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Contract Farming and its Implications for Input-supply, Linkages between Markets and Farmers in Karnataka

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Abstract

This study is focused on the economic analysis of contract farming with a comparison of income, access to technology and credit of contract and non-contract farmers. The advantages of contract farming for smallholders have also been evaluated. In contract farming, quality inputs such as seeds, fertilizers and plant protection chemicals are provided to the farmers at their farm gate, coupled with the technical advice on production aspects. This not only reduces the working capital needs of farmers but also substantially reduces their transaction cost per unit of output. Borrowing of crop loans has been found 33 per cent higher by non-contract farmers than contract farmers, as the former have to buy material inputs. The net returns have been found higher for contract than non-contract farmers. Within contract farming, net returns have been recorded higher under domestic than foreign contracts for both baby corn and chilli. In the case of non-contract farmers, the net returns (Rs 3,035) have been found less than one-third of domestic contract farmers (Rs 10,610) and slightly more than one-third of foreign contract farmers (Rs 8,050). In the case of chilli also, the net returns realized per acre have been recorded maximum under domestic contract farmers, followed by foreign contract farmers and non-contract farmers. The returns per rupee invested have been noted higher in farming of baby corn in all the three categories than those of chilli farming. The constraints identified in the study include delay in payment and delivery of inputs, delay in lifting the produce, access to seeds, manipulation of grades by the buyers, and high cost of inputs in contract farming. Factors inducing farmers into contract are: low initial investment, better price for the produce, access to market, technical support on package of practices, access to inputs and easy transportation facilities.

Introduction

Around 70 per cent of India's poor live in rural areas; and tackling poverty implies addressing the problems faced by the rural poor. A majority of these people are farmers who depend on agriculture and the related activities for their sustenance. In many situations, small farmers are able to make efficient production choices, if they are not constrained in choosing optimal input and output levels. Increased production does not necessarily lead to higher incomes, particularly where prices fluctuate widely,

markets are unorganized and inefficient, market access is limited, or bargaining power is weak. There is an intense feeling that in the era of liberalization and globalization, small farmers are being completely neglected and marginalized from high-value agribusiness activities and hence are unable to derive 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 contractual arrangements is necessary to link product characteristics and production processes to consumer preferences.

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Contract farming is an economics intervention to provide an environment of competition in the background of an institutional set up. In India, this system can be traced back to the colonial period when cotton and indigo were produced by the Indian farmers for the English factories (Asokan and Singh, 2003). Contract farming is the contractual arrangement between farmers and a company, whether oral or written, specifying one or more conditions of production and or marketing (Roy, 1963). The new agricultural policy of the Government of India is aimed at promoting growth of private sector participation in agribusiness through contract farming, which accelerates technology transfer, and capital flow and provides assured markets for crops. Contracting leads to environmental equity, food security and sustainability problems. It provides better income to farmers and generates more employment for labour through introduction of new crop technologies and by providing markets and inputs. In fact, contract farming as a system would affect the producers positively or negatively depends on the context of the economy (Singh, 2000).

Contract farming is in vogue in different parts of the Karnataka state to produce *inter alia*, baby corn, chillies, poultry, dairy, sweet corn, papaya, maize, capsicum, onion and gherkins. Karnataka is emerging as one of the leading states in contract farming in vegetables with around 22 companies (both domestic and multinational) offering contract farming for a variety of vegetables. Contract farming of fresh vegetables is concentrated in south Karnataka. Baby corn is the new crop introduced in 1999 by contract farming firms. Similarly, green chilli production under contract farming started in 2002. High-value agriculture is associated with vertically coordinated marketing channels, super markets and export-oriented agribusiness. However, impact of vertical coordination on small farmers has not been adequately studied in India. Therefore, it is imperative that surveys on contract farming, as a case of vertical coordination, would be useful to examine the conditions under which contract farming performs effectively for enhancing income and technology of smallholders. Accordingly, an economic study of contract farming for vegetables

was undertaken with the following specific objectives.

- To study the relative features of contract farming offered by domestic and foreign firms,
- To compare income, technology and credit access of contract and non-contract farmers, and
- To analyze the economics of contract farming for smallholders.

