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## Causes of reducing area under soybean crop and suggestions for enhancing area in Chhattisgarh

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### Abstract

A study was conducted in Kabirdham and Bemetara districts of Chhattisgarh found that farmers are reducing soybean cultivation due to biotic factors (weeds, insects and diseases), environmental factors (excessive rainfall and rain during harvest season), unstable prices, lack of government procurement system, and a shortage of improved seeds. Farmers who shifted to high-yielding and high-revenue generating crops (rice and sugarcane) experienced an increase in income and expenses, but the cultivation of high-nutrient-demanding crops may led to decrease in soil fertility. Farmers recommended providing them with improved soybean varieties at competitive price, offering subsidies for agricultural inputs, creating soybean processing facilities, implementing contemporary agricultural technologies, providing crop insurance, supporting farmers with training sessions, promoting crop rotation, and providing government assistance for land improvement to revitalize soybean cultivation in the area.

**Keywords:** Soybean, biotic and abiotic factors, improved seeds, subsidies, processing facilities, training

### Introduction

Soybean (*Glycine max* L.) is a legume crop that is native to central China. It is the most important oilseed crop in the world and is also called the "Golden Bean" or "Miracle Bean" because of its highly nutritional qualities. Soybean has 38 to 42% protein content, which is a complete protein, meaning it contains all nine essential amino acids. It also contains 18-20% oil, lecithin, and vitamins A and D. Soybean can be grown in tropical to subtropical regions of India and can tolerate a wide range of climatic conditions. It is a short-duration crop and is most sensitive to variety, temperature, and irrigation facilities. India ranks fifth in soybean production in the world, after Brazil, the United States, Argentina, and China. India produces 11,500 MT of soybean, which is about 3% of the world's total production. Soybean is a world's first rank crop as a source of vegetable oil and India is the largest consumer of edible oil in the world. This means that India imports a large amount of edible oil from other countries. Soybean was introduced to India in 1963 with trials conducted at Pantnagar and Jabalpur Agriculture Universities, using varieties from the USA. In India, soybean is the second most important oilseed crop after groundnut. It occupies an area of 11.4 million ha with production 12.03 million tons and productivity of 1051 kg per ha. The major soybean grower states in India are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Gujarat, Telangana, and Chhattisgarh. Chhattisgarh is a small state in central India with a total geographical area of 138 Lakh ha. The net sown area in Chhattisgarh is 46.51 Lakh ha, which is about 34% of its total geographical area. About 57% area has medium to light soil. Chhattisgarh state is divided into 3 Agro-Climatic Zones *viz.* Chhattisgarh Plain (51.00%), Bastar Plateau (28.00%) and Northern Hills (21.00%) of the area respectively. (Directorate Agriculture, Chhattisgarh Raipur). In Chhattisgarh, soybean is grown during the kharif season. Soybean occupies an area of 0.420 lakh ha with production 0.441 lakh metric tonnes with average productivity 1050 kg/ha. The plain area of Chhattisgarh provides the best suitable climatic conditions for soybean production. The important growing districts in Chhattisgarh are Rajnand gaon, Bemetara, and Kabirdham.

### Materials and Methods

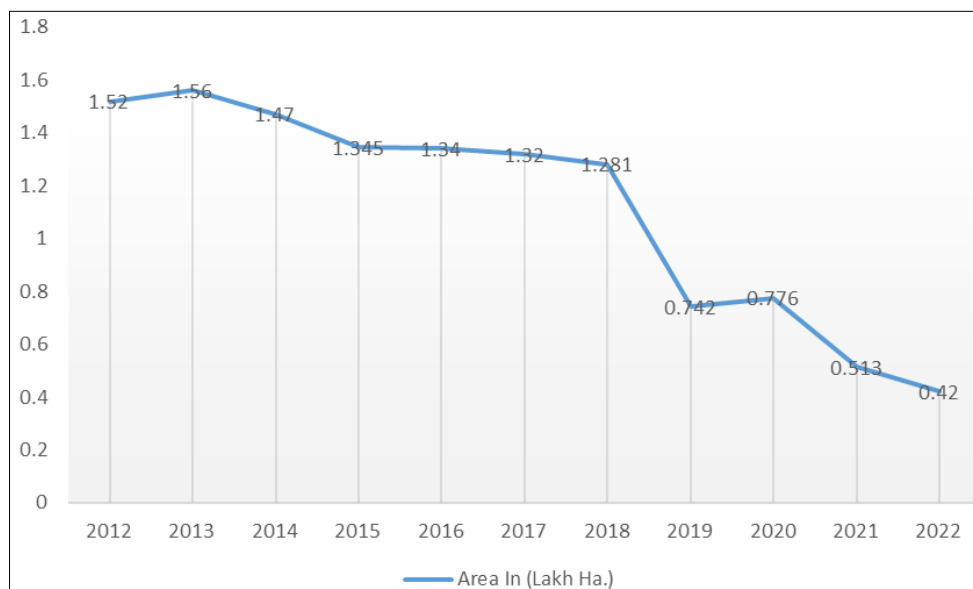
The study was conducted in Kabirdham and Bemetara districts of Chhattisgarh state, which had the maximum area under soybean crop. Two blocks were selected from each district based on the area under soybean cultivation. Kawardha and Bodla blocks were selected from Kabirdham district, similarly Nawagarh and Bemetara blocks were selected from Bemetara

district. Two villages were selected from each of the selected blocks on the basis of largest area under soybeans over the previous five years. Thus total of eight villages were included in the study for the purpose of choosing respondents. Fifteen respondents from each of the chosen villages who had discontinued growing soybean were selected. Therefore, a total of 120 respondents/farmers were included in the study for data collection by interviewed for this investigation.

