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Socio-economic Factors Involved for the Risk in Cotton Cultivation in Odisha

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ABSTRACT

Background: The cotton cultivation involves risks due to climatic variation, the most important being aberrant rainfall. Further, the farmers fetch poor returns to their produce due to quality maintenance of lint during harvesting and storage. The farmers face problem in marketing as the cotton trade is mostly done by local traders. Hence, the current study was carried to identify risks involved in cotton cultivation due to climatic variation, harvesting, storage and marketing of produce.

Methods: A study was conducted by collecting information from 240 cotton growers of four blocks in Gajapati and Rayagada districts of Odisha. The opinion of cotton growing farmers on most important parameters of risk in cotton cultivation among climate, harvesting and post-harvest, marketing and socio economic was collected individually through a semi-structured schedule and analyzed.

Result: The opinion of cotton growing farmers of South Odisha indicate that the initial heavy rainfall followed by insufficient pre-monsoon rain; the rat menace in storage; exploitation by the traders in marketing and lack of community organization for facilitation of cluster approach are the most important risk parameters that influence cotton cultivation.

Key words: Climatic factors, Cotton cultivation, Marketing, Risk, Social factor.

INTRODUCTION

Risk is an uncertainty that affects an individual's welfare, and is often associated with adversity and loss and it involve the probability of losing money, possible harm to human health, resources (irrigation, credit) and person's welfare (Bodie and Merton, 1998). The farmers grow cotton for income generation for their livelihood support and investment in other farm activities. The-management of cotton production against volatile environmental conditions while maintaining product quality and yield at acceptable costs has become challenging due to climate change (Kobori, 2011). In cotton production, the harvesting, processing and storage of cotton are all linked, prone to various environmental risks (*e.g.*, flooding) and operational risks (*e.g.*, excess spraying of pesticides) (Ülkü *et al.*, 2020). The effects of climatic factors such as rainfall, evaporation, sunshine duration, humidity and temperature significantly affect the yield of cotton.

The farmers are always interested to dispose the produce immediately with reasonable price to get better money. Lint production with good quality fetches more prices and facilitate easy disposal. Many a times, the cotton growers-are exploited by the traders and business man due to insufficient knowledge about quality production. Timely and proper stage of harvesting along with grading, drying and storing are some of the important practices in harvesting and post harvesting.

The farmers need coordination and cooperation of the villagers to extend possible help to each other in raising the crop satisfactorily. Therefore, social environment has its own importance for effective management of the crop.

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The social impact of cotton includes unfair trade practices, forced labour and child labour. As the cotton is a commercial crop, its cost of cultivation is comparatively higher than other field crops. Hence, cotton growers essentially need financial support to grow the crop.

In this article, an effort has been made to collect and analyze the information from 240 farmers in two cotton growing districts of south Odisha on the factors risk like climate, harvesting and post-harvest operations, marketing and social environment.

MATERIALS AND METHODS

The information with pre tested questionnaire was collected from Rayagada and Kashinagar blocks of Gajapati district and Gunupur and Ramanagda blocks of Rayagada district of Odisha where cotton is grown for the study. At random, four panchayats were chosen in each block for studying the

climatic, involved in harvesting and post harvesting, marketing and socio economic factors -that are involved for the risks in cotton cultivation.-Sanathundi, Kumelsingha, Karadasinghi and Rayagada in Rayagada block; Budura, Khandaba, Alada, Jogibandha in Kashinagar block; Gadiakhala, Sirijholi, Chalakamba, Jagannathpur in Gunupur block; Buting, Neelamguda, Bhamini and Golumunda in Ramanagda block were randomly chosen from each of the above panchayats. A total of 240 farmers (67 from Rayagada block, 53 from Kashinagar block, 62 from Gunupur block and 58 from Ramanaguda block) were selected.-Data was individually collected through a semi-structured schedule after pretesting. Data on climate, sociological issues, harvesting and post-harvesting and marketing was gathered from the farmers by using the scale points of always, sometimes and not possible for different parameters and then scored as 3, 2 and 1 for analysis. Results were analyzed using statistical methods including mean score, gap percentage and rank order.

