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An analysis of okra seed production under contract farming

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Abstract
The present investigation was carried out in Haveri district of Karnataka state, India. Ninety Okra seed production farmers under contract farming were personally interviewed using pre-tested interview schedule. Results revealed that the cost of Okra seed production per hectare was Rs.16,865/- and net returns was Rs.1,42,132.50 The returns per rupee of investment was 2.07 and it was higher when compared to previously growing crops Cotton (1.67), Tomato (1.58), Chilli (1.55), Okra (1.43), Radish (1.35) and Maize (1.34). Majority of Okra seed production contract farmers were belonged to middle age group and cent per cent of the farmers were educated. As high as 57.78 per cent of farmers were belonged to medium sized family with medium level of annual income (38.89 %) and 75.56 % of farmers were belonged to nuclear family category. Further, 56.67 per cent of respondents were belonged to medium level of extension contact and 55.56 per cent were belonged to medium level of economic motivation category. The contract agreement prevailing between the farmers and companies was a written document indicating the role and responsibilities of each. High wage rate, non availability of skilled labour, non- availability of mechanical seed extraction facility, higher rejection rate were the major constrains perceived by the farmers under contract farming. Advance payment to take up seed production, higher price to the okra seeds produced, supply of critical inputs by the company were the important suggestions expressed by the farmers for the betterment of okra seed production under contract farming.

Keywords: Contract farming, okra seed production, cost and returns, constraints, suggestions

1. Introduction
About 52 per cent of Indian population depends on agriculture for their livelihood. Majority of them are small and marginal farmers. They are poor investors and depends on climate. Increased production does not essentially lead to higher incomes, particularly where prices vary widely, markets are disorganized and inefficient, market access is restricted power is weak. There is a strong feeling that in the era of liberalization and globalization, small farmers are being entirely neglected and marginalized from high value agribusiness activities and hence are unable to develop maximum benefits due to their fragmented and uneconomic size of holdings and inadequate access to external inputs and services. Against this backdrop, vertical coordination through predetermined arrangements is necessary to link product characteristics and production processes to consumer preferences. This has given rise to the concept of 'Contract Farming'. It is a form of vertical integration within agricultural commodity chains, such that the firm has higher control over the production process, as well as the quantity, quality, characteristics and the timing of what is produced. The conventional approach to vertical integration has been for firms to invest directly in production through large-scale estates or plantations (Especially for traditional tropical commodities such as tea, bananas and sugarcane). Contract farming, in its various forms, allows a degree of control over the production process and the product without the firm directly entering into production.
The seed companies resort to contract farming with the intention of procuring assured supply of genuine seeds in required quantity at the right time, under their supervision. Similarly the farmers enter into contract farming mainly to minimize the price risk in marketing and also to reap higher profits in seed production activity. Particularly in okra hybrid seed production under contract farming is highly profitable, even small farmers can practice it. Risk involved due to fluctuation in market price is minimized through contract farming. As okra seed production is highly specialized and profitable, it helps the farmers to get loan from the commercial banks. Farmer is assured of better returns compared to other field crops as the companies offer relatively better prices. With this background the present study was undertaken with the following specific objectives.
1. To find out the economics of okra seed production under contract farming.

2. To estimate benefit cost ratio of crop grown before okra seed production under contract farming.
3. To analyze the profile of Okra seed production contract farmers.
4. To study the mode of contract farming system in Okra seed production; and
5. To document the constraints and suggestions of Okra seed production contract farmers for improvement in contract farming.

2. Methodology

The present investigation was carried out in Haveri district of Karnataka, India. Three taluks namely Ranebennur, Hirekerur and Byadgi were purposively selected since these taluks occupies top tanks in okra seed production under contract farming. In selected taluk three villages were randomly selected. In each selected village the list of farmers practicing okra seed production under contract farming was prepared. From such a list ten farmers were randomly selected. Thus, Ninety farmers constituted the sample size of the study. The data was collected through personal interview method with the help of pre-tested interview schedule. Descriptive statistics like averages, percentages were used. Further, Garrett's ranking technique was used to compile the problems faced by the okra seed production contract farmers.

