input rainfed agriculture.

Agriculture sector is one of the most important sectors of Indian economy. It plays a significant role in the overall socio-economic development of India. Census 2011 data shows that 54.6 per cent of the population is engaged in agriculture and allied activities, and it contributes 17 per cent to the country's Gross Value Added (current price 2015-16, 2011-12 series). India is the world's largest producer of fresh fruits and vegetables, milk, major spices, various crops such as jute, staples such as millets and castor oil seed. It is also the second largest producer of wheat and rice.

Increase in agricultural production and productivity depends a lot on the availability of water, and so irrigation plays an important role in this regard. It has been corroborated by various studies that irrigation facility makes significant difference in crop output. According to the Food and Agriculture Organization of the United Nations (FAO), the highest yields that can be obtained from irrigation are more than double the highest yields that can be obtained from rainfed agriculture. Even low input irrigation is more productive than high-input rainfed agriculture.

Irrigation significantly increases crop output for various reasons. First, irrigation facility encourages the farmers to use better varieties and other bio-chemical

technologies which obviously lead to increased productivity. Second, the cropping pattern followed in the irrigated area is superior to that of un-irrigated area and therefore, the output of crop is invariably higher under irrigated land. Third, irrigation facility allows the farmers to use the land more intensively throughout the year with higher level of cropping intensity, which is not possible under un-irrigated land. Fourth, the risk in getting the assured output from the crops cultivated due to moisture stress is very high under un-irrigated land while it is much less in irrigated land. Importantly, given the highly inelastic supply of land and reduced net sown area, the future growth of agriculture will have to heavily rely on irrigation facility as it allows for multiple cropping on the same piece of land.

India is a water-stressed country where more than 50 percent of agriculture depends on rainfall. But for most parts of India, the rainy season is restricted to only four months of monsoon. Even during monsoon, insufficient or irregular rain is not uncommon. This high variability and inadequacy of rainfall makes irrigation a decisive factor for Indian agriculture. That's why, the Government has recently taken several steps to provide improved access to irrigation and to enhance water efficiency, primarily through an umbrella scheme—Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).

PMKSY has been operationalised from 1st July, 2015 with the objective of enhancing irrigation coverage and improving the delivery system at farm level. The major objective of the PMKSY is to achieve convergence of investments in irrigation at the field level, expand cultivable area under assured irrigation, improve on-farm water use efficiency to reduce wastage of water, enhance the adoption of precision-irrigation and other water saving technologies, enhance recharge of aquifers and



introduce sustainable water conservation practices by exploring the feasibility of reusing treated municipal based water for peri-urban agriculture and attract greater private investment in precision irrigation system, thus bringing much desired rural prosperity.

PMKSY was approved with an outlay of Rs. 50,000 crore for a period of 5 years (2015-16 to 2019-20). The mission is administered by Ministry of Water Resources, River Development and Ganga Rejuvenation. All the States and Union Territories are covered under the programme. The scheme envisages decentralized state level planning and projectised execution, allowing the states to draw their own irrigation development plans based on local needs with a horizon of 5 to 7 years.

PMKSY has four components:

- a. **Accelerated Irrigation Benefit Programme (AIBP) & Command Area Development & Water Management (CADWM):** To focus on faster completion of ongoing Major and Medium Irrigation including National Projects.
- b. **Har Khet Ko Pani (HKKP):** Creation of new water sources through minor irrigation (both surface and ground water); repair, restoration and renovation of traditional water bodies; command area development; strengthening and creation of distribution network from sources to the farm etc.
- c. **Per Drop More Crop (PDMC):** Precision irrigation systems, efficient water conveyance & application, micro level storage structures, topping up of input cost beyond Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) permissible limits, secondary storage, water lifting devices, extension activities, coordination & management etc.
- d. **Watershed Development (WD):** Ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting and other watershed interventions.

Under PMKSY, 99 ongoing Major/Medium irrigation projects with ultimate irrigation potential of 76.03 lakh ha. have been prioritized during 2016-17, in consultation with 18 different States, for completion in mission mode by December 2019. Total requirement of funds for completion of these projects under PMKSY-AIBP, was estimated at Rs. 77,595 crore (Rs. 48,546 crore for project works and Rs. 29,049 crore for Command Area Development works) with Central Assistance of Rs. 31,342 crore. Maharashtra benefits most under the programme with selection 26 of its irrigation projects, to be completed on priority basis.

