

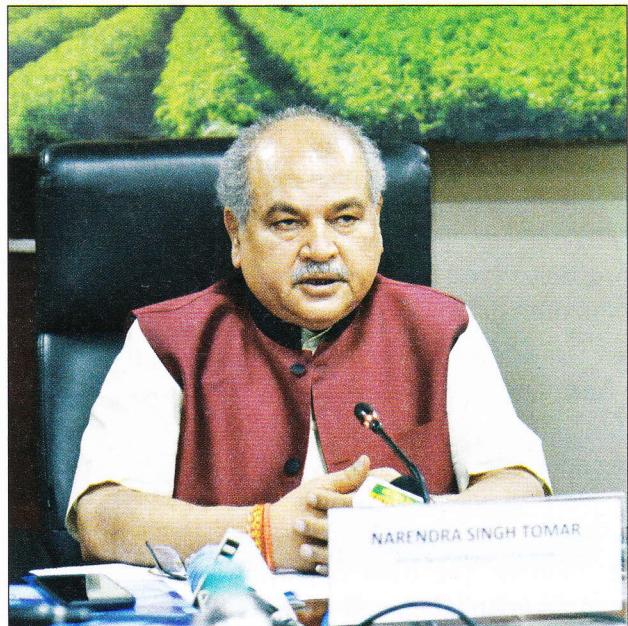
Rejuvenation of Agriculture through Research

Narendra Singh Tomar

Agricultural production has become the axis of the country's economy today. The Government desires that economic condition of all farmers improves, agricultural production and productivity increase, our farmers get adequate opportunity to do farming with scientific methods and research in all vital areas of agriculture accelerates. There should not only be the development of agricultural equipment and machinery, but the ordinary farmer should have easy access to them also. Agricultural technology should be cost-effective rather than expensive so that every farmer can use it. Since the last tenure of the Modi Government, full attention has been given on boosting agricultural production and maintaining nutritional quality through agricultural research.

The NDA Government under the leadership of the Prime Minister Shri Narendra Modi, is making unprecedented efforts to boost the growth rate of the agriculture sector and for the welfare of the farmers. The focus is not only on production but also on raising farmers' income and reducing agriculture-related risks. The Government has initiated several policy reforms to increase the income of farmers. In July 2019, the Prime Minister constituted a high-powered committee of Chief Ministers to "rejuvenate Indian agriculture." The committee members included Chief Ministers of seven states, Union Minister for Agriculture and Farmers Welfare, and a member of NITI Aayog. The Government has allocated 2.83 lakh crore rupees in the budget for the year 2020-21 for agriculture and allied activities, irrigation and rural development, which is the highest budget allocation to date. The Government desires that economic condition of all farmers improves, agricultural production and productivity increase more and more, our farmers get adequate opportunity to do farming with scientific methods and research in all vital areas of agriculture accelerates. There should not only be the development of agricultural equipment and machinery, but the ordinary farmer should have easy access to them also. Agricultural technology should be cost-effective rather than expensive so that every farmer can use it.

While laying the foundation stone of Agricultural Research Institute at Hazari Bagh, Jharkhand in 2015, the Hon'ble Prime Minister had commented on the future of the agriculture sector and said that our country had witnessed the first Green Revolution and it was high time that the second Green Revolution takes place. In fact, the Prime Minister, sensing future food grain



(The Union Minister for Agriculture & Farmers Welfare, Rural Development and Panchayati Raj, Shri Narendra Singh Tomar addressing at the 92nd ICAR Foundation Day & Award Ceremony through virtual platform, in New Delhi on July 16, 2020.)

challenges, had urged the farmers, agricultural experts, and state governments for a second Green Revolution. Today, the nation is progressing at a fast pace to realise the vision of the Prime Minister with multi-faceted development of the agriculture sector, application of the scientific methodology, innovations and optimum use of modern technology in agriculture. Since the last tenure of the Modi Government, full attention has been given on boosting agricultural production and maintaining nutritional quality through agricultural research.

The Ministry of Agriculture and Farmers' Welfare, Government of India, and its associated agricultural research institutes have given a new direction to agricultural research during the past

years. It was the outcome of providing latest technology of agriculture to the farmers that as compared to the year 1950-51, today our country has registered growth of 5.6 times more in food grain production, 10.5 times more in the horticulture sector, 18.26 times more in the fisheries sector, 11 times more in milk production and 52.9 times more in egg production. It is a pleasant scenario that India's total food grain production, which was only 50 million tonnes in 1950-51, has increased to 285 million tonnes in 2018-19. India has achieved these milestones despite the decrease in availability of land and water resources. The Green Revolution of the 1960s completely transformed the scenario of food security in India. The Government has ensured availability of food to every citizen of the country by implementing policies and initiatives like National Food Security Act, National Nutrition Mission etc. and made every effort to make nutritious food items available to the needy at the minimum price.

