

Production and Marketing of Gingelly in Tamil Nadu

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ABSTRACT

Gingelly is an important edible oilseed crop. The major districts producing gingelly are Erode, Villupuram, Thanjavur, Karur, Cuddalore, Thoothukudi and Salem (Anonymous,2012). Farmers face lot of production as well as marketing problems right from the selection of varieties to use of equipments and post-harvest technologies. To understand the above issues a study was conducted in Erode and Karur districts of Tamil Nadu. Primary data were collected in both the districts from various stakeholders consisting of 90 farmers and 90 market intermediaries operating in various levels of marketing channel. The collection of the data were analysed from various statistical tools viz., conventional analysis, price spread, Acharya's(2003) approach of marketing efficiency and Garrett's ranking technique.

The results, indicated that both in Erode and Karur districts , about 48 per cent of the farmers belonged to the age group of 36- 55 years. About 40 per cent of farmers were under medium category. About 72 per cent of the farmers raised gingelly under irrigated condition and 47 per cent of the farmers used the seeds of private dealers and about 65 per cent of the farmers preferred to grow brown variety. Four marketing channels were identified based on the selling behaviour of farmers. The results indicated that in Erode and Karur districts, majority of farmers sold the produce through regulated market which accounted for 58 per cent. The marketing efficiency was much higher in channels (I) and (II) and poor marketing efficiency

was found in the channels(III) and (IV). From the result, it is understood that the movement of gingelly from farmers to consumers was low in channel (I) even though both the farmers and consumers attained maximum benefits. The major production constraints were non availability of labour and marketing constraints were undue price fluctuation. The post harvest losses were high in all the channels. There had been a post harvest losses of 10 -11 per cent in the supply chain. The losses were mainly due to uneven maturity of grains in the field. At the processor's level, use of improper processing techniques and poor storage contributed to the huge post harvest losses of about 15 per cent. The study suggested that farmers should improve the production of gingelly under irrigated condition and sell the produce through regulated market, adopt post harvest management practices and value addition to make gingelly cultivation a profitable venture.

Key words : *Cost of Production,MarketingChannel, Marketing Efficiency,Postharvest losses,Price Spread and Constraints.*

INTRODUCTION

Gingelly (Sesame) is an important edible oilseed in India. India exports gingelly seeds to China, Holland, USA, Germany, Turkey, The Netherlands, Hong Kong, Israel, UK, UAE, etc. Globally, China and India are the major gingelly producers. In India, gingelly seed production in Kharif (2012-13) was 3.40 lakh tonnes and it was 4.20 lakh tonnes in Kharif during 2011-12. The major gingelly producing states are Uttar Pradesh,

Rajasthan, Madhya Pradesh, Orissa, Tamil Nadu and Gujarat. The eastern region comprising of West Bengal, Orissa, Assam and Andhra Pradesh mostly produce red and black varieties while white gingelly is grown in Maharashtra and other western States. Gingelly occupies about 0.63 lakh hectares in Tamil Nadu with an average yield of 506 kg per hectare and an annual production of 0.31 lakh tonnes (Anonymous,2011).The major districts producing gingelly are Erode, Villupuram, Thanjavur, Karur, Cuddalore, Thoothukudi and Salem. Gingelly crop is taken up in two seasons viz., *Thaipattam* (Jan - Feb) and *Adipattam* (July-August). The prominent varieties grown in Tamil Nadu are viz., TMV-3, TMV-4, TMV-5 and TMV-6 (Brown Gingelly), CO-1 (Black gingelly) and SVPR-1 (White gingelly). White gingelly is generally preferred for export. Brown varieties are used for oil extraction and black varieties for confectionary purposes.

Value-added Products

Sesame seeds have been a source of food and oil. About 65 per cent of the annual sesame crop is processed into oil and 35 per cent is used as food. The food segment includes about 42 per cent roasted sesame, 36 per cent washed sesame, 12 per cent ground sesame and 10 per cent roasted sesame seed with salt. The small sesame seed is used whole while cooking for its rich nutty flavor (although such heating damages its healthful polyunsaturated fats) Most of the U.S. sesame crop is sold as some form of whole seed product for the confectionary and baking industries. Less than 10 per cent of total production is processed into oil, meal or flour.

