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Pulses For Sustainable Agriculture and Nutritional Security In India

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Abstract

Pulses are part of a healthy and balanced diet with low fat source of protein, with a high fibre content and low glycaemic index, high in fibre, vitamins B like folate, thiamine and niacin and minerals like iron, potassium, magnesium and zinc. Besides serving as an important source of protein for a large portion of the global population, pulses contribute to healthy soils and climate change mitigation through their nitrogen-fixing properties. Pulses improves soil health by enriching nitrogen in the soil, thus incorporating pulse in cereal-based cropping systems contributes to soil fertility by enriching organic nitrogen. The Government of India has initiated the Pulse Mission for increasing the production, productivity and availability of pulses in the country by expanding the area of cultivation, providing improved varieties, disseminating improved technologies to the farmers.

Keywords: Pulses, sustainable, agriculture, nutrition, food security, livelihood.

Introduction:

Pulses are leguminous crops which includes lentil, chickpea, beans and peas. They are an important source of proteins, vitamins, essential minerals like iron, calcium, magnesium and zinc, high fibre content and low glycaemic index. Increasing productivity of crops ensure the livelihood security of the farmers because it depends upon the productivity of the crops. Pulse crop plays a vital role in ensuring the nutritional security of the country as it is considered to be an essential component of a balance diet.

Importance of Pulses

Pulse is an important part of Indian diet and have been consumed for centuries. During Green Revolution growing of rice and wheat was promoted largely with the use of external inputs and use of improved seeds whereas, pulse crop was grown in marginal areas which has resulted in decline in productivity and land degradation. Pulse is still cultivated on marginal and sub-marginal lands predominantly under unirrigated conditions. Also, the trend of commercialization in agriculture has further aggravated the status of pulse crop in Indian farming system. However, due to the awareness about the improved practices of soil management like crop rotation and inter-cropping and since less external inputs are required for pulse crop, it has been integrated

into Indian farming system and is gaining attention in recent years. India is the largest producer and consumer of pulse in the world contributing 26 % of the global pulse production (FAOSTAT, 2017). Pulse crop plays an important role in mitigating greenhouse gas emissions in agriculture production by lowering greenhouse gas emissions due to lower fertilizer requirements, supplying their own nitrogen as well as contributing nitrogen to succeeding crops (Leme *et al*., 2007). Pulses improves soil health by enriching nitrogen status, long term fertility and sustainability of the cropping system and incorporating pulse in cereal-based cropping systems contributes to soil fertility by enriching organic nitrogen, reducing the demand of chemical fertilizers, enhancing soil micro flora as well as supplement protein diet for large population of the country. Pulses are a versatile crop and can be grown in areas where other crop cannot be cultivated and their deep and numerous roots allow them to withstand severe drought conditions. Another important aspect of pulse is that they can be cultivated easily without requiring excessive chemical fertilizers or pesticides. World Pulses Day is celebrated on February 10 every year and it represents a unique opportunity to highlight the role of pulses in more efficient, inclusive, resilient and sustainable agriculture food systems. It also continues to shine a light on how pulses can contribute to food security through better production, nutrition, a better environment and a better life for all.

Pulse crop in Indian scenario

Pulse is an important part of Indian diet and have been consumed for centuries. During Green Revolution growing of rice and wheat was promoted largely with the use of external inputs and use of improved seeds whereas, pulse crop was grown in marginal areas which has resulted in decline in productivity and land degradation. Hence, pulse is still cultivated on marginal and sub-marginal lands predominantly under unirrigated conditions. Also, the trend of commercialization in agriculture has further aggravated the status of pulse crop in Indian farming system. However, due to the awareness about the improved practices of soil management like crop rotation, inter-cropping etc and since less external inputs are required for pulse crop, it has been integrated into Indian farming system and is gaining attention in recent years. India is the largest producer and consumer of pulse in the world contributing 26 % of the global pulse production (FAOSTAT, 2017). About 72% of the global pigeon-pea, 61% of gram and 16% of lentil area is under India. The major pulse producing states of India are Madhya Pradesh (33%), Maharashtra (13%), Rajasthan (12%), Uttar Pradesh (9%), Karnataka (8%), Andhra Pradesh (33%), Gujarat (4%) and remaining 16% by all other state like Jharkhand, Tamil Nadu and Telangana. In India, states like Madhya Pradesh, Uttar Pradesh, Karnataka, Bihar, Odisha, Tamil Nadu, West Bengal, Chhattisgarh, Andhra Pradesh, Jharkhand, Gujarat are growing spring, summer and Zaid pulses. India has exported about 775,024.48 MT of pulses to the world during the year 2022-2023 to countries like Bangladesh, China, UAE, USA and Nepal. Pulse crop

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represent an important economic opportunity to boost the income and reduce the risk of the farmer community by diversifying their crop and income stream portfolio.