Methodology

The study focuses on the economics of contract farming of green chillies and baby corn in Karnataka and its impact on income, employment and access to technology and credit by contract farmers and non-contract farmers. The advantages of contract farming for smallholders have been evaluated and a comparison has been done between advantages of contract farming with foreign and domestic firms.

Multistage sampling method was used to choose the sample farmers. At the first stage, based on the concentration of area under baby corn and chillies contract farming, one domestic and one foreign firms were selected. At the second stage, after discussions with the production manager of the company, a cluster of villages participating in contract farming was chosen. Finally, based on the farmers' details maintained by the firm, around 180 contract farmers, 45 each growing baby corn and 45 each growing green chilli under foreign contracting firm and domestic contracting firm were selected. A sample of 40 farmers who are not involved in contract farming but cultivating baby corn and green chilli were also selected. The study pertains to the year 2005-06.

Data Collection

Primary data were collected from the selected farmers using pre-tested schedule through personal interview, involving company supervisors. The primary data were analysed using measures of central tendency, ratios and proportions. The costs and returns of baby corn and chilli crops were calculated on per acre basis. The costs included explicit costs, implicit costs and marketing costs. To assess the differential impact of contract farming across

different classes of farmers, the Gini coefficients of income and employment were computed.

Results and Discussion

The socio-economic analysis of sample respondents indicated that they were young to middle aged farmers (Table 1). More than 90 per cent of the sample farmers were literate. However, a marked difference was not noted with respect to their age, family-size and educational level. The holding-size was higher (7.4 acres) of non-contract than contract farmers (4.6 acres with foreign firm and 3.5 acres with domestic firm) for baby corn farmers. The irrigated area was also higher among non-contract farmers than contract farmers. The contract farmers had higher proportion of area under irrigation.

Area Allocation under Contract and Non-contract Farmings

The average gross cropped area of chillies was the highest for contracting farmers with foreign firm (8.5 acre), followed by domestic firm (6.3 acre) and non-contracting farmers (5.2 acre). Farmers under foreign firm had two-times the area under non-contract than contract crops, while domestic firm farmers had 72 per cent of the gross cropped area

under contract crops. This indicated that the major source of income was from contract crops. Around 20 per cent of the total gross cropped area was devoted towards cultivation of chilli in the case of non-contract farmers (Table 2).

The average gross cropped area of baby corn was higher for non-contract farmers (8.8 acre) than contract farmers (5.2 acre under domestic contract firm and 5.1 acre under foreign contract firm). Farmers growing baby corn had almost equal area under contract with domestic and foreign firms, while under contract with foreign firm, they had about 36 per cent of the gross cultivated area. Around 30 per cent of the total gross cropped area was devoted towards cultivation of baby corn in the case of non-contract farmers.

Features of Contract Farming Companies

The salient features of domestic and foreign contracting firms, reported in Table 3, reveal that there were several parallels between these types of firms. Entrepreneurship and resource endowment of the farmers were the main criteria for choosing farmers for contract by both the firms. Both the companies supplied quality inputs such as seeds, fertilizers, plant protection chemicals and technical

Table 1. General features of sample farmers in Karnataka: 2005-06

| Particulars | Contract | | | | Non-contract | |
|---------------------------------|--------------|---------|---------------|---------|--------------|---------|
| | Foreign firm | | Domestic firm | | Baby corn | Chilli |
| | Baby corn | Chilli | Baby corn | Chilli | | |
| No. of sample farmers | 45 | 45 | 45 | 45 | 40 | 40 |
| Age of farmers (years) | 37 | 37 | 45 | 35 | 39 | 35 |
| Size of family (No.) | 6 | 6 | 6 | 5 | 6 | 6 |
| Educational level (years) | 9 | 8 | 7 | 8 | 9 | 8 |
| Number of illiterates | 2 (4) | 3 (7) | 5 (10) | 2 (4) | 1 (3) | 1 (2) |
| Number of literates | 43 (96) | 42 (93) | 40 (90) | 43 (96) | 39 (97) | 39 (98) |
| Primary school (No.) | 10 | 13 | 18 | 12 | 15 | 14 |
| High school (No.) | 29 | 19 | 17 | 24 | 16 | 15 |
| College and above (No.) | 4 | 10 | 5 | 7 | 8 | 10 |
| Average landholding size (acre) | 4.6 | 7 | 3.5 | 4.5 | 7.4 | 6 |
| Dry land (acre) | 1.7 | 4 | 0.7 | 3.3 | 3.6 | 4.3 |
| Irrigated land (acre) | 2.9 | 3 | 2.8 | 1.2 | 3.8 | 1.7 |
| Proportion of small farmers (%) | 84 | 56 | 82 | 71 | 62 | 53 |

