



Navigating Challenges: Groundnut Cropping Systems Realities in Tumkur District, Karnataka, India

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This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

India is the fourth largest oilseed producer in the world, contributing 20.80 % of the total global cultivation area and accounting for 10 per cent of the global production. In spite of this India is one of the largest importers of vegetable oil in order to meet the growing needs of the population by bridging the demand and supply gap. This scenario is due to climatic factor and decrease in area under groundnut cultivation as well as in productivity. Adoption of cutting-edge crop production

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technologies in our nation led to a significant improvement in the output of oilseeds. Groundnut (*Arachis hypogaea* L.) is called as 'King' of oilseeds a key oil seed crop in India, and it plays a significant part in bridging the country's vegetable oil deficit. The present study was conducted during 2023 in Tumkur district of Karnataka to know the constraints faced by the farmers practicing groundnut based cropping systems and suggestions given to overcome the problems. Sixty farmer of each CS- I (Groundnut alone) and CS- II (Groundnut + Redgram) were selected respectively thus, the total sample size was 120. An ex post facto research design was adopted. Data was collected using a pre-tested personnel interview method. The study revealed the major production, marketing, technical and financial constraints by the faced by the groundnut growers like high wage rate, price fluctuation, low price for the produce, exploitation by the middleman and non-availability of quality inputs at reasonable rate. The majority of these farmers advocate for a reasonable minimum support price for groundnut and seeds and fertilizers availability at affordable rates in time.

Keywords: *Groundnut based cropping systems; production constraints; marketing constraints; financial; technical constraints; suggestions.*

1. INTRODUCTION

India is an agrarian country where more than 58 % of the population secures livelihood from agriculture. India is the second largest producer of oil seeds and the major oilseeds grown in the country include peanut, soybean, sunflower, sesame, niger, mustard, and safflower, although unfortunately the country is also the largest importer of edible oils [1]. Over 72 % of the oilseed area was grown by small farmers under rainfed conditions [1], resulting in low production and due to post Green Revolution impacts such as soil degradation, climate change, imbalance nutrients, decline of agricultural land holding and loss of soil fertility, which resulted in low production and productivity. These can be minimized by not only adopting appropriate technologies and suitable cropping systems considering regional agro- climatic situations and resource. The introduction of modern crop production technologies in our country led to a significant improvement in the output of oilseeds (*Arachis hypogaea*), 'the unpredictable legume', also known as groundnut, earthnut, peanut, monkeynut [2] can bridge the gap between demand and supply in the domestic consumer market. With this background in order to achieve self-reliance, constraints faced by the groundnut growers should be identified and addressed with proper government policies and adoption of improved production technologies by the farmers[3].

2. METHODOLOGY

The study was conducted in Tumkur district of Karnataka in 2023. Out of ten taluks, Sira and Pavagada were specifically selected for the study

as these taluks have a larger area under groundnut cultivation compared to other taluks. From each taluk, three potential groundnut cultivating villages were selected. Further, from each village, 5 farmers practicing the cropping system were selected for the study: CS- I (Groundnut alone) and CS- II (Groundnut + Redgram) were selected respectively, making the sample size 30 each under category from each taluk. Thus, the total sample size from these villages is 120. An ex post facto research design was adopted. Data was collected using a pre-tested personnel interview method. Some of the common constraints were listed and the farmers [3-9] were asked to indicate the constraints faced by them on a three continuum i.e. greater extent, lesser extent and not at all. A score of 'one' was assigned for response not at all, two for lesser extent and three for greater extent. Some of the common suggestions were listed [8,10,9,11-14] and the respondents were asked closed end questions. The responses obtained were scored on two-point continuum scale with score of 1 and 0 for yes and no respectively.

3. RESULTS AND DISCUSSION

3.1 Constraints Faced by the Farmers Practicing Groundnut Based Cropping System

3.1.1 Constraints as expressed by the farmers practicing cropping systems-I (Groundnut alone)

3.1.1.1 Production constraints

Table 1 shows that the majority of the CS-I respondents opined that high wages (70.00%),

uneven distribution of rainfall (68.33%), scarcity of own resources (53.33%), shortage of family labour (51.67%) and incidence of pest and disease (43.33 %) were faced as constraints by them to a greater extent. Problems like high labor costs due unavailability of labour during peak sowing and harvesting seasons impose a considerable financial burden, leading to increased overall production costs. Moreover, irregular rainfall patterns lead to moisture stress during cultivation, which negatively affect crop growth and ultimately reduces yields. Further, lack of awareness about the recommended cropping sequence (43.33%) is the problem faced to a lesser extent and nearly half of the respondents (48.33%) expressed the difficulties in mechanization due to intercropping will not pose any problem for maximization of production, productivity as well as profit of groundnut growers.