Table 1: Funds released under PMKSY during 2016-17

Components	CA released (Rs. In cr.)
AIBP	3307.86
CADWM	853.95
Surface Minor Irrigation (SMI) Schemes	148.01
Per Drop More Crop	1991.17
Watershed Development	1471.73

(Source: Ministry of Water Resources)

The government has approved an initial corpus of Rs.5,000 crore for setting up of a dedicated Micro Irrigation Fund (MIF) with NABARD, under PMKSY. The allocation of Rs. 2,000 crore and Rs. 3,000 crore will be utilized during 2018-19 and 2019-20 respectively. NABARD will extend the loan to State Governments during this period. The dedicated Micro Irrigation Fund would supplement the efforts of PDMC in an effective and timely manner. Also, under PMKSY- Har Khet Ko Pani (HKKP) component Rs. 2600 crore has been allocated for the year 2018-19.

The impact of irrigation development on crop output cannot take place instantaneously because of the time lag involved for making adjustments to the factors of production. However, this is a well-documented fact that irrigation is one of the critical inputs to improve productivity in agriculture sector along with seeds, fertilizers, credit and mechanization. So, irrigation and water use efficiency schemes discussed above are bound to reflect in increased crop production.

As per Fourth Advance Estimates for 2017-18, total Rabi Foodgrain production in the country is estimated at 144.10 million tones, which is higher by 7.32 million tonnes than the previous record production of 136.78 million tonnes achieved during 2016-17. The rabi foodgrain production during 2017-18 is also higher by 13.58 million tonnes than the previous five years' (2012-13 to 2016-17) average production of foodgrain.

The production of foodgrains in the country during Kharif 2018-19 has been estimated at 141.59 million tonnes (First Advance Estimates). This is higher by 0.86 million tonnes as compared to last year's kharif foodgrain production of 140.73 million tonnes. Further, kharif foodgrain production is 11.94 million tonnes more than the average production of five years (2012-13 to 2016-17) of 129.65 million tonnes.

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ACCELERATING PRODUCTIVITY THROUGH IRRIGATION MANAGEMENT

Bharat R Sharma

There are additional technologies like use of Solar Photovoltaic Pumps which can be used both for irrigation and sale of excess electricity produced during peak hours, adoption of improved crop varieties and cropping systems which have high water productivity, use of Soil Health Cards for precise and right application of the nutrients, registration under Pradhan Mantri Fasal Bima Yojana (PMFBY) to have insurance against droughts, floods and heat and cold waves, and creating appropriate irrigation infrastructure and providing “Har Khet ko Pani” through funds and guidance available under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).

India's farms are still mainly rainfed. A good monsoon leads to bountiful crop which raises farm incomes, boosts rural consumption and drives the economy. A weak monsoon- and droughts, in extreme cases- hurts farm workers, raises food prices, enhances rural migration, and generally creates distress in the country. Some 68% of India, according to the Indian Space Research Organisation, is prone to droughts in varying degrees - a third of this area is actually “chronically drought prone”. Indian monsoons have always been uncertain in their arrival, duration and amount and the date of departure.

Even more worrying is the trend that since 1997 the annual average rainfall has been lower than the long term average and the districts with very low and very high rainfall show the highest variability rendering the uncertain rainfed agriculture all the

more vulnerable. Additionally, climate change is occurring earlier and more rapidly than expected. Increased temperatures and changes in rainfall pattern could cause heat waves, droughts and flooding in large parts of India. Wheat and maize yield could be reduced by drought. Changing monsoon patterns are projected to reduce sorghum and wheat yield by upto 32 % in India. Under these existing and even more challenging future scenarios, improvement in the country's available water resources and their efficient use through improved irrigation management is the only option for accelerating the agricultural growth.

Accelerated Irrigation Benefit Program (AIBP): Central Government and the State governments have been trying different interventions to bridge this ever-increasing gap. The Government of India had launched Accelerated Irrigation Benefit Programme





Successful laying out of Under Ground Pipe Line System for efficient water distribution in Sardar Sarovar Project, Gujarat

(AIBP) in 1996-97. The objective of the scheme was to provide Central Loan Assistance (CLA) to the MMI projects to encourage and expedite the completion of ongoing projects. This was also supposed to encourage completing last mile delivery systems so that benefits from these projects can actually be accrued to the intended farmers in the command areas. Upto 2014-15, a total of Rs. 55,601 cr. grant in the form of Central Loan Assistance has been released under the program.