Note: Figures within the parentheses indicate percentages to the number of farmers of respective crops.

Table 2. Area allocation under contract and non-contract farming by sample farmers

| Particulars | Foreign contract | | Domestic contract | | Non-contract | |
|---|------------------|----------------|-------------------|----------------|----------------|----------------|
| | Baby corn | Chilli | Baby corn | Chilli | Baby corn | Chilli |
| Area under non-contract crops (acre) | 3.27 (63.6) | 5.52 (65.2) | 2.57 (49.2) | 1.73 (27.6) | 6.16 (70.1) | 4.16 (80.6) |
| Area under other contract crops (acre) (other than chilli and baby corn) | 0.13 (2.5) | 2.1 (24.8) | 1.84 (35.3) | 3.9 (62.2) | NA | NA |
| Area under baby corn / chilli (acre) | 1.74 (33.9) | 0.85 (10.0) | 0.81 (15.5) | 0.64 (10.2) | 2.63 (29.9) | 1 (19.4) |
| Gross cropped area | 5.1 (100) | 8.5 (100) | 5.2 (100) | 6.3 (100) | 8.8 (100) | 5.2 (100) |

Notes: NA: Not Applicable

Figures within the parentheses indicate percentages to the respective total.

know-how and procured the output, establishing vertical linkages between firms and farmers. Farmers were given the flexibility to grow crops of other companies also. Payments were made after deducting the cost of inputs. No compensation was given in the event of crop failure. However, the domestic firm indirectly shared a part of the production risk in the event of crop failure, by way of allotting larger area in the next season in order to compensate the loss incurred by the contract farmers in the contract crop this season. The most striking difference between domestic and foreign companies was in their marketing; the foreign company was totally export-oriented, while the domestic company was supplying to local as well as international markets (Table 3).

Comparison of Crop Loan Borrowings

The crop loan borrowed by farmers of baby corn was highest (~38%) by non-contract farmers, followed by contract farmers under foreign firm (33%) and domestic firm (24%). The average amount of loan borrowed was also higher by non-contract farmers (Rs 29,893) than contract farmers, it being Rs 18,600 under foreign firm and Rs 20,625 under domestic firm (Table 4).

The percentage of farmers borrowing crop loans was higher for cultivating chilli than for cultivating baby corn. In the case of chilli, around 53 per cent of the non-contract farmers borrowed crop loans as against 42 per cent in the case of foreign and 29 per cent in domestic firm contract farmers. The average

amount of loan borrowed ranged from Rs 20,846 to Rs 31,276 among contract and non-contract farms. Irrespective of type of contract farming, a majority of farmers borrowed from the institutional sources. Crop loan borrowed by non-contract farmers was 33 per cent higher than by contract farmers, as they had to buy material inputs.

Relative Share of Inputs

The ratios of purchased-inputs to owned-inputs and purchased-inputs to the company supplied-inputs (Table 5) indicate that for every one unit of owned-input, the purchased-inputs (and or company supplied-inputs) were around 5 units in the case of non-contract farmers, as against about 4 and 3.5 units in the case of farmers under foreign and domestic contract, respectively for baby corn farmers. Similarly, for every one unit of inputs-supplied by the company, the farmers purchased around 1.7 units of inputs and owned-input-use was 0.7 units under both types of contracts.

Similarly for the chilli farmers, for every one unit of owned-input, the purchased-inputs (and or company supplied-inputs) were 3 units in the case of non-contract farmers, as against 1.2 units each in the case of farmers under foreign and domestic contract firms. Similarly, for every one unit of company supplied-inputs, purchased- and owned-inputs by the contract farmers were around 0.7 unit. Thus, the contract farmers were greatly benefited due to the provision of inputs supplied by the company.

