GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

LOK SABHA
UNSTARRED QUESTION NO. 3363
TO BE ANSWERED ON 01/01/2019

AGRICULTURAL RESEARCH

3363. SHRI ASHOK SHANKARRAO CHAVAN:
SHRI T. RADHAKRISHNAN:
SHRI SUDHEER GUPTA:
KUNWAR HARIBANSH SINGH:
SHRI S. RAJENDRAN:
SHRI S.R. VIJAYAKUMAR:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि और किसान कल्याण मंत्री be pleased to state:

(a) the steps taken by the Government for the purpose of agricultural research in the country;

(b) whether any advances/achievements in agricultural technology have been made in any of the agricultural research institutes in the country;

(c) if so, the details thereof during each of the last three years and the current year;

(d) whether these advances/achievements have been adopted by farmers in the country;

(e) if so, the details thereof and if not, the reasons for the same; and

(f) the steps taken/being taken by the Government to import agricultural technology from other countries?

A N S W E R

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण मंत्रालय में राज्य मंत्री
(SHRI GAJENDRA SINGH SHEKHAWAT)

(a) The agricultural research and development (R&D) system in India has a strong base. The Indian Council of Agricultural Research (ICAR) in collaboration with the National Agricultural Research and Education System is the apex research organization of the country mandated for coordinating the agricultural research, education and extension activities for productivity enhancement and diversification of Indian agriculture for the welfare of society. To keep pace with the changing environment, the ICAR has been updating its visions and strategies from time to time to develop strategic framework

for inclusive and sustainable agricultural growth in the country. ICAR/NARS with its 103 research Institutes, 75 Agricultural Universities and 91 All India Coordinated Research Projects/ Network Projects is engaged in developing and promoting new crop varieties, technologies in package of practices in the field of agriculture including animal husbandry and fisheries. The major focus is on addressing issues at ground level to develop location specific, cost effective, eco-friendly, climate resilient technologies keeping in view the farmers' resource availability and grass-root farm innovations to enhance agricultural production, productivity and profitability in the country.

- Concrete steps have been taken by the Government to promote Agricultural R&D during the last 4 years.

- Identified and documented efficient alternative cropping systems having higher productivity potential for different agro-climatic zones. These alternative systems have been included in the Crop Production Guide/ package of practices of respective states.
- Developed 51 Integrated Farming System Models encompassing field and horticultural crops, agroforestry, livestock, fisheries for doubling income of small and marginal farmers of different agro-ecological regions of the country. Developed 45 organic farming package of practices for dominant crops and cropping systems to enhance farmers' income, which are being promoted under *Parampragat Krishi Vikas Yojana* (PKVY). 633 district contingency plans are in place for preparedness and real time implementation in the event of weather aberrations and extreme climatic events.
- Under National Innovation in Climate Resilient Agriculture (NICRA), ICAR through KVKs of 121 climatically vulnerable districts of 29 States/Union Territories implemented proven climate resilient technologies and practices which are being up-scaled by many State Governments.
- Nanaji Deshmukh National Phenomics Facility established at IARI, Pusa New Delhi was dedicated to the nation by the Honourable Prime Minister. The facility, only one of its kind in the whole world is helpful to scientists in conducting state of art research in various spheres of crop and agricultural sciences. The facility is proving to be a boon for addressing the challenges posed by the climate change and tackling adverse effects of variable climate on agricultural crops.
- Farm implement and machines suitable for farmers under Indian conditions are being developed and popularized among farmers of the country. For this purpose, farm machinery banks and custom hiring centers are being established.
- With eastern India focus, two new IARI like institutions, one in Jharkhand and Assam have been established, National Biological Research Institute has been established in Todong (Sikkim), Indian Institute of Agricultural Biotechnology (IIAB) has been established in Ranchi (Jharkhand), Rajendra Prasad Agricultural University has been upgraded to Dr. Rajendra Prasad Central Agricultural University. Further, Mahatma Gandhi National Integrated Agricultural Research Institute has been established in Bihar for conducting research and promoting integrated farming.

(b) Yes, Madam.