Commercial sesame oil has two basic types. One type of sesame oil is a pale yellow liquid and has a pleasant grain-like odour and it is somewhat nutty in taste. This oil is high in polyunsaturated fats, ranking fourth after safflower, soybean and corn oil. It is excellent for use as frying oil in

cosmetics and in food preparations. The other type of oil is amber-colored and aromatic, made from pressed and roasted sesame seeds. This is not used as a cooking oil. Sesame oil is normally added as a flavoring agent in the final stages of cooking. Oil is extracted from sesame seeds by mechanical pressing. The oil yield is from 50 per cent to 57 per cent, depending on growing conditions and seed variety.(Anonymous,2012)

PROBLEM FOCUS

Farmers face lot of production as well as marketing problems. The production constraints include high cost of labour, non availability of quality seeds etc., . Producers were not using improved technologies and high yielding varieties. They also did not adopt improved equipments and post-harvest technologies. Similarly, the marketing constraints faced by the farmers were undue price fluctuations, lack of storage yard etc. Further, supportive mechanism in the form of agricultural inputs, post harvest infrastructure set up, marketing system, institutional credit have not come up in proportionate numbers for development of processing and marketing. Due to uneven maturity of pods, seasonality in production and poor post-harvest practices, the post harvest losses were also reported to be high in sub-standardized marketing system thus reducing further availability of gingelly for consumption, value addition and export. There are also issues such as weak institutional arrangement, limited marketing facilities, lack of coordination among the various institutions which acted as hindrance to the growth of gingelly sector. Hence this study focuses the above issues in an elaborate manner in Erode and Karur districts of Tamil Nadu, where the area under gingelly is significantly high.

OBJECTIVES

The specific objective of the study are

- i. to study the cost of cultivation of gingelly

- ii. to identify the existing marketing channels for gingelly in the study area
- iii. to evaluate the price spread and marketing efficiency of gingelly in different channels
- iv. to assess the post harvest losses in different transaction points in the marketing channels, and
- v. to examine the production and marketing constraints faced by the gingelly farmers and market intermediaries

METHODOLOGY

The key aspect of the present study was to measure the price spread, study the marketing channel, marketing efficiency of farmers, post-harvest losses and production and marketing constraints. Among the 31 districts of Tamil Nadu, Erode, Villupuram, Karur and Tanjavur districts are the major sesame producing districts. For the present study, Erode and Karur districts were purposively chosen due to larger area and

production among the districts. In these two districts, three blocks in each district were selected based on area. Gingelly growing farmers were selected purposively in both the districts based on the acreage under sesame. Thus a total of 90 sample farmers were selected. The farmers were contacted individually with the help of a well structured and pre-tested interview schedule. The intermediaries involved in marketing of gingelly namely commission agents, local trader, wholesaler, oil millers, oil distributor and oil retailer and consumers were also contacted personally. The distribution of sample intermediaries is shown in Table 1. In the study area, 90 farmers, 20 commission agents, 10 local traders, 10 wholesalers, 30 oil industries, 10 oil distributors and 10 oil retailers were contacted to study the nature of value addition activities and other related issues.

Table 1. Distribution of Sample Respondents (N= 180)

District	Block	No. of Farmers	Commission Agent	Local Traders	Wholesaler	Processing Industry	Oil Distributer	Oil Retailer
Erode	Erode	45	10	5	5	30	10	10
	Modakuruchi							
	Kodumudi							
Karur	Aravakuruchi	45	10	5	5	30	10	10
	Kulithalai							
	K.Paramathi							
TOTAL		90	20	10	10	30	10	10

TOOLS OF ANALYSIS

The collected data were analyzed with reference to the objectives of the study. The analytical techniques employed in this study are explained in this section.