Table 3. Salient features of contract farming companies

| Particulars | Foreign company | Domestic company |
|--|--|---|
| Year of establishment in the state | 2002 | 2000 |
| Type of contract | Written/Oral | Oral |
| Criteria for choosing farmers | Entrepreneurship, resource endowment (specifically assured groundwater irrigation) | Entrepreneurship, resource endowment (specifically assured groundwater irrigation) |
| No. of farmers under contract | 1500 | 2500 |
| Input supply | Seeds, fertilizers, plant protection chemicals | Seeds, fertilizers, plant protection chemicals |
| Flexibility to grow crops of other company | Allowed | Allowed |
| Mode of payment | Payment after deducting cost of inputs | Payment after deducting cost of inputs |
| Advanced payment | No provision | Sometimes provided |
| Form of payment | By cheque | In cash |
| Time of payment | 20-25 days after the day of last delivery of produce of produce | 15-20 days after the day of last delivery |
| Compensation in the event of crop failure | No compensation | Indirectly provided by allocating larger acreage in the ensuing season |
| Crops contracted | Gherkin, chilli, baby corn | Okra, gourd, brinjal, chilli, beans, green peas, carrot, asparagus, baby corn, cole crops, capsicum, onion, lettuce, tomato, cucumber, green leafy vegetables, melons |
| Area | 3300 acres (all outsourced) | 300 acres (captive) 1200 acres (outsourced) |
| Most common type of contract violation | Selling to other buyers | Using prohibited pesticides, selling to other buyers |
| Catchment area | Parts of Bangalore rural and Tumkur districts | Parts of Bangalore rural and Ooty |
| Price fixation | Pre-determined | Pre-determined |
| Research and development unit | Absent | Present |
| Technical guidelines | Provided | Provided |
| Processing unit | Semi-processing unit | Processing unit with sophisticated refrigeration for fresh packing of commodities |
| Type of commodities traded | Canned and pickled commodities | Fresh refrigerated |
| Market destination | International markets | Local and international markets |

Returns Realized by Contract and Non-contract Farmers

A perusal of Table 6 shows the production cost of baby corn was highest under domestic contract farming (Rs 9,948/acre) and lowest under foreign contract farming (Rs 8,499/acre); the cost under non-contract farming being in between the two (Rs 9,653/

acre). In the case of chilli, the cost pattern was different from baby corn. It was highest under foreign contract farming (Rs. 26,657/acre) and lowest under non-contract farming (Rs 23,493/acre); domestic contract farming assumed the middle level (Rs 24,484/ acre). These results are similar to those reported by Dileep *et al.* (2002).

Table 4. A comparison of crop loan borrowings between contract and non-contract farmers

| Credit | Foreign contract | | Domestic contract | | Non-contract | |
|---|------------------|--------|-------------------|--------|--------------|--------|
| | Baby corn | Chilli | Baby corn | Chilli | Baby corn | Chilli |
| Percentage of farmers borrowing crop loans | 33 | 42 | 24 | 29 | 38 | 53 |
| Average amount of loan per farm (Rs) | 18,600 | 21,263 | 20,625 | 20,846 | 29,893 | 31,276 |
| Percentage of farmers borrowing from commercial banks | 20 | 16 | 37 | 18 | 47 | 43 |
| Percentage of farmers borrowing from cooperatives | 73 | 20 | 45 | 9 | 47 | 8 |
| Percentage of farmers borrowing from non-institutional agencies | 7 | 7 | 18 | 2 | 6 | 3 |

Table 5. Relative share of inputs by domestic and foreign contract firms in cultivation of baby corn and chilli in Karnataka

| Particulars | Foreign contract | | Domestic contract | | Non-contract | |
|---|------------------|--------|-------------------|--------|--------------|--------|
| | Baby corn | Chilli | Baby corn | Chilli | Baby corn | Chilli |
| Inputs supplied by the company (%) | 29.85 | 47 | 28.64 | 25 | NA | NA |
| Inputs purchased by the farmers (%) | 50.01 | 29 | 49.36 | 40 | 83.14 | 75 |
| Inputs owned by farmers (%) | 20.13 | 24 | 21.98 | 35 | 16.85 | 25 |
| Ratio of purchased-inputs (and or company supplied) to owned-inputs | 3.96 | 1.22 | 3.55 | 1.15 | 4.93 | 3.1 |
| Ratio of owned-inputs to supplied-inputs | 0.69 | 0.56 | 0.77 | 1.41 | NA | NA |
| Ratio of purchased-inputs to supplied-inputs | 1.69 | 0.61 | 1.72 | 1.59 | NA | NA |

