

Performance and Constraints of Gherkin Contract Farming

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ABSTRACT

Gherkin is an export oriented vegetable (cucurbit) crop. Karnataka state accounts for almost 90 per cent of export of preserved gherkins. Gherkin cultivation is largely driven through contract farming. The present study was undertaken to study the performance of contract farming of gherkin on farmers and to examine the constraints of gherkin contract farming. The study was carried out in two randomly selected talukas 'Kunigal' and 'Sira' of purposively selected 'Tumkur' district of Karnataka state. Performance of farmers was measured using structured interview schedule on five dimensions such as contract farming, extension, market, economic and social dimensions. Constraints of gherkin contract farming was measured using Principal Component Matrix on six dimensions such as soil and environmental management, lack of Government support in contract management, disease pest complex management, difficulty in management, timely input and technical know-how support and high input cost. The overall analysis revealed that rank wise farmers were highly satisfied with assured income, timely availability of quality inputs, assured price and ready market, getting transport arrangement and increased employment at village level. Soil and environmental management ranked first, Lack of government support in contract management ranked second. Disease pest complex management and poor risky management of the crop rank high and almost equal in importance, Timely input and technical know-how support and High input cost were far behind in order of importance. The finding emanating from study makes a strong case for promoting the model of contract farming of gherkin on a wider scale.

Key words: Contract farming; Gherkin; Performance; Constraints;

Gherkin (*Cucumis anguria* L.) belonging to the family 'Cucurbitaceae' is a vegetable crop, which has been recently introduced in India in the year 1989 for commercial production mainly for exports. It is also known as pickling cucumber as the fruits are used for preparing pickles and are a common ingredient in hamburgers. Gherkin cultivation in India is driven largely through contract farming. Karnataka state contributes more than 80 per cent of country's gherkin production. Nearly one lakh small and marginal farmers are involved in gherkin farming and the State produced 2.65 lakh tones of gherkin in 50,000 hectares of land in 2010-11 (Prabhu, 2011). The lack of domestic marketing is one of the reasons for the success of gherkin contract farming. The contract farming offers advantages of reduced capital investment, reduced risk of price fluctuation, guaranteed returns and provision of technical assistance to the farmers. A sizable number of small

and medium farmers are taking to contract farming of gherkin in Karnataka. However, the performance of contract farming on farmers has not been studied adequately in India. In the background of this scenario, the present study was planned and conducted with the specific objectives to study the performance of contract farming of gherkin on farmers and to examine the constraints of gherkin contract farming.

METHODOLOGY

The study was conducted in purposively selected 'Tumkur' district of Karnataka state, owing to its large area under successful contract farming of gherkin. Out of the ten talukas in the district, two talukas viz Kunigal and Sira were selected randomly. A list of gherkin contract farmers was obtained from the contracting companies namely 'Global Green Contracting Company' and 'Reitzil' company. By using simple

random sampling technique, villages were selected in such a manner as to draw a sample of 60 respondents. The number of farmers selected from each of the two Taluka was thirty, thus making the total sample size of 60 respondents.

Contract farming performance refers to the efficiency with reference to farming, extension, market, economic and social benefits by comparing the standards already set. The items pertaining to above aspects that could possibly represent the performance were presented to respondents and their responses were recorded as highly satisfied, satisfied and least satisfied in a three-point continuum. The scores of 2, 1 and 0 were assigned accordingly.

Factor analysis technique was used to discern and quantify the dimensions of gherkin contract production. It provides a means of identifying and measuring the relationships or basic patterns in a data set (Nagabhushanam and Kiremath, 1990). The unique feature of factor analysis is that it greatly facilitates identification of key traits from the mosaic of overlapping relationship and is capable of achieving scientific parsimony by reducing a set of large number of variables to achieve a convenient size of underlying factors (often called dimensions) which can not be easily accomplished by any other analytical technique including the multiple regression analysis. It was done with the principal component or Axis method of factoring (Hotelling, 1993). The principal component model is expressed as $Z_j = a_{j1} F_1 + a_{j2} F_2 + a_{j3} F_3 + \dots + a_{jq} F_q$

Where,

Z_j = magnitude of the indicator j ; i.e., j th principal component or factor in the model,

a_{jq} = the factor loading of the q th indicator in the j th principal component or factor,

F_q = the amount of association in magnitude of indicators, the uncorrelated trait measured by factor 'q' which is possessed by indicator j ,

j = factor loading with reference to indicators (1, 2, 3...q),

q = a set of indicators in the model (1, 2, 3...q),

$a_{jq} F_q$ = factor coefficient or loading of indicator j on factor q .

Since the unrotated factors are rarely interpretable and may not give meaningful pattern of variables, a new set of variables is created by rotations. The Varimax Rotation method was used which maximizes the variance of the factors in the matrix and contained several high

or low loadings. Only those factor loadings were considered which were having more than or equal to 3 times standard error. The inferences were drawn on the basis of factor loading.

$$\sigma_a = \frac{1}{2} \sqrt{(3/r - 2 - 5r + 4r^2)/N}$$

where,

σ_a = standard error of factor loadings,

r = average value in correlation matrix or factor loading and

N = is the number of observations.

