

# Cost and Benefit Analysis of Contract Farming

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## Abstract

*This article focused on the cost-benefit analysis of contract farming. The cost-benefit analysis includes total cost, total income and profit before and after contract farming of respondents. Total cost calculated without a fixed price and with a fixed cost, profit also calculated with a fixed cost and without fixed cost. Contract farming is beneficial to farmers after contract farming. The total cost should be considered without a fixed cost.*

**Keywords: Agriculture, Farmers, Income, Expenditure, Profit, etc.,**

## Introduction

The scenario of agriculture in India is changing. Farmers are keen on transforming from a traditional approach of farming to a market-led approach. Farmers are now looking for the means and ways to shift from subsistence agriculture to market-oriented production. In this context, contract farming provides a unique opportunity to diversify their production. With minimum risk, it motivates the farmers to take up a new venture. There is an unprecedented interest shown by all the stake holders of contract farming. After opening up the Indian economy and entry of many domestic and multinational players into the agribusiness sector, contract farming, which was restricted now, became the dominant and growing node of raw material production and procurement coordination among the processors and fresh produce marketers and exporters. In this regard, a study has been taken up to know the cost-benefit analysis of contract farming on practicing farmers.

## Review of Literature

**Mallikarjun M.N (2014):** A conducted study on "A Comparative study of Contract Farming with Conventional Farming of Potato in Southern Transition Zone of Karnataka." The fundamental objective is cost and returns analysis of potato in both contract farming and regular farming. The technique was 30 respondents from Arakalugudu, Hassan locale. The significant discovering potato contract farming is gainful to farmers. The limitation was that the investigation not concentrated on dangers, vulnerability and requirements of ranchers in contract farming.

**Nagaraj M. Sannamani (2014):** A conducted study on "An Economic Analysis of Tomato Hybrid Seed Production under Contract Farming in Haveri District." The principle objective was cost and returns in tomato hybrid seed production. The approach was 120 tomato developing farmers. The significant discoveries are contract farming practice is more befit to half and half tomato seed delivering farmers. The limitation of this investigation failed to center different expenses of development and effect.

**Dr. Manas Chakrabarti (2015):** A conducted study on “An Empirical Study on Contract Farming in India.” The main limitation of this study has featured the advancement of contract farming with regards to globalization and progression in India on agriculture division. System of this examination, fundamentally exploratory and depends solely on optional information. The findings are the financial outcomes of contract farming are drawing insignificant consideration openly strategy banter today. The limitations are just centered around reasonable issues not concentrated on any exact issues like expense and advantage of contract farming, the effect of contract farming and so forth.

**Shrikant Tirakappa Mulimani (2015):** A conducted study on “Analysis of Contract Farming in selected seed production crops in Haveri district Karnataka.” The main objective was to consider the financial profile of contract farmers, cost and advantage of seed production. The methodology was 120 farmers of unpleasant gourd, edge gourd, cold and tomato. The finding of the examination was that seed production under contract farming was more advantage than that of conventional farming. The limitation of this study was that not engaged in extension contact, expansion investment, open acknowledgment and dangers/risks of contract farming.

**Manjunath A.V, Ramappa K.B et al. (2016):** A conducted study on “Present Status and Prospectus of Contract Farming in India”. The Main objective of the study was to study the present status and outline of contract farming in cultivating and inspect the different models of contract farming. The investigation discovered that their prosperity is subject to a gainful market, the physical and social condition, and government bolster. The eventual general fate of contract farming in India is very encouraging because of expanding pattern for sorted out retailing among the blossoming middle-class population and the food security prerequisites of the fare advertise in created nations. The main limitation of the examination was just engaged models of contract farming.

**Irfana Noor et al. (2016):** A conducted study on “Economic analysis of banana production under contract farming in Sindh Pakistan”. The objective

of this study was that of cost & return structure in banana production. The methodology was a primary survey with 60 samples. The findings are banana production under contract farming was gives more returns. The major limitation of the study was the neglected problems of farmers under contract farming.