Price Spread Analysis

In the process of marketing of gingelly, the difference between price paid by the consumer and that received by the gingelly producer for an

equivalent quantity of gingelly was defined as Price Spread. Profits of the various market functionaries involved in moving the produce from the initial point of production till it reached the ultimate consumer was recorded.

a. Sum-of-Average Gross Margin Method

The average gross margins of all the market intermediaries were added to obtain the total

marketing margin as well as the breakup of the consumer's rupee.

$$MT = \sum_{i=1}^n \frac{[S_i - P_i]}{Q}$$

Where,

MT = Total Marketing Margin

S_i = Sale value of a gingelly by the i^{th} intermediary
 P_i = Purchase value of a gingelly by the i^{th} intermediary

Q_i = Quantity of the product handled by the i^{th} intermediary

$i = 1, 2, 3 \dots N$ (Number of intermediaries involved in the marketing channel)

b. Farmer's Share in Consumer's Rupee

Further, the farmer's share in consumption of gingelly was calculated with the help of the following formula.

$$F_s = (F_p / C_p) \times 100$$

Where, F_s = Farmer's share in consumer's rupee (percentage),

F_p = Farmer's price ; C_p = Consumer's price

Marketing Efficiency

Marketing efficiency is the most important component in the supply chain management. It is the measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing. For calculating the marketing efficiency, Acharya's (2003) approach was used.

c) Acharya's Approach

Acharya (2003) developed an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate market channels, taking into account of the following:

- a) Total marketing costs (MC)
- b) Net marketing margin (MM)
- c) Prices received by the farmer (FP)
- d) Prices paid by the consumer (RP)

Further, the measure should reflect the following relationship between each of these variables and the marketing efficiency.

- i) Higher the (a), the lower the efficiency
- ii) Higher the (b), the lower the efficiency
- i) Higher the (c), the higher the efficiency
- i) Higher the (d), the lower the efficiency

As there is an exact relationship among four variables, i.e. $a+b+c = d$, any three of these could be used to arrive at a measure for comparing the marketing efficiency. The following measure is suggested by Acharya,

$$ME = FP \div (MC + MM)$$

Garrett's Ranking Technique

This technique was used to rank the reasons that hampered the production and marketing of gingelly. Garrett's score technique has been widely used to rank the important cause based on the sources (Athiyaman, 2008). The respondents were asked to rank the reasons in order of importance and these ranks were converted into per cent position by using the following formula

$$\text{Per cent position} = \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

R_{ij} = Rank given for i^{th} reasons by j^{th} individual

N_j = Number of reasons ranked by j^{th} individual

Period of study

The collection of data from the sample respondents were taken up during the months of January to March, 2013.

MAJOR RESULTS

The present study analyses the production and marketing of gingelly starting from producer till it is sold to end user, covering various market intermediaries and processing firms involved in the value chain. Based on the objectives, the cross-section data collected from sample respondents were analyzed. The results thus obtained are presented and discussed below.

I. General Characteristics of Sample Farmers

As the general characteristics of the sample farmers and farm details would help in understanding the nature and behaviour of the respondents, it was analysed and the result obtained are presented below.

Distribution of Farmers Based on Age

The sample farmers were classified into three categories, based on the age viz., less than 35 years, 36-55 years, and more than 55 years and the details are furnished in Table.1

Table.1 Age Wise Distribution of Farmers

S.No.	Age (Years)	Number of farmers				Overall	
		Erode		Karur		No.	%
		No.	%	No.	%		
1	Young (upto35)	8	17.78	11	24.44	19	21.10
2	Middle (36-55)	20	44.44	24	53.33	44	48.90
3	Old (More than55)	17	7.78	10	22.22	27	30.00
Total		45	100.00	45	100.00	90	100.00

From the table 1, it could be concluded that most of the farmers were under middle age group; (in the age group of 36-55 years) in both Erode and Karur districts. Overall, most of the farmers belonged to the age group of 36-55 years and it accounted for 48.90 per cent. It is expected that they would have rich experience in gingelly cultivation.

Distribution of Farmers Based on Education

The educational level of the farmers is expected to play a significant role on the use of inputs, adoption of new technologies and post harvest practices. Therefore the details of the same were examined and results are presented in Table.2

In the Erode, majority of the farmers had primary level of education (35.55 per cent) followed by farmers with middle level education (37.78 per cent) in Karur district. Overall, the middle school level education was reported high (32.23 per cent). The result show that the level of education was found to be higher among the gingelly growers.