Recently, the government further improved the program and prioritised 99 irrigation projects which were supposed to be completed by December, 2019. This program has now been included under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and is being regularly monitored. Targeted irrigation potential to be created for these 99 projects taken together is 7.6 million hectare (Mha).

Potential Interventions for Improved Irrigation Management:

i. Accelerate and Improve the 'AIBP'

Accelerated Irrigation Benefit Program (AIBP) is a flagship program of the government for improving the irrigation potential utilisation through faster completion of the on-going projects. The recent initiative of providing loans/ grants through 'Long Term Irrigation Fund (LTIF)' and linking it with NABARD has met with some success. Though it is too early to evaluate the progress made in the last 3-4 years, the signs are positive and need to be pursued more earnestly. Efforts should be made to provide funds only to those States/projects which perform better and

are monitored through well-designed performance indicators and benchmarking reports.

ii. Enhanced Use of Underground Pipe Line (UGPL) and Canal Based Micro-Irrigation Systems:

To overcome the long-drawn and costly process of land acquisition for laying out the On-Farm Development (OFD) works such as sub-minors, channels etc. the implementing agencies should consider replacing these with underground pipeline systems which are faster to construct and avoid wastage of land. Such systems have found much favour with farmers in Sardar Sarovar Project in Gujarat who were reluctant to provide land for OFD but have now benefitted immensely from UGPL systems. These systems also dramatically raise water use efficiency and farm productivity. Additionally, such systems can be converted to large scale canal-based micro-irrigation projects such as Ramthali in Karnataka and Sinchaur in Rajasthan which reduce the water requirements and wasteful losses and can be used for high value vegetable and fruit crops for higher economic returns.

iii. Use of Improved Irrigation Techniques at the Farm Level

A number of simple and innovative irrigation management technologies are now available which can accelerate the agricultural growth:

a. Laser Land Levelling: Laser land leveller replaces the inefficient operations of traditional soil scrapping after tillage operations. Farmer eye judgement is replaced by a sharp laser beam which have near perfect results. One machine



Robust root and tillering system of an SRI planted rice plant as compared to a normal transplanted plant at farmers' field in Haryana

can cover about 400 ha during the season and farmer need to do it once in 3 years.

- Laser land levelling considerably lowers irrigation time for rice by 47-69 hours per ha per season and for wheat by 10-12 hours per ha per season.
- It increases yields by an average of 8 percent for both the crops. Studies at Punjab Agricultural University, Ludhiana showed an increase in yield by 11 % and savings in irrigation water by 26 per cent.

- It saves electricity by about 755 kWh per hectare per year for rice-wheat systems.
- b. *Cultivation on raised beds:* Permanent raised beds are especially suitable for regions with higher and uncertain rainfalls, heavy soils, wide thermal variations and farming systems requiring shorter crop turn-around time. Its advantages over the flat beds are given in Table 1.
- c. *Improved irrigation Management for Rice Crop:* Rice is the most water intensive crop and its large scale cultivation in north western region of Punjab, Haryana, western UP and other drier regions is the major reason for depletion of ground water. Successful rice crop with lesser water inputs can be cultivated with raising the bund heights to capture all the rain water, scheduling irrigation through 'Alternate Wetting and Drying (AWD)' where next irrigation is provided only after all the standing water has disappeared, delayed transplanting of paddy (beyond June 10) so as to synchronise with onset of monsoons. Above all, efficient irrigation channels or pipes should be used for conveyance and application of irrigation water.

Table 1. Effect of raised beds on yield and water savings for different crops

Crops	Yield in beds, (t/ha)	Yield on flats, (t/ha)	Water savings, % over flat beds	Yield increase, % over flat beds
Maize	3.27	2.38	35.5	37.4
Wheat	5.12	4.31	26.3	6.4
Rice	5.62	5.29	42.0	6.2
Urdbean	1.83	1.37	26.9	33.6
Greenpeas	11.91	10.40	32.4	14.5
Gram	1.85	1.58	27.3	17.1
Cauliflower	25.9	18.8	36.4	37.0



Surface lined (left) and piped water (right) conveyance systems save water and energy and improve the crop yields.