**Varun Milani (2016):** A conducted study on “Economic analysis of contract farming: A case of white onion and chip grade potato cultivation in the selected district of Maharashtra”. The main objective of the study was that the economics of contract crop cultivation. The methodology of the study was 249 respondents and two crops. The study identified that the production of onion and chip grade potato under contract farming is profitable. The main limitation of this study was that it only focused on two crops, and neglected constraints, problems and risks of contract farming practice.

**Sahana S, Nanjappa D, and Vasanthi C (2017):** A conducted study on “Social Impact of Contract Farming on farmers practicing Contract Farming”. The main objective of the study was about the social effect of contract farming on agriculturists. The system of this investigation was directed in six areas of Karnataka state viz., Chikkaballapur, Tumkur, Davanagere, Haveri, Gadag and Bellary. For each yield, 40 respondents were chosen; subsequently, the aggregate example estimate for the examination was 204 farmers. The real discoveries of this investigation the effect of contract farming on farmer’s demonstrates that it is one of the vital expansion procedures that can be considered to enhance the societal position of the farmers. The main limitation of this study was just engaged social effect of contract farming on farmers not others affect.

**Ramakrishna (2017):** A conducted study on “Gherkin cultivation in Karnataka- A SWOT Analysis”. The main objective of the study was to contemplate the quality, shortcomings, openings and dangers of gherkin cultivation. The system of this examination was optional information. Contract farming offers focal points to decrease capital speculation, diminished danger of value vacillation, ensured returns and arrangement of specialized help to the ranchers. The investigation discovered

that a sizable number of little and medium ranchers taking contract cultivating in gherkin development in Karnataka. The main limitation of this study was just engaged gherkin edit not different yields.

### Research Gaps

- Most of the studies like Clapp - 1994, Tanya Korovkin - 1992, Behrooz Morvaridi's - 1995, Sharanesh Jalihal - 2009, S.S. Hiremath & Dr.K.R.Kadam - 2012, focused on general issues like the nature of relationships among farmer and firm of contract farming and did not focus other important issues like cost and returns of contract farming.
- Many significant conclusions of earlier literature like Vupenyu Dzingiral - 2003, N T Sudarshan Naidu - 2007, Pramod Kumar - 2007, were drawn from the available macro-level studies. Macro-level studies have unlikely to shed light on the specific features and challenges in contract farming.
- Many studies such as Raghavendra Naduvinami - 2007, Mallikameti, S.V.Suresha & K.P. Raghuprasad - 2013, Sahana.C - 2013, Manjunath A.V, Ramappa K.B, Lavanya B.T & Mamatha .C - 2016 focused only socio-economic issues and factors influencing farmer's decision to participate or not participate in contracting of contract farming and other aspects are neglected.

### Methodology

The methodology used in the study was a primary and secondary date. The primary data was collected through a structured schedule. The study area was Karnataka state, two districts, namely Bangalore Rural and Tumakuru districts. Two taluks each from each district, Tumakuru and Gubbi taluks from Tumakuru district and Nelamangala and Doddaballapura taluks from Bangalore Rural district were selected. A total of three crops were selected purposively, namely Gherkin, Watermelon, Tomato. The respondents were selected based on simple random sampling techniques; the sample size was Gherkin 35, Tomato 35, Watermelon 10 and the total sample size is 320.

### Secondary Data

The study has used secondary data on the status and performance of the contract farming system at the

international, national and state levels. Information about contract farming is collected from the standard literature, journals, research articles, news papers, magazines and census reports, Administrative reports, reports of the various committees, Manuals, Gazetteers and directories. Various other reports like Ministry of Agriculture and Rural Development, Economic Survey of Karnataka for various years, Directorate of Economics and Statistics, Government of Karnataka, Reports of Ministry of Agriculture and Rural Development, Agriculture Census of Government of Karnataka and Government of India, Company Annual Reports and online access, etc. The economic profile of Bangalore Rural and Tumakuru districts and Karnataka was collected from District statistical office. A Gazetteer of Bangalore Rural, Tumakuru and Karnataka state and survey report of India was also referred.