Table 2. Distribution of Farmers Based on Education

S.No.	Education	Number of Farmers				Overall	
		Erode		Karur		No.	%
		No.	%	No.	%		
1	Illiterate	3	6.67	5	11.11	8	8.87
2	Primary	16	35.55	11	24.44	27	30.0
3	Middle School	12	26.67	17	37.78	29	32.23
4	High School	9	20.00	4	8.89	13	14.45
5	Higher Secondary School	3	6.67	5	11.11	8	8.89
6	Graduate	2	4.44	3	6.67	5	5.56
Total		45	100.00	45	100.00	90	100.00

Distribution of Farmers Based on Land Holding

Size of land holding of farmers in general would influence the cropping pattern, cost of cultivation, buying behaviour of the farmers with respect to agricultural inputs etc. Hence the details of size of holding of the farmers were analyzed and the results are reported in Table.3

Table 3. Distribution of Farmers Based on Land Holding

S.No.	Farm Category	Numbers of Farmers				Overall	
		Erode		Karur		No.	%
		No.	%	No.	%		
1	Marginal (< 1 Ha)	-	-	3	6.67	3	6.67
2	Small (1-2 Ha)	12	26.67	15	33.33	27	30.00
3	Semi-medium (2-4 Ha)	8	17.78	10	22.22	18	20.00
4	Medium (4-10 Ha)	19	42.22	17	37.78	36	40.00
5	Large (>10 Ha)	6	13.33	-	-	6	13.33
Total		45	100.00	45	100.00	90	100.00

It could be observed from the table.3, that majority of the sample farmers belonged to the category of medium size both in Erode (42.22 per cent) and Karur districts (37.78 per cent). Overall, majority of the sample farmers were under the medium category (40.00 per cent).

Distribution of Farmers Based on Farming Experience

The sample farmers were categorized into different groups based on experience and the results are reported in Table.4.

Table 4. Distribution of Farmers Based on Farming Experience

S.No.	Experi-ence (Years)	Number of the Farmers				Overall	
		Erode		Karur		No.	Per cent
		No.	Per cent	No.	Per cent		
1	< 15 years	8	17.78	11	24.45	19	21.11
2	16-30 years	20	44.44	24	53.33	44	48.89
3	31-45 years	7	15.56	2	4.44	9	10.00
4	> 45 years	10	22.22	8	17.78	18	20.00
Total		45	100.00	45	100.00	90	100.00

It could be observed from the Table 4 that in Erode district majority of the farmers had 16-30 years of experience and it accounted for 44.44 per cent whereas in Karur district farmers having 16-30 years of experience was more (53.33 per cent). Overall, about 48 per cent of the farmers had an experience of 16-30 years. Hence it could be concluded that the sample farmers had enough experience on the various aspects of production and marketing technology of gingelly.

Distribution of Farmers Based on Irrigation

Irrigation plays a major role in the selection of the crop as well as the yield. Therefore the irrigation details of sample farms were analyzed and the results are presented in Table.4

Table 4. Distribution of Farmers Based on Irrigation

S.No.	Irriga-tion	Erode		Karur		Overall	
		No.	%	No.	%	No.	%
1	Irri-gated	36	80.00	29	64.44	65	72.22
2	Rain fed	9	20.00	16	35.56	25	27.78
Total		45	100.00	45	100.00	90	100.00

It could be observed that about 80 per cent of the sample farmers cultivated the crop under irrigated condition in Erode district while it was 64.44 per cent in Karur district. Overall, about 72 per cent of the farmers were cultivating the gingelly under irrigated condition and only the remaining 27 per cent of farmers cultivated the crop under rainfed condition.

Sources of Purchase of Seed

Sources of purchase of seed plays a critical role in the selection of the variety and quality of seeds. Therefore the source of purchase of seed by sample farms were analyzed and the results are presented in Table 5.

Table 5. Sources of Purchase of Seed

S.No.	Purchase point	Erode		Karur		Overall	
		No.	%	No.	%	No.	%
1	Private Dealers	27	60.0	15	33.33	42	46.66
2	Agri. depots	8	17.78	6	13.33	14	15.56
3	Own Seed	4	8.89	11	24.45	15	16.67
4	Relatives & Friends	6	13.33	13	28.89	19	21.11
Total		45	100.00	45	100.00	90	100.00

It could be inferred from results reported in Table 5. that 60 per cent of the farmers in Erode district purchased the gingelly seed from private dealers whereas only about 46 per cent of the farmers in Karur district sourced the seed from private dealers. Overall, about 47 per cent of the farmers purchased the seed from private dealers. It is interesting to note that only 15.56 per cent of the farmers got the seed from Agricultural Depots. So farmers should be motivated to purchase the seed from Department of Agriculture, where one could expect availability of quality seeds.