The Indian Council of Agricultural Research (ICAR) was established on 16th July 1929 to promote agricultural research in the country. It has, on its account, a glorious history of 91 years. It has given a new dimension to the country's agricultural science, agricultural research, and agricultural technology. The ICAR is playing a pivotal role in guiding, managing, and coordinating activities and functions related to the agriculture sector, including horticulture, fisheries development, animal science, agriculture education, and research. There are, at present, 102 research institutes and 71 agricultural universities affiliated to ICAR, across the country. It is one of the largest national agricultural systems in the world. ICAR has, through its various research works and technology development initiatives, played a significant role in the development of the agricultural sector and taking forward the benefits of the Green Revolution in the country. It is the result of the ICAR's agricultural research and hard work of the country's farmers that today our granaries are full of food grains. The term 'food crisis' has disappeared from the dictionary of our country, having the world's second-largest population. ICAR has also earned recognition internationally in teaching subjects like agronomy and agricultural engineering. This organisation has established a vast network of 718 Krishi Vigyan Kendras (KVKs) for extension and spread of its valuable agricultural

research benefits. Scientific research in agriculture has resulted in unprecedented success in the development of high yielding varieties of crops, high milk yielding cattle species, and development of the horticulture sector. Our agricultural scientists have brought out several research works and innovations and tried their best to make them available to our peasants. Some of these achievements can be described as follows:

Research Related to Crop Varieties

If we discuss about the recent past, total of 220 crop varieties have been notified and released for commercial cultivation in the year 2019-20. It includes 101 varieties that are climate-friendly, while 15 are multi-stress tolerant varieties. Of the total developed varieties, there are 96 grains, 51 oilseeds, 18 commercial crops, and 18 fodder crop varieties. Twenty bio-fortified varieties of various crops, including rice, maize, wheat, sorghum, millet, linseed, and ragi, have also been developed. It is encouraging to note that in the last two-three years, we have reached near self-reliance in production. To achieve this, ICAR and the Department of Agricultural Cooperation have set up 150 seed hubs in different parts of the country and provided seeds of improved varieties to the farmers.

The Prime Minister had expressed concern that despite being an agrarian country and agro-based economy, we still have to import edible oil. This problem must be resolved in mission mode through 'zero edible oil import.' Taking action in this direction, ICAR has conducted more than 50 thousand national level cluster frontline demonstrations on oilseed crops in the last one year. Through these demonstrations, the target achieved in linseed crops has firmed the hope that we will soon be able to reduce the expenditure on imports of oilseeds.

A total of 545 varieties of crops were released during the period 2009 to 2014. In the period 2014 to 2019, ICAR developed 1020 varieties, which are about two times as compared to the period 2009 to 2014 and thus made a significant contribution to agricultural production. While only 269 varieties of horticultural crops were developed in the period 2009-2014, the period 2014 – 2019 saw the development of 339 varieties of horticultural crops. Pusa Basmati, developed by ICAR, is the world's longest kernel of paddy. It is the most sought after

rice variety in the world. Income from its production has increased by about Rs. 33,000 crore during 2014-2019 as compared to 2009-2014. About 16,700 crore rupees worth of foreign exchange is being earned every year by exporting this variety.

The productivity of sugarcane variety-CO-0238, developed by ICAR's Sugarcane Breeding Institute, Coimbatore, is 76.5 tonnes per hectare, which is 14 tonnes per hectare more than the popular varieties. Farmers in North India earn good profits by growing this variety in more than half the area of sugarcane cultivation. This variety of sugarcane has significantly raised the income of farmers. Similarly, the disease-resistant varieties of tomato- 'Arka Rakshak' and 'Arka Samrat' have been developed to ensure bumper production. These varieties are being cultivated by farmers in an area of about 30 thousand hectares in 27 states and they are earning more than Rs. 500 crore annually.

The ICAR has developed 53 bio-reinforced varieties of foodgrains between 2014 and 2019. These varieties of 10 crops like rice, wheat, maize, and mustard have proved to be useful in alleviating malnutrition. The health and nutrition level can be improved by providing food grains of these varieties to the people through mid-day meals and public distribution system.