### Primary Data

The study is primarily based on a sample survey, the area which is confined to Bangalore Rural and Tumakuru districts. The field survey has been under taken and information has been collected through a structured pre-tested questionnaire schedule prepared for the contract farmers with personal interview methods. The schedule has both close and open-ended questions covering various issues involved in contract farming like socio-economic background, their economic conditions, occupation and income, the standard of living, expenditure patter, history of contract farming and problems faced by them, cultivation aspects, etc. Apart from this, the information is gathered from personal interaction with various stakeholders' viz. farmers, contract firm officials and Focus Group Discussions (FGD).

### Reference Period

The study has two types of periods:

#### Study Period

The study period includes the total time taken in completion of the present study; it started in May 2013 and completed by June 2018 around 5 years.

#### Survey Period

The survey period is for the field survey, nearly six months, time starting from June 2016 to December 2016.

**Table 1 Cost and Benefit Analysis**

Indicators	Particulars	Before	After	Test Statistics		
				Paired Sample t test	df	p value
Total Cost without Fixed Cost	Tumakuru	41573.04	94870.12	-108.797	159	.000
	Bangalore Rural	41571.38	95839.47	-100.239	159	.000
	Grand Mean	41572.21	95354.79	-147.147	319	.000
Total Cost with Fixed Cost	Tumakuru	1188741.82	1242038.89	-110.797	159	.000
	Bangalore Rural	1145205.03	1199473.13	-101.139	159	.000
	Grand Mean	1166973.43	1220756.01	-148.247	319	.000
Total Income	Tumakuru	198086.202	298086.208	-212.85	159	.000
	Bangalore Rural	198450.799	298450.795	-220.56	159	.000
	Grand Mean	198268.5	298268.502	-218.67	319	.000
Profit with Fixed Cost	Tumakuru	-990655.6125	-1043952.688	107.797	159	.000
	Bangalore Rural	-946754.2375	-1001022.331	100.339	159	.000
	Grand Mean	-968704.9250	-1022487.509	247.147	319	.000
Profit without Fixed Cost	Tumakuru	156513.1625	203216.0875	128.797	159	.000
	Bangalore Rural	156879.4188	202611.3250	102.239	159	.000
	Grand Mean	1,56,696.2906	2,02,913.70625	210.247	319	.000

**Source:** Primary Data (Field Survey)

It is clear in Table 1 that the average total cost without the fixed cost of in Tumakuru district before contract farming was 41,573 and after contract farming was 94,870. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average cost without fixed cost in Tumkur district before and after joining contract farming differs significantly. In Bangalore Rural district, the average total cost without fixed cost before contract farming was 41,571 and after contract farming was 95,839. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average cost without fixed cost in Bangalore rural district before and after joining contract differs significantly. The Grand Mean value average total cost without fixed cost in both the districts is before contract farming was 41,572 and after contract farming was 95,354. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average cost without fixed cost across both the district before and after joining contract farming differs significantly.

It is observed in Table 1 that the average total cost with a fixed cost of in Tumakuru district before contract farming was 11,88,741 and after contract farming was 12,42,038. The p 0.000 value obtained by paired sample 't' statistics test result indicates

that the average cost with fixed cost in Tumkur district before and after joining contract farming differs significantly. In Bangalore Rural district, the average total cost without fixed cost before contract farming was 11,45,205 and after contract farming was 11,99,473. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average cost with fixed cost in Bangalore rural district before and after joining contract differs significantly. The Grand Mean value average total cost with fixed cost in both the districts is before contract farming was 11,66,973 and after contract farming was 12,20,756. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average cost with fixed cost across both the district before and after joining contract farming differs significantly.

Table 1 that the average total income of in Tumakuru district before contract farming was 1,98,086 and after contract farming was 2,98,086. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average total income in Tumkur district before and after joining contract farming differs significantly. In Bangalore Rural district, the average total income before contract farming was 1,98,450 and after contract

farming was 2,98,450. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average total income in Bangalore rural district before and after joining the contract differs significantly. The Grand Mean value average total income in both the districts is before contract farming was 1,98,268 and after contract farming was 2,98,268. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average total income across both the district before and after joining contract farming differs significantly.