Distribution of Farmers Based on the Choice of Variety

Selection of a crop variety is crucial to attain high yield and tolerance to physical stress, pest and disease incidences. Therefore the distribution of farmers based on the variety, were analyzed and the results are presented in Table 6.

Table 6. Distribution of Farmers Based on the Choice of Variety

S.No.	Major Variety	Erode		Karur		Overall	
		No.	%	No.	%	No.	%
1	Brown	32	71.11	27	60.00	59	65.55
2	Black	13	28.89	18	40	31	34.45
3	White	-	-	-	-	-	-
Total		45	100.00	45	100.00	90	100.00

It could be inferred from Table 6, that majority of the farmers preferred brown gingelly in Erode district and it accounted for 71.11 per cent. In Karur district, about 65 per cent of the farmers' choice was brown gingelly. Overall 65.55 per cent of the farmers had grown brown variety while 34.45 per cent had chosen black gingelly. In the study area, majority of the oil millers preferred brown varieties because extraction of oil content was reported to be high to an extent of 50-52 per cent. Black varieties were preferred for confectionary purposes and none of the farmers cultivated white gingelly because of less tolerance to drought and high incidence of pest infestation.

Cost of cultivation

The cost of cultivation was worked out to understand the nature of cost involved in the cultivation of gingelly. As there was no significant changes in the cost of cultivation of gingelly across the two study zones the data were pooled together and the analysis was done separately for both irrigated and rainfed systems.

Table 7. Cost of Cultivation of Gingelly

S.No.	Operations	Irrigated (65)		Rainfed (25)	
		Rs/ha	%	Rs/ha	%
I	Fixed Cost				
i	Rental value of land	2534	8.69	1243	4.89
ii	Depreciation on Implements	2023	6.94	3047	11.98
iii	Total fixed cost	4557	15.63	4290	16.86
II	Variable cost				
	Land Preparation				
i	Cultivator	1853	6.36	1776	6.98
ii	Rottavetor	1324	4.54	1858	7.30
iii	Labour	3732	12.80	1645	6.47
iv	Cost of seed	437	1.50	523	2.06
v	Cost of Sowing	323	1.11	346	1.36
III	Fertilizer				
i	DAP	4675	16.04	4231	16.63
ii	Potash				
ii	Urea				
iv	Fertilizer Application cost	1148	3.94	1234	4.85
III	Irrigation	476	1.63	0	0.00
i	Labour cost				
IV	Weeding and Thinning	2355	8.08	2166	8.51
i	Labour cost				
V	Plant protection				
i	Cost of chemicals and cost of spray	2421	8.31	2073	8.15
VI	Harvest /Threshing	3212	11.02	3033	11.92
	Labour cost				
VII	Total Variable Cost	21956	75.33	18885	7.41
i	Interest on working capital (12 %)	2635	9.04	2266	8.91
ii	Total variable cost	24591	84.37	21151	83.40
VII I	(Fixed cost +Variable cost)	29148	100.00	25441	100.00
	Yield /ha (896*87)	77952	-	-	-
	Yield/ha (617*84.50)	-	-	52136	-
IX	Net Profit	48804	-	26695	-

The result shows that the annual fixed cost was high in rainfed condition and it accounted for about 16 per cent. It could be inferred that the cost of seeds was minimum and it was 4.5 kg per ha

under irrigated field. The total variable cost was higher under irrigated field because it required higher inputs and it constituted about 84 per cent. The net profit was higher in irrigated condition due to high yield(896 kg/ha). Under rainfed condition the yield was low and it was 617 kg per ha. The result indicated that growing gingelly under irrigated condition resulted in enhanced yield. The government should take necessary steps to protect rainfed farmers by means of subsidy, trainings and supply of drought tolerant and high yielding varieties of gingelly.

Marketing

In both Erode and Karur districts, farmers' marketing pattern of gingelly did not exhibit any significant difference and hence data were pooled and analysis was done for the entire set of data and the results obtained are furnished below in Table 8.