The study followed ex-post facto research design. The data were collected from the respondents through pre-tested structured interview schedule for measuring performance of contract farming of gherkin and to estimate the growth rate secondary data was used. The data were tabulated, processed and analyzed through application of log-linear functions, compound growth rate and mean score.

RESULTS AND DISCUSSION

Performance of contract farming of gherkin on farmers : The impact of gherkin contract farming was judged in terms of the farmer's perception. Respondent farmers perceptions to different dimensions such as contract farming, extension, market, economic and social dimensions, and their responses were recorded as highly satisfied, satisfied and least satisfied on a three-point continuum. The scores of 2, 1 and 0 were assigned accordingly. Based on the mean score value rank was given to each dimension. The results are presented in the following table.

It was revealed from the table 1, that performance of gherkin farming under farming dimension. Rank wise farmers were highly satisfied with assured income, minimum production risk and assured production respectively. Whereas they were least satisfied with increased farm mechanization and water requirement compared to previous crop. Gherkin is more profitable than all the other crops grown in the area. This may be due to the short duration of gherkin crop (90 days) and its suitability for cultivation throughout the year.

With regard to extension dimension the farmers were highly satisfied with respect to timely availability of quality inputs and regular technical guidance, and satisfied with respect to awareness about appropriate technology and motivation by field officers. Thus it may say that extension functionaries of the company in the

Table 1. Distribution of respondents according to performance of gherkin contract farming (N=60)

Dimensions	MS	Rank
<i>Farming Dimension</i>		
Assured income	1.06	I
Assured production	1.00	II
Minimum production risk	1.00	II
Learning new skills in farming	0.78	III
Less water requirement compared to previous crop	0.10	IV
Increased farm mechanization	0.00	V
<i>Extension Dimension</i>		
Timely availability of quality inputs	1.95	I
Regular technical guidance	1.73	II
Awareness about appropriate technology	1.41	III
Motivation by field officers	1.03	IV
<i>Market Dimension</i>		
Assured price and ready market	1.91	I
Reduction in price risk	1.01	II
<i>Economic Dimension</i>		
Getting transport arrangement	1.91	I
Better standard of living	1.01	II
Adequate financial support	1.00	III
Possibility for credit diversion to meet other expenses	1.00	III
Reliable income	1.00	III
Availability of credit from firm	0.90	IV
Immediate settlement of money	0.80	V
Repayment of loan	0.50	VI
Labour requirement compared to other crops	0.00	VII
<i>Social Dimension</i>		
Increased employment at village level	1.96	I
Social recognition	1.05	II
Coordination among farmers	1.03	III
More progressiveness	1.01	IV
More awareness about legal aspects	1.01	IV
Member of any organisation	0.88	V
Availability of more leisure time	0.60	VI
Awareness to adopt eco-friendly technologies	0.00	VII

MS= Mean score

Rank=Rank in terms of degree of satisfaction

study area are very active and it contributes to the success of gherkin contract farming.

The data in Table 1 clearly indicates that the farmers gave first priority to assured price and ready market and last priority to reduction in price risk under market dimension. So farmers are having good market for gherkin and there is no risk in marketing.

In economic dimension farmers were highly satisfied with the transport arrangement provided by the firm, and satisfied with adequate financial support, better standard of living etc. and least satisfied with respect to labour requirement followed by repayment of loan. Since gherkin crop consumes a lot of labour, and mostly labours are migrating towards city, there may be shortage of labour in future.

Farmers were highly satisfied for the increased employment at village level and least satisfied for awareness to adopt eco-friendly technologies and satisfied for the remaining items under social dimension. So it may say that gherkin contract farming is providing a lot of employment opportunities to people. Similar findings were also observed by Ponnusamy and Karthikeyan (2006).

Constraints of gherkin contract farming: Factor analysis through PCA (Principal Component Analysis) tool was used in order to find out the constraints faced by the gherkin contract farmers. Extraction is a method of pooling variables under one dimension giving variance range of 0.5. It means all variables having less than or equal to 0.5 variance will be clubbed together under one dimension, some variables are positively associated and some are negatively associated. In order to make the results positive all negative values are squared into positive values. Loading means relative importance of each dimension, higher the loading factors more important is the dimension and vice versa.

The details of this procedure are given in Table 2 factor analysis through PCA.

Constraint analysis by factor analysis: A perusal of Table 2 revealed that 21 variables were found having significant association/impact with respective dimensions, factors or axis. All these 21 variables were found intricately interwoven among six measure dimensions. The variables viz, poor drainage, severe drought, highly fluctuating weather conditions, excessive soil erosion except non-availability of labour during harvest and low soil fertility status are positively associated with dimensions nomenclated as soil and environmental management. This dimension occupies first rank contributing nearly 11.00 per cent variance. The non-availability of labour during harvesting is inversely related with soil and environmental dimension. This might be due to regular and frequent harvest of gherkin in harsh and marginal environment.