A Laser Land Leveller in operation in a field in Haryana, India (CIMMYT, India)

System of Rice Intensification (SRI) -The success of SRI is based on synergetic development of both the tillers and roots. Rice yields under SRI are increased by 20-50 %, sometimes > 100%. Reduction in irrigation water requirement and higher water productivity by 30-50% have been reported under SRI. Less fertiliser and agro-chemicals are needed as the emphasis is on use of organics.

iv Large Scale Adoption of Micro-Irrigation Systems (Drip and Sprinklers):

Water saving technologies like micro-irrigation are the appropriate interventions when water resources are limited and scarce; cultivated crops are of high value like vegetable and fruit crops, cash crops and row crops; soils are undulating, and quality of the crop is important for good marketing. With micro-irrigation, impressive benefits have been observed for accelerating the agricultural growth and farm incomes:

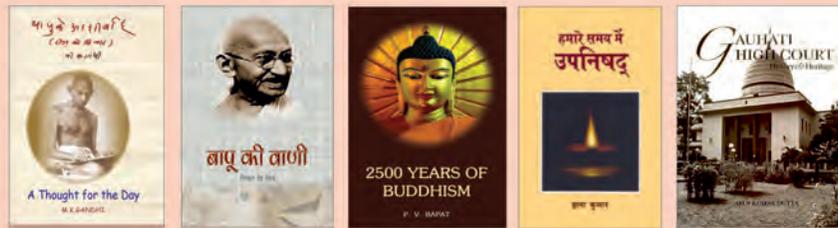
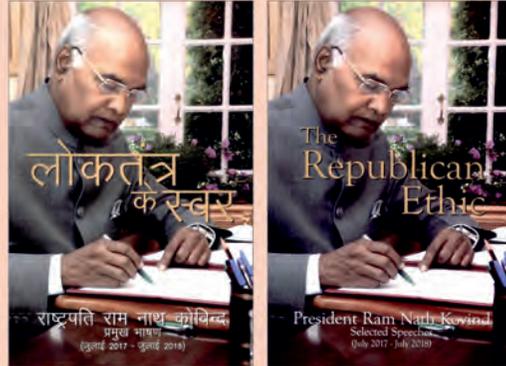
- Increase in yield up to 100 per cent have been observed.
- Saves water up to 70% compared to flood irrigation. More land can be irrigated with the water thus saved.
- Crop grows consistently, uniformly, healthier and matures early.

- Fertilizer use efficiency increases by about 30 per cent
- Cost of fertilizers, inter-cultural operations and labour use gets reduced.
- Fertilizer and agro-chemical application can be given through Micro Irrigation System itself.
- Undulating terrains, saline soils, water logged, sandy & hilly lands can also be brought under productive cultivation. Waters of poor quality can also be safely applied through drip irrigation.
- Best insurance against droughts, dry spells, heat and cold waves and protection to young plants.

There are additional technologies like use of Solar Photovoltaic Pumps which can be used both for irrigation and sale of excess electricity produced during peak hours, adoption of improved crop varieties and cropping systems which have high water productivity, use of Soil Health Cards for precise and right application of the nutrients, registration under Pradhan Mantri Fasal Bima Yojana (PMFBY) to have insurance against droughts, floods and heat and cold waves, and creating appropriate irrigation infrastructure and providing “Har Khet ko Pani” through funds and guidance available under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).

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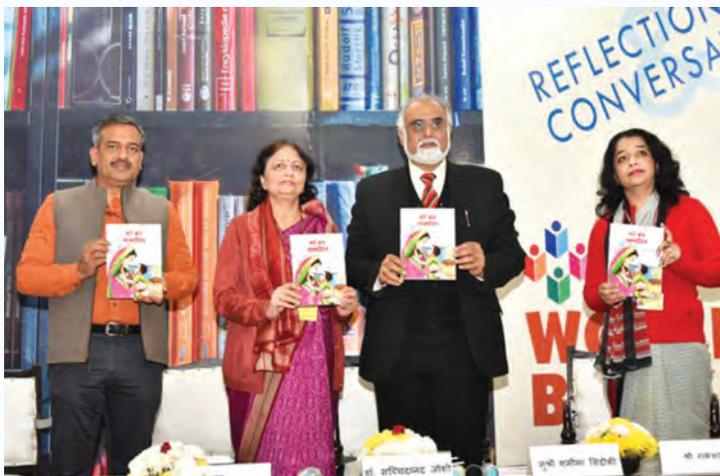
Publications Division, Ministry of I & B participated in the New Delhi World Book Fair held at Pragati Maidan, New Delhi from 5th to 13th January, 2019. Seven books brought out by the Publications Division were released by Secretary, Ministry of I&B Shri Amit Khare on the inaugural day, at the World Book Fair. The Secretary said that the Publications Division not only gives opportunities to good writers from across the length and breadth of country, but also helps to spread Indian literature abroad.