## Results and Discussion

### Area reduced in Chhattisgarh

Based on secondary data obtained from the Indian Soybean Processing Association. Data presented on the fig. number 1 concluded that 1100 lakh hectare area under soybean cultivation in 2022 as compare to base year (2012) it was reduced 72.37 percent in Chhattisgarh.



**Fig 1:** Area under soybean crop in last ten years in Chhattisgarh

### Main causes of reducing area of soybean

Main causes for reducing are under soybean crop are the extreme decline in soybean production due to biotic and abiotic factors, the rise in production costs every year, high impact of climate change on soybean production, government

policies that support farmers' to produce rice and sugarcane, and low adoption of recommended crop packages and practices were the main five factors in descending order, Another were shown in table number 1.

**Table 1:** Causes of reducing area of soybean as perceived by the farmers

Sl. No.	Causes	Frequency	Percentage	Rank
1.	Extreme reduction in production of soybean due to biotic and abiotic factor.	120	100	I
2.	Increase in cost of cultivation of soybean every years.	118	98.33	II
3.	Government policies that promote farmers for rice and sugarcane production.	110	91.67	IV
4.	Climate change's impact on soybean production.	115	95.83	III
5.	Higher income from rice and sugarcane crops.	100	83.33	VII
6.	Unavailability of high yielding improved seeds.	95	79.17	IX
7.	Higher production of rice and sugarcane due to availability of HYV.	98	81.67	VIII
8.	Ignorance of severe infestation of insect pest disease control by the farmers.	101	84.17	VI
9.	Low adoption of recommended package and practices of the crop.	108	90	V
10.	Less production cost of sugarcane.	65	54.17	X

Data based on multiple response method

### Suggestions of farmers for enhancing the area under soybean crop

According to the statistics in table 2, the vast majority of respondents 99.17 percent suggest for an increase in the number of improved soybean seed varieties that farmers could purchase at least price. Additionally, 97.50 percent of the respondents said that subsidies for soy-related inputs like seeds and pesticides were necessary, 96.67 percent of the respondents recommended supporting the development of soybean processing facilities for the production of food, soymilk, and oil, 84.17 percent of the responders advocated offering incentives to accomplish high soybean production. 83.33 percent of the respondents advocated for encouraging the use of contemporary agricultural technologies, such as

automation and genetically altered soybean varieties. In the case of droughts or floods, 80.83 percent of the respondents advised providing crop insurance with large returns. The necessity for training programs to teach farmers about contemporary farming practices, resource management, pest control, and post-harvest techniques was highlighted by 79.17 percent of the respondents. 78.33 percent of the respondents suggested that facilitating direct market connections between farmers and buyers, such as cooperatives and food processing companies. To enhance soil health, lessen pests, and boost output, the respondents 76.67 percent proposed encouraging crop rotation using complementary crops. Finally, 74.17 percent of respondents said that government support for land improvement activities.

**Table 2:** Suggestions from farmers for increasing the area under soybean cultivation

SI. No.	Courses	Frequency	Percentage	Rank
1.	Improved varieties of soybean seed available to farmers at affordable prices.	119	99.17	I
2.	Provide subsidies for soybean inputs like chemicals and seeds.	117	97.50	II
3.	Encourage the establishment of soybean processing units for oil, soymilk, and food products.	116	96.67	III
4.	Promote the use of modern agricultural technologies like, mechanization, and genetically modified soybean varieties.	100	83.33	V
5.	Conduct training programs to educate farmers on modern farming practices, resource management, pest control, and post-harvest techniques.	95	79.17	VII
6.	Facilitate direct market connections between farmers and buyers, such as cooperatives and food processing companies.	94	78.33	VIII
7.	Encourage crop rotation with compatible crops to improve soil health, reduce pests, and increase yield.	92	76.67	IX
8.	Providing bonus on high production of soybean.	101	84.17	IV
9.	Offer crop insurance with high returns in case of drought or floods.	97	80.83	VI
10	Government support for land improvement.	89	74.17	X

Data based on multiple response method

### Conclusion

It can be concluded that main causes of reducing area under soybean crop was less production of soybean due to biotic and abiotic factors, increase in cost of cultivation every year, state government policies providing bonus on rice and sugarcane crop, climate change impact on soybean such as high rainfall and high rainfall at harvesting time, ignorance of insect pest infestation and low adoption of recommended package and practices. Majority of the respondents were suggested that providing improved varieties seeds, providing subsidies for soybean inputs, encourage the establishment of oil extraction industries, providing bonus in high production of soybean and promote the farmers to use modern technologies for soybean production.

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