RESULTS AND DISCUSSION

Climate

The effects of climatic factors such as rainfall, evaporation, sunshine duration, humidity and temperature significantly affect the flower and boll production in cotton. The opinion-of-the farmers of both Gajapati and Rayagada district were-similar on various aspects of climatic factors involved for the risks in cotton cultivation.

It has been observed from Table 1 that the most important risk involved in cotton cultivation are initial heavy rainfall followed by insufficient pre-monsoon rain which causes risk in summer ploughing and land preparation. The farmers are of the opinion that the most important risk aspect in climate is the initial heavy rainfall that creates problems in timely weeding, hoeing and gap filling and cause heavy weed menace. Further, it was mentioned that delay in onset of monsoon causes late in timely sowing. The third major climatic risk is the mid-season high temperature with humidity causes boll shedding, delay in crop maturity and reduces lint quality. Foggy weather with dew also increases pest and disease menace as well as flower and boll production (Gopalakrishnan *et al*., 2007). These findings are in agreement with that of Padhy *et al.* (2024) who reported higher risks due to climate change.

The farmers' response indicate that the initial heavy rainfall, mid-season high temperature with humidity, delay in onset of monsoon and insufficient pre monsoon rain were the most pertinent risk factors in cotton cultivation.

Harvesting and post harvesting

It has been observed from Table 2 that the rat menace in the storage in the house that reduces the fibre quality is the most important risk factor. The respondents are storing the produce in their thatched houses, there is every possibility of fire hazard. The other parameters that follow are smoke coming from the kitchen make lint discoloration of the stored cotton. All these happen because of insufficient knowledge about quality maintenance in the storage. Insufficient drying yard create inconveniency in proper drying. Further, dew drops during harvesting time make contamination of fiber due to moisture in the busted boll. As the farmers mix different pickings of cotton due to insufficient space although separate storing of 1st and 2nd pickings is recommended for better quality fibre.

Moisture stress usually occurs during reproductive stage after cessation of monsoon rain that results in low quality boll formation and thereby poor quality lint. Since picking of busted bolls are tedious work, clean picking sometimes is not possible due to shortage of labour and time the ultimately end-up contamination with mixture of leaves from the busted boll resulting poor marketing.

Marketing

It is illustrated from Table 3 that the farmers have given the following three aspects in order of risk in marketing of cotton produce. The data collected from two districts indicate that major risk in marketing is the exploitation by the traders. This happens because the farmers need money to meet the essential requirements as well as purchasing inputs for farm activities which becomes an advantage to the traders. Furthermore to have more business, the traders promise higher price before sowing but the same is not paid after harvest. And also, if the produce is not disposed in time,

Table 1: Opinion of cotton growers of Gajapati and Rayagada districts of Odisha on climatic factors that cause risk in cotton cultivation.

Factor	Mean score		Diff (%)	Pooled mean score (n=240)	Rank
	Gajapati district (n = 120)	Rayagada district (n=120)			
Insufficient pre-monsoon rain	3.82	3.71	2.88	3.76	2
Delay in onset of monsoon	3.79	3.58	5.54	3.69	4
Initial heavy rainfall	4.14	4.06	1.93	4.10	1
Early cessation of rain	3.47	3.54	1.98	3.50	8
Erratic distribution of rainfalls	3.77	3.58	5.04	3.67	5
Prolonged dry spell	3.58	3.54	1.12	3.56	6
Mid-season high temperature with humidity	3.93	3.58	8.91	3.75	3
Foggy weather with dew	3.52	3.52	0.00	3.52	7

(Maximum obtainable score -5).

Table 2: Opinion of cotton growers of Gajapati and Rayagada districts of Odisha on risk factors involved due to harvesting and post harvesting.