Note: NA= Not Applicable

Table 6. Cost of production of baby corn and chilli under foreign and domestic contract and non-contract farmers: 2005-06

| Particulars | (Per acre) | | |
|-------------|--------------------------|-----------------------|-----------------|
| | Total variable cost (Rs) | Total fixed cost (Rs) | Total cost (Rs) |
| Baby corn | 7606 | 894 | 8499 |
| Chilli | 24195 | 2462 | 26657 |
| Baby corn | 8996 | 952 | 9948 |
| Chilli | 21495 | 2989 | 24484 |
| Baby corn | 8906 | 747 | 9653 |
| Chilli | 20774 | 2499 | 23493 |

In the total production cost of baby corn and chilli, the major item of expenditure was labour, accounting for about 30 per cent and 32 per cent in contract farming and 23 per cent and 32 per cent in non-contract farming, respectively. The impact of

contract farming was clearly visible on the transaction costs (involved in marketing produce and buying inputs) of baby corn and chilli. These were Rs 89/acre and Rs 79/acre, respectively for farmers under foreign firm and Rs 6/acre and Rs 5/acre under domestic firms, respectively, while in the case of non-contract farmers, these costs were Rs 2,318/acre for baby corn and Rs 4,991/acre for chilli.

For baby corn, the farmers under domestic contract firm realized higher productivity of 22.6 q/acre compared to 19.5 q/acre under foreign contracting firm and 16.2 q/acre by non-contract farmers. The domestic contract farmers derived higher net returns than foreign contract farmers. In the case of non-contract farmers, the net returns (Rs 3,035) were less than one-third of domestic contract farmers (Rs 10,610) and slightly more than one-third of foreign contract farmers (Rs 8,050). In the case of chilli also, the net returns realized per acre were maximum under domestic contract farmers, followed

Table 7. Net returns realized by contract and non-contract farmers for baby corn and chilli in Karnataka

| Particulars | Foreign contract | | Domestic contract | | Non-contract | |
|--------------------------------|-------------------------|------------------------|-------------------------|------------------|-------------------------|--------------------------|
| | Baby corn PAC Series | Chilli Confidential | Baby corn PAC Series | Chilli Ns-114 | Baby corn PAC Series | Chilli Chikkaballapur |
| Yield (kg/acre) | | | | | | |
| I Grade | 1954 | 4071 | 2259 | 4307 | 1619 | 2894 |
| II Grade | - | 214 | - | 227 | - | - |
| Price (Rs/ kg) | | | | | | |
| I Grade | 7 | 8 | 7 | 8 | 6.6 | 10.2 |
| II Grade | - | 5 | - | 5 | - | - |
| Returns (Rs/ acre) | | | | | | |
| Main product | 13678 | 33638 | 15814 | 35591 | 10669 | 29374 |
| Byproducts | 2871 | - | 4745 | - | 2019 | - |
| Gross returns | 16549 | 33638 | 20558 | 35591 | 12688 | 29374 |
| Total cost of production | 8499 | 26657 | 9948 | 24484 | 9653 | 23273 |
| Net returns | 8050 | 6981 | 10610 | 11108 | 3035 | 6101 |
| Cost of production /kg | 4.34 | 6.20 | 4.40 | 5.40 | 5.96 | 8.00 |
| Returns per kg | 4.1 | 7.9 | 4.7 | 7.5 | 1.9 | 10.2 |
| Returns per rupee invested, Rs | 2.0 | 1.3 | 2.1 | 1.5 | 1.3 | 1.3 |

by foreign contract farmers and non-contract farmers. The returns per rupee invested were higher in farming of baby corn in all the three categories than those of chilli farming (Table 7).

