ISSN 0976-3120

JOURNAL OF AGRICULTURAL EXTENSION MANAGEMENT

Vol. XVI January - June 2015 No. 1

NATIONAL INSTITUTE OF
AGRICULTURAL EXTENSION MANAGEMENT
Rajendranagar, Hyderabad - 500 030
INDIA

Leveraging Contract Farming for Supply Chain in India: a Case of Gherkin Production

K.C.Gummagolmath[1], Purushottam Sharma[2] and Shalendra[3]

Abstract

The cultivation of gherkin is undertaken in 20 districts of Karnataka. The farmers cultivating gherkin mostly belong to the category of marginal (37 per cent) and small farmers (53 per cent). These farmers take up less than one acre since the crop is labour intensive. Firms provide credit facilities for secondary expenses in addition to inputs such as seeds, fertilizers, chemicals and other cash inputs. The average yield varies from 3.60 tonnes per acre to 3.85 tonnes per acre. All the categories of contract farmers who produced gherkin along with other crops had higher income compared to non-contracting farmers. The average income of marginal farmers was Rs. 48,105 followed by small farmers (Rs. 49,156) and big farmers (Rs.70,238). In the case of non-contract farmers the net income of marginal, small and big land holders was Rs. 30,185, Rs. 38,454 and Rs. 57,003 respectively. The minimum income and the maximum income of the contracting marginal farmers was Rs. 35,313 and Rs. 63,005 respectively. In case of non-contracting marginal farmers it was Rs. 26,531 and Rs. 57,730 which is lesser than the contracting farmers. The buyback system with a pre-agreed price reduced the risk in production and provided good income for a better standard of living. Most of the farmers are firm about continuing the production of gherkin in future years also. The farmers expressed that the income of the family has increased after undertaking the cultivation of gherkin and they could acquire required assets and enjoy a better standard of living. The successful models like gherkin model in Karnataka should be encouraged and extended progressively to the rest of the agricultural commercial enterprises for mutual benefit of the farmer and the consumer in particular and the development of Indian agriculture in general.

Introduction

Indian agriculture is characterized by farmers with small and fragmented holdings, limited resources and traditional marketing channels. These handicaps render Indian farmers at a disadvantage when coping with the rigors of modern day agriculture, which is complex and market driven. As a consequence, most of the small and marginal farmers who constitute about 85 % of the total, are what can be described as subsistence farmers. The evolution from subsistence farming system to the present market-oriented agricultural system has been marked by a gradual disintegration of functions. Specialization is one of the distinguishing features of present commercialized

[1] Deputy Director, National Institute of Agricultural Extension Management (MANAGE), Hyderabad
[2] Senior Scientist (Agricultural Economics), Directorate of Soybean Research, Indore
[3] Research Officer, National Institute of Agricultural Marketing, Jaipur

agriculture. In the recent years the trend of a shift from cultivation of traditional crops such as grains to higher value commodities such as fruits, vegetables, eggs, meat, dairy, fish and flowers is observed in developing countries like India.

For marketing agricultural produce, besides the Agricultural Produce Market Committees (APMCs), the different alternative models available are contract farming, marketing through farmers' interest groups, producer companies, retail chain linkage, setting up of wholesale markets by private sector, forward markets and future exchanges etc. One of the prominent alternative marketing models noticed in the recent past has been contract farming. The latest reforms in agricultural marketing also envisage contract farming as an important area.

Contract farming is an institutional arrangement that allows export/agro-processing companies to participate in and have control over the quality of production without owning or operating those firms (Ashok and Gurudev Singh, 2003). In essence, contract farming is a demand/market driven arrangement unlike in traditional farming in which a crop is first produced and then the producer endeavors to market it (Singh, 2000). Contract farming can also be thought of as a better solution in inducing the total supply chain in agriculture.