3.1.1.2 Marketing constraints

Farmers practicing CS-I had voiced their problems regarding the marketing of groundnut which hamper them to a greater extent. Price fluctuations emerged as the most pressing issue, with a substantial proportion (76.67 %) of respondents indicating that the impact it has on the farmers' income and financial planning, making it a critical issue in the marketing process. Nearly three-fourth (73.33%) of respondents mentioned exploitation by middlemen as a major challenge. Middlemen often wield considerable influence in agricultural markets and their practices can sometimes result in unfair prices for farmers, exacerbating their difficulties. Further, 63.33% of farmers reported that receiving low prices for their produce posed a considerable obstacle in the marketing of groundnut. While three-fifth (60.00%) cited a lack of transportation, followed by difficulty in timely availability of market information (53.33%), which is crucial for making informed decisions, and half of them (50.00%) cited a lack of storage facilities. These challenges they faced were to a lesser extent.

3.1.1.3 Technical constraints

Table 1 shows that three-fifth (60.00%) of the CS-I practicing farmers reported that unavailability of quality inputs at the right time and at reasonable cost was a major technical constraint faced by them to a greater extent.

Lack of technical guidance about production technologies (60.00%) and relevant literature availability in the local language (46.67%) hindered the CS-I respondents to a lesser extent in groundnut cultivation.

3.1.1.4 Financial constraints

Farmers practicing CS-I expressed that the lack of incentives and subsidies from the government (66.67%) and high cost of production (61.67%) were affecting them more in groundnut production. They also stated that the lack of credit availability (45.00%) results in them facing fewer issues in groundnut production activities. The probable reason may be raising input costs and wage rates that raise production costs, government neglect of oilseed farming, and labor-intensive and time-consuming loan application processes.

3.1.2 Constraints as expressed by the farmers practicing cropping systems-II (Groundnut + Redgram)

3.1.2.1 Production constraints

Table 2 revealed that the majority of the CS-II reported that they were more affected by various constraints such as high wages (70.00%), shortage of family labor (65.00%), scarcity of own funds (56.67%) and unequal rainfall distribution (48.33%) in groundnut production. More than half of the respondents (53.33%) faced difficulties in mechanization owing to inter cropping sequences followed by lack of information about the appropriate cropping sequence (45.00%) and the incidence of pest and diseases (43.33%), which to a lesser extent groundnut cultivation contributed to producer productivity and profit maximization. Notably, the issue of high labor costs imposing a financial burden on farmers and driving up the overall expenses associated with production and limited availability of personal funds constrains their ability to make crucial investments essential inputs for successful farming. Further, scarcity of family labor and the prevalence of pests and diseases have also emerged as prominent concerns, presenting formidable challenges to their agricultural pursuits. While a smaller segment expressed that they did not perceive mechanization challenges associated with intercropping (53.33%) and lack of awareness regarding recommended cropping sequences (45.00%) as a major issue.

Table 1. Constraints as expressed by the farmers practicing cropping systems-I (Groundnut alone)

Sl. No.	Constraints	n =60					
		Greater Extent		Lesser Extent		Not at all	
		No.	%	No.	%	No.	%
A Production constraints							
1	High wages	42	70.00	18	30.00	00	0.00
2	Scarcity of own fund	32	53.33	28	46.67	00	0.00
3	Lack of awareness about recommended cropping sequences	20	33.33	26	43.33	14	23.34
4	Intercropping-come in the way of mechanization	08	13.33	23	38.34	29	48.33
5	Scarcity of family labour	31	51.67	25	41.67	04	6.66
6	Uneven distribution of rainfall	41	68.33	14	23.33	05	8.34
7	Disease and pest incidence	26	43.33	26	43.33	08	13.34
B Marketing constraints							
1	Lack of storage facility	22	36.67	30	50.00	08	13.33
2	Lack of timely market information	28	46.67	32	53.33	00	0.00
3	Lack of transportation	22	36.67	36	60.00	02	3.33
4	Price fluctuation	46	76.67	14	23.33	00	0.00
5	Low price for the produce	38	63.33	22	36.67	00	0.00
6	Exploitation by middlemen in the market	44	73.33	16	26.67	00	0.00
C Technical constraints							
1	Non-availability of quality inputs like seeds, pesticides and insecticides at right time	36	60.00	24	40.00	00	0.00
2	Lack of technical guidance about production techniques	24	40.00	36	60.00	00	0.00
3	Lack of relevant literature in local language	17	28.33	28	46.67	15	25.00
D Financial constraints							
1	Lack of credit availability	26	43.33	27	45.00	07	11.67
2	High cost of production	37	61.67	23	38.33	00	0.00
3	Lack of incentives and subsidies	40	66.67	18	30.00	02	3.33

3.1.2.2 Marketing constraints

Farmers practicing CS-II stated that difficulties such as price fluctuation (70.00%), poor price for the commodity (65.00%) and exploitation by middlemen (61.67%) were affecting groundnut marketing to a higher extent. The most prominent issue, identified by them was instability of prices in the market and respondents noted that receiving poor prices for their commodities was a significant hindrance. Low pricing can lead to reduced profitability for farmers, affecting their economic sustainability. Other restrictions, such as a lack of storage space (58.33%) and transportation facility (41.67%) were cited as far less of a barrier to groundnut marketing by CS-II respondents.