Effect of Contract Farming on Income

As evident from Table 8, for small and medium farmers growing baby corn, the proportion of gross contract area to total gross cropped area was around 40 per cent, deriving 74 per cent and 63 per cent of their total income from crop enterprises, respectively from contract farming. On the contrary, 37 per cent of income was derived from 17 per cent of gross cropped area in case of large farmers. But, the income derived from contract crop per acre was highest for small farmers (Rs 7,547), followed by medium (Rs 7,244) and large (Rs 6,778) farmers.

In the case of small and medium farmers growing chilli, the proportion of gross contract area to total gross cropped area was around 36 per cent and 28 per cent, deriving 58 per cent and 38 per cent of their total income from crop enterprises, respectively from contract farming. On the contrary, 32 per cent of income was derived from 21 per cent of gross cropped area in the case of large farmers. But, the

income derived from contract crop per acre was highest for large farmers (Rs 15,002), followed by small (Rs 10,878) and medium (Rs 7,635) farmers.

A perusal of Table 9 reveals that more than 50 per cent of small and medium farmers derived 74 per cent of their total income from contract farming of baby corn. In the case of large farmers, around 54 per cent of their total income was derived from contract farming with 37 per cent of their gross cropped area under contract. The income derived from contract crop per acre was highest for small farmers (Rs 14,625), followed by large (Rs 13,131) and medium (Rs 10,287) farmers.

In the case of small and medium farmers growing chilli under domestic contract, the proportion of gross contract area to total gross cropped area was around 57 per cent and 42 per cent, deriving 54 per cent and 43 per cent of their total income from crop enterprises, respectively from contract farming. On the contrary, 33 per cent of income was derived from 24 per cent of gross cropped area in case of large farmers. But, the income derived from contract crop per acre was highest for large farmers (Rs 13,603), followed by medium (Rs 11,231) and small (Rs 10,485) farmers.

Table 8. Area and income of different classes of farmers under foreign contract

| Type of farmer | Proportion of sample farmer (%) | | Gross area (acre) | | Average gross area (acre) | | Gross contract area (acre) | | Average contract holding (acre) | | Proportion of gross contracted area to total gross cropped area (%) | | Percentage of contract income to total income | | Income from contract crop (Rs/acre) | |
|----------------|---------------------------------|----|-------------------|--------|---------------------------|-------|----------------------------|-------|---------------------------------|------|---|----|---|----|-------------------------------------|-------|
| | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH |
| Small farmers | 84 | 56 | 159.25 | 118.33 | 4.19 | 4.73 | 64.00 | 42.75 | 1.68 | 1.71 | 40 | 36 | 74 | 58 | 7547 | 10878 |
| Medium farmers | 9 | 24 | 29.50 | 91.50 | 7.38 | 8.32 | 13.00 | 26.00 | 3.25 | 2.36 | 44 | 28 | 63 | 38 | 7244 | 7635 |
| Large farmers | 7 | 20 | 42.75 | 120.75 | 14.25 | 13.42 | 7.25 | 25.25 | 2.42 | 2.81 | 17 | 21 | 37 | 32 | 6778 | 15002 |

Note: BC = Baby corn; CH = Chilli

Table 9. Area and income of different classes of farmers under domestic contract

| Type of farmer | Proportion of sample farmer (%) | | Gross area (acre) | | Average gross area (acre) | | Gross contract area (acre) | | Average contract holding (acre) | | Proportion of gross contracted area to total gross cropped area (%) | | Percentage of contract income to total income | | Income from contract crop (Rs/acre) | |
|----------------|---------------------------------|------|-------------------|------|---------------------------|------|----------------------------|------|---------------------------------|------|---|----|---|----|-------------------------------------|-------|
| | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH | BC | CH |
| Small farmers | 82 | 71.1 | 172.87 | 124 | 4.67 | 3.87 | 90.62 | 70.2 | 2.45 | 2.19 | 52 | 57 | 74 | 54 | 14625 | 10485 |
| Medium farmers | 14 | 24.4 | 42.25 | 67.5 | 7.04 | 6.13 | 23.50 | 28 | 3.92 | 2.55 | 56 | 42 | 74 | 43 | 10287 | 11231 |
| Large farmers | 4 | 4.4 | 19.75 | 22.1 | 9.88 | 11.1 | 7.25 | 5.38 | 3.63 | 2.69 | 37 | 24 | 54 | 33 | 13131 | 13603 |