Rationale of the Study

This study attempts to comprehensively investigate the available evidence in order to substantiate the claim that contract farming indeed helps to overcome fragmented supply chain of production and marketing risks of producers in general and small and marginal farmers in particular in India. The policy makers are evolving several alternatives to enhance as well as stabilize their incomes and employment through high-value agriculture. Hi-tech agriculture is mostly associated with vertically integrated marketing, processing and export oriented business. Studies pertaining to the impact of vertical integration on small and marginal farmers have not thrown sufficient light on this issue, more particularly on gherkin cultivation under contract farming (Kiresur *et al* 2001). This study explores forms of contract farming in gherkin cultivation in Karnataka, and how such institutional arrangement affects supply chain in toto. It also looks at how internalized cost of management effects profitability.

Contract Farming in Karnataka

Contract farming is not unknown to Karnataka's agriculture. It was prevalent in the sugar industry where farmers agreed to grow sugarcane at a pre-fixed price for over the last five decades. Tobacco was another crop under contract farming for over six decades. In recent times many multinational corporations have entered the agricultural sector and

introduced new crops like baby corn, sweet corn, chilly, gherkin, vanilla, medicinal and aromatic crops. The processed products of these crops have a high demand in overseas markets. However, the present formats of contracts are totally different in their design and functioning. In certain cases like production of certified seeds, the state notifies the price and extends other facilities such as supply of seeds, fertilizers, package of practices, and buy-back from the farmer's field, grade-wise price fixation and also extends guarantee for the contract agreement between the farmer and the concerned contracting firm. The liberalized seed policy has enhanced the introduction of many new hybrids, genetically modified seeds and plant materials from developed countries

The Department of Agriculture, Government of Karnataka is now actively working to bring some of the agricultural crops such as maize, wheat, cotton, *tur,* Bengal gram and chillies under contract farming systems, designed to benefit both the farmer and the user industry (Kiresur *et al.,* 2001). The paper aims at providing a bird's eye view of how contract farming is helping the farmers to overcome the problem of small holding and fragmented supply chain.

Approach and Methodology

Selection of Study Area

Gherkin cultivation in Karnataka is undertaken in about 20 Districts out of the total 30 districts distributed across the state. However, traditionally Gherkin cultivation is predominantly carried out in the southern part of the state. In recent years, northern districts are also picking up pace with the traditional belts. The data for the current study were collected from six districts of the state, which represent both the traditional and the nontraditional gherkin growing areas. The selection of the districts for the study is as follows

a) Tumkur district is considered as a traditional belt in which Gherkin crop was introduced in the early 1990s
b) Davanagere and Haveri districts have emerged as important gherkin growing centres during the mid 1990s.
c) Apart from these regions, Koppal, Bellary and Bagalkot districts are considered as emerging gherkin growing areas.

Sample size

Contract Farmers

In order to understand the present status of contract farming in the study area, six leading districts were selected based on the maximum area under cultivation of gherkin crop. From each district, 100 farmers were randomly selected making a total sample size

of 600. The districts selected are Tumkur, Hassan, Haveri, Davanagere, Kolar and Dharwad.

Non-contract Farmers

To facilitate comparison of contract farmers with non-contract farmers, 600 non-contract farmers were also selected for the study by choosing 100 farmers from each district.

The present study is based on both primary and secondary data. The primary data were collected by administering a pre-tested interview schedule to the sample respondents. The information collected includes demographic details, land holdings, irrigation facilities, cropping pattern, contracting arrangements, economics of gherkin cultivation etc. Similarly, information pertaining to operating area, input supplies, credit facilities, crop management, price, procurement and export data were collected from the industry. The necessary secondary data were collected from institutions such as Agricultural and Processed Food Products Export Development Authority (APEDA), Bangalore, Karnataka State Agricultural Produce Processing and Export Corporation Ltd (KAPPEC), Bangalore, Directorate of Economics and Statistics (DES), Bangalore, Department of Horticulture, Government of Karnataka. Additional secondary data were also compiled from the records of EOUs, books, journals and research reports.

The data collected from the producers of gherkin on production, marketing etc. pertain to the year 2007-08, unless it is stated otherwise. The data from the EOUs also has the same reference period.

The interview schedules were scrutinized for data validity and completeness. The data collected from both primary and secondary sources were analyzed using mostly tabular analysis by working out averages and percentages. The results are presented in the form of tables. Analysis was done, by working out simple averages and percentages. The relevant results and inferences are presented in the report.