It could be observed from Table 1 that the average profit with a fixed cost of in Tumakuru district before contract farming was -946754 and after contract farming was -1043952. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit with fixed cost in Tumkur district before and after joining contract farming differs significantly. In Bangalore Rural district, the average profit with fixed cost before contract farming was -946754 and after contract farming was -1001022. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit with fixed cost in Bangalore rural district before and after joining contract differs significantly. The Grand Mean value average profit with fixed cost in both the districts is before contract farming was -968704 and after contract farming was -1022487. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit with fixed cost across both the district before and after joining

contract farming differs significantly.

The information presented in Table 1 that the average profit without the fixed cost of in Tumakuru district before contract farming was 1,56,513 and after contract farming was 2,03,216. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit without fixed cost in Tumkur district before and after joining contract farming differs significantly. In Bangalore Rural district, the average profit without fixed cost before contract farming was 1,56,879 and after contract farming was 2,02,611. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit without fixed cost in Bangalore rural district before and after joining contract differs significantly. The Grand Mean value average profit without fixed cost in both the districts is before contract farming was 1,56,696 and after contract farming was 2,02,913. The p 0.000 value obtained by paired sample 't' statistics test result indicates that the average profit without fixed cost across both the district before and after joining contract farming differs significantly.

### ANOVA Model of Total Income

The total income of all the farmers under contract farming in both Bangalore Rural and Tumakuru district of the present study area reveals whether there is any difference in the total income of the said districts. To evaluate this objective, the Table-2 shows the descriptive statistics of the total income of both districts and followed by the ANOVA model.

**Table 2 ANOVA Model of Total Income**

District	N	Mean	Std. Deviation	Std. Error Mean
Tumakuru	160	198086.21	38545.761	3047.310
Bangalore Rural	160	198450.79	38323.341	3029.726

**Source:** Primary Data (Field Survey)

To find out if the average value of total income differs among the two districts under contract farming in the study area, the following ANOVA model has been constructed.

$$Y_i = \beta_1 + \beta_2 D_{2i} + u_i$$

where

$Y_i$  = Mean value of the total income of an  $i$ th individual

$D_{2i}$  = 1 if the observation belongs to the Tumakuru district

= Otherwise (i.e., observation belongs to Bangalore Rural district)

Here the bench mark category is Bangalore Rural district; hence, the intercept  $\beta_1$  provides the mean value of the total income of Bangalore Rural district.  $\beta_2$  provides by how much the mean value of the total income of the Tumakuru district differs from the Bangalore Rural district. In other words, the mean value of the total income of Tumakuru district can be obtained by summing the value of  $\beta_1$  and  $\beta_2$  ( $\beta_1 + \beta_2$ ).



Using the data, the obtained model result:

$$Y_i = 198450.794 - 364.587D_{2i}$$

$$se = (3038.531) (4297.131)$$

$$t = (65.311) (-.085)$$

$$(0.000)^* (0.932)$$

where \* indicates significant p value at 5%.

From the regression model, the mean total income of the Bangalore Rural district is about 198450.794. Compared with this, the mean total income of Tumakuru district is lower by about 364.587, for an actual mean total income of 198086.207 (198450.794 - 364.587). From the regression model,  $\beta_2$  is statistically insignificant at 5% since the p-value is more than 0.05. Therefore, the average of the total income of the Tumakuru district does not

differ significantly from the average total income of Bangalore Rural district.

### ANOVA Model of Total Profit before Entering into Contract Farming

The total profit without the fixed cost of all the farmers before joining in contracting to farm in both Bangalore Rural and Tumakuru district of the present study area reveals whether there is any difference in the total profit of the said districts. To evaluate this objective, Table 3 shows the descriptive statistics of the total profit of both districts before joining in contracting to farm and followed by the ANOVA model.

