

Constraints in Adoption of Groundnut Cultivation Technology by the Farmers of Odisha

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ABSTRACT

Groundnut is one of the important oilseeds and it contributes substantially to Indian economy. Its importance is notable in terms of nutrition as well as revenue generation. The present study was carried out in Dhenkanal and Angul districts of Odisha involving 220 respondents chosen through multistage simple random sampling procedure. Data were collected through pre-tested interview schedule. The constraints were measured at 3-point continuum *i.e.* not serious, serious and most serious with scores 1, 2 and 3 respectively. Institutional constraint was identified as the most serious among all the major dimensions of constraints. Inadequate knowledge on recommended practices of the production technology, paucity of credit facility, fluctuating market price, lack of awareness about new technology were the other constraints in decreasing order of seriousness. A well-orchestrated institutional mechanism need to be thought of for support and incentives to the farmers.

Keywords: Adoption, Constraints, Groundnut, Production technology

INTRODUCTION

India is the largest producer of oilseeds in the world and this sector occupies an important position in the agricultural economy of the country. Oilseeds are among the major crops that are grown in the country apart from cereals. In terms of acreage, production and economic value, these crops are second only to food grains (Jha *et al.*, 2012). Groundnut (*Arachis hypogaea* L.) is one of the most demanding oil crops to have effect on Indian economy. It is grown on a large scale in almost all the tropical and sub-tropical countries of the world. During 1950-51 groundnut area, production and yield in India were 4.49 M ha, 3.48 MMT and 775 kg/ha respectively, which has increased to 4.91 M ha, 9.18 MMT and 1893 kg/ha respectively during 2017-18. Though groundnut production has almost doubled from 3.48 MMT in 1950-51 to 6.69 MMT in 2018-19 but it has decreased from the previous year *i.e.* against 9.18 MT (GOI, 2019).

Odisha state contributes more than 2/3rd oilseed production towards the total oilseed production of the country. Groundnut production continues to dominate the oilseed production in the state (Samal *et al.*, 2017). The state of Odisha is sixth in India in terms of groundnut production. (358.03 MMT in 2017-18). The districts Dhenkanal and Angul occupy 5th and 6th position in groundnut production in Odisha with 21.8 MMT and 20.72 MMT production respectively. They combined contribute 11.9 per cent of the total groundnut production of Odisha (GoO, 2019). However, availability of quality seeds is a major problem for the smallholder farmers, forcing them to save their own seeds year after year or to get it from other farmers (ICRISAT, 2016). Emphasis should be given on the unexplored resources of groundnut production in the state. Shiferaw *et al.* (2013) mentioned that availability and adoption constraints must be analysed and addressed in order to achieve the potential impact of new technology

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in agriculture. Even after the availability of improved groundnut varieties, yields are still low compared to their potential. Hence it is time to identify the hindrances in the adoption of groundnut cultivation technology and to suggest measures to overcome these constraints as much as possible so as to increase groundnut production. The present investigation is an attempt to identify the constraints perceived by the farmers in adoption of recommended groundnut cultivation technology

METHODOLOGY

Angul and Dhenkanal districts were selected purposively from Odisha as both the districts share a significant contribution towards the groundnut production of the state. From each district three blocks were selected purposively on the basis of large area under groundnut cultivation. From each block two villages were selected randomly making 12 villages. From each village 18-20 groundnut farmers were selected randomly making a total sample size of 220 for primary data collection. Both primary and secondary data were collected for the study. A pre tested (on 20 farmers in each selected district) structured interview schedule was developed for collection of primary data. Secondary data were collected through reviewing various literatures and from District Agriculture Office, Dhenkanal; Angul. A list of 37 constraints was prepared in consultation with experts and various past studies. The constraints were grouped under six major dimensions of constraints *viz.*, production constraints, economic constraints, ecological constraints, post-harvest and marketing constraints, social constraints and institutional constraints having 8, 8, 4, 7, 5 and 5 statements respectively. The responses from the farmers were collected on a three-point continuum *viz.*, most serious, serious and not serious with score of 3, 2 and 1 respectively. The tabulated data were analysed using frequency, percentage, mean score and rank order. The total score was obtained by summing up individual score for the constraint. Based on total score the mean average score for each constraint was calculated to ascertain seriousness of each constraint and finally the constraints were given rank order as per perceived seriousness. It is one of the approaches to scaling responses in survey research (Kumar *et al.*, 2017).