Identified Marketing Channels

It is a matter of concern that the marketing of gingelly in the study area is not well organized and the commonly encountered channels are presented in Table 8. The first two channels operate along the regulated market while the remaining two channels were moving with regular market. About 64 per cent of sample farmers used to sell the produce through regulated market while only 35.56 per cent of the farmers soled the produce under regular market. It was understood that markets functioning at Muthur, Sivagiri and Mylampadi were popular and farmers friendly. It was revealed that most of the farmers were able to get immediate payment in the regulated market and hence eager to sell the produce thro' regulated market.

Table 8. The Existing Market Channels

Ch. No.	Channels	Number of Farmers	%
I	Producer(G)- Regulated Market (G)-Commission Agent(G) - Processor(I) - Distributor(GO) - Retailer(GO) - Consumer(GO)	26 (28.90)	58 (64.44)
II	Producer(G)- Regulated Market (G) -Wholesaler(G) - Processor(I) - Distributor(GO) - Retailer(GO)- Consumer(GO)	32 (35.55)	
III	Producer(G) - Regular Market(G)- local trader(G) - Processor(I) - Distributor(GO) - Retailer(GO) - Consumer(GO)	12 (13.33)	32 (35.56)
IV	Producer(G) - Regular Market(G)- Wholesaler(G) - Processor(I) - Distributor(GO) - Retailer (GO)- Consumer(GO)	20 (22.22)	
Total		90 (100.00)	90 (100.00)

Note: G-Gingelly; I-Industry ; GO-Gingelly Oil ;
Figures in parenthesis indicate percentage to total

II. Price Spread in the Identified Marketing Channels

Price spread in general, is referred to as the difference between price paid by the consumer and the price received by the farmers for an equivalent quantity of a commodity. This analysis involved computation of different marketing costs and profits margins at each stage and their expression as a percentage to the consumers' price. Various costs incurred in the marketing process were considered for each of the identified channels and price spread was worked out channel wise. The details are presented in Table 9.

Table 9. Price Spread for Different Marketing Channels

(Rs/tonne)

S.No.	Particulars	Regulated Market				Regular Market			
		Ch-I	%	Ch- II	%	Ch- III	%	Ch-IV	%
I	Producer 's sale price	85254	90.67	84383	85.78	83619	83.201	84106	83.29
A	Cost incurred by the farmers								
i	Threshing	625	0.66	612	0.62	623	0.620	647	0.64
ii	Cleaning/ Winnowing/ Packing & Loading	544	0.58	561	0.57	516	0.513	532	0.53
iii	Transport	458	0.49	536	0.54	-	-	714	0.71
iv	Unloading	104	0.11	116	0.12	-	-	122	0.12
v	Commission charges	50	0.05	50	0.05	-	-	50	0.05
vi	Marketing cost	1781	1.89	1875	1.91	1139	1.133	2065	2.04
vii	Net price received by the farmers	83473	88.78	82508	83.87	82480	82.067	82041	81.24
B	Local trader								
i	Purchase price	-	-	-	-	83619	83.201	-	-
ii	Loading & unloading charges	-	-	-	-	321	0.319	-	-
iii	Transport charges	-	-	-	-	618	0.615	-	-
iv	Labour charges	-	-	-	-	636	0.633	-	-
v	Total expenses	-	-	-	-	1575	1.567	-	-
vi	Sale Price	-	-	-	-	85888	85.458	-	-
vii	Profit margin	-	-	-	-	694	0.691	-	-
viii	Market margin	-	-	-	-	2269	2.258	-	-
C	Wholesaler								
i	Purchase price	-	-	84383	85.78	-	-	84106	83.29
ii	Market cess / shop rent	-	-	662	0.67	-	-	-	-
iii	Loading charges	-	-	152	0.15	-	-	181	0.18
iv	Transport charges	-	-	459	0.47	-	-	-	-
v	Labour	-	-	312	0.32	-	-	614	0.61
vi	Total expenses	-	-	1585	1.61	-	-	795	0.79
vii	Profit margin	-	-	1642	1.67	-	-	2820	2.79
viii	Market margin	-	-	3227	3.28	-	-	3615	3.58
ix	Sale Price	-	-	87610	89.06	-	-	87721	86.87