Factor	Mean score		Diff(%)	Pooled mean score (n=240)	Rank
	Gajapati district (n = 120)	Rayagada district (n=120)			
Field contamination of fibre due to dew drops.	4.01	4.33	7.39	4.17	6
Moisture stress resulting poor quality fibre	3.92	4.03	2.73	3.98	9
Unnatural rain during harvesting stage	3.83	3.89	1.54	3.86	11
Difficult to separate mixture of leaves from fibre	4.01	3.88	3.24	3.95	10
Insufficient drying yard	4.10	4.40	6.82	4.25	5
Contamination in the drying floor	3.96	4.10	3.41	4.03	7
Mixing of different pickings due to limited storage	3.97	4.03	1.49	4.00	8
Fibre quality reduce due to smoke discolouration in house	4.33	4.31	0.46	4.32	4
Rat menace reduce fibre quality	4.46	4.53	1.55	4.50	1
Every possibility of fire hazard in storage	4.41	4.58	3.71	4.49	2
Insufficient knowledge about quality maintenance	4.42	4.47	1.12	4.44	3

(Maximum obtainable score -5).

Table 3: Opinion of cotton growers of Gajapati and Rayagada districts of Odisha on risk factors involved in marketing of the produce.

Factor	Mean score		Diff (%)	Pooled mean score (n=240)	Rank
	Gajapati district (n = 120)	Rayagada district (n=120)			
Produce not disposed immediately	4.21	4.19	0.48	4.20	3
No remunerative sale price	3.85	3.88	0.77	3.87	5
Bargaining from 3rd picking onwards	3.83	3.73	2.61	3.78	8
Uncertainity in fixing minimum support price	3.97	3.64	8.31	3.80	7
Exploitation by traders with plea of low quality	4.32	4.51	4.21	4.41	1
Delayed payment by the traders	3.68	3.97	7.30	3.83	6
Poor knowledge about FAQ standard	3.72	3.72	0.00	3.72	9
False committment of higher price by the traders before sowing	4.17	4.34	3.92	4.25	2
Uncertainty in opening of market yard (mandi) by Govt.	4.21	3.90	7.36	4.05	4

(Maximum obtainable score -5).

Table 4: Opinion of cotton growers of Gajapati and Rayagada districts of Odisha on risk factors involved due to social environment.

Factor	Mean score		Diff (%)	Pooled mean score (n=240)	Rank
	Gajapati district (n = 120)	Rayagada district (n=120)			
Poor coordination and cooperation among the growers	4.18	4.28	2.34	4.23	3
Non-cooperation of the family members	3.58	3.55	0.84	3.56	8
Poor management efficiency of the growers	4.19	4.27	1.87	4.23	3
Reluctant to help others in crisis	3.57	3.57	0.00	3.57	7
No control in free movement of cattle	3.43	3.57	3.92	3.50	9
Not allowing to use community resources	3.93	4.28	8.18	4.10	4
Poor community organisation	4.55	4.64	1.94	4.60	1
No cooperation for cluster approach	4.43	4.30	2.93	4.37	2
Limited social support	3.76	3.59	4.52	3.68	6
No cooperation in common watch and ward	4.01	3.82	4.74	3.91	5

(Maximum obtainable score -5).

there is every possibility of uncertainty of disposing the produce a later date at remunerative price. The most important risk factor is the uncertainty of market yard opening which create anxiety among the farmers thereby the farmers try to dispose the produce at the earliest possible time. It is also reported that the low prices of cotton is also due to heavy glut in the market because of lack of well organised marketing system (Kumar *et al.,* 2003).

Social factor

It has been observed from Table 4 that poor community organization is one of the important risk factors that influence cotton cultivation which indicates effective community organizations facilitate cluster approach that provides opportunities for timely operation and better supervision of watch and ward. Poor management efficiency of the growers is another factor that influences the risk. Coordination and cooperation among the growers helps in doing all management practices at the same time for effective crop management that helps in control of pests and diseases. This will also facilitate to use community resources by the needy growers. Since all these facilities are not available in the society, the respondents had stated all of these are essentialities in reduction of risk in cotton cultivation.

CONCLUSION

The most important parameters of risk in cotton cultivation of Odisha among climate, harvesting and post-harvest, marketing and socio economic *viz*; initial heavy rainfall followed by insufficient pre-monsoon rain which causes risk in summer ploughing and land preparation, in storage the rat menace in the house that reduces the fiber quality is the most important risk factor followed by the fire hazard, the major risk involved in marketing is the exploitation by the traders, lack of community organization that facilitates cluster approach is one of the important risk factors that influence cotton cultivation.

Conflict of interest

All authors declare that they have no conflict of interest.

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