RESULTS AND DISCUSSION

All the constraints under six major dimensions were studied, the frequency and percentage for each constraint were computed. Thus, the constraints were presented in the following table with their respective mean scores and rank order.

A. Production Constraints

It is evident from Table 1 that 'improper plant protection measures' was the most serious constraint perceived by the farmers among production constraints with a mean score of 2.64 followed by 'unavailability of seed timely' (2.63). The farmers were not having expertise in using the proper plant protection chemicals, applicable for the particular diseases during different stages of crop growth. The farmers should be trained on plant protection measures to protect the crop from the common diseases like tikka disease and groundnut rust and pests like white grub and termite attack. The farmers also perceived 'application of improper dose of fertilizers and micronutrient' as the third most serious constraint having a mean score 2.16. Even if the farmers were well known to the fertilizers and micronutrients to be applied, somewhere they failed to apply with recommended doses. The other production constraints perceived by the groundnut growers were 'unavailability of location specific high yielding varieties', 'weed infestation', 'poor yield due to aflatoxin in groundnut', 'incompetency in seed treatment' and lack of irrigation facilities with a mean score of 2.02, 1.63, 1.52, 1.39 and 1.27, respectively. To make the field manually weed free in regular interval is time consuming and requires more labourers. Irrigation was not major problem for them because most of the farmers were cultivating the crop on the riverbank. Non-availability of inputs in time and at reasonable prices, lack of knowledge about various cultivation practices, inadequate improved implements and inadequate labourers were reported as barriers to adoption of recommended groundnut cultivation technology by Umesh (1991); Shinde *et al.* (2003); Kasana and Kumar (2013); Sharma *et al.* (2013) and Banla *et al.* (2018).

B. Economic Constraints

Among economic constraints 'unavailability of credit facility' was the most prioritised constraint by the farmers

Table 1: Constraints encountered by respondents

S.No.	Constraints	Not Serious (%)	Serious (%)	Most Serious (%)	Mean Score	Rank order
A	Production Constraints					
1.	Unavailability of location specific high yielding varieties	11.82	74.09	14.09	2.02	IV
2.	Unavailability of quality seed timely	10.00	16.36	73.64	2.63	II
3.	Incompetency seed treatment	72.27	16.36	11.36	1.39	VII
4.	Lack of irrigation facilities	80.00	12.73	7.27	1.27	VIII
5.	Application of improper dose of fertilizers and micronutrient	6.82	69.55	23.64	2.16	III
6.	Improper plant protection measures	3.64	28.64	67.73	2.64	I
7.	Weed infestation during crop growth	51.82	33.18	15.00	1.63	V
8.	Poor yield due to aflatoxin in groundnut	62.27	23.18	14.55	1.52	VI
B	Economic Constraints					
1.	High cost of HYV/quality seeds	7.27	80.91	11.82	2.04	VI
2.	High cost of fertilizers	5.45	80.45	14.09	2.08	IV
3.	High cost of insecticide, pesticide, weedicide	9.09	75.00	15.91	2.06	V
4.	High cost of agricultural equipment	2.27	81.36	16.36	2.14	II
5.	High wages of labour at harvesting	25.00	71.82	3.18	1.78	VIII
6.	Unavailability of credit facility to farmers	4.55	75.91	19.55	2.15	I
7.	Vulnerable price of the produce	6.36	74.55	19.09	2.12	III
8.	Premium amount of crop insurance is high	21.82	75.00	3.18	1.81	VII
C	Ecological Constraints					
1.	Moisture scarce soil	72.73	11.82	15.45	1.42	III
2.	Erratic rainfall	12.27	23.18	64.55	2.52	II
3.	Delay in monsoon	73.64	14.09	12.27	1.38	IV
4.	Foggy weather	6.82	25.91	67.27	2.60	I
D	Post-harvest and Marketing Constraints					
1.	Lack of storage facility after harvesting	75.45	8.64	15.91	1.40	III
2.	Improper grading and drying	88.18	11.36	0.45	1.12	V
3.	Transportation problem	86.82	13.18	0	1.13	IV
4.	More Involvement of middlemen	91.82	7.73	0.45	1.08	VI
5.	No marketing facilities in remote area	4.55	84.09	11.36	2.06	II
6.	Uncertain market price after harvesting	5.00	72.73	22.27	2.17	I
E	Social Constraints					
1.	Lack of awareness about new technology	9.09	62.73	28.18	2.19	I
2.	Lack of family support in adopting technology	92.73	7.27	0	1.07	V
3.	Less contact with extension personnel	8.64	64.09	27.27	2.18	II
4.	Less exposure towards social media	5.00	74.55	20.45	2.15	III
5.	Poor farmer co-operative structure	76.36	18.18	5.45	1.29	IV
F	Institutional Constraints					
1.	Inefficient extension activities	28.64	65.45	5.91	1.77	V
2.	Lack of knowledge on recommended practices	9.55	51.36	39.09	2.29	I
3.	Inadequate follow up after conductance of training and demonstration	10.00	61.82	28.18	2.18	II
4.	Inadequate training programme on improved crop technology	7.73	69.55	22.73	2.15	III
5.	No facility for minikit trial	21.36	71.82	6.82	1.85	IV