Government initiatives and policies

The Government of India has initiated the Pulse Mission known as the National Food Security Mission -Pulses (NFSM-Pulses), which aims to increase the production, productivity and availability of pulses in the country. The main objective is to expand the area of cultivation, distribute quality seeds, disseminate agricultural technologies and promote suitable practices to the farming community. The mission supports soil health management, provides price support through minimum support price and strengthens market linkages. The mission address different aspects of pulse cultivation and marketing, enhance farmers income, bridge the demand-supply gap and improve nutritional security by ensuring affordable pulses for the Indian population. Under the Pulse Mission, several policies have been initiated which is effective in increasing the production of pulses and make India self-sufficient in pulses.

The different policies under the Pulse Mission like providing subsidies for producing pulse crop, promote the use of high yielding varieties of pulse crop and improve the infrastructure for pulse production and marketing.

Role of pulse crop in food and nutritional security

Although pulses have existed for a while, their contribution to food security, good health and the environment is just starting to be fully acknowledged. Pulses are also an important component of the response of the Food and Agriculture Organization of the United Nations (FAO) in emergencies. The world aims at achieving the Sustainable Development Goals (SDG 2). The potential of pulses can play a major role in addressing global environmental and food security challenges, while contributing to healthy and affordable diets.

Indian agriculture fiercely depends on monsoons to yield sufficient agricultural returns. Pulses, therefore, witness huge fluctuations in terms of production and prices depending upon rainfall scenario. The Government of India thus initiated to create a buffer stock of pulse since 2016-17 to reduce price fluctuations and ensuring availability. This also helped in providing remunerative prices fluctuations and ensuring availability. This also helped in providing remunerative prices to farmers. India is the highest producer of pulses in the world, its domestic production of 25.23 MT in 2017-18 for the first time has brought self sufficiency in pulses. Long-term solution to meet demand for pulses lies in increasing productivity of pulses by bridging the yield gaps, intercropping of pulses and growing pulses during summer. Efforts to introduce pulses in rabi season can have a significant economic benefit (Joshi *et al*., 2002). The is also scope for producing pulses in the rainfed areas using resource conservation and water harvesting techniques, providing incentives for growing pulses,

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introduction of improved varieties that can enhance productivity, ensuring the availability of pulses to a larger population at an affordable price.

Pulse for sustainable agriculture food system

Pulses have been grown throughout the world for centuries and they continue to play a fundamental role in creating a sustainable and food secure country. Incorporation of pulses in cropping systems helps in promoting a sustainable farming practice which contribute in enriching the soil with nutrients, leading to a better growing condition reducing the need for synthetic fertilizers and promote biodiversity. Pulse has an important role in contributing to food and nutritional security and replenishing soil nutrients having a huge potential in addressing needs like future global food security, nutrition and environmental sustainability needs. Besides the environmental benefits of incorporating pulses to crop rotations, there is also social and economic benefit of production as it fulfils the protein requirements, minimize soil degradation and support diversification in food production and consumption. Crop rotation based on incorporating pulses into cereal-based systems reduces synthetic fertilizer use. Optimizing the time and rate of fertilizers applied to crops are two most important interventions to decrease nitrogen application (Canfield *et al*., 2010). Though substantial progress has been made in evolving techniques to obtain high yields of pulse their production has stagnated for the past many years primarily due to the number of biotic and abiotic constraints under rainfed environments.

Conclusion

Pulses are an important crop in context of Indian scenario as it improves soil health by enriching the availability of Nitrogen in soil, sustain the cropping system, reduce the demand of chemical fertilizers, enhancing soil micro-flora and nutritional security and replenishing soil nutrients having a huge potential in addressing needs like future global food security, nutrition and environmental sustainability. Achieving pulse sufficiency in India requires a comprehensive approach that encompasses policy changes, research and development, extension services, irrigation infrastructure, affordable credit and insurance, market linkages and trade facilitation measures. The commitment of the Government of India for formulating and implementing the policies under the Pulse Mission should be effectively implemented so that it will play a crucial role in boosting the cultivation of pulse crop in India.

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