3.1.2.3 Technical constraints

Exactly half (50.00%) of them encountered major obstacles such as a shortage of quality inputs at the correct time and at a reasonable cost, which had a major impact on their production activities. This challenge blows the effect on their production activities, as it affects the quality and quantity of inputs they can access. This in turn influences the overall success of their groundnut cultivation. Further, difficulties stemming from a lack of technical guidance regarding production technologies was notable but appears to have a relatively smaller impact compared to the problem of input availability and affordability. Further, lack of technical guidance about production technologies (61.67%) and relevant literature availability in local language (45.00%)

were hinder the CS-II respondents to a lesser extent in groundnut cultivation.

3.1.2.4 Financial constraints

Farmers practicing CS-II encountered that lack of incentives and subsidies from government (60.00%) is affects groundnut production to a greater degree. Nearly half (48.33%) of the CS-II respondents opined that hindering their production process followed by lack of credit availability (46.67%) to a lesser extent. The reason may be due to the rising input costs and wage rates that raise production costs, diminished government support for the production of oilseeds, and labor-intensive and time-consuming loan application processes.

3.2 Suggestions as Expressed by the Farmers Practicing Groundnut Based Cropping Systems

It can be clearly noted that, majority (96.66%) of the growers practicing CS-I expressed the need for the reasonable minimum support price for groundnut. Other suggestions given by the growers were providing seeds and fertilizers at affordable prices (90.00%) and promoting soil and moisture conservation technologies (80.00%). Further, respondents highlighted the importance of training in the latest improved agricultural techniques (71.66%) followed by

awareness about importance of potash and gypsum application (68.33%), teaching skills related to seed treatment, insecticide usage, and trichoderma application (65.00%) while, 56.66% emphasized the importance of creating awareness about bio fertilizers and 51.66% advocated for raising awareness about the significance of ammonium sulphate.

The findings from Table 4 offer valuable insights into the perspectives of CS-II growers. Majority (95.00%) of the growers, voiced a strong preference for the implementation of a minimum support price for their groundnut crop and 86.66% of respondents advocated for training in the latest advanced farming techniques. Other suggestions given by respondents include promotion of soil moisture conservation technologies (85.00%), importance of imparting essential skills related to seed treatment, insecticide usage, and the application of trichoderma (81.66%). Beyond these key recommendations, other valuable suggestions include providing seeds and fertilizers at reasonable prices (78.33%), the need for greater awareness regarding the benefits of potash and gypsum application (65.00%), and importance of promoting bio fertilizers (63.33%). Lastly, 56.66% of growers advocated for increased awareness about the significance of ammonium sulphate in farming practices.

Table 2. Constraints as expressed by the farmers practicing cropping systems-II

Sl. No.	Constraints	n =60					
		Greater Extent		Lesser Extent		Not at all	
		No.	%	No.	%	No.	%
A Production constraints							
1	Wages are high	42	70.00	18	30.00	00	0.00
2	Scarcity of own fund	34	56.67	21	35.00	05	8.33
3	Lack of awareness about recommended cropping sequences	25	41.67	27	45.00	08	13.33
4	Intercropping-come in the way of mechanization	11	18.33	32	53.33	17	28.34
5	Scarcity of family labour	39	65.00	18	30.00	03	5.00
6	Uneven distribution of rainfall	29	48.33	28	46.67	03	5.00
7	Disease and pest incidence	19	31.67	26	43.33	15	25.00
B Marketing constraints							
1	Lack of storage facility	09	15.00	21	35.00	30	50.00
2	Lack of timely market information	24	40.00	35	58.33	01	1.67
3	Lack of transportation	02	3.33	25	41.67	33	55.00
4	Price fluctuation	42	70.00	14	23.33	04	6.67
5	Low price for the produce	39	65.00	21	35.00	00	0.00
6	Exploitation of middlemen in the market	37	61.67	21	35.00	02	3.33

