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Contract Farming: Problems, Prospects and its Effect on Income and Employment

Jagdish Kumar* and Prakash Kumar K.
Department of Agricultural Economics, G. B. Pant University of Agriculture & Technology, Pantnagar - 263 145, Uttarakhand

Abstract

This farm-level study conducted in the Tumkur district of Karnataka state has reported the effect of contract farming on income and employment generation and has identified constraints in and prospects of contract farming. Both income and employment generation have been found higher, almost double, on contract than non-contract farms. The study has observed dominance of female labour on both types of farms. Delayed payment for crop produce, lack of credit for crop production, scarcity of water for irrigation, erratic power supply and difficulty in meeting quality requirements have been found to be the major constraints faced by contract farmers. The scarcity of water for irrigation, erratic power supply, lack of credit for crop production, and lower price for crop produce have been identified as major constraints of non-contract farmers. The major constraints expressed by the contracting agencies in expanding contract farming include violation of terms and conditions by farmers, lack of proper management by the company, frequent price fluctuations in international markets, and scarcity of transport vehicles during peak periods.

Introduction

Indian agriculture has undergone a phenomenal transformation during the past five decades. The metamorphosis was brought by not only technological changes such as green revolution, but also by institutional innovations in delivering farm inputs and marketing of output. Contract farming is one such institutional initiative undertaken in recent years to address some of the problems faced by the Indian farmers. The National Agricultural Policy 2000, announced by the Government of India, seeks to promote contract farming by involving the private sector to 'accelerate technology transfer, capital inflow and assured marketing of crop production' (Asokan, 2005).

Contract farming is a system for production and supply of agricultural/horticultural produce under forward contracts between producers/suppliers and buyers (Haque, 2000). It is a case of bringing the market to the farmers, which is navigated by agri-business firms (Christensen and Scott, 1992). The contractual agreement encompasses three areas, viz. (i) market (grower and buyer agree for future sale and purchase), (ii) resources (buyer agrees to supply inputs and technical advice), and (iii) management specifications (growers agree to follow the recommended package of practices for crop cultivation) (Wright, 1989). Wide support has been received for contract farming under the Structural Adjustment Programme (SAP) and liberalization policies by the international development agencies like World Bank, United States Agency for International Development (USAID), International

*Author for correspondence

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Finance Corporation (IFC) and Commonwealth Development Corporation (CDC) (Little *et al*. 1994; White, 1997). With market liberalization, globalization and expansion of agribusiness, there is a growing concern that the small and marginal farmers may find it difficult to compete in the market economy. It is also being witnessed that such farmers are becoming marginalized, as the scale of economies assumes increasing importance for profitable crop production. There is a continued drift or migration of small and marginal farmers to the urban areas, which is a consequence of their growing economic challenges. In 1995, the World Bank had estimated that the number of people migrating from the rural to the urban centres in India by the year 2010, which is not far away from now, would be equal to twice the combined population of the UK, France and Germany. India has access to about 4.5 per cent of the present water, and about 2 per cent of the total land resources available but houses about 17 per cent of the world population. Therefore, the pressure on land and water is very high and for this, we need to capitalize on cost of agriculture production, its quality and technology transfer.

On the other side, the agriculture-based food industry requires timely and adequate inputs of good quality agricultural produce. Against this backdrop, contract farming is considered to be a real instrument to address many of the traditional limitations of the agriculture sector. Keeping this in view, the present study was conducted with the following specific objectives: (a) to study the effect of contract farming on income and employment, and (b) to identify the constraints and prospects of contract farming.

Methodology

The primary data was collected from two taluks (Sira and Tiptur) of the Tumkur district in Karnataka state selected purposively for their highest share in total area covered under contract farming in the district. The respondent farmers were selected from four villages (two villages from each selected taluk) wherein contract farming was in operation, using three stage sampling technique. After dividing all the farmers of four villages into five holding-size groups, viz. marginal (<1 ha), small (1- 2 ha), semi-medium (>2 - 4 ha), medium (>4 - 10 ha) and large (> 10 ha), thirty per cent of the contract farmers were selected randomly on proportionate basis to their numbers in respective holding-size group, subject to a sample of minimum five farmers from each holding-size group. Thus, a sample of 33 contract and 33 non-contract farmers was randomly drawn from the study area, making the total sample size of 66 farmers. The data were collected from these farmers by personal interview method using pre-tested questionnaire.