D	Processing Industry								
i	Purchase price	85254	90.67	87610	89.06	85888	85.458	87721	86.87
ii	Transport cost	513	0.55	651	0.66	712	0.708	840	0.83
iii	Unloading charges	122	0.13	127	0.13	112	0.111	130	0.13
iv	Cleaning /Grading	346	0.37	353	0.36	422	0.420	435	0.43
vi	Processing cost (Electricity+ labour)	3120	3.32	3715	3.78	3074	3.059	2985	2.96
vii	Total expenses	4101	4.36	4846	4.93	4320	4.298	4390	4.35
viii	Profit margin	1233	1.31	1420	1.44	3354	3.337	2800	2.77
ix	Marketing margin	5334	5.67	6266	6.37	7674	7.636	7190	7.12
X	Sales Price (oil)	86475	91.97	89726	91.21	89817	89.367	90856	89.97
xi	Sales price (oil cake)	4113	4.37	4150	4.22	3745	3.726	4055	4.02
xii	Total	90588	96.34	93876	95.42	93562	93.094	94911	93.99
E	Distributor								
i	Purchase price	86475	91.97	89726	91.21	89817	89.367	90856	89.97
ii	Transport /labour	224	0.24	316	0.32	417	0.415	370	0.37
iii	Loading/unloading	202	0.21	177	0.18	160	0.159	150	0.15
iv	Shop rent + Electricity	1231	1.31	1050	1.07	1500	1.492	1250	1.24
v	Total expenses	1657	1.76	1543	1.57	2077	2.067	1770	1.75
vi	Profit margin	1395	1.48	1744	1.77	2976	2.961	1974	1.95
vii	Market margin	3052	3.25	3287	3.34	5053	5.028	3744	3.71
viii	Sales price	89527	95.21	93013	94.55	94870	94.395	94600	93.68
E	Retailer								
i	Purchase price	89527	95.21	93013	94.55	94870	94.395	94600	93.68
ii	Transport /labour	300	0.32	430	0.44	355	0.353	340	0.34
iii	Loading/unloading	150	0.16	120	0.12	114	0.113	150	0.15
iv	Shop rent + Electricity	800	0.85	1070	1.09	1270	1.264	800	0.79
v	Total expenses	1250	1.33	1620	1.65	1739	1.730	1290	1.28
vi	Profit margin	3250	3.46	3744	3.81	3894	3.875	5095	5.05
vii	Market margin	4500	4.79	5364	5.45	5633	5.605	6385	6.32
viii	Sales price	94027	100.00	98377	100.00	100503	100.000	100985	100.00

Note : Ch- Channel

It could be observed from Table 9 that Channel-1 involved producer, commission agent, processor, oil distributor, oil retailer and consumer. Gross price received by the farmers was Rs 85,254 per tonne and it constituted 90.67 per cent of the consumer's price. Processor took a profit margin of Rs 1233 and oil distributor had a margin of Rs 1395 and retailer had Rs 3250 per tonne, which accounted to 1.31 per cent, 1.48 per cent and 3.46 per cent of the consumers' price respectively. The ultimate consumers' price of oil was Rs 94,027 per tonne.

In channel-2 farmers realized a gross price of Rs 84,383 per tonne, which accounts for 85.78 per cent of the consumers' price. Farmers incurred a marketing cost of Rs 1875 per tonne and it accounted for 1.91 per cent of the consumers' price. Farmers received a net price which was low compared to channel-1 due to the operation of wholesaler in the channel.

In other words, in both the channels, farmers sold the produce through regulated market which showed that by avoiding regular market and choosing the regulated market made the farmers realise more share of consumer's payment.

In regular market, it could be observed from Table 9 that the gross price received by farmers in channels (III) and (IV) were Rs 83,619 and Rs 84,106 per tonne respectively which constituted about 83.20 per cent and 83.90 per cent of the final price of the consumers. Local traders and wholesalers took a profit margin of Rs 694

and Rs 2820 per tonne which accounted to 0.66 per cent and 2.79 per cent of the consumers' price, respectively.

Farmers' net price received in channels (III) and (IV) was low compared to channels (I) and (II). It could be concluded that farmers should sell the produce through regulated market for fair price, non interference of market intermediaries and immediate payment for the traded goods.