Livestock Development Research

Agricultural scientists have also done remarkable work in livestock development and in triggering the White Revolution in the country. During the period 2014 - 2019, 40 new animal species have been registered and notified. During these five years, ten vaccines have been developed to combat animal diseases, which is 40 percent more than the number of vaccines developed during the period 2009-2014. An active surveillance system has also been developed to make India free from Foot and Mouth (FMD) disease by 2024. For this, a temperature tolerant vaccine is being developed. A total of 43 diagnostic kits were developed to diagnose animal diseases between 2014 and 2019, which is 51 percent more than the previous five year period.

Horticulture Sector

Today our country ranks first in horticultural production. The horticulture sector has emerged as

a significant agro-enterprise in giving momentum to the Indian economy. This sector has also created many new opportunities for employment generation. The report of the committee constituted in 2018 to take measures for doubling the income of farmers, estimated that the volume of horticultural production is expected to reach 451 million tonnes by the year 2022-23. For this, agriculture acreage will have to increase by 2.8 percent and productivity by 3.1 percent.

Towards Holistic Development of Horticulture Sector

- Scheme for Integrated Supply Chain for fruits & vegetables rolled out to help farmers get remunerative prices
- 22.50 lakh ha additional area brought under horticulture cultivation during last 5 years
- Record horticulture production of 320.48 million tons, an increase of 39.5 million tons during last five years
- 902 new nurseries established during last five years
- ₹10,508 crore invested in horticulture sector during last five years

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Date: 8 August, 2020

The ICAR has notified a total of 133 new varieties of horticultural crops during 2019-20 and released them for commercial cultivation. It includes 71 varieties of vegetables, 14 of spices, 15 of spice seeds, 5 of potatoes, 18 of tuber fruits, 6 of fruits, and 4 varieties of planting crops.

Fisheries Sector

The fisheries sector of India is playing a vital role in the country's economy with a production of 13.4 million tonnes. Apart from meeting domestic demand, the country has also earned \$7 billion in foreign exchange through fish exports. An online information system has been developed to provide information on various aspects of fish species of India origin.

Agricultural Education

The inclination of students towards agricultural courses is increasing day by day in the country. The Indian Council of Agricultural Research and our agricultural colleges have made exceptional prog-

ress in agricultural science and agricultural engineering education. New programmes and modules have been developed from time to time to make agricultural education innovative and employment-oriented.

Due to the Coronavirus crisis, many educated youths who have returned to the villages from the metros are now trying their hand in farming. Their focus is not only on production but also on giving scientific form to marketing, processing, and agricultural operations. These young farmers are engaged in farming professionally using modern farming techniques and information technology. Thus, it seems that the day is not far when a new agricultural revolution will soon emerge. During the lockdown, the Central Government removed restrictions from agricultural activities. As a result, the agricultural sector demonstrated an extraordinary resilience to withstand economic shocks even during the Corona crisis. When other sectors of the economy are facing a recession, the agriculture sector continues to maintain a satisfactory growth rate, which in itself is a great achievement. This is a clear proof that the Government is committed to providing full support to agriculture and farmers. If there was not enough stock of food grain in the country during this crisis, mere imagination of the critical situation that the country would have suffered is enough to shock anyone. To tap the inherent potential and possibilities in the agriculture sector, the present government, under the dynamic leadership of the Prime Minister, focuses on innovations in the agricultural sector so that farming can become a profitable deal, not just a means of survival and satisfying the fire of stomach. For this purpose, the government is also emphasising on promoting the export of agricultural products. A report by the World Trade Center says that India could register among the top five exporters in the world in terms of exports of agricultural commodities by focusing on farming and practical measures for the betterment of farmers. India is ranked eighth in 2019, with annual agricultural exports of \$39 billion. Europe ranks first with agricultural exports valued at \$181 billion.

To limit the use of chemical fertilisers in the agricultural sector, the Government is promoting organic farming. At present, the demand for organic products has also increased. Because of this, the government has implemented a scheme

to encourage organic farming in more than a hundred districts of the country. The Ministry of Agriculture provides financial assistance to the tune of 50 thousand rupees per hectare to the farmers associated with organic farming under Paramparagat Krishi Vikas Yojana (PKVY). The government is also promoting the food processing industry in areas under organic farming so that agro-based industrialisation can also be encouraged in those areas. The government is also promoting the cultivation of herbs to increase the supply of herbal products in the country which can also be exported.