The Secretary, Ministry of Information & Broadcasting, Shri Amit Khare releasing the books of the Publications Division, during the New Delhi World Book Fair, at Pragati Maidan, New Delhi on January 05, 2019.

The books released on the occasion were *Bapu ke Ashirwaad*, *2500 years of Buddhism*, *Portraits of Strength*, *Hindi Swadesh Mein aur Videsh Mein*, *Rang Birangi Kahaniyan*, *Badal ki Sair* and *Aao Paryavaran Bachayen aur Dhara ko Swarg Banayen*.

Dr. Varsha Das, former Director of National Gandhi Museum, Dr. Reeta Rani Paliwal, Secretary, Sasta Sahitya Mandal, Dr. Sadhana Rout, Director General, Publications Division and other senior officials of Publications Division were also present on the occasion.



The Publications Division also organised a discussion on 'Children's Literature and Young Readers Trapped in Electronic Gadgets' at the World Book Fair on January 10, 2019. The discussion highlighted the importance of books and their impact on children who in today's time are often found preoccupied in the world of electronic gadgets. On the occasion, a set of ten books was released namely, *Saral Panchatantra Part I*; *Children's Vivekananda*; *Children's Mahabharat in English*; *Shekhawati ki Lok Sanskriti*; *Hamare Samay mae Upanishad*; *Haar Ki Khushi*; *Maa Ka Janamdin*; *Bapu ki Vani*; *Ved Gatha*; and *Bal Mahabharat in Hindi*.

Dr. Sachchidanand Joshi, Member Secretary, Indira Gandhi National Centre for the Arts (IGNCA), was the Chief Guest on the occasion.

Publications Division's stall attracted an encouraging response from the visitors and there was a regular stream of visitors to the stall. The special discount scheme on selected titles of DPD books was appreciated by the visitors who used the opportunity to buy quality titles on subjects of art and culture, Builders of Modern India Series, children's literature, history and freedom struggle etc. Facility of digital payment was also extended and it was availed overwhelmingly.

About Our Books

2500 YEARS OF BUDDHISM

Edited by P.V. Bapat

Pages: 424, Ninth Edition: 2018,

Publications Division, Ministry of Information & Broadcasting,
Government of India

The book gives an exhaustive account of the ethos, philosophy and art-related aspects of Buddhism, evolved in the last 2500 years. The Foreword of the book was written by Dr. Radhakrishnan, world-renowned philosopher. The book contains 16 chapters and about 100 articles written by eminent Buddhist scholars from India, China, Japan, Sri Lanka and Nepal.

Buddhism is a way of life, of purity in thinking, speaking and acting. This book gives an account of Buddhism not only in India but also in other countries of the East. Detailed and insightful glimpse into the different schools and sects of Buddhism find a place in this book. Buddhist ideas on education and the prevailing state of Buddhism as revealed by the Chinese pilgrims who visited India during that time are other components of the book. Chapters on Buddhist art in India and abroad and places of Buddhist interest are also included to give it a holistic perspective.

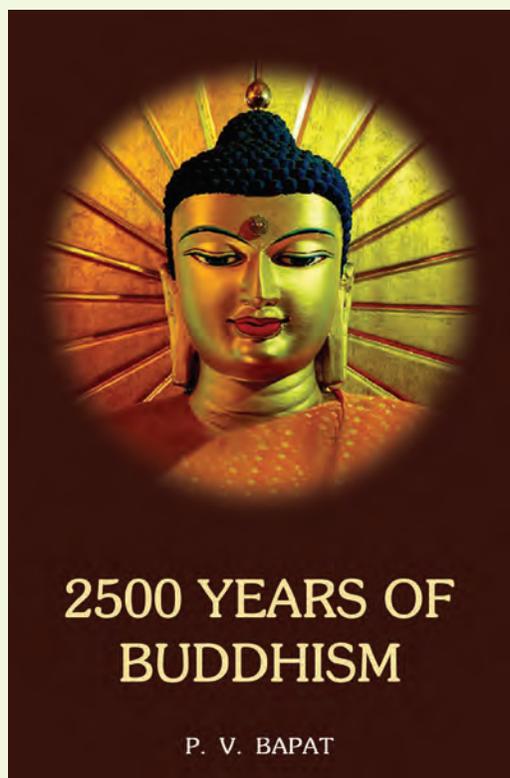
The chapters, written by eminent scholars of Buddhism, present exhaustive information and analysis on diverse aspects of Buddhist ways of life. The historical aspect covers the four Buddhist Councils and consolidation and spread of Buddhism during the reign of Ashoka and thereafter. The Buddhist thought and ethos spread over the entire south, south eastern and central Asia. The book presents an in-depth analysis about principal schools and sects of Buddhist canon. The books also presents a holistic glimpse of Buddhist literature, from *Mahavstu* to *Pitakas*. There is an absorbing chapter on eminent Buddhist Scholars – in India and in other countries of Buddhist influence.