3. Results

3.1 Cost of cultivation of okra seed production under contract farming

A close look at Table 1 reveals that on an average the cost of okra seed production under contract farming was Rs.1,68,296/- per hectare. The gross returns was Rs.3,50,000/- and net returns was Rs. 2,09,772.50 per ha. The returns per rupee of expenditure was 2.07. The expenditure on emasculation and pollination (23.62%) ranked first, fertilizers (11.10%) ranked second, plant protection (10.48%) ranked third, rental value of land (9.89%) ranked fourth, farmyard manure (9.80%) ranked fifth, mulching sheet (9.04%) ranked sixth, land preparation (7.13%) ranked seventh, interest on working capital (5.47%) ranked eighth, interest on fixed capital (3.52%) ranked ninth, depreciation on farm machinery and equipment's (3.29%) ranked tenth, weeding (2.32%) ranked eleventh, crushing and extraction of seeds (1.79%) ranked twelfth, sowing (1.43%) ranked thirteenth, packing and transportation (0.83%) ranked fourteenth and cleaning and drying (0.29%) fifteenth

3.2 Benefit - cost ratio of crops grown before okra seed production under contract farming

An attempt has been made to realize whether okra seed production under contract farming is profitable or not by estimating the benefit-cost ratio of crops grown by the farmers before switching on to okra seed production under contract farming. The data in table 3 reveals that earlier to okra seed production under contract farming. Farmers were growing Cotton, Maize, Chilli, Tomato, Radish and okra and getting net returns of Rs.62, 500/- from cotton, Rs.33,500/- from maize, Rs.42,500/- from chilli, Rs.70,875/- from tomato, Rs.41,976/- from radish and Rs.79, 440 from okra per hectare. On the other hand the farmers were getting Net returns of Rs.1,40,227/- per hac. from okra seed production. The benefit cost ratio was 1.67 for cotton, 1.34 for maize, 1.55 for chilli, 1.58 for tomato, 1.35 for radish and 1.43 for okra per ha. On the other hand the befit cost ratio was 2.07 for okra seed production under contract farming. It clearly indicates that okra seed production is economically beneficial to farmers.

3.3 Profile of okra seed production contract farmers

The data in Table 3 reveals that nearly (50.00 %) of Okra seed production contract farmers were belonged to middle age group. About 25.55, 27.28, 27.28 and 11.11, per cent of respondents were studied up to primary school, middle school, high school and PUC, respectively. The remaining 7.78 per cent of respondents were studied up to degree and above. It was observed that half (50.00%) of the Okra contract seed production farmers were belonged to small land holding category and slightly more than one third (38.89%) of the farmers were having medium level of annual income. Majority (75.56%) of Okra contract seed production farm families were comes under nuclear family category. It was observed that 57.78% of the Okra seed production contract farmers were belonged to medium sized family and slightly more than half (56.67%) of the respondents were having medium level of extension contact. Nearly half (48.89%) of the Okra seed production contract farmers were having high level of achievement motivation and majority of Okra contract seed production farmers (55.56%) were belonged to high economic motivation category. It was revealed that 52.22 per cent of respondents fall in the medium level of organization participation category and majority of Okra seed production farmers (54.44%) were belonged to medium level mass media exposure category. About 45.56 per cent of respondents were belonged to high level management orientation category and 51.11 per cent of Okra seed production contract farmers were fall in the medium level of extension participation. Further, half of the Okra seed production contract farmers were belonged to medium level of aspiration

3.4 Modus operandi prevailing in okra seed production under contract farming

The agreement between the seed producing farmers and the seed procuring companies was observed that almost all the farmers had contract farming in written agreement and none of the farmers had oral agreement (Table 4). In the agreement farmers were entitled to produce the seeds within the time period which was agreed during the contract signing with the company. The written agreement referred to a signed confirmation from the farmer that he/she wished the company to reserve a contract for him/her. The technical aspects of the agreement were drafted in short, simple terms, clarifying the responsibilities of both the farmer and the firm.

