GOVERNMENT OF INDIA MINISTRY OF AGRICULTURE & FARMERS' WELFARE DEPARTMENT OF AGRICULTURE & FARMERS' WELFARE

LOK SABHA UNSTARRED QUESTION NO. 3437

TO BE ANSWERED ON THE 21st MARCH, 2023

ABIOTIC CONSTRAINTS

3437. SHRI BRIJENDRA SINGH:

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

(a) the details of the measures taken by the Government to tackle the issue of abiotic constraints in crop productivity that lead to significant yield reductions;

(b) whether the Government has data on the decline in crop production due to abiotic constraints;

(c) if so, the details thereof and if not, the reasons therefor;

(d) whether the Government has taken any initiatives to develop abiotic stress-tolerant varieties using modern breeding techniques; and

(e) if so, the details thereof and if not, the reasons therefor?

ANSWER

MINISTER OF AGRICULTURE AND FARMERS WELFARE

कृषि एवं किसान कल्याण मंत्री (SHRI NARENDRA SINGH TOMAR)

(a) to (c): Government of India is implementing various programmes viz. Rainfed Area Development (RAD); Pradhan Mantri Krishi Sinchai Yojana (PMKSY); National Food Security Mission (NFSM); Crop Diversification Programme (CDP); Mission for Integrated Development of Horticulture (MIDH); Sub Mission on Agro Forestry (SMAF); National Bamboo Mission and Rashtriya Krishi Vikas Yojana (RKVY) for promoting sustainable agricultural practices in the country and to increase the productivity. Under these schemes, the financial assistance and technologies are provided to farmers for adopting the agro-ecologically suitable crops and efficient water management for sustainable production. Due to various technical interventions in the programmes of Department of Agriculture & Farmers Welfare, food-grains production of country including major crops has enhanced from 285.01 Million Tonnes (2017-18) to 315.62 Million Tonnes (2021-22), which is likely to be enhanced to 323.55 Million Tonnes during 2022-23 as per the Second Advance Estimates. ICAR conducts research through its institute's namely; National Institute of Abiotic Stress Management (NIASM), Baramathi and Central Soil Salinity Research Institute (CSSRI), Karnal on abiotic stresses caused due to both climatic and edaphic factors in different sectors of agriculture. In field crops, nearly 10% to complete

yield loss has been observed depending on the severity of stress. In order to educate farmers, ICAR imparts training and organizes Front Line Demonstrations (FLDs). To meet the challenges of sustaining domestic food production in the face of changing climate, the Indian Council of Agricultural Research (ICAR) under Ministry of Agriculture and Farmers Welfare, Government of India has launched a flagship network project namely National Innovations in Climate Resilient Agriculture (NICRA). The project aims to study the impact of climate change on agriculture including crops, livestock, horticulture and fisheries and to develop and promote climate resilient technologies in agriculture which will address vulnerable areas of the country and the outputs of the project will help the districts and regions prone to extreme weather conditions like droughts, floods, frost, heat waves, etc. to cope with such extremes. The salient achievements under ICAR are as follows:

- 1. Sixty eight location-specific climate resilient technologies to manage abiotic stresses have been developed and popularized for wider adoption among the farming communities through farmer participatory research in NICRA villages.
- 2. Agricultural contingency plans for 650 districts have been prepared and State officials have been sensitized for preparedness through 57 State-level interface meetings during the past eight years. Agricultural contingency plans have been made available online for policy makers to take decisions in the event of delayed monsoons and other extreme weather events.
- 3. District level risk and vulnerability assessment of Indian agriculture to climate change has been prepared which is useful for several Ministries/ Departments for prioritizing resources towards developmental programs.
- 4. Based on vulnerability assessment, climate resilient technologies are being demonstrated on farmer's fields in 151 clusters covering 446 villages.
- 5. At present, ICAR in collaboration with India Meteorological Department (IMD) is issuing Agromet advisories twice a week (Tuesday and Friday) to farmers of the country through Gramin Krishi Mausam Seva program. The advisories are reaching the farmers through, WhatsApp groups, SMS services etc.
- During the past decade, 16,958 capacity building programs were conducted throughout the country under NICRA project to educate stakeholders on various aspects of climate change and resilient technologies, covering 5,14,816 different stakeholders including farmers so as to enable wider adoption of climate resilient technologies.

(d) & (e): Indian Council of Agricultural Research (ICAR) through its 57 Institutes and 40 All India Coordinated Research Projects/ All India Network Projects operating in more than 930 centres across 45 State/Central Agricultural Universities is promoting research on improvement of seed /varieties /hybrids including abiotic stress tolerant varieties adopting modern breeding techniques. Since 2014, 407 varieties have been bred specially for extreme abiotic stress conditions like flood/ water submergence/ water logging tolerance (73), drought/moisture stress/ water stress tolerance (220), salinity/ alkalinity/ sodic soils tolerance (52), heat stress/ high temperature tolerance (49), cold/ frost/ winter chilling tolerance (13) using the precision phenotyping tools. The details on crops, stress traits and number of varieties in each crop are given in Annexure-I.

Annexure to the Lok Sabha Unstarred Question No. 3437 due for Reply on 21.03.2023 on Abiotic Constraints

Traits	Crops (no. of varieties)
A. Flood/ water	Rice (50), Maize (2), Sorghum (1), Jute (4), Rice
submergence/water logging	bean (1), Sugarcane (15)
tolerant varieties (73)	
B. Drought/moisture stress /water	CEREALS (114):Rice (51), Wheat (17), Maize
stress tolerant varieties (220:	(18), Sorghum (7), Pearl Millet (10), Little millet
Field Crops– 217; Potato - 3)	(3), Kodo millet (3), Finger Millet (5)
	OILSEEDS (22): Soybean (5), Groundnut (4),
	Sesame (2), Indian Mustard (6), Niger (1), Toria
	(3), Taramira (T)
	PULSES (31): Urdbean (2), Pigeonopea (15),
	(0), (1) , (2) , (1) ,
	(1)
	FIBER CROPS (9): Cotton (6), Roselle (2), Jute
	(1)
	FORAGES (15): Pearl Millet (2), Forage Sorghum
	(1), Forage Maize (1), Napier Bajra Hybrid (1),
	Cowpea (1), Fescue Grass (1), Guinea Grass (2),
	Rice bean (2), Marvel Grass (1), Anjan Grass (1),
	Forage Sewan Grass (1), Setaria Grass (1)
	SUGARCROPS (23): Sugarcane (23)
	VEGETABLES (3): Potato (3)
C. Salinity/Alkalinity/Sodic soils	Rice (29) , Wheat (2) , Barley (3) , Indian Mustard
tolerant varieties (52)	(5), Lentil (2), Sesbania (1), Sugarcane, (10)
D. Heat stress/ high temperature	Cereals (34): Rice (9), Maize (4), Pearl Millet (4), W_{boat}
-47: Potato -2	Oilsoods (6): Sosamo (1) Indian Mustard (4)
-47,1000-2)	Vellow Sarson (1)
	Pulses (4):Chicknea (1) Lentil (3)
	Fiber Crop (3):Cotton (3)
	Vegetable crops (2):Potato (2)
E. Cold tolerant/Frost/ winter	Cereals (7): Rice (5), Maize (2)
chilling tolerant field crop varieties	Pulses (1):Lentil (1)
(13)	Forage Crops (3):Setaria Grass (1),Fescue Grass
	(1), Nepier Bajra Hybrid (1)
	Fiber Crop (2): Cotton (2)