Results and Discussions

Gherkin Production in Karnataka

The cultivation of Gherkin in Karnataka was introduced in the early 1990s in the districts of Bengaluru (U), Bengaluru (R), Kolar, Tumkur and Hassan. Later the production has been extended to other districts across the state namely Mysore, Dharwad, Chitradurga, Davanagere, Haveri, Bagalkot, Bellary, Koppal, Chamarajanagar, Mandya, Shimoga, Chikkamagaluru, Uttara Kannada, Gadag and Bidar. The estimated area under cultivation of gherkin in these districts is 56,900 acres, contributing about 2.13 lakh tonnes of produce in the year 2007-08 (Table 1). The average productivity is

estimated to be 3.75 tonnes per acre. About, 70,000 farmers are estimated to be engaged in gherkin cultivation in Karnataka with an area of about 56,900 acres. The following table depicts the distribution of gherkin cultivation in Karnataka.

Table1. District wise Area, Production and Productivity of Gherkin in Karnataka (2007-08)

Sl. No.	District	Area (in Acre)	Percent	Production (in Tonnes)	Percent	Productivity (Tonnes/Acre)
1	Tumkur	12,500	21.97	46,250	21.67	3.7
2	Hassan	6,500	11.42	24,700	11.57	3.8
3	Haveri	5,900	10.37	22,715	10.64	3.85
4	Davanagere	4,500	7.91	17,775	8.33	3.95
5	Kolar	3,750	6.59	15,750	7.38	4.2
6	Dharwad	2,750	4.83	10,175	4.77	3.7
7	Bangalore (R)	2,500	4.39	9,625	4.51	3.85
8	Chitradurga	2,500	4.39	9,125	4.28	3.65
9	Koppal	2,500	4.39	9,000	4.22	3.6
10	Bellary	2,250	3.95	8,213	3.85	3.65
11	Gadag	2,000	3.51	7,300	3.42	3.65
12	Chikmagalore	1,500	2.64	5,475	2.57	3.65
13	Mysore	1,450	2.55	5,148	2.41	3.55
14	Bidar	1,500	2.64	5,100	2.39	3.4
15	Bagalkot	1,250	2.20	4,500	2.11	3.6
16	Chamarajanagar	1,000	1.76	3,350	1.57	3.35
17	Shimoga	750	1.32	2,700	1.27	3.6
18	Bangalore (U)	700	1.23	2,590	1.21	3.7
19	Mandya	600	1.05	2,160	1.01	3.6
20	Uttar Kannada	500	0.88	1,775	0.83	3.55
	Total	**56,900**	100.00	**213,425**	100.00	**3.75**

Area under Gherkin Cultivation

Among the Gherkin producing districts in the state, Tumkur (12500 acres) ranks first, followed by Hassan (6500 acres), Haveri (5900 acres), Davanagere (4500 acres) and Kolar (3750 acres) enjoy the major share in area to the extent of about 58%. Tumkur alone constitutes about 22% of the area under Gherkin in the state. The area under Gherkin in the non-traditional area is fast expanding.

Production of Gherkin

The top five producing districts in the states are Tumkur (46,250 tonnes), Hassan (24,700 tonnes), Haveri (22,715 tonnes), Davanagere (17,775 tonnes) and Kolar (15,750 tonnes) which together have about 60% share of total output of the state. These districts are the traditional zone for Gherkin crop in the State. The top ten producing districts

contribute about 81% of the total output with the highest share of about 21% by Tumkur. (Department of Horticulture, Government of Karnataka).

Yield of Gherkin in Karnataka

The average productivity of gherkin in the state ranges from 3.35 to 4.20 tonnes per acre. Kolar stands at the top of the productivity chart with yield of about 4.20 tonnes per acre, while Chamarajanagar has recorded the lowest yield of 3.35 tonnes per acre. In terms of productivity, the major producing districts such as Kolar (4.20 tonnes/ acre), Davanagere (3.95 tonnes/ acre), Haveri (3.85 tonnes/ acre), Bangalore (R) (3.85 tonnes/ acre),Tumkur (3.70 tonnes/acre) and Hassan (3.80 tonnes/ acre) stand above the state average productivity of 3.75 tonnes/ acre. The minimum and maximum yield of the state ranges between 2.4 tonnes and 12.tonnes per acre. (Department of Horticulture, Government of Karnataka).