The company undertakes some essential steps like cleaning, grading and grow out test to confirm germination percentage and homogeneity test. Once the seeds were passed grow out test and confirm homogeneity then the company pay the amount through cheque (100%) which was agreed and signed in the contract paper and no company will pay the amount in cash directly to the farmers. Normally payment to the farmers done through the cheque after two to three months. It was observed that cent per cent of the grading was done by the company. After harvesting of the seeds, farmers were not able to undertake proper cleaning and grading of the seeds due to lack of facilities like seed separator, seed cleaner and seed grader. In Okra seed production it was observed that cent per cent of the farms were visited by the supervisor of the company in sowing time, roughing stage, pollination and emasculation stage. Further, 94.44 per cent farms were visited in plant protection stage 91.11 per cent during the time of

harvesting stage and 45.56 per cent farms were visited in post-harvest stage.

3.5 Constrains in okra seed production under contract farming as perceived by farmers

The data in Table 5 indicates the production problems in Okra seed production under contract farming on the order of rank were higher wage rate (77.11 %), non availability of skilled labour (72.12 %), more pests and disease attack (58.72 %), climatic factors (53.90 %), indiscriminate use of fertilizers (47.13%), supply of low yielding varieties (43.82%), non-availability of seeds on time (30.68 %) and non-availability of funds to meet production expenses (28.87%).

The processing problems as perceived by Okra seed production contract farmers on the order of rank were non-availability of mechanical seed extraction facility (64.63%), non-availability of skilled labour for seed extraction and processing (51.01 %), difficult to follow stringent grade specification(44.54%) and lack of technical guidelines during seed extraction (40.81 %).

The contractual problems as perceived by okra seed production contract farmers on the order of rank were higher rejection rate (70.55), irregular payment (64.51) and low contract price (51.96).

3.6 Suggestion of okra seed production contract farmers for improvement in contract farming

The data presented in Table 6 reveals that as high as 97.78 per cent of Okra contract seed production famers were suggested for advance payment to take up seed production, higher price to the Okra seed produced by the company (95.56%), supply of all critical inputs by the company (88.89%), establishment of custom hiring seed extraction equipment's (86.87%), payment at regular intervals (83.33 %) and Crop loan to farmers by financial institutions (77.77%) for improvement in contract farming.

4. Discussion

On an average the cost of okra seed production under contract farming was Rs.1,68,655/- per hectare. The net returns is Rs.3,50,000/- and net returns was Rs.40,277.50 per ha. The returns per rupee of expenditure was 2.07. The expenditure on emasculation and pollination ranked first, fertilizers ranked second, and plant protection ranked third. Further, earlier to okra seed production under contract farming. Farmers were growing Cotton, Maize, Chilli, Tomato, Radish and okra and the benefit cost ratio was 1.67 for cotton, 1.34 for maize, 1.55 for chilli, 1.58 for tomato, 1.35 for radish and 1.43 for okra per hectare. On the other hand the befit cost ratio was 2.07 for okra seed production under contract farming. It clearly indicates that okra seed production is economically beneficial to the farmers. The above results may be attributed to the fact that the Okra seed production farmers benefitted to a greater extent because of bye back arrangement. The contract farming is beneficial to both the parties (Farmers and companies) if both the parties' interest were protected on a long run. Mundinamani *et al* (2009) [4] reported that the benefit: cost ratio tomato, bendi and cotton were 3.29, 2.4 and 2.83, respectively under contract farming in Northern Karnataka. Sridhara and Hosamani (2010) [10] studied the economics of contract farming of chilli in Bagalkot district of Karnataka. The results revealed that per hectare cost of chilli cultivation estimated to be Rs. 39,882.74. The marginal productivity analysis indicated that there is a scope for reorganizing the resources like seeds, bullock labour and plant protection chemicals. Prasad *et al*. (2015) [6] indicated that with the participation in gherkin contract farming, the farmers were able to improve their standard of living and status in the society. A large majority of respondents reported about diversification of cropping system more than half of the respondents were able to repay their pending loans.

