



Constraints and Suggestions Perceived by the Pulse Farmers of Nayagarh District of Odisha

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: To study the constraints faced by pulse farmers in adopting improved pulse production practices and their suggestions to overcome the constraints.

Study Design: Ex post facto survey research design with proportionate random sampling techniques.

Place and Duration of the Study: Nayagarh district of Odisha during 2019-2020.

Methodology: A total of 256 respondents covering 8 villages from 4 blocks of Nayagarh district were selected as sample respondents. The data were collected by personal interview using a well structured questionnaire. The data were tabulated and analyzed by using Garrett's ranking technique for the study of constraints and suggestions.

Results: The findings of the study indicate that major constraints for adopting pulse production technologies were improper knowledge about recommended doses of pesticides and fertilizers (59.57 percent), lack of knowledge about improved agricultural technologies time to time (59.2 percent), lack of technology and training to create local storage structures (66.55 percent) and inadequate training of farmers (55.49 percent). Major suggestions of pulse farmers to overcome these constraints were improved varieties should be provided (68.04 percent), more number of FLDs should be given in village to enable other farmers to take advantage (66.85 percent) and training be imparted to implement new technologies (66.85 percent).

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Conclusion: Research on modification of agronomic practices and their different components for excelling production under changing climatic scenario need to be strengthened with more training for the farmers to enrich their knowledge and skill about pulse production.

Keywords: Constraint; farmer; Garrett's ranking; pulse production; suggestion.

1. INTRODUCTION

Pulses, with their high protein content, play an important role in a country like India for citizens of all ages. Pulses have twice the protein content of wheat and three times the protein content of rice. Pulses are often grown under rainfed conditions and do not need extensive irrigation, which is why they are grown in areas that are left over after cereal/cash crop demand has been met. Apart from their high protein content, pulses have a number of other advantages, including improved soil quality and physical structure, compatibility with mixed/intercropping systems, crop rotations, and dry farming, and the ability to produce green pods for vegetables and healthy fodder for livestock.

Pulses are an essential part of the Indian diet since they are a major protein source. Pulses are known as "poor man's meat" because dairy and animal products are seldom consumed by India's poorest people, both in rural and urban areas. Pulse crops are a form of green manure that helps to improve soil quality. As a result of their nitrogen-fixing properties, pulses help to improve human health while still conserving soil. Pulses play such an important role in the agricultural system and in people's diets that they are an optimal crop for achieving food and nutritional stability, as well as eliminating poverty and hunger.

Pulses are cultivated in each of Odisha's 30 districts. Pulses are currently cultivated on 20.8 million hectares, with a harvest of 10.6 million tonnes and a yield of 508 kilograms per hectare. Odisha falls into the country's low pulse productivity zone (600 kg/ha). Pulse productivity in the state is around two-thirds of the national average of 764 kg/ha, with 30 to 50 percent of demonstrated yield and only 25 to 35 percent of possible yields recorded from study plots, suggesting that there is a lot of room to increase both productivity and production of these crops by removing various production constraints. The significant pulse crops grown in Odisha are green gram, black gram, horse gram, and pigeon pea, which together account for 88 percent of total pulse area and 85 percent of total pulse

output [1]. Pulses are mostly grown in Odisha as rainfed crops in marginal and submarginal areas with no nutrient control. In general, farmers do not apply any nutrient or biofertilizer, and YMV is the primary cause of low yield in this region. Since the crops are grown in residual soil moisture, they are often subjected to water stress. Pulses, in comparison to other grains, are weak competitors to cereals, oilseeds, and other cash crops due to yield volatility, high storage losses, and a shortage of post-harvest control facilities such as refining. Pulses are often subjected to water stress conditions when grown in abandoned lands with residual soil moisture and inadequate management practices, resulting in a decline in production and viability [2]. The increasing population, rising income of the people, regional shift, sudden climate change, complex disease-pest syndrome, socio-economic policies, and input constraints have all been due to the demand-supply gap pulses marked and shortage in pulses [3]. Pulses production is less profitable than other crops due to this, as well as other economic factors such as a lack of guaranteed demand, ineffective government procurement, a lack of a minimum support price, and trade liberalization [4].