with the highest mean score of 2.15. They are expecting some kind of credit support from the government system especially for groundnut crop. There are several institutional sources that extend credit facility to the farmers to improve the production. The farmers should avail it easily from their nearest branch. Use of groundnut harvester to harvest the crop can minimize their physical labour and can also save time. However, high cost of agricultural equipments and their rental is an impediment. Other economic constraints perceived by them in decreasing order of severity were 'vulnerable price of the produce', 'high cost of fertilizers', 'high cost of insecticide, pesticide, weedicide', 'high cost of HYV/quality seeds', 'premium amount of crop insurance is high' and 'high wages of labour at harvesting' with mean scores 2.12, 2.08, 2.06, 2.04, 1.81 and 1.78 respectively. High cost of chemicals and fertilizers, high wages of labour, high cost of seed were the major constraints identified by Angadi (2010); Sharma *et al.* (2013); Kumar *et al.* (2018); Patel *et al.* (2018) and Rohilla *et al.* (2018).

C. Ecological Constraints

Ecological constraints also play a significant role in groundnut cultivation. 'foggy weather' was referred as the most serious constraint by the groundnut growers with the highest mean score of 2.60 followed by 'erratic rainfall', 'moisture scarce soil' and 'delay in monsoon' with mean scores 2.52, 1.42 and 1.38 respectively. According to them foggy weather adversely affected the groundnut pod development resulting in a lower yield. Untimely heavy rain is also harmful for the crop growth. As groundnut grows below the soil, moisture availability to the soil is the important aspect for the pod growth. Sufficient moisture unavailability, fertility of soil and dependency on monsoon and erratic rainfall were among the ecological constraints reported by Mishra (1998); Virmani and Shurapli (1999) and Sharma *et al.* (2013).

D. Post-harvest and Marketing Constraints

From the above table it is revealed that 'uncertain market price after harvesting' was identified as the most serious constraint and ranked as I. The second most constraint for the farmers was 'no marketing facilities in remote areas' with mean score 2.06. Other constraints perceived by farmers were 'lack of storage facility after

harvesting', 'transportation problem', 'improper grading and drying' and 'more Involvement of middlemen' with mean scores 2.06, 1.40, 1.13, 1.12 and 1.08 respectively. Post-harvest constraints *viz.*, inadequate knowledge about storage pest control measures, market price fluctuation, lack of knowledge about quality range and fumigation were also mentioned by Chavda (2007) and Sharma *et al.* (2013).