Sl. No.	Constraints	Greater Extent		Lesser Extent		Not at all	
		No.	%	No.	%	No.	%
C Technical constraints							
1	Non-availability of quality inputs like seeds, pesticides and insecticides at right time	30	50.00	25	41.67	05	8.33
2	Lack of technical guidance about production techniques	12	20.00	37	61.67	11	18.33
3	Lack of relevant literature in local language	12	20.00	27	45.00	21	35.00
D Financial constraints							
1	Lack of credit availability	11	18.33	28	46.67	21	35.00
2	High cost of production	24	40.00	29	48.33	07	11.67
3	Lack of incentives and subsidies	36	60.00	23	38.33	01	01.67

Table 3. Comparative analysis of constraints faced by the farmers practicing groundnut based cropping systems

(n=120)

Sl. No.	Constraints	CS-I n ₁ =60			CS-II n ₂ =60		
		Total score	Mean score	Rank	Total score	Mean score	Rank
A Production Constraints							
1	Wages are high	162	2.70	I	162	2.70	I
2	Scarcity of own fund	152	2.53	III	149	2.48	III
3	Lack of awareness about recommended cropping sequences	126	2.10	V	137	2.28	V
4	Intercropping-come in the way of mechanization	99	1.65	VII	114	1.90	VII
5	Scarcity of family labour	147	2.45	IV	156	2.60	II
6	Uneven distribution of rainfall	155	2.58	II	146	2.43	IV
7	Disease and pest incidence	114	1.90	VI	124	2.07	VI
B Marketing constraints							
1	Lack of storage facility	134	2.23	VI	99	1.65	IV
2	Lack of timely market information	148	2.47	IV	143	2.38	III
3	Lack of transportation	140	2.33	V	89	1.48	V
4	Price fluctuation	166	2.77	I	158	2.63	II
5	Low price for the produce	158	2.63	III	159	2.65	I
6	Exploitation by middlemen in the market	164	2.73	II	99	1.65	IV
C Technical constraints							
1	Non-availability of quality inputs like seeds, pesticides and insecticides at right time	156	2.60	I	145	2.42	I
2	Lack of technical guidance about production techniques	144	2.40	II	121	2.02	II
3	Lack of relevant literature in local language	122	2.03	III	111	1.85	III
D Financial constraints							
1	Lack of credit availability	139	2.31	III	110	1.83	III
2	High cost of production	157	2.61	II	151	2.52	II
3	Lack of incentives and subsidies	158	2.63	I	155	2.58	I

Table 4. Suggestions as expressed by the farmers practicing groundnut based cropping systems

Sl. No.	Suggestions	(n=120)			
		CS-I n ₁ =60		CS-II n ₂ =60	
		No.	%	No.	%
1	Providing minimum support price	58	96.66	57	95.00
2	Skill teaching about seed treatment with insecticide and Trichoderma	39	65.00	49	81.66
3	Promote soil and moisture conservation technologies	48	80.00	51	85.00
4	Training on latest improved technologies	43	71.66	52	86.66
5	Provide seeds and fertilizer at reasonable cost and at a right time	54	90.00	47	78.33
6	Create awareness about importance of potash and gypsum	41	68.33	39	65.00
7	Create awareness about importance of ammonium sulphate	31	51.66	34	56.66

Efforts from relevant authorities are essential in establishing an appropriate minimum support price (MSP) for groundnut to counter market price fluctuations, demand uncertainties, increased cultivation costs, and seasonal market gluts. Small and marginal farmers, constrained by limited resources, often face market exploitation due to their limited bargaining power. Farmers are more willing to spend in higher-quality seeds, fertilizers, irrigation, and other agricultural inputs when they are guaranteed a minimum price for their harvests this can lead to increased production and yields. Soil and moisture conservation activities like dead furrow method, growing cover crops should be promoted by the line departments in order to reduce the risk posed by the uneven rainfall due to climatic change. Nutrients management by application of micro-nutrients which helps in improving oil content and pod development encouraged by creating awareness through extension strategies.

4. CONCLUSION

Constraint analysis revealed that high wage rate, price fluctuation, low price for the produce, exploitation by the middleman and non-availability of quality inputs at reasonable rate are hindering the productivity of groundnut and indirectly influencing the farmers to not choose groundnut cultivation and opt for other commercial crops. These can be addressed by proper government intervention. Promotion of oilseed cultivation can be achieved by increasing the training and awareness programmes on production technologies, soil and water conservation technologies and foremost thing is

in time availability of quality inputs at reasonable price. The government needs to bring awareness among farmers about regional specific inter cropping of oilseed with pulses through proper coordination with line departments and grass root level workers.

FUTURE SCOPE

The study focuses on only one district of Karnataka. Similar studies can be carried out in other agro climatic zones of the state and country in order to reach a more concrete conclusion.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have not been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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