Pulses are perfect crops for achieving the sustainable development goals of reducing poverty and malnutrition, improving human health and nutrition, and strengthening environmental sustainability because of their complex and essential positions in agricultural systems and people's diets. Furthermore, certain pulses (chickpeas, peas) have properties that increase soil quality and productivity [5]. Farmers lack knowledge of and access to sowing technology that aid seed germination. Farmers are in dire straits. They don't have enough money to buy essential inputs like seed, fertilizer, and pesticides. Institutional credit is difficult to come by. The lack of these inputs, especially seed, also limits the production of rabi crops. The public extension scheme is ineffective at getting infrastructure, supplies, and knowledge to farmers. The aim of this study was to identify barriers to constraint of production of pulse crops in the Nayagarh district of Odisha.

2. MATERIALS AND METHODS

With latitude and longitude of 19° 54' to 20° 32' N; 84° 29' to 85° 27' E, the Nayagarh district has a tropical climate. The district covers 3890 square kilometers and has a population of 9.63 lakhs. Agriculture and related operations dominate the district, which has 1702 villages. The net sown area and total cultivated area are respectively 1.27 lakh ha and 2.23 lakh ha [6]. Cropping intensity is 176 percent, which is higher than the national average, reflecting the district's significance in agriculture. Just around a third of the net sown area (0.39 lakh ha) is irrigated, and the remainder of the crops are grown in rainfed conditions, relying on an annual rainfall of about 1355 mm. The temperature fluctuates between 40°C in the summer and 10°C in the winter. Red, alluvial, black, and laterite soil types are ideal for paddy, green gram, black gram, sugarcane, coconut, mango, vegetables, tuber crops, maize, and other main crops [7]. In the Nayagarh district, paddy was grown on 94610 hectares, green gram on 49280 hectares, black gram on 17440 hectares, other pulses on 6950 hectares, sugarcane on 5420 hectares, and sesame on 5950 hectares. After paddy, pulses have the second highest ground coverage in the district. The district's total pulse productivity was around two-thirds of the national average of 764 kg/ha [1], which was the reason for selection of the district for study of constraints faced by the pulse farmers and their suggestions on how to overcome the problem.

The study was conducted in Nayagarh district, which is one of the major producers of pulses in Odisha. A total of 256 (Two hundred fifty six) number of respondents were selected for the purpose of the investigation during 2020. The study was carried out in Ex post facto survey research design with proportionate random sampling techniques. Proportionate random sampling technique represents the characteristics of major population by sampling a proportional total [8]. The district Nayagarh was selected purposively as it was one of the major pulse producer districts. Four major pulse producer blocks were selected out of 6 total blocks purposively. Gram panchayat and villages were selected randomly for the study. The data were collected using pretested structured interview schedule.

Garrett's ranking technique was engaged for ranking the preferences of respondents on

different variables. Garrett's ranking technique provides the change of orders of constraints and suggestions into statistical scores. The main advantage of this technique over simple frequency distribution is that the constraints are arranged based on their rigorosity from the point of view of farmers. Hence, the identical number of respondents on two or more constraints may be given different rank [9]. The respondents were asked about their preference for all factors and which were ranked. The resultant outcomes of such rankings were converted to percent position using the formula:

$$\text{Percent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i_{th} variable by j_{th} respondents.

N_j = Number of variable ranked by j_{th} respondents.

From the Garrett's Table, the percent position calculated was converted into scores. Then for each factor, the scores of each individual were added and then total value of scores and mean values of score was calculated. The factors having highest mean value was considered to be the most important factor.

3. RESULTS AND DISCUSSION

During investigation, there were many reasons due to which the recommended pulse production technologies could not be adopted on the farms as expressed by the farmers. These factors were termed as constraints faced by farmers in adoption of improved pulse production technology. Such constraints as expressed by the farmers are explained below with respect to different categories.

3.1 Crop Production Related Constraints

In case of crop production related constraints as observed in the Table 1, main constraints expressed by pulse farmers were improper knowledge about recommended doses of pesticides and fertilizers with mean score 59.57, followed by insufficient knowledge about fertilizer usage with mean score 58.68, unavailability of improved varieties with mean score 58.09, insufficient knowledge of pest and diseases with mean score 52.27, severe problem of soil

erosion with mean score 47.85 and effect of unfavorable climatic conditions with mean score 38.2 respectively. Similar results were reported by Poonguzali et al. [10] lack of pest and disease resistant variety was one of the major constraints.