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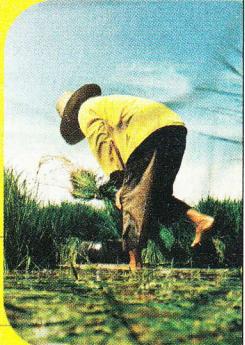
**Paramparagat Krishi
Vikas Yojana (PKVY) -
Towards Sustainable
Agriculture**

15 lakh marginal farmers adopted simple & cost effective Participatory Guarantee System (PGS) certification

- Certification of contiguous patches/villages for providing additional income
- 3.5 lakhs worth of organic products sold by farmers on Jaivik Kheti Portal
- 6 lakh ha Area covered under Organic Farming - Additional 25 lakh ha planned

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Agricultural production has become the axis of the country's economy today. It has long been felt that new reforms should take place in the agriculture sector. The well-known agricultural scientist and the President of the then National Farmers Commission, Prof. M. S. Swaminathan had, in his report, recommended a steady increase in public investment for the agriculture sector, especially for improvement in irrigation, drainage, land development, water conservation, research development, road connectivity and development of agricultural infrastructure. The Swaminathan report emphasised on improving the implementation of the minimum support price. The report recommended inclusion of crops other than paddy and wheat in the MSP system. The report also recommended that the minimum support price for the crop be at least 50 percent more than the average cost of production. It is a matter of

great pleasure for crores of countrymen engaged in farming that the government has approved the Agriculture Infrastructure Fund of Rs one lakh crore. Encouraging private investment through this fund will lead to the all-round development of rural areas for agricultural activities across the country. It will prove to be a boon for the rejuvenation of the farm sector and upliftment of farmers. Fisheries, animal husbandry, herbal farming, beekeeping, and agricultural entrepreneurship are being promoted through the Innovation and Agri-Entrepreneurship Development Program under the National Agriculture Development Scheme. Rupees 1185.90 lakh have been made available to 112 start-ups. Funds worth more than Rs. 2485 lakh will be provided to the start-ups in the agriculture and allied sector. It will open up doors of new employment opportunities for the youths in the agriculture sector. Recently a state-of-the-art honey testing laboratory of international standard has been set up in Anand, Gujarat. It will increase the production of quality honey and its export to foreign countries. The government has made efforts to bring prosperity to the farmers by connecting more and more with schemes like Pradhan Mantri Fasal Bima Yojana, PM Kisan, and Kisan Credit Card.

The Government has taken four landmark decisions in the interest of farmers, which will write new chapters for their future. 'One Country One Market' has been introduced and Mandi Act has been amended so that farmers can get a fair price for their produce. With the implementation of the Farming Produce Trade and Commerce (Promotion and Facilitation) Ordinance, now farmers can sell their crops anywhere in the country. It is not to exaggerate that the country got independence from the British rule in 1947, but the farmer has got independence with the promulgation of this ordinance. The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020, is also a landmark decision of the Government for the agriculture sector. Its main objective is to establish a legal order for agricultural agreements between farmers and sponsors so that farmers get fair and remunerative prices for their products. The system of electronic trade and e-platform for agricultural produce will make the farmers free from the difficulties arising out of physical

distances. The farmer will now be able to sell his farm produce sitting at his home to the trader in any state where he gets the better price. Farmers have also benefitted with the exemption of the Mandi fee.

The Government has increased the minimum support prices (MSP) of Kharif crops for the 2020-21 marketing season as per expectations. These prices are fixed by adding a 50 percent to 83 percent profit on the cost of production. Millions of farmers will get direct benefits from this. Since the beginning, it has been the endeavor of the present government that farmers must get at least one and a half times the cost of their produce. Prime Minister has announced setting up of 10 thousand Farmer Producer Organisations (FPO) so that agriculture becomes a profitable business all over the country and small farmers get more empowered. It would also facilitate increase in production and productivity, provide a proper marketing platform to farmers and encourage them to venture into the fields of processing and packaging. It is hilarious that we have taken rapid steps in this direction.

Our Prime Minister Shri Narendra Modi has said that it is a time to convert the challenge of COVID-19 into an opportunity. The path to self-reliance begins from here. The food provider farmer of our country is at its core, and his concern is on top priority. In fact, the resolve to fulfil the objective of upliftment of the village, the poor, and the farmer will certainly bring prosperity to our farmers in the future. In this, the scientific methodology of traditional agriculture and farming based on modern technology will play an important role. It is delightful to know that various branches of agronomy, agro-engineering, and agriculture are working today in a mission mode to bring forth new methodologies, research, and innovations. The day is not far when the farmer of our country will play pivotal role in establishing the agriculture sector of the country as an agricultural industry by using modern technology with a scientific mindset. No doubt, even the highly educated youth of our country will, then, take pride in adopting it as a most sought after enterprise.

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