**Table 3 ANOVA Model of Total Profit before Entering into Contract Farming**

District	N	Mean	Std. Deviation	Std. Error Mean
Tumakuru	160	103216.09	39057.128	3087.737
Bangalore Rural	160	102611.33	39472.033	3120.538

Source: Primary Data (Field Survey)

To find out if the average value of total profit before entering into contract farming differs among the two districts in the study area, the following ANOVA model has been constructed.

$$Y_i = \beta_1 + \beta_2 D_{2i} + u_i$$

where

$Y_i$  = Mean value of total profit before entering into contract farming of the  $i$ th individual

$D_{2i} = 1$  if the observation belongs to the Tumakuru district

= Otherwise (i.e., observation belongs to Bangalore Rural district)

Here the bench mark category is Bangalore Rural district; hence, the intercept  $\beta_1$  provides the mean value of the total profit of Bangalore Rural district before entering into contract farming.  $\beta_2$  Provides by how much the mean value of the total profit of the Tumakuru district before entering into contract farming differs from the Bangalore Rural district. In other words, the mean value of the total profit of Tumakuru district can be obtained by summing the value of  $\beta_1$  and  $\beta_2$  ( $\beta_1 + \beta_2$ ). Using the data, the obtained model result:

$$Y_i = 102611.325 + 604.7625D_{2i}$$

$$se = (3104.181) (4389.975)$$

$$t = (33.056) (0.138)$$

$$(0.000)^* (0.890)$$

where \* indicates significant p value at 5%.

From the regression model, the mean total profit of the Bangalore Rural district is about 102611.325. Compared with this, the mean total income of the Tumakuru district is higher by about 604.7625, for an actual mean total income of 103216.09 (102611.33 + 604.7625). From the regression model,  $\beta_2$  is statistically insignificant at 5% since the p-value is more than 0.05. Therefore, the average of a total profit of Tumkur district before entering into contract farming does not differ significantly from the average of the total profit of the Bangalore Rural district.

### ANOVA Model of Total Profit after Entering into Contract Farming

The total profit without the fixed cost of all the farmers after joining in contracting to farm in both Bangalore Rural and Tumakuru district of the present study area reveals whether there is any difference in the total profit of the said districts. To evaluate this objective, Table 4 shows the descriptive statistics of the total profit of both districts after joining in contracting to farm and followed by the ANOVA model.

**Table 4 ANOVA Model of Total Profit after Entering into Contract Farming**

District	N	Mean	Std. Deviation	Std. Error Mean
Tumakuru	160	156513.16	38485.168	3042.520
Bangalore Rural	160	156879.42	38569.552	3049.191

**Source:** Primary Data (Field Survey)

To find out if the average value of total profit after entering into contract farming differs among the two districts in the study area, the following ANOVA model has been constructed.

$$Y_i = \beta_1 + \beta_2 D_{2i} + u_i$$

where

$Y_i$  = Mean value of total profit after entering into contract farming of the  $i$ th individual

$D_{2i}$  = 1 if the observation belongs to the Tumakuru district

= Otherwise (i.e., observation belongs to Bangalore Rural district)

Here the bench mark category is Bangalore Rural district; hence, the intercept  $\beta_1$  provides the mean value of the total profit of Bangalore Rural district before entering into contract farming.  $\beta_2$  Provides by how much the mean value of the total profit of the Tumakuru district after entering into contract farming differs from the Bangalore Rural district. In other words, the mean value of the total profit of Tumakuru district can be obtained by summing the value of  $\beta_1$  and  $\beta_2$  ( $\beta_1 + \beta_2$ ). Using the data, the obtained model result:

$$Y_i = 156879.4188 - 366.256D_{2i}$$

$$se = (3045.857) (4307.492)$$

$$t = (51.506) (-.085)$$

$$(0.000) * (0.932)$$

where \* indicates significant p value at 5%.

From the regression model, the mean total profit of the Bangalore Rural district is about 156879.4188. Compared with this, the mean total income of the Tumakuru district is lower by about 366.256, for an actual mean total income of 156513.16 (156879.4188 – 366.256). From the regression model,  $\beta_2$  is statistically insignificant at 5% since the p-value is more than 0.05. Therefore, the average of a total profit of the Tumakuru district after entering into contract farming does not differ significantly from the average of the total profit of the Bangalore Rural district.