Inspiring journeys of Chinese travellers *and* their travel accounts, a peep in the Buddhist Art and places of interest make the volume additionally interesting and absorbing. Later modifications and contemporary studies have also been covered. In a nutshell, this volume is a ‘must-read’ treatise for all scholars and students of Buddhism.

First published in 1956 on completion of 2500 years of Buddhism, the present tastefully illustrated edition has been brought out recently, after its inclusion in the prestigious limited list of Indian publications which have been selected by Ministry of External Affairs for Indian Missions and libraries abroad under its ‘Bharat - Ek Parichay’ programme.

The spirit of Buddha comes alive in the book and enlightens the reader with his teachings.

The book is available at Book Gallery, Publications Division, Sookhana Bhawan, CGO Complex, New Delhi. Email at: businesswng@gmail.com to order your copy.



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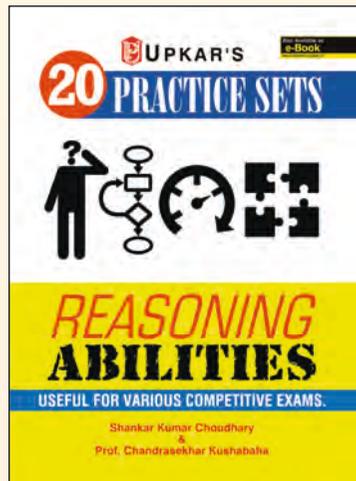
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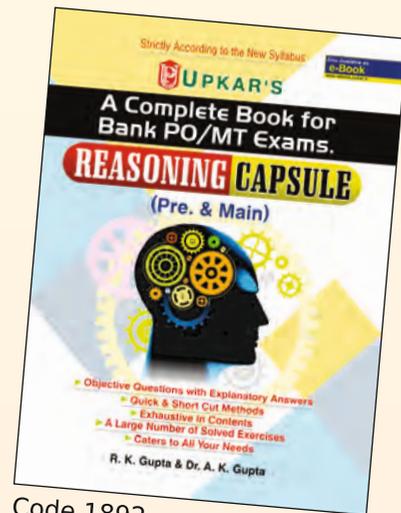
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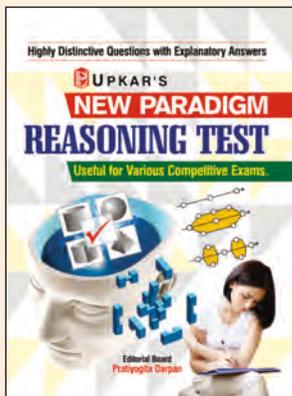
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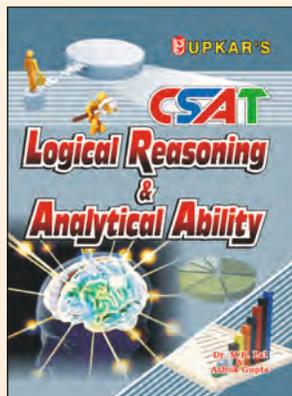
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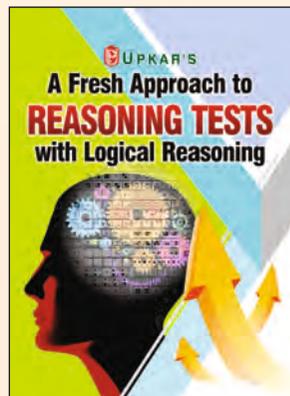
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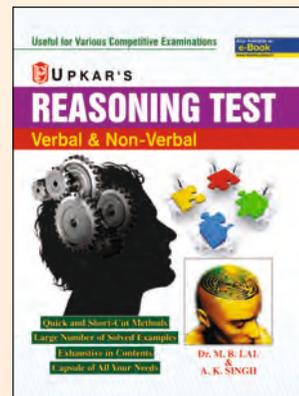
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