E. Social Constraints

The table indicates that 'lack of awareness about the new technology' was perceived as the most serious by the respondents with rank I, followed by irregular contact with extension personnel. 'less exposure towards social media', 'poor farmer co-operative structure' and 'lack of family support in adopting technology' were the other social constraints perceived by the farmers with mean scores of 2.15, 1.29 and 1.07 respectively.

F. Institutional Constraints

It is evident from the result that 'lack of knowledge on recommended practices' was the most serious constraint perceived by the farmers hence it has got the highest mean score of 2.29. The farmers need to be made aware about latest production practices of groundnut farming. The constraint 'inadequate follow up after conductance of training and demonstration' has got the mean score of 2.18. They perceived 'inadequate training programme on improved crop technology', 'no facility for minikit trial' and 'inefficient extension activities' as other constraints with mean scores of 2.15, 1.85, 1.77 respectively. Sharma *et al.* (2013) in their study mentioned that lack of technical know-how, lack of visit of extension personnel and lack of farmers training were among the constraints in groundnut cultivation.

Figure 1 reveals that institutional constraint is the top most constraint perceived by the groundnut growers. Economic constraint is another major problem perceived by them with the second highest mean score of 2.02. Ecological constraints, production constraints and social constraint were followed with mean scores 1.98, 1.91 and 1.78 respectively. Post harvesting and marketing constraint was perceived the least serious with the mean score of 1.49.

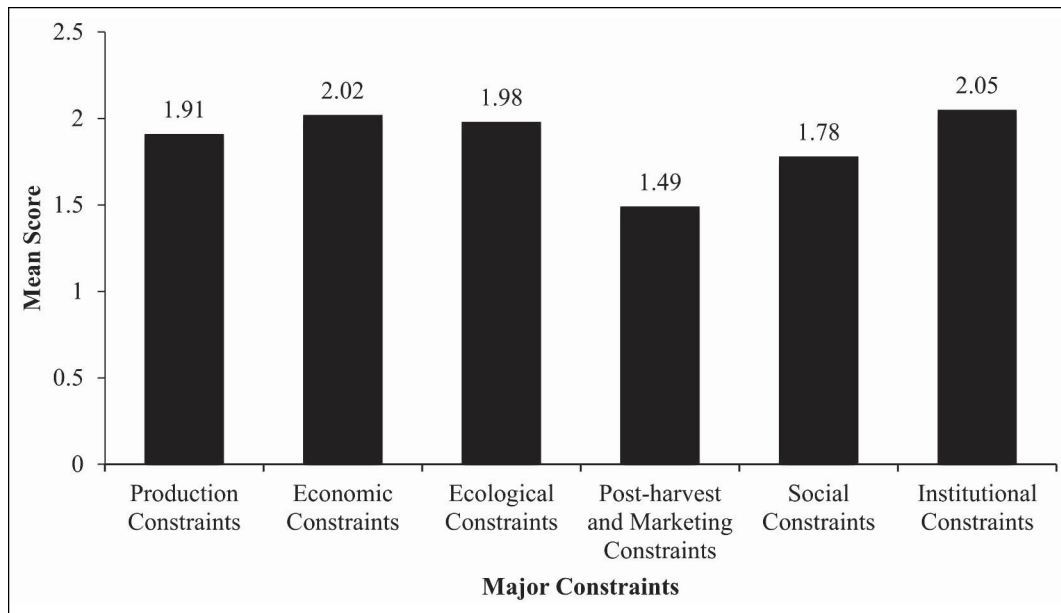


Figure 1: Comparative analysis of the major constraints

CONCLUSION

The study identified three major issues that hinder groundnut farming in Angul and Dhenkanal districts of Odisha. These are extension and advisory services, credit support and quality inputs in the form of disease-free seed, agro-chemicals and equipments. Revamped extension services, farm loans on easy terms and a network of farm service centres dealing with seed, fertilizer, chemicals and equipments would help bringing desirable changes in groundnut scenario in Odisha. A well-orchestrated institutional mechanism had to be thought of for providing required support and incentives to the farmers. These efforts coupled with extensive training of farmers on important aspects of groundnut production viz., plant protection measures, seed treatment and other important aspects of the production technology need to be organised on continuous basis.

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