3.2 Market Related Constraints

The major marketing constraints expressed by pulse farmers in Table 2 were lack of knowledge about improved agricultural technologies time to time with mean score 59.2 followed by excessive presence of middlemen in market with mean score 49.93, wider distance of markets and incorrect and lesser price of pulses with mean score 47.63, non-remunerative price with mean score 47.18, more expensive price of chemicals, fertilizers, pesticides and herbicides in market with mean score 44.73, lack of finance to purchase inputs with mean score 39.68 and lack of transportation facilities with mean score 31 respectively. Similar results were found by Gohain and Singh [11], they reported that there was lack of public procurement of the produce and lack of remunerative price of the crop.

3.3 Storage Constraints

The major storage constraints expressed by pulse farmers in Table 3 were lack of technology and training to create local storage structures with mean score 66.55 followed by non availability of proper loans on keeping agricultural products in ware houses with mean score 65.96, lack of proper care of agricultural products in ware houses with mean score 60.91 and lack of storage facilities with mean score 59.95 respectively.

3.4 Social and Psychological Constraints

Social and psychological constraints expressed by pulse farmers as observed in Table 4 were inadequate training of farmers with mean score 55.49 followed by lack of motivation with mean score 52.3, lack of coordination between farmers with mean score 32.18, lack of active local leaders with mean score 32.93 and unskilled work of innovators with mean score 32.63 respectively. Similar results were reported by Bansilal et al. [12] where lack of frequent technical supervision and guidance was a major constraint for pulse growers.

Table 1. Garrett ranking of crop production related constraints (n=256)

S. No.	Constraints	Garrett's mean score	Rank
1	Unavailability of improved varieties	58.09	3
2	Effect of unfavorable climatic conditions on the crop production	38.2	6
3	Insufficient knowledge about fertilizer usage	58.68	2
4	Insufficient knowledge of pest and diseases	52.27	4
5	Improper knowledge about recommended doses of pesticides and fertilizers	59.57	1
6	Severe problem of soil erosion	47.85	5

Table 2. Garrett ranking of market related constraints (n=256)

S. No.	Constraints	Garrett's mean score	Rank
1	Lack of knowledge about improved agricultural technologies time to time	59.2	1
2	Non remunerative price	47.18	4
3	More expensive price of chemicals, fertilizers, pesticides and herbicides in market	44.73	5
4	Lack of transportation facilities	31	7
5	Excessive presence of middlemen in market	49.93	2
6	Wider distance of markets and incorrect and lesser prices of pulse	47.63	3
7	Lack of finance to purchase inputs	39.68	6

Table 3. Garrett ranking of storage constraints (n=256)

S. No.	Constraints	Garrett's mean score	Rank
1	Lack of storage facilities	59.95	4
2	Lack of technology and training to create local storage structures	66.55	1
3	Lack of proper care of agricultural products in ware houses	60.91	3
4	Non availability of proper loans on keeping agricultural products in ware houses	65.96	2

Table 4. Garrett ranking of social and psychological constraints (n=256)

S. No.	Constraints	Garrett's mean score	Rank
1	Inadequate training of farmers	55.49	1
2	Lack of motivation	52.3	2
3	Lack of active local leaders	32.93	4
4	Unskilled work of innovators	32.63	5
5	Lack of coordination between farmers	32.18	3

Table 5. Garrett ranking of suggestions given by farmers to overcome pulse production related constraints (n=256)

S. No.	Suggestions	Garrett's mean score	Rank
1.	Intimation for conduction of FLDs should be given in advance	38.72	12
2.	Improved varieties should be provided	68.04	1
3.	More number of FLDs should be given in village to enable other farmers to take advantage	66.85	2
4.	Visit of scientists at critical stage of application of technology	49.55	8
5.	All critical inputs for maximization of yield should be given in advance	49.11	9
6.	Training be imparted to implement new technologies	66.85	2
7.	Latest technologies need to be made available time to time by govt. or non govt. organizations	64.99	4
8.	Weather forecasting to be made available	46.88	10
9.	Middlemen interference should be minimum	50.59	7
10.	Market and transportation facilities should be provided	40.2	11
11.	Farmers should be motivated to adopt new technology	57.05	6
12.	Storage facilities should be provided	61.43	5

3.5 Suggestions Given by Farmers to Overcome the Constraints

While talking to the farmers it was found that the constraints discussed above are the majority in the pulses production related, in order to cope up with these constraints farmers have suggested several possible solutions. Following Table 5 shows the major suggestions given by the farmers mentioned rank wise.