The average gross cropped area was 3.88 ha and 2.76 ha on contract and non-contract farms, respectively while their average net cultivated area was 2.24 ha and 2.15 ha. The cropping intensity was found as 173.21 per cent on contract and 128.37 per cent on non-contract farms. The contract farmers had devoted only 22.16 per cent of gross cropped area for contract crops.

To analyze income and employment of farmers, simple statistical tools were used. The complete enterprise cost accounting method was used to work out per hectare and whole farm incomes. The student 't'-test was used to find significant variations in the mean values of income and employment generated under contract and non-contract farm situations. Constraints in contract farming were prioritized by using Garrett's ranking technique in the following manner:

$$\text{Percentage position} = \frac{100\ (R_{ij} - 0.50)}{N_j}$$

where,

R_{ij} = Rank given for the i^{th} item by the j^{th} individual, and

N_j = Number of items ranked by the j^{th} individual.

The percentage position of each rank was converted into scores using Garrett table. For each constraint, scores of individual respondents were added together and were divided by total number of respondents for whom scores were added. Thus, mean score for each constraint was ranked by arranging them in the descending order.

In the same manner, opinion about the problems and prospects was obtained from selected contracting agencies and then Garrett's ranking technique was used for prioritizing the constraints.

Results and Discussion

Income and Employment Generation

The results pertaining to annual income and crop-wise income obtained on contract and non-contract farms are discussed below.

Average Annual Farm Income and Off-farm Income on Contract and Non-contract Farms

On-farm income (from both crops and livestock) and off-farm income on contract and non-contract farms have been presented in Table 1. It revealed that the average gross farm income was higher on contract (Rs 135898) than non-contract (Rs 69498) farms by about 96 per cent. However, off-farm income was higher on non-contract (Rs 8182) than contract (Rs 5636) farms by about 44 per cent.

The per-year income from crops was higher on contract (Rs 124215) than non-contract (Rs 56418) farms, the former contributing 91.4 per cent and the latter 81.2 per cent to the gross farm income. The per-year crop income was found 120 per cent higher on contract than non-contract farms. Similarly, per-ha income of gross cropped area was higher on contract (Rs 32014) than non- contract (Rs 20441) farms, by 57 per cent. But, income from livestock was higher on non-contract (Rs 13080) farms, contributing 18.8 per cent towards gross farm income, whereas in the case of contract farms, the income from livestock was Rs 1l683, which accounted for just 8.6 per cent of gross farm income. The higher income from livestock on non-contract farms was because of higher number of milch animals with them. The total income from all sources was found higher on contract (Rs 141534) than non-contract (Rs77680) farms by 82 per cent. The differences in crop income per year, gross farm income and total income were significant at 1 per cent level of significance.

Per-hectare Income from Crops on Contract and Non-contract Farms

The crops grown under contract farming were not being grown normally by non-contract farmers. Therefore, it was not possible to compute additional cost incurred under contract farming and only incomes from various crops have been compared.

The per-ha income for various crops under contract and non-contract farms has been reported in Table 2. A perusal of Table 2 reveals that among contract crops, the income generated by gherkin was

Table 1. Average annual farm income and off-farm income on contract and non-contract farms

(Rs/year)

Particulars	Contract farms	Non-contract farms	Change over non-contract farms
On-farm income			
Crops			
Per year	124215 (91.4)	56418 (81.18)	67797* (120)
Per ha of GCA	32014	20441	11573 (57)
Livestock	11683 (8.60)	13080 (18.82)	-1397 (-11)
Gross farm income	135898 (100)	69498 (100)	66400* (96)
Off-farm income	5636	8182	-2546 (-31)
Total income	141534	77680	63854* (82)

Notes: Figures within the parentheses indicate the percentages to gross farm income

Figures were rounded off to the nearest integers

Bold figures within the parentheses indicate the percentage change over non-contract farms

* indicates significance at 1 per cent level.