(c) The achievements in agricultural technology by research institutes include development of hybrids and superior varieties of cereals, cotton, vegetables and fruits,

technology for pest management, climate resilient agriculture and natural resource management to indicate a few. Besides, ICAR provides technology backstopping and policy support to the Government on various schemes and initiatives notably, seed industry, market reforms, doubling farm income and GST. The salient achievements in the field of agricultural research and education made by the Govt. have been documented and can be accessed at ICAR website through the link https://icar.org.in/content/4-year-achievement. Some of these achievements are given in **Annexure-I.**

(d) Yes, Madam.

(e) Development in agriculture sector is the testimony of adoption of advances/ achievements in agricultural technology by the research institutions. There is a time lag between adoption and development of new technology and it normally varies from 5-7 years to reach to farmers' field. The studies on spread of technologies and acceleration of growth in total factor productivity in agriculture are evidence of technology developed by the research institutions. ICAR/NARS has developed a strong mechanism to take the technologies to the farmers' field.

During the last 4 years, through the network of 704 KVKs, the ICAR has provided technological support to around 6.0 crore farmers, farm women and rural youth by conducting 6.45 lakh technology validation and demonstrations, capacity development of 53.96 lakh farmers, organizing extension activities for 540.04 lakh farmers. Besides, the KVKs produced and distributed 18.46 lakh quintals quality seeds of different field crops, 17.12 crore planting materials of different horticultural crops and 9.50 crore livestock strains and fingerlings during the period. The KVKs also provided 10.23 crore agro-advisories on plant protection, weather information, market related information, animal husbandry, fisheries, etc. on the mobile of farmers.

The government has started the Pandit Deen Dayal Unnat Krishi Shiksha Yojana- under which training programs are being organized on organic farming / natural farming and cow-based economy for farmers. Under Mera Gaon- Mera Gaurav scheme, teams of 4 scientists from different ICAR Research Institutes and agricultural universities are working in a cluster of 5 villages each and guiding the farmers on different areas of technology adoption in agriculture. More than 13500 villages have already been covered in the scheme so far. Besides, through the 'Farmer First' scheme launched in the year 2015-16 for overall village development, over 48,200 farm families have been benefitted so far.

ICAR is making efforts for reaching out to large number of farmers through KVK portal, mobile apps, video films and e-platform for mobile advisory besides radio and television networks. Agro meteorological advisories, package of practices and market related information is regularly uploaded on KVK portal, over 360 websites of KVKs, 30,777 video clips and 666 e-publications have been developed and over 130 lakh farmers registered on mKisan portal. More than 120 commodity and region specific mobile Apps have been developed for rapid transfer of technology. These include, PUSA KRISHI- Technology Mobile App, "riceXpert", E-Kapas network and technology documentation, Pulse-Expert for pests & diseases, e-Pest surveillance, advisory system for horticultural crops, online pest monitoring and advisory services, pest forewarning application, KRISHI-Digital data portal.

(f) The concerted efforts are being made in all fields by the agricultural research institutions to develop innovative technology for meeting the needs of the country. Attempts are being made to develop technology that requires less resources/ energy. Proprietary foreign technologies are being accessed by the private sector for commercialization in the country. Twenty accessions of oil palm germplasm (Sierra Leone and Senegal sourced) were imported from MPOB, Malaysia through NBPGR under the project entitled "International collaborative research project on oil palm germplasm exchange between India and Malaysia" during 2014-15.

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Annexure I

[Part (c) of Lok Sabha USQ No.3363 for 01/01/2019]

The steps taken by the Government for the purpose of agricultural research in the country. The advances/ achievements in agricultural technology made by the agricultural research institutes in the country

- In order to increase seed choice, reduce vulnerability of crops for climate change and resistance towards diseases a total of 898 crop varieties have been developed by our National Agriculture Research System since 2014, which includes traits of stress and disease tolerance, high yielding and agro-climatic zone specificity comprising of 480 of cereals, 131 of oil seeds, 127 of pulses, 72 of Fibre crops, 57 of forage crops, 30 of sugarcane and 01 of water melon. Of these 898 varieties, 580 varieties are climate resilient of which 497 have been demonstrated at Farmers' fields under various agro-climatic conditions under National Innovations in Climate Resilience Agriculture (NICRA). Besides, during 4 years of Government, ICAR has developed 20 bio- fortified varieties of crops having high contents of nutrients like Iron, Zinc, Vitamin- A etc. A total 20 bio- fortified varieties of crops having high contents of nutrients like Iron, Zinc, Vitamin- A were developed to fight against malnutrition. These varieties are: Paddy (CR Dhan 310, DRR Dhan 45, GNR-4, DRR Dhan 48, DRR Dhan 49), Wheat (WB 02, HPBW 01), Maize (Pusa Vivek QPM 9 Unnat, pusa HM 4 Unnat, Pusa HM 8 Unnat, Pusa HM 9 Unnat), Bajra (HHB 299, AHB 1200), Lentil (Pusa Ageti Masoor), Mustard (Pusa 00 31, Pusa Sarson 30), Cauliflower (Pusa Bt Kesari 1), Sugarbeet (Bhu Sona, Bhu Krishna) and Pomegranate (Solapur Lal).