Farmers engaged in Gherkin cultivation

The farmers of all the three main categories, namely marginal, small and large farmers, are engaged in cultivation of Gherkin as an additional crop with other agricultural and horticultural crops. However, majority of the Gherkin growers are small and marginal farmers. This situation is similar in all the Gherkin growing districts of the state. More so, the companies engaged in Gherkin contract farming usually restrict the cultivation ranging from 0.5 acre to 1.5 acre only.

Number of Crops produced

In India, as well in Karnataka the normal duration of gherkin crop is 70 to 90 days. The crop can be grown throughout the year barring the months of November and December. On an average the farmers of Karnataka produce 1 to 2 crops of Gherkin per year. There are instances of farmers producing 3 to 4 crops per year in the state.

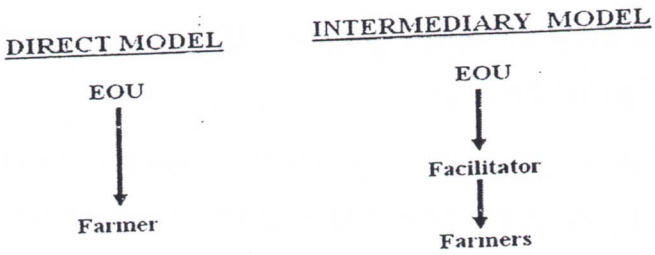
Farmers covered by EOUs

The export oriented units played a significant role in promoting gherkin exports of the state. During the year 2001 the total exports from the state amounted to Rs. 69 crores, and rose to Rs.245 crores in 2007, covering about 70,000 farmers of the state. This is a land mark achievement of the 25 EOUs operating in the state. In early 1990's, the EOUs like Ms Green Agro Pack Company Ltd., started operation with 500 farmers. Now, the EOUs are serving from 1500 to 10000 farmers in Gherkin producing districts in the state. These units are encouraging small and marginal farmers to take up this activity to raise their family income as well as living standards. Demonstrations carried out by the

contracting firms are motivating more number of farmers of small holdings to adopt contract farming.

Gherkin Contract Model in Karnataka

The export oriented units are functioning with two types of contract agreement which are also known as contract models namely direct model and indirect model. The direct model indicates that the EOUs have direct link with the farmers to undertake gherkin cultivation. The second model, is known as intermediary model in which, a facilitator operates between EOUs and farmers. These two models can be seen from the following chart.



Grading of Gherkins

Gherkin is produced by the farmers based on grade specifications. Grades are assigned on the basis of size of the fruits. The farmers harvest the produce after 28-30 days after sowing and the harvest of the Gherkin continues daily for the next 60 days. The smaller the gherkin fruit size, the better is the grade. As depicted in Table 2, fruits weighing 12-16 mm fall under Grade-I category, 17-18mm Grade-II, 18-24 under Grade-III and over 25mm under Grade-IV. The following table gives the grade specifications of Gherkin. The number of fruits per kg. are 300+ in Grade-I, 100+ in Grade-II, 60+ in Grade-III and upto 30 in the case of Grade-IV (Table 2).

Table 2. Grade specifications and Procurement Price of Gherkins

Grade	Size of fruit (mm)	No. of fruits / kg	Procurement Price (Rs.) per kg
I	12	300 +	16-18
II	17	100 +	12-15
III	19	60 +	4-6
IV	25 +	Up to 30	1

Source: EOUs in Gherkin

Procurement Price

The price of Gherkin depends upon the size of the fruit. The lower the size, the higher will be the price and vice versa. The fruits are classified on the basis of size of the fruit. If fruits are more than 300 in number per kg, they will be graded as first quality,

which would fetch Rs. 16 to Rs.18 per kg. Similarly, the third grade in which 30-100 fruits constitute a kg would get Rs.4 to Rs. 6 per kg. The details can be seen from table 2.