Table 2. Per-hectare income from different crops on contract and non-contract farms

Crop	Contract farms (Rs/ha)	Non-contract farms (Rs/ha)	Change over non-contract farms
Gherkin	77066	-	-
Baby corn	64681	-	-
Paddy	31602	27257	4345(15.3)
Groundnut	30462	28821	1641(5.7)
Sunflower	28553	30477	-1924(-6.3)
Chilli	20372	-	-
Ragi	16671	12250	4421(36.1)

Note: Figures within the parentheses indicate the percentages change over non-contract farms

highest (Rs 77066/ha), followed by baby corn (Rs 64681/ha) and paddy (Rs 31602/ha). Among non-contract crops, sunflower contributed the maximum (Rs 30477/ha), followed by groundnut and paddy. Sunflower was the only crop that yielded more income on non-contract than contract farms. It may be because the contract farmers devote their best land for the cultivation of contract crops and use relatively inferior land for cultivation of sunflower.

Employment Generation

The results for employment (per year, per-hectare and crop-wise) generatation have been presented below.

Per-year Employment on Contract and Non-contract Farms

The average level of employment per-year on contract and non-contract farms, given in Table 3, reveals that contract farms employed more hired human labour than that by non-contract farms. The family human labour employed in crop production and livestock was also more on contract than non-contract farms. The overall average human labour employment generated was more on contract than non-contract farms, by 363 human-days/year (37% male and 63% female). It was due to higher cropping intensity, more labour-intensive crops and better economic status of contract farmers to pay wages for the hired labourers.

Per-ha Employment Generation on Contract and Non-contract Farms

Employment generated per ha of gross cropped area on contract and non-contract farms, presented

Table 3. Average level of yearly employment on contract and non-contract farms

Particulars	Contract farms	Non- contract farms (human-days)	Change over non-contract farms, %
Hired human labour			
Male	48 (15.5)	22 (19.8)	26* (118.2)
Female	261 (84.5)	89(80.2)	172* (193.7)
Total hired human labour	309 (100)	111 (100)	198* (178.4)
Family labour-use in crop production			
Male	197(70.4)	64 (73. 6)	133* (207.8)
Female	83 (29.6)	23 (26.4)	60* (260.9)
Total family human labour	280(100)	87 (100)	193* (221.8)
Family labour-use in livestock production			
Male	41 (21.7)	64 (29.5)	-23 (-35.9)
Female	148 (78.3)	153 (70.5)	-5 (-3.3)
Total family labour	189 (100)	217 (100)	-28 (-12.9)
Total male labour	286 (36.8)	150 (36.1)	136** (90.7)
Total female labour	492 (63.2)	265 (63.9)	227** (85.7)
Total human labour	778 (100)	415 (100)	363** (87.5)

Notes: Figures within the parentheses indicate percentages to total
The figures within the parentheses indicate percentage change over non-contract farms
* and ** indicate significance at 1 per cent and 5 per cent levels, respectively.

Table 4. Per-hectare employment generation on contract and non-contract farms

Particulars (human-days)	Contract farms (human-days)	Non-contract farms	Change over non-contract farms (%)
Hired human labour			
Male	13	8	4 (50)
Female	67	32	35(109)
Total hired human labour	80	40	40 (100)
Family human labour			
Male (crop production)	51	23	28 (122)
Female (crop production)	21	8	13 (162)
Total family human labour (crop production)	72		
	32	40 (125)	
Total male labour	64	31	
	33 (106)		
Total female labour	88	40	48 (120)
Total human labour	152	71	81 (114)

Note: Figures within the parentheses indicate percentages change over non-contract farms

Table 5. Per-hectare employment generation under various crops on contract and non-contract farms

(Human-days/year/ha)

Crops	Contract farms			Non-contract farms		
	Male	Female	Total	Male	Female	Total
Ragi	55(58.5)	38(41.5)	94	31(50.8)	30(49.2)	61
Paddy	45(40.2)	67(59.8)	112	38(41.3)	54(58.7)	92
Baby corn	67(54.5)	56(45.5)	123			
Groundnut	41(46.1)	48(53.9)	89	22(38.6)	35(61.4)	57
Gherkin	142(26.3)	398(73.7)	540			
Sunflower	63(48.5)	67(51.5)	130	39(34.2)	75(65.7)	114
Chilli	89(37.1)	152(63.3)	240			

Note: Figures within the parentheses indicate the percentages to total.

in Table 4, indicate that contract farms employed more hired human labour than that on non-contract farms. The family human labour employed on contract farms was also higher on contract than non-contract farms, by 40 human-days/ha. Thus, family labour employed per hectare was 125 per cent more on contract farms. The overall average human labour employment generation was more on contract than non-contract farms, by 114 per cent. The differences in per hectare use of human labour on contract and non-contract farms were statistically non-significant.