- Realizing pulses as a cheaper protein source, the Government is promoting pulses and country. For this purpose, the Government established 150 pulses seed hubs to produce quality seeds of important pulse in collaboration with Department of Agricultural Cooperation & Farmers Welfare. These seed hubs produced 1.12 lakh quintals of certified quality seed during 2017-18. The pulse focus of the Government has paved the way for the record production of pulses in the country and achieving self-sufficiency in pulse production.

- First time in the country ICAR has developed 8 GM Bt Cotton varieties for commercial cultivation. The seed of these varieties will be available at Rs. 200 per Kilogram to the farmers and can be used by the farmers for 2-3 years which is not possible in case of Bt Hybrid Cotton varieties where farmers have to purchase the costly Hybrid seed every year.

- New improved varieties of horticultural crops such as fruits and vegetables with multiple resistance and higher productivity have been developed for higher productivity, nutritional quality and other attributes. Similarly, phytochemicals and nutrient rich varieties of spices and tuber crops have been identified for strengthening nutritional security of general populace. Keeping in view the demand of the horticulture industry,

ICAR, during the last 4 years, developed processable varieties of fruit and vegetable crops which include; Pomegranate (2); Grapes (5); Litchi (3); Banana (2), Mushroom (1); Onion (3); Garlic (1) and Tomato (2). As the horticulture production is increasing, the Government is extending all possible research and policy support for production of safe food for enhanced export both for ensuring remunerative prices to farmers and earning foreign exchange.

- In order to achieve self-sufficiency in milk, meat (including fish) and egg production, the Government is taking up research and developmental efforts through the network of animal and fisheries science institutes. Several technologies/ processes have been standardized for value addition of milk, meat, hair/wool products.
- ICAR has developed 14 new strains (4 of backyard poultry, 9 of pigs and one sheep) during the last 4 years.
- For forecasting and forewarning of 13 important livestock diseases National Animal Disease Referral Expert System has been developed for timely and appropriate action. Vaccines against 9 major diseases of livestock have also been developed by the Council during the last 4 years.
- In fisheries and aquaculture, during the last 4 years ICAR developed 5 different high – value compounds and nutraceuticals for human health (i) Green mussel extract and (ii) Green algal extract for pain & arthritis (iii) Seaweed antidiabetic extract for type-2 diabetes (iv) Seaweed anti-obesity extract to combat obesity/dyslipidemia and (v) Seaweed anti-hypothyroidism nutraceutical to combat hypothyroid disorder. Further, breeding and seed production technology for 9 different fish species including 5 marine fish species suitable for open sea cage culture. Over 1600 cages have already been installed all along the coast of India. Developed a Rapid Detection Kits for detecting Formaldehyde and Ammonia contamination in fresh fish by paper strip method - A path breaking initiative.
- During the last 4 years, ICAR research institutes developed 75 equipment/machines/gadgets and 37 products/ process protocols for mechanization of farm and postharvest operations. Established 652 custom hiring centres and established 49 agro-processing centres in rural catchments to encourage entrepreneurship and processing at the production sites.

ICAR, during the last 4 years, developed over 750 agriculture based startups and Agri-entrepreneurs including the Farmer Entrepreneurs in various areas of agriculture. ICAR, Research Institutes have provided the support for technology incubation activity and nurturing the techno-entrepreneurs in Agri-business Incubation (ABI) Centers established in 25 ICAR institutes, keeping in view the spectrum of technologies, available infrastructure and the core competency of the institutes.

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