The second dimension viz, lack of Government

Table 2. Principal component Matrix

Variables	Components					
	1	2	3	4	5	6
Poor drainage	.805	-.195	.043	-.185	.019	-.041
Severe drought	.791	-.031	.141	-.181	.062	.150
Highly fluctuating weather conditions	.703	.021	.201	-.009	-.066	.057
Excessive soil erosion	.647	.035	.156	.009	.376	.084
Non-availability of labour during harvesting	-.571	.237	.405	-.170	.130	.055
Low soil fertility status	-.490	.094	-.026	-.180	-.331	.162
Crop insurance is not covered for gherkin	.058	.751	-.332	.088	-.132	-.013
No produce procurement policy of government	-.051	.661	-.313	.035	-.062	-.055
Lack of price policy for gherkin by the government	-.112	.655	-.385	-.114	-.105	-.181
Terms and conditions made in favour of firm	-.067	-.569	-.223	-.119	.167	-.435
Lower price at the harvesting stage	.261	.484	-.351	-.192	.218	-.068
High cost of plant protection chemicals	.014	-.417	-.639	-.111	.030	.227
Lack of disease resistant varieties	.045	.512	.559	.189	-.078	.053
Less risk bearing capacity of the farmer	.397	-.128	.238	.499	.025	-.240
Enhanced disease incidence with fertilizer use	-.277	-.218	-.085	.459	.079	-.174
Unawareness of credit facilities	-.077	-.095	.138	-.179	.675	.002
Lack of insufficient information on gherkin cultivation	.049	.230	-.295	-.023	.487	.256
Lack of adequate extension support	.009	.143	.190	-.124	.464	-.100
Lack of availability of good quality planting material	-.019	.185	.021	.397	.459	.210
Resource poor farmers	.181	.209	-.085	.247	-.103	.517
High cost of planting material	-.243	-.017	.217	-.450	.098	.497
Nomenclature of dimension	SE	IG	D	DI	T	H
Contribution of each dimension	10.90	9.40	6.78	6.08	5.5	5.25
Cumulative total	10.905	20.302	27.079	33.109	38.604	43.855
Extraction Sums of Squared Loadings (Total)	4.471	3.853	2.78	2.25	1.87	1.7

SE = Soil and environmental constraints and non- availability of labour.

D = Disease pest complex management

IG = Lack of Government support in contract farming

DI = Difficulty in management of gherkin

T = Timely input and technical know-how support

H = High input cost

support in contract management contains the mosaic of variables like lack of crop insurance, lack of Government procurement policy, lack of price policy, lower price at the harvesting stage and favourable terms and conditions to firms are nomenclated as lack of Government support in contract farming of gherkin. Hence this clearly indicates that the farmers perceived involvement of Government in contract farming because of the fact that the firm could provide lower price to the produce and lack of availability of crop insurance when the conditions of crop failure takes place.

High cost of plant protection chemicals and lack of disease resistant varieties fall under the category disease pest complex management. This might be due to high charge of pesticides by the firm and the varieties grown were of traditional once or so for no researcher produced good variety in gherkin.

Under fourth dimension viz, less risk bearing capacity of the farmer and enhanced disease incidence with fertilizer use are nomenclated as difficulty in management of gherkin. This might be due to more application of fertilizer by the farmer in order to get good yield and firm can provide all the necessary requirements needed by the farmer.

The variables viz, lack of insufficient information, lack of adequate extension support and lack of availability of good quality planting material except unawareness of credit facilities are positively associated with the dimension timely input and technical know-how support. This dimension occupies fifth rank contributing nearly 5.50 per cent variance. Unawareness of credit facilities is inversely related with timely input and technical know-how support dimension. This might be due to lack of farmer's interest in ongoing changing aspects of agriculture.

The last dimension includes two variables such as resource poor farmers and high cost of planting material and these are nomenclated as high input cost. This could be due to higher charge of inputs by the firm. Similar observations were also observed by *Manjunatha and Prasad (2012)*.

CONCLUSION

The findings of the study clearly indicate that the performance for gherkin contract farming was ranked better by the respondents with regard to assured income, timely availability of quality inputs, assured price and ready market, getting transport arrangement and increased employment at village level. Furthermore respondents gave lowest ranks to increased farm mechanization, labour requirement compared to other

crops and awareness to adopt eco-friendly technologies. The study also concludes that comparative rankings of the factors governing the constraints of gherkin production in the state of Karnataka. Soil and environmental management ranked first because it explained 10.90 per cent of variance. Lack of government support in contract management ranked second. Disease pest complex management and poor risky management of the crop rank high and almost equal in importance. Timely input and technical know-how support and High input cost were far behind in order of importance hence it seems to have little importance as constraint.

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