### Logistic Regression Model

A logistic regression model is used in which the response variable takes a discrete value and the explanatory variables can either be continuous or discrete. In the present case, the value of the dependent variable/response variable  $Y$  is either 0 or 1. The engagement of farmer either into contract farming or non-contract farming are coded as ‘0’ and ‘1’ respectively. The binary logistic regression model is given by

$$P(Y = 1) = \frac{e^z}{1 + e^z}$$

where

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + u_i$$

Here  $X_1$ ,  $X_2$  and  $X_3$  are independent variables and  $X_1$  = Size of the family,  $X_2$  = Size of land holding and  $X_3$  = Annual income of the family. The major objective of this logistic regression of classification is to predict the probability that an individual observation will belong to a particular group of contract farming or non-contract farming, given the stated explanatory variables. Hence the model helps in determining the factor which helps in classifying the farmer either into contract farming or non-contract farming. The parameter of the stated model is estimated by using the maximum likelihood estimation method.

**Table 5 Omnibus Tests of Model Coefficients**

	Chi-square	df	Sig.
Model	7.879	3	.049

The Chi-Square test value of 8.603 with 3 degrees of freedom is statistically significant at 5% since the p-value of the model is 0.049. Therefore the predictor variables in the model are statistically significant.

**Table 6 Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	392.443 <sup>a</sup>	.020	.031

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

After controlling for the size of the family, size of the land holding and annual income of the family, the model explains the variance between 20% to 31% and classifies the 80% of the cases correctly.

**Table 8 Logistic Regression Coefficients**

Particulars	B	S.E.	Wald	df	Sig.
Size of the family	.143	.021	45.918	1	.000
Size of the land holding	-.323	.145	4.937	1	.026
Annual income of the family	.234	.107	4.832	1	.007
Constant	15.297	7.329	4.263	1	.037

The binary logistic regression output is displayed in the Table and the values of  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are 15.297, .143, -.323 and .234 respectively. The Wald statistics of regression coefficients are statistically significant. Using the output from Table 8, the model can be represented as

$$P(Y = 1) = \frac{e^z}{1 + e^z} = \frac{e^{(15.297 + .143X_1 - .323X_2 + .234X_3)}}{1 + e^{(15.297 + .143X_1 - .323X_2 + .234X_3)}}$$

Here the coefficient for the size of the family and annual income of the family is positive. Thus the  $P(Y = 1)$ , i.e., the probability of observation engaging into non-contract farming, will increase as the  $X_1$  and  $X_3$  increase. Similarly, the coefficient of the size of land holding is negative. Thus the  $P(Y = 1)$ , i.e., the probability of observation engaging into non-contract farming, will decrease as the  $X_2$  increases. Therefore, the size of the family, size of the landholding and annual income of the family are major determinants of farmers to them into a contract and non-contract farming.

### Major Findings

- The average total cost without the fixed cost of in Tumakuru district before contract farming was 41,573 and after contract farming was 94,870.. In Bangalore Rural district, the average total cost without fixed cost before contract farming was 41,571 and after contract farming was 95,839.
- The average profit without the fixed cost of in

**Table 7 Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
1	12.918	8	.115

The null hypothesis of the logistic regression model fits the data well is tested by using Chi-Square test based Hosmer-Lemeshow statistics. The test value of 12.918 with 8 degrees of freedom is statistically insignificant; hence, we do not reject the null hypothesis and conclude that the logistic regression model fits the data.

- Savings of total income of respondents in Tumakuru district before contract farming is 2.50 percent and after contract, farming is 91.25 percent. It is in Bangalore Rural district after contract farming 88.13 percent of respondents done savings. It indicates that after contract farming, both the districts savings out of total income were improved.

### Conclusion

The income of respondents increased after joining contract farming because it gives assured prices to crops and the market. The profit of Farmers almost increased after joining contract farming. Savings and investment practice is improved by farmers.

### Future Areas of Research

- Further investigation may be taken up in different districts of Karnataka and different crops.
- A special study conducted on the benefits for the companies and the farmers.
- Studies have also been conducted on the relationship between corporate and contract farming.



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