Note: BC = Baby corn; CH = Chilli

Table 10. Gini coefficients for net returns from contract and non-contract crops per farm per year

| Type of farmers | Foreign contract | | Domestic contract | | Non-contract | |
|-----------------|------------------|--------|-------------------|--------|--------------|--------|
| | Baby corn | Chilli | Baby corn | Chilli | Baby corn | Chilli |
| Small | 0.76 | 0.81 | 0.66 | 0.88 | 0.87 | 0.87 |
| Medium | 0.77 | 0.74 | 0.69 | 0.94 | 0.87 | 0.71 |
| Large | 0.86 | 0.87 | 0.78 | 0.81 | 0.77 | 0.83 |
| All | 0.75 | 0.81 | 0.64 | 0.87 | 0.81 | 0.80 |

Table 11. Constraints and advantages of contract farming

| Constraints | Rank | Advantages | Rank |
|------------------------------|------|-------------------------------------|------|
| Delay in payments | 1 | Low initial investment | 1 |
| Delay in delivery of inputs | 2 | Fair price for the produce | 2 |
| Delay in lifting the produce | 3 | Assured market, less risk | 3 |
| Access to seeds | 4 | Access to information on production | 4 |
| Buyers manipulation of grade | 5 | Access to inputs | 5 |
| High cost of inputs | 6 | Transportation facilities | 6 |

Impact of Contract Farming on Equity

There existed inequity in the income distribution between contract and non-contract farmers, as there was a wide variation in the production of baby corn across contract and non-contract farms. The inequity in distribution of income was higher for non-contract than contract farmers, as validated by Gini coefficients (Table 10). Contrary to it, the inequity of income among different categories of chilli-growing farmers was high under domestic contract firms (0.87), followed by foreign contract firms (0.81) and non-contract farmers (0.80). Within contract farmers, the small farmers had lesser instability of income compared to large farmers, indicating that small and medium farmers performed better and realized higher production and better incomes.

Advantages/ Constraints in Contract Farming

To identify the problems and advantages of contract farming, the responses of sample farmers were analysed by the Garret's ranking technique. It combined the ranks given by all the farmers and provided the final rank of each factor.

It is evident from the Table 11, that delay in payment ranked as first constraint, followed by delay in delivery of inputs, delay in lifting the produce, access to seeds, buyers manipulation of grades and high cost of inputs, in contract farming.

Among different benefits from contract farming, contract farmers felt that lack of initial investment was the prime factor to prefer contract farming as the firm provided the inputs such as seeds, fertilizers, etc. to farmers initially without cash from the farmers and these costs were deducted at the time of final payment. The second most important factor was fair price and third was assured market, guarding them against fluctuating prices in the open market. The fourth factor was information on production methods. The fifth factor was timely access to inputs and provision of transport facilities, which lowers transportation cost to contract farmers.

Conclusions and Policy Implications

The conclusions and policy implications derived from the study are given below:

- In contract farming, quality inputs such as seeds, fertilizers, and plant protection chemicals are provided to the farmers at their farmgate, coupled with technical advice on production aspects. This not only reduces the working capital needs of farmers but also substantially reduces their transaction cost per unit of output. The contract farming has helped the small farmers to improve their income levels. The government should facilitate contract farming in feasible areas.

- The production of baby corn has been found a profitable enterprise, which supports livestock too. Considering its short duration, cultivation of baby corn needs to be promoted under non-contract also as a complementary enterprise. In this regard, the Department of Horticulture has to take some initiatives to establish market links with retail outlets like Food World, Subhiksha, etc.
- In spite of several advantages, the farmers under contract farming have expressed certain problems like delay in payments, delay in the delivery of inputs, etc. These need to be addressed by the companies in the interest of sustaining long-term synergistic relationships between the firm and farmers. The government should also enact suitable bye-laws to make contract farming a more transparent and balanced enterprise.

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