Crop-wise Employment Generation on Contract and Non-contract Farms

Employment generation per hectare of gross cropped area under various crops on contract and non-contract farms is given in Table 5. A perusal of Table 5 shows that under contract farms maximum human labour employment (540 human-days/year) was generated by the gherkin crop, followed by chilli, sunflower, baby corn and paddy. Among non-contract crops, sunflower ranked first (114 human-days/ha/year), followed by paddy (92 human-days/ha/year).

Table 6. Difference in crop-wise employment generation on contract and non-contract farms

Crops	Employment, Human-days		
	Male	Female	Total
Ragi	24*(77.42)	8 (26.67)	33 (54.10)
Paddy	7 (18.42)	13 (24.07)	20 (21.74)
Groundnut	19* (86.36)	13 (37.14)	32 (56.14)
Sunflower	24* (61.54)	-8 (-10.67)	16 (14.03)

Note: Figures within the parentheses indicate percentage changes over non-contract farms
* and ** indicate significance at 5 and 10 per cent levels, respectively.

An interesting observation was that among common crops under contract and non-contract farms, the order of employment generation was same, viz. sunflower > paddy > ragi > groundnut.

The overall dominance of male human labour was observed only in crops like ragi and baby corn and in all other crops on contract farms, female labour was dominant. On non-contract farms, male human labour was employed more only in ragi crop and in all other crops, female labour was employed more. The main reasons for employment of more female labour in farm activities were less wage rate and more honesty in work compared to male labour.

A Comparison of Employment Generation on Contract and Non-contract Farms

The difference in crop-wise employment generated on contract and non-contract farms, presented in Table 6, reveals that male labour employed per hectare in crops like ragi, paddy, groundnut and sunflower was 77 per cent, 18 per cent, 86 per cent and 62 per cent higher on contract farms, respectively, whereas in the case of female labour, it was 27 per cent, 24 per cent and 37 per cent higher and 11 per cent lower on contract farms than non-contract farms, respectively. However, the total human labour employed was higher on contract than non-contract farms in all the four crops.

Constraints in Contract Farming

Based on the information furnished by sample farmers, the constraints being faced by contract farmers in practising contract farming and problems being faced by non-contract farmers in adopting contract farming were ranked and prioritized by using the Garrett's ranking method, and have been recorded in Table 7.

Table 7. Ranking of various constraints faced by farmers in contract and non-contract farming based on Garrett score

Constraints	Contract farms		Non-contract farms	
	Score	Rank	Score	Rank
Lack of credit for crop production	56.8	II	53.0	III
Lower price for crop produce	49.9	VI	51.0	IV
Faulty grading by an agency	47.1	VIII	-	-
Scarcity of water for irrigation	54.8	III	57.4	I
Difficulty in meeting quality requirements	51.1	V	-	-
Lack of quality inputs	45.6	IX	38.9	IX
Provision of inputs at higher rate	37.0	XII	-	-
Poor service delivery by firms	43.0	X	-	-
Delay in arranging inputs	40.0	XI	-	-
Delayed payment for crop produce	60.0	I	-	-
Frequent power cutting	53.0	IV	54.6	II
Scarcity of labour during peak periods	47.4	VII	45.7	VIII
Delay in procurement of produce	29.6	XIII	-	-
Lack of provision for rainfed crops	-	-	49.8	V
Lack of government control	-	-	47.8	VI
Cheating by an agency	-	-	47.4	VII

Table 8. Ranking of various constraints expressed by agencies

Constraints	Garrett Score	Rank
Lack of proper management by the company	58.0	II
Non-availability of extension staff	38.1	IX
High rate of rent for hiring transport vehicles	46.0	VII
Inability to provide proper transport facilities to farmers due to poor road network, strikes, etc.	50.0	V
Scarcity of transport vehicles during peak periods	52.0	IV
Holding-up of transport vehicles by farmers	32.4	X
Frequent price fluctuations in international markets	56.0	III
Violation of terms and conditions by farmers	61.9	I
Selling of produce to other companies by farmers	42.0	VIII
Farmer's negligence in maintaining quality	48.0	VI

On contract farms, delay in payment of produce was the most important constraint (60 Garrett score), followed by lack of credit for crop production (56.8 score), scarcity of water for irrigation (54.8 score), frequent power cutting (53.0 score), difficulty in meeting quality requirements (51.0 score) and lower price for crop produce (50.0 score).