As observed in the Table 5, the major suggestion provided by pulse farmers were improved varieties should be given in advance with mean score 68.04 followed by both training to be imparted to implement new technologies and more number of FLDs should be given in village to enable other farmers to take advantage with mean score 66.85, latest technologies need to be made available time to time by govt. or non govt. organizations with mean score 64.99, storage facilities should be provided with mean score 61.43, farmers should be motivated to adopt new

technologies with mean score 57.05, middlemen interference should be minimum with mean score 50.59, visit of scientists at critical stage of application of technology with mean score 49.55, all critical inputs for maximization of yield should be given in advance with mean score 49.11, weather forecasting to be made available with mean score 46.88, market and transportation facilities should be provided with mean score 40.2 and intimation for conduction of FLDs should be given in advance with mean score 38.72 respectively. Similar results were found by Parmar et al. [13] where he reported major suggestions as provision of training and timely availability of improved seed.

4. CONCLUSION

On the basis of the study it may be concluded that the maximum numbers of pulse farmers experienced various constraints in adoption of improved pulse production technologies. The most important problems were improper knowledge about recommended doses of pesticides and fertilizers, lack of knowledge about improved agricultural technologies time to time, lack of technology and training to create local storage structures and inadequate training of farmers were the major constraints in adopting improved pulse production practices. The suggestions of pulse farmers to overcome these constraints were improved varieties should be provided, more number of FLDs should be given in village to enable other farmers to take advantage and training be imparted to implement new technologies. Research on modification of agronomic practices and their different components for excelling production under changing climatic scenario need to be strengthened with more training for the farmers to enrich their knowledge and skill about the pulse production.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Garnayak LM. Strategies for enhancing pulse production in Odisha. Orissa Environmental Society. 2016; 71-74.
2. Dash SR, Rautaray BK, Dhal A. Perception and constraints faced by pulse growers and yield gap analysis of green gram (*Vigna radiata* L.) in east and south east coastal plain of Odisha, India. Int J Curr Microbiol App Sci. 2018;7(1):338-46.
3. Ali M, Gupta S. Carrying capacity of Indian agriculture: pulse crops. Current Science. 2012;874-81.
4. Narayan P, Kumar S. Constraints of growth in area production and productivity of pulses in India: An analytical approach to major pulses. Indian Journal of Agricultural Research. 2015; 49(2):114-24.
5. Campbell CA, Zentner RP, Selles F, Biederbeck VO, Leyshon AJ. Comparative effects of grain lentil-wheat and monoculture wheat on crop production, N economy and N fertility in a Brown Chernozem. Canadian Journal of Plant Science. 1992;72(4):1091-1097.
6. GoO. Government of Odisha; 2019. Available:www.odisha.gov.in
7. Jaganathan D, Immanuel S, Prakash P, Sivakumar PS. Sustainable livelihood assessment of taro and paddy growers in Nayagarh District of Odisha. Journal of Community Mobilization and Sustainable Development. 2020;15(3):686-693.
8. Etikan I, Bala K. Sampling and sampling methods. Biometrics & Biostatistics International Journal. 2017;5(6):215-217.
9. Zalkuwi J, Singh R, Bhattarai M, Singh OP, Rao D. Analysis of constraints influencing sorghum farmers using Garrett's Ranking Technique; A comparative study of India and Nigeria. International Journal of Scientific Research and Management (IJSRM). 2015;3(3):2435-2440.
10. Poonguzali B, Velusamy R, Pushpa J, Sujatha K, Prabhakaran K. Study on attitude and the constraints faced by pulse growers in practicing indigenous technologies. International Journal of Chemical Studies. 2020;8(1):365-7.
11. Gohain N, Singh S. An analysis of problems and constraints faced by farmers in marketing of agricultural produce in Punjab. Economic Affairs. 2018;63(3):671-678.
12. Bansilal A, Naika KV, Gowda NS, Manjunath V, Jayadeva HM. Constraints and Suggestions as Expressed by Redgram Growers in North-Eastern

- Karnataka, India. *Int. J. Curr. Microbiol. App. Sci.* 2020;9(1):1-6.
13. Parmar VS, Joshi NS, Prajapati PJ, Hadiya NJ. Constraints Faced by the Farmers in Adoption of Improved Cultivation Practices of Gram. *Int. J. Curr. Microbiol. App. Sci.* 2019;8(11):2071-2075.

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