Cent per cent of the okra seed production farmers were educated. Further majority of farmers were belonged to nuclear family and medium sized family. They had medium extension contact, economic motivation, organization participation, mass media exposure, extension participation and aspiration. It is universal fact that education plays a key role in bringing desirable changes in behavior of human beings. All categories of farmers were relatively educated, which could be the result of a common social environment. As the farmers are educated, they were able to gather knowledge on recent technologies on production. Due to modernization majority of farm families were disintegrated from joint living to nuclear living and size of land holding has reduced. In modern days the farm families were found as medium size family group may be because the household labour can be used in the farming activities of Okra seed production. Farmers wanted to try different ventures in his / her farm and to get up dated information they used to have regular contact with the extension personnel. Achievement motivation helps an individual to decide and complete the tasks in certain direction, which in turn helps in achieving the desired results. The seed production is more risky and involves timely operations when compared to Okra cultivation hence this needs proper planning and execution. Now-a-days farmers were trying new system of cultivation to get more income and they also succeeded in achieving some of the aspects. Now they were self-motivated and wanted to try new ideas which gave them more profit to get good position in the society better than the existing one. Sahana (2013) [8] reported that in Karnataka Majority of the contract farmers growing Tomato, Marigold and Pearl millet under contract farming had low level of economic motivation. Nearly half of the respondents growing Cotton and Watermelon had medium level of economic motivation. Whereas farmers practicing contract farming in Gherkin had high economic motivation. Shrikantha (2015) [9] reported that in Karnataka the average family size of the farmers involved in contract farming was 7 members and almost all the farmers were educated with average age of 40 years.

The agreement between the seed producing farmers and the seed procuring companies was in written agreement. In the agreement farmers were entitled to produce the seeds within the time period which was agreed during the contract signing with the company. The written agreement referred to a signed confirmation from the farmer that he/she wished the company to reserve a contract for him/her. The company undertakes some essential steps like cleaning, grading and grow out test to confirm germination percentage and homogeneity test. Once the seeds were passed grow out test and confirm homogeneity then the company pay the amount through cheque which was agreed and signed in the contract paper. It was observed that cent per cent of the grading was done by the company. After harvesting of the seeds farmers were not able to undertake proper cleaning and grading of the seeds due to lack of facilities like seed separator, seed cleaner and seed grader. Nethrayini (2010) [5] in her study on contract farming of gherkin under Agri-export zone in Tumkur district of Karnataka revealed that the agreement between farmers and company was oral and informal for 77.70 per cent of the

farmers and for the rest 22.3 per cent it was written and formal agreement. It was observed that all inputs needed for gherkin cultivation were supplied by company. Company provided no credit facilities and mechanization services to the farmers under contract farming system. Payments were made at an interval of fifteen days.

Farms were visited by the supervisor of the company in sowing time, roughing stage, pollination and emasculation stage, plant protection stage and harvesting stage. The regular field visits by the company personnel's helped the farmers to take up all the field operations timely and in a proper way. Company staff gave suggestion to the farmers to take up all the agricultural operations like land preparation, sowing, isolation distance, pollination and emasculation and seed extraction and grading. The regular field visits of company personnel benefitted equally both the farmers and the company. Rajashekar and Virendra Singh (2017) [7], in their study on terms of contract in hybrid rice seed production in Telangana indicated that 62.22 per cent of farmers reported that company staff and technical experts visited their field weekly to render the technical guidance, while 37.77 per cent farmers reported that they received technical guidance from company staff, twice a week. Further, 45.55 per cent farmers received extension service from company once in a month, while 32.22 per cent and 22.22 per cent farmers received the extension services bimonthly and quarterly, respectively. Further, no company provided transportation facility to farmers to transport the produce from their fields to local seed collection center.

Majority of the Okra seed production contract farmers reported high wage rate & non availability of skilled labour were as the major problem may be because of lack of training and more skill is involved in roughing, grading, and emasculation. In addition majority of the farmers reported more pests and disease attack, indiscriminate use of fertilizers and plant protection chemicals were as the major problems in Okra seed production may be due to low knowledge on balanced application of fertilizers, integrated pests & disease management, use of bio-agents and bio insecticides etc., to safe guard environment and to reduce cost of production in Okra seed production. Further, high rejection rate, irregular payment and low contract price were perceived as the major problem may be because of the reason that the terms and condition were unilaterally fixed by the companies without farmers participation. Jagadeesh (2011) [2] reported that major problems faced by the ashwagandha growing contract farmers in case of centralised model were high rejection rate (80 per cent), followed by lack of credit facility (70 per cent), irregular payment (60 per cent), low contract price (40 per cent), manipulation of norms by contract farming firm (30 per cent), non-availability of package of practice (25 per cent), lack of technical assistance (15 per cent) and high cost of planting material (15 per cent). Prasad *et al.* (2013) [6] reported the Constraints of gherkin contract farming using principal component matrix on six dimensions such as soil and environmental management, lack of Government support in contract management, disease pest complex management and difficulty in management, timely input and technical know-how support and high input cost in Tumukur district of Karnataka Chethankumar (2017) [1] reported that the payment was made as per the price fixed in the contract and there was no price risk for the farmers but they complained about the delay in the payment by the company.