Export Oriented Units (EOUs)

Gherkins are consumed the world over in salads, pickles besides being relished as pizza toppings. Though, India is producing over 3.0 lakh tonnes of gherkin annually mainly from Karnataka, Andhra Pradesh, Tamil Nadu and Punjab, they are not consumed locally. The cultivation of gherkin is exclusively for export. Major destinations for gherkin are Europe, US, Russia, France, Germany, Belgium, Ukraine, Estonia, Israel, China, Sri Lanka, and Australia. It is estimated that the global demand for gherkin is about 20 lakh tonnes, 50 per cent of which goes to US, 43 per cent to the European Union and the rest to the Asia Pacific region.

Twenty five companies are engaged in the production, procurement, processing and export of gherkins in the state. The firms enter into contracts for gherkin cultivation and most of the EOUs are located in and around Bangalore, with only six units operating outside Bangalore. As mentioned earlier about 70,000 farmers have entered into contracts. The crop is spread over about 58000 acres in twenty districts of the state.

Gherkin Exports

The export oriented units process gherkin procured from the farmers. The EOUs process the gherkin and pack them in two forms namely bulk packing and bottling of gherkins. Table 3 indicates company wise gherkin exports in value (Rs. in lakhs) from Karnataka for the year 2003 to 2007-08. The table reveals that Karnataka exported Rs.140.7 crores of gherkin during the year 2003-04 followed by Rs. 141.3 crores during 2004-05, Rs. 213.9 crores during 2005-06, Rs.313.3 crores in 2006-07 and Rs. 244.5 crores in 2007-08.

Major Export Units

Though 25 units are operating in Karnataka only 17 EOUs are exporting gherkin from Karnataka. A large volume (77% by value) of gherkins are exported only by 5 units with remaining 23 per cent from the rest of the EOUs. The break-up of the volume of gherkins exporting units are M/S The Global Green Co. Ltd (29.58 %), M/S Inter garden (India) Ltd (23.41%), M/S Ken Agritech Pvt. Ltd. (10.15 %), M/S Sterling Agro Products (7.03 %) and M/S Kolemen India Pvt. Ltd (7.0 %).

Table 3. Company wise Gherkin exports from Karnataka from 2003-04 to 2007-08

(Value in lakhs)

Sl.No.	Name of the Company	Year					Total
		2003-04	2004-05	2005-06	2006-07	2007-08	
1	Blossom Showers Pvt. Ltd., Bangalore	363	205	0	0	0	567
2	Green Agro Pack Pvt. Ltd., Bangalore	1440	1068	1019	1392	1195	6114
3	Ken Agritech Pvt .Ltd., Hubli	1247	1619	1865	3214	2749	10694
4	Koeleman India Pvt. Ltd., Bangalore	1029	1178	1530	1738	1902	7377
5	S.A.Corporation, Bangalore	315	25	0	0	0	340
6	SMS Foods Tech. Pvt. Ltd., Bangalore	173	9	0	0	0	182
7	Sterling Agro Products Processing Bangalore	1312	1255	1674	1850	1318	7410
8	Sterling Agro Chennai (unit in Davangere)	298	0	0	0	0	298
9	The Global Green Co. Ltd., Bangalore	4263	3379	4735	10970	7822	31169
10	Unicorn Agrotech Ltd., Bangalore	749	933	799	1025	952	4457
11	Vishaal Natural Food Products Bangalore	516	477	530	900	724	3148
12	Intergarden (India) Pvt. Ltd., Bangalore	1703	2553	7627	8043	4746	24672
13	Southern Gardens, Bangalore	132	244	85	144	0	605
14	Green Pickles Pvt. Ltd, Bangalore	218	220	209	212	244	1102
15	Zenobia Agro Pvt Ltd., Bangalore	312	458	142	295	751	1957
16	Planet Pickles Pvt Ltd., Bangalore	0	507	1181	1264	905	3856
17	Bharathi Associates	0	0	0	289	1143	1432
	TOTAL	**14070**	**14130**	**21396**	**31334**	**24450**	**105380**

Source: KAPPEC, Bangalore

Economics of Gherkin Production

Land Holdings

The selected farmers are classified as marginal, small and large categories based on the size of the land holdings. The marginal farmers are those who possess less than 2.5 acres of land, small farmers are those who have more than 2.5 acres and less than 5 acres land and large farmers own more than 5 acres of land.