On non-contract farms, scarcity of water for irrigation was the most important constraint (57.4 score), followed by frequent power cutting (54.6 score), lack of credit for crop production (53.0 score), lower price for crop produce (51.0 score) and lack of provision for rain-fed crops (49.8 score).

It was also observed that some constraints like scarcity of irrigation water, lack of credit for crop production, erratic power supply, lower price for produce, lack of labour during peak periods, etc. were being faced by both contract and non-contract farmers. There were some constraints specific to contract farmers while there were some others concerning non-contract farmers too.

Constraints Expressed by Agencies in Expanding Contract Farming

The constraints expressed by agencies in expanding contract farming were prioritized based on Garrett score and have been presented in the Table 8. It was found that violation of terms and conditions by farmers was the most important constraint, with 61.9 Garrett score, followed by lack of proper management by the company (58.0 score), frequent price fluctuations in international markets (56.0 score), scarcity of transport vehicles during peak periods (52.0 score), inability to provide proper transport facilities to farmers (50.0 score) and farmer's negligence in maintaining quality (48.0 score).

Prospects of Contract Farming

The study on prospects of contract farming revealed that 57.6 per cent of farmers were willing to retain the existing area under contract farming, whereas 36.4 per cent wanted to decrease the existing area under contract farming. Only 6.0 per cent farmers showed inclination towards increasing their existing contract farming area. The contract farmers expressed difficulty in maintaining more area under contract farming due to labour-intensive nature of crops under it.

A high percentage of non-contract farmers were interested to join contract farming provided the problem of irrigation was solved, contract farming system was brought under government jurisdiction, and provision was made for rain-fed crops also.

All the agencies were interested to extend the area under contract farming by covering more farmers in the present and new taluks and villages in the district of Tumkur.

Conclusions

The study conducted in the Tumkur district of Karnataka state has revealed that the total income is

more to contract farmers, almost double, than non-contract farmers. Employment generation on contract farms has also been found almost double compared to that on non-contract farms. Female labour has been observed to dominate over male labour on both types of farms. Also, delayed payment for crop produce, lack of credit for crop production, scarcity of water for irrigation, erratic power supply and difficulty in meeting quality requirements have been found to be the major constraints faced by contract farmers, whereas, scarcity of water for irrigation, erratic power supply, lack of credit for crop production and lower price for crop produce are the major constraints expressed by non-contract farmers. The major constraints expressed by contracting agencies are violation of terms and conditions by farmers, lack of proper management by the company, frequent price fluctuations in international markets and scarcity of transport vehicles during peak periods in the way of expansion of contract farming.

References

Asokan, S. R. (2005) A perspective of contract farming with special reference to India, *Indian Journal of Agricultural Marketing,* **19**(2): 94-106.

Christensen and Scott, R. (1992) Between the farmer and the state. Towards a policy analysis of the role of agri-business in Thai agriculture. Thailand Development Research Institute (TDRI). *Background Report to the 1992 Conference on Thailand's Economic Structure: Towards the Balanced Development*? Chon Bury, Thailand.

Dileep, B. K., Grover, R. K. and Rai, K. N. (2002) Contract farming in tomato: An economic analysis, *Indian Journal of Agricultural Economics*, **57**(2): 197-210.

Haque, T. (2000) Contractual arrangements in land and labour markets in rural India, *Indian Journal of Agricultural Economics*, **55**(3): 233-252.

Little, D. Peter, Michael, J. and Watts (1994) *Living under Contract: Contract Farming and Agrarian Transformation in Sub-Saharan Africa*, Madison: University of Wisconsin Press, pp. 216-217.

Nakhat, A. N. (2004) Contract faming: Towards low risk and high gain agriculture, *Agriculture Today*, **7**(9): 21-32.

White, B. (1997) Agro-industry and contract farming in upland Java, *The Journal of Peasant Studies,* **23**(3): 100-136.

Wright, D. (1989) Contract farming agreements: *Farm Management*, **7**(14): 177-184.