Majority of the farmers suggested for financial help and for payment in regular intervals because of the reason that seed production is a complex process, involves more risks and investment when compared to Okra production The above findings gets the supports of findings of Key Neigel and Runsten (1999) [3] suggested for regularity in payment. Further, provision of good price was highlighted by 85.00 per cent of farmers due to fact that the firms made payments based on standard grades which fetched different prices in international market. Companies might try to reject some lot of produce and in return purchase the same for a lower price.

Table 1: Economics of Okra seed production under contract farming (Rs / ha) (n=90)

Sl. No	Items	Rupees	Per cent	Rank
A.	**Variable cost**			
1.	Land preparation	12000	7.13	VII
2.	Farmyard manure	16500	9.80	V
3.	Sowing	2407	1.43	XIII
4.	Fertilizers	18685	11.10	II
5.	Weeding	3910	2.32	XI
6.	Emasculation and Pollination	39755	23.62	I
7.	Plant protection	17633	10.48	III
8.	Crushing and extraction of seeds	3025	1.79	XII
9.	Cleaning and drying	500	0.29	XV
10.	Mulching sheet	15212	9.04	VI
11.	Packing and transportation	1400	0.83	XIV
12.	Interest on working capital @ 7%	9200	5.47	VIII
	Cost A	140227	83.3	
B.	Fixed cost			
1.	Depreciation on farm machinery and equipment's	5532	3.29	X
2.	Rental value of land	16625	9.89	IV
3.	Interest on fixed capital @ 12%	5912	3.52	IX
	Cost B	28069	16.7	
	Cost A + Cost B	168296	100.00	
II	**Returns**			
1.	Yield (Seeds)	1000 Kgs.		
2.	Gross returns	Rs. 3,50,000 @ Rs.350 / Kg.		
3.	Net returns	Rs. 2,09,772.50		
4.	Returns per rupee of Expenditure	Rs. 2.07		

Table 2: Benefit cost ratio of crops grown before okra seed production under contract farming (ha.) (n=90)

SI. No	Crop	Cost of Production (Rs. / ha)	Grass Return (Rs. / ha)	Net Returns (Rs. / ha)	B:C ratio
1	Cotton	37500	100000	62500	1.67
2	Maize	25000	58500	33500	1.34
3	Chilli	27500	70000	42500	1.55
4	Tomato	45000	115875	70875	1.58
5	Radish	31054	73030	41976	1.35
6	Okra	55560	135000	79440	1.43

Table 3: Profile of okra seed production contract farmers (n=90)

SI. No.	Characteristics	Category	Contract farmers	
			No	Percent
1.	Age	Young	35	38.89
		Middle	45	50.00
		Old	10	11.11
2.	Education	Illiterate	00	00.00
		Primary	23	25.55
		Middle school	25	27.78
		High school	25	27.78
		PUC	10	11.11
		Graduation and above	07	7.78
3.	Land Holding	Marginal farmers	30	33.33
		Small farmers	45	50.00
		Big farmers	15	16.67
4.	Annual income Mean=4.40 SD=1.86	Low	26	28.89
		Medium	35	38.89
		High	29	32.22
5.	Family type	Nuclear	68	75.56
		Joint	22	24.44
6.	Family size	Small	25	27.78
		Medium	52	57.78
		Big	13	14.44
7.	Extension contact Mean=11.53 SD=1.062	Low	27	30.00
		Medium	51	56.67
		High	12	13.33
8.	Achievement motivation Mean=09.21 SD=0.86	Low	25	27.78
		Medium	21	23.33
		High	44	48.89
9.	Economic Motivation Mean=14.38 SD=1.68	Low	15	16.67
		Medium	50	55.56
		High	25	27.78
10.	Organization participation Mean=22.44 SD=04.43	Low	28	31.11
		Medium	47	52.22
		High	15	16.67
11.	Mass media exposure Mean =07.12 S.D.=01.14	Low	12	13.33
		Medium	49	54.44
		High	29	32.22
12.	Management Orientation Mean=35.21 SD=2.08	Low	21	23.33
		Medium	28	31.11
		High	41	45.56
13.	Extension participation Mean=14.48 SD=1.71	Low	26	28.89
		Medium	46	51.11
		High	18	20.00
14.	Level of aspiration Mean=23.16 SD=2.89	Low	10	11.11
		Medium	45	50.00
		High	35	38.89