The results presented in Table 4 show that small and marginal categories of farmers constitute a large group of the 600 contract farmers interviewed, of which 37 per cent (220 farmers) are marginal farmers, 53 per cent (316 farmers) are small farmers and only 11 per cent are large farmers. Similarly, of the 600 farmers from non-contracting category, 35 per cent (210 farmers) are marginal followed by 54 per cent (324 farmers) small farmers and 11 per cent (66 farmers) large land holders. In both the categories, the proportion of small and marginal farmers is the highest. The results are in conformity with the figures at macro level.

Table 4. Distribution of Land holdings of sample farmers (in No.s)

Districts	Contracting farmers			Non-contracting farmers		
	Marginal	Small	Large	Marginal	Small	Large
Tumkur	40	50	10	40	50	9
Haveri	33	55	12	25	60	15
Davanagere	31	58	11	40	55	4
Koppal	32	56	12	35	55	6
Bagalkot	43	48	9	35	50	20
Bellary	41	49	10	35	54	6
Total (Nos.)	**220** (37)	**316** (53)	**64** (11)	**210** (35)	**324** (54)	**66** (11)

Source: Primary Survey: Figures in parenthesis indicate percentage

Cropping Pattern

Research studies have revealed that the farmers are shifting from the production of food crops to non-food crops, that is, subsistence to commercial agriculture. This trend is also observed in the present study; both the contracting and non-contracting farmers devoted a considerable area of land for non-cereal crops. Table 5 reveals that non-contracting farmers also produced pulses, oil seeds and other crops such as fruits and vegetables.

The contracting farmers produced gherkin in an area of less than one acre. It is because the crop is labour intensive and all the farming operations have to be completed in 90 days from the time of sowing. The average land devoted for cereal crops is high among non-contract farmers (2.05 acres) compared to contracting farmers (1.9 acres). A similar trend is also seen in pulses, oilseeds and all other crops produced by these two groups of farmers (Table 5).

Other major crops produced

In addition to the focus of the study on the economics of gherkin cultivation, an attempt is being made to provide information on the major crops produced in the study area. Ragi, maize, jowar and paddy are major cereal crops and ground nut and sunflower

are the two major oilseeds produced in these districts. Ragi and maize are the two important cereal crops produced in the traditional gherkin region, jowar and paddy are the major cereals in upcoming gherkin districts.

Table 5. Area under different crops in sample districts (in acres)

Districts	Contract Farmers					Non-contract farmers			
	Cereals	Pulses	Oilseeds	Others	Gherkins	Cereals	Pulses	Oilseeds	Others
Tumkur	1.80	0.90	0.30	0.70	**0.80**	1.95	1.10	0.35	0.60
Haveri	2.00	0.15	0.05	0.85	**0.79**	1.86	0.23	0.09	0.76
Davanegere	2.25	0.20	0.50	0.80	**0.85**	2.85	0.26	0.75	0.85
Koppal	1.70	0.60	0.15	0.65	**0.78**	1.65	0.75	0.27	0.75
Bagalkot	1.80	0.80	0.20	0.70	**0.72**	1.96	1.20	0.36	0.85
Bellary	1.90	0.95	0.22	0.81	**0.70**	2.08	1.00	0.38	0.90
Average	1.9	0.6	0.23	0.69	**0.77**	2.05	0.80	0.36	0.79

Gherkin yield in sample districts

The yield of any agricultural crop is a result of several factors including geographical factors. The yield of gherkin also varies from one region/district to another depending upon the type of the soil, topography, rainfall, climatic conditions, incidence of pests and diseases. In addition to this, crop management such as application of inputs, weeding, irrigation, etc. are also affecting the production. Table 6 shows the minimum, maximum and average yield in the selected districts. The average yield varied from 3.60 tonnes per acre to 3.85 tonnes per acre. The minimum yield of 2.50 tonnes per acre is recorded in Tumkur district and the maximum in Davanagere district. (12.0 tonnes / acre). Due to strict monitoring of cultivation of gherkin by the field staff of the companies, the average yield is around 3 tonnes on majority of the farmers' fields. However, few progressive farmers have obtained yield as high as 12 tonnes per acre.

Table 6. Gherkin yield in sample districts (tons/ acre)

Districts	Min	Max	Average
Tumkur	2.50	10.00	3.70
Haveri	2.75	11.50	3.80
Davanegere	3.00	12.00	3.85
Koppal	2.85	10.50	3.60
Bagalkot	2.70	10.00	3.60
Bellary	2.80	10.75	3.65
Average	**2.8**	**10.8**	**3.7**

Source: Primary Survey

Cost of cultivation of gherkin

The EOUs supply seeds, fertilizers, pesticides and jute thread to the farmers. Though the EOUs supply these inputs, some of the farmers do require cash for paying for hired labour, supply of water, digging of wells, etc. The farmers would approach the banks for their additional cash requirements. The cost of producing gherkins in one acre of land is computed taking the various costs such as land preparation and sowing, Farm yard manure and fertilizers, seeds, weeding and staking, thread, labour etc. The details of production costs among marginal, small and large size land holders in the study area are given in Table 7.

Table 7. Cost of cultivation of Gherkin (per acre per crop) (in Rs.)

Particular	Marginal	Small	Large	Average
Land Preparation and Sowing	1,100	1,200	1,400	1,233
FYM & Fertilizer	5870.6	6022.3	6090.7	5,995
Seeds	3,171	3,171	3,171	3,171
Weeding and Staking	1,258	1,331	1,327	1,306
Threads	1,777	1,755	1,789	1,774
Pesticides	1,043	940	938	974
Labour for Picking	12,400	12,650	12,800	12,617
Electricity and Other Charges	380	380	380	380
Gross Cost	27,000	27,450	27,896	27,448
Gross Returns	55,350	55,375	55,311	55,345
Net Returns	28,350	27,925	27,415	27,897

Source: Primary Survey

It is apparent from the table that a major amount was spent on fertilizer, farm yard manure and picking (harvesting) of fruits which contributes about 60 per cent of total cost. The other components of costs included expenditure on seeds, thread (jute and plastic), land preparation and sowing, which constituted 40%. The gross cost per acre is comparatively low among marginal farmers (Rs 27,000) followed by small farmers (Rs 27,450) and large farmers (Rs 27,896). The average cost of all these farmers amounted to Rs.27,448. There was not much difference in the cost of cultivation of gherkin across the categories of farmers. It may be due to cultivation of crop under the controlled conditions. Moreover, companies prescribed the same level of inputs for all the farmers. The net return on production of gherkin stands at Rs 28,350 per annum, for marginal farmers, Rs 27,925 for small farmers and Rs 27,415 for large farmers. The marginal farmers realized marginally higher income per acre compared to other categories of farmers. This can be attributed to the fact that, scale of labour operated in the case of small farmers.

Net Income of contract and non-contract farmers

The average net income of farmers who are producing gherkin along with other crops (contract farmers) and the farmers who produce crops other than gherkin (non-contract farmers) is computed using the data provided by the different categories of farmers namely marginal, small and large landholders. Table 8 shows the details of net income among the farmers.