Table 4: Modus operandi prevailing in Okra seed production under contract farming

SI. No.	Particulars	No	Per cent
1.	Type of Agreement		
A	Written	90	100
B	Oral	-	-
	Total	90	100
2.	Mode of payment		
A	Through Cheque	90	100
b	In Cash	-	-
	Total	90	100
3.	Grading		
a	By the Company	90	100
b	By the Farmers	-	-
	Total	90	100
4.	Field visits by the field officers of the contracting company		
a	Sowing time	90	100
b	Roughing stage	90	100
c	Pollination and emasculation stage	90	100
d	Plant protection time	85	94.44
e	Harvesting stage	82	91.11
f	Post-harvest stage	41	45.56

(n=90)

Table 5: Constraints in Okra seed production under contract farming as perceived by contract farmers. (n=90)

SI. No.	Problems	Garrett's Score	Rank
I	Production problems		
1.	High wage rate	77.11	I
2.	Non availability of skilled labour	72.12	II
3.	More pests and disease attack	58.72	III
4.	Climatic factors	53.90	IV
5.	Indiscriminate use of fertilizers	47.13	V
6.	Supply of low yielding varieties seeds	43.82	VI
7.	Non-availability of seeds on time	30.68	VII
8.	Non-availability of funds to meet production expenses	28.87	VIII
II	Processing problems		
1.	Non- availability of mechanical seed extraction facility	64.63	I
2.	Non- availability of skilled labour for seed extraction and processing	51.01	II
3.	Difficulty to follow stringent grade specification	44.54	III
4.	Lack of technical guidance during seed extraction	40.81	IV
III	Contractual problems		
1.	Higher rejection rate	70.55	I
2.	Irregular payment	64.51	II
3.	Low contract price	51.96	III

Table 6: Suggestion of Okra seed production contract farmers for improvement in contract farming (n=90)

SI. No.	Particulars	No.	Per cent	Rank
1.	Advance payment to take up seed production	88	97.78	I
2.	Higher price to the Okra seeds	86	95.56	II
3.	Supply of all critical inputs by the company	80	88.89	III
4.	Establishment of custom hiring seed extraction equipment's	78	86.87	IV
5.	Payment at regular intervals	75	83.33	V
6.	Crop loan to farmers by the financial institutions	70	77.77	VI

5. Conclusion

Contract farming helps the farmers to get assured higher income for their production through pre-marketing contract with the company. The young, educated farmers with better extension contact and scientific orientation opted for contract farming. Majority of the contract farmers perceived high wage rate, non-availability of skilled labour and indiscriminate use of pesticides and fertilizers. The cost of production of okra seeds clearly indicates that, it is a capital intensive activity. Hence, there is a need for extending credit facility to the contract farmers by companies to meet the input cost and other related expenditure. At present most of the okra seed farmers are extracting seeds manually, it is an expensive and time consuming factor. It is ideal to mechanize the seed extraction activity by providing scientific seed extraction machines to the farmers at affordable price or to farmers associations to utilize them jointly. This facility enables the farmers to save labour charges and wastages leading to enhanced income. The okra seed production is a highly risky activity in spite of taking all operations in time, even a slight variation in climatic conditions such as unexpected rains results in loss of crop or destroy seed quality which may lead to rejection of seeds by the contracting firm, in such a situation to protect the farmers, the scheme of crop insurance may be introduced to cover the seed production activity which involves climatic risks. Further, there are stray cases of seed rejection by the companies due to poor quality, which results in substantial losses to the seed growers. To overcome this problem, there is a need to provide technical support and educate the farmers on maintaining quality parameters in seed production from sowing to harvest in an integrated manner.

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