Table 8. Average net income during the year 2007-08 (in Rs. per farm)

Type of Farmers	Contract farmers			Non-Contract farmers		
	Gherkin	Other crops	Total	Other crops		
Marginal Farmers	28350	19755	48105	30185		
Small Farmers	27925	21231	49156	38454		
Large farmers	27415	42823	70238	57003		
Type of Farmers	**Contract Farmers**			**Non Contract Farmers**		
	Min	**Max**	**Average**	**Min**	**Max**	**Average**
Marginal Farmers	35313	63005	48105	26531	57730	30185
Small Farmers	39850	72150	49156	31090	69818	38454
Large farmers	57960	95635	70238	50937	91060	57003

Source: Primary data

It is revealed that across various categories of farmers who produced gherkin along with other crops, contract farmers have higher income compared to non-contracting farmers. The average income of marginal farmers was Rs. 48,105 per annum followed by small farmers (Rs. 49,156) and large farmers (Rs.70,238). The respective figures in the case of non-contract farmers were Rs. 30,185, Rs. 38,454 and Rs. 57,003. There was no glaring difference in the income earned from gherkin cultivation across categories of the farmers. It was mainly due to uniform cultivation of practices followed by the farmers and a fixed package and technical advice given by the company representative. As a result, except in the case of very few farmers, the income difference across categories was quite similar.

Minimum and Maximum farm income

The range of farm income in both the groups of farmers varies as there are several factors influencing the output of agricultural crops. The cost of cultivation is also a reason for low or high income from the farm activities. It is evident from the above Table that the variations in income of the farmers in both the contracting farmers and non-contracting farmers was due to variation in cost of cultivation. The minimum income and the maximum income of the contracting marginal farmers is Rs. 35,313 and Rs. 63,005, respectively. In case of non-contracting marginal farmers it is Rs. 26,531 and Rs. 57,730

which is lesser than the contracting farmers. A similar trend is seen in the small and the large categories of farmers.

Conclusion and Policy Issues

The buyback system with a pre-agreed price reduces the risk in production and provides good income for a better standard of living. Most of the farmers are firm in continuing the production of gherkin in future years also. The farmers expressed that the income of the family has increased after undertaking the cultivation of gherkin and they could acquire some assets and enjoy a better life.

Commitment driven contract farming is no doubt a viable alternate to traditional farming, which overcomes the burning problems associated with diminishing farm size and assures reliable input supply to farmers and delivery of farm produce to the contracting firms, and solves their marketing problems in one stroke. The successful models like Gherkin model in Karnataka should be encouraged and extended progressively to the rest of the commercially oriented agricultural commodities for mutual benefit of the farmer and the consumer in particular and the development of Indian agriculture in general. Some of the inferences that can be drawn from the study are:

1. Efforts must be made to reduce the transaction costs of companies through the promotion of producers/cooperatives so that small farmers are able to effectively participate in marketing their produce.
2. A legal protection and an insurance mechanism to secure the crop in the event of crop failure due to pests and diseases or any other natural calamities like drought etc.
3. The sponsoring company should ensure supply of quality inputs and their timely delivery to the farmers. The company should be made legally liable for crop failure due to supplies of inputs of poor or spurious quality. A comprehensive contract farming bill should be enacted with provisions for mandatory registration of contract farming, a dispute redressal mechanism and a regulatory body at the state and district levels.
4. Prices of gherkins are fixed by the EOUs. Farmers should know the modalities in fixing the price for different grades of gherkins. Government agencies can regulate this. Information on the trends in world gherkin prices could be provided to the farmers so as to increase their bargaining power.
5. The EOUs should be encouraged by the Government to extend all facilities including making provision for credit at low rates of interest as these units are providing all inputs required for gherkin crop
6. The extension and research systems should include gherkins as a mandate to address the problems faced by the farmers growing the crop.

References

Anonymous (2008) Annual Report of "Department of Horticulture" Government of Karnataka.

Ashok, S.R. and Gurudev Singh (2003). Role and constraints of contract farming in agro-Processing industry", *Indian Journal of Agricultural Economics*, 58 (3): 566-575

Kiresur, V. R., Paril, S. A. and Vijayakumar, H. S. (2002). Contract Farming Opportunity for Small and Marginal Farmers in the context of Trade Liberalization, PII, *Agricultural Economics Research Review*, 15 (1):78-87.

Singh, Sukpal, (2000). Contract Farming and Agricultural Diversification in the Indian Punjab: A Study of Performance and Problems, Indian Journal of Agricultural Economics, 55(3): 283-294.