Farmer's Share in Consumer's Rupee

The price received by farmers expressed as a percentage of retail price of the consumers i.e. the price paid by consumers was studied channel wise and the results are presented in Table 10.

From the Table 10, it could be concluded that the farmer's share in consumer's rupee was relatively high in channel- I and it accounted for 90.67 per cent and it was mainly due to procurement of gingelly from farmers by market functionaries through Regulated market. Also in channel- II, the farmer's share in consumer's rupee was about 85 per cent because of low marketing cost incurred by the intermediaries. In case of channel-III, the farmer's share in consumer's rupee was minimum compared to other channels and it ranged from 83 per cent due to high marketing costs incurred by the intermediaries. Thus, the results finally showed that by avoiding one or more intermediaries in regular market and choosing the regulated market by minimizing the marketing cost would ensure the share of the rupee paid by the end user (consumer)

Table 10. Farmer's Share in Consumer's Rupee

(in Rs)

S.No.	Market Functionaries	Ch- I	Ch- II	Ch- III	Ch- IV
1	Farmer's price (Selling price)	85254	84383	83619	84106
2	Consumer's Price (Purchase price)	94027	98377	100503	100985
3	Farmer's share in consumer's rupee	90.67	85.78	83.20	83.28

Note: Ch-Channel

Marketing Efficiency

The marketing efficiency of different channels was analysed using Acharya and Agarwal index(2003) and the results are presented in Table 10. It was used to compare the efficiency of the marketing chains. In this study, the marketing efficiency for gingelly in various channels were analysed the marketing cost involved and the value addition done in the chain were studied. The higher the index higher would be the efficiency of the chain.

Table 11. Marketing Efficiency

S.No.	Market Functionaries	Ch- I	Ch- II	Ch- III	Ch- IV
1	Sale price of gingelly	94027	98377	100503	100985
2	Producers' Marketing Cost	1781	1875	1139	2065
3	Total Marketing Margin of the Intermediaries	12886	18144	20629	20934
4	Producers' Marketing Cost + Total Marketing Margin of the Intermediaries	14667	20019	21768	22999
	Index of Marketing Efficiency	6.4	5.0	4.6	4.3

Note : Ch- Channel

It is evident from Table 11. that channel -1 was found to be the most efficient channel with a high index value where the processors procured the produce directly from the farmers through commission agents. The value added per rupee of the marketing cost was low and consumers were able to get the gingelly oil at lower prices.

Post Harvest Losses of Gingelly in Different Transaction Points

The post-harvest losses of gingelly were estimated at different stages and are presented in Table 12. Post production and post harvest losses of

gingelly were estimated from farm to home. At the farm level, losses were maximum due to pest incidence (*Aphids : Aphis gossypii*), lack of appropriate harvest mechanisors and uneven matured pods. The losses of gingelly during processing were maximum due to lack of quality seeds and presence of pest & disease affected grains. Majority of the producers depended on tractor or truck to transport the produce. The losses during transportation were due to improper loading/unloading and nature of packaging material(Gunny bags) used. There were no storage losses at farm level because farmers never used to store the produce and sell the groups immediately after harvest to intermediaries to meet their liquidity.

The post harvest losses were high during transportation due to uneven and undulating topography and substandard packaging material. Improper harvesting method, cleaning and winnowing also compounded the post harvest losses of gingelly significantly.

Table 12. Post Harvest Losses of Gingelly in Different Transaction Points (Kg/tonne)

Stages	Channel I		Channel II		Channel III		Channel IV	
	Loss (Kg/Tonne)	Percentage	Loss (Kg/Tonne)	Percentage	Loss (Kg/Tonne)	percentage	Loss (Kg/Tonne)	percentage
I. Farm Level Losses								
Harvesting	26	10.57	30	9.32	24	6.72	45	16.54
Collection	12	4.88	15	4.66	21	5.88	27	9.93
Threshing	22	8.94	18	5.59	22	6.16	23	8.46
Winnowing	20	8.13	24	7.45	24	6.72	13	4.78
Drying/packaging	22	8.94	24	7.45	25	7.00	22	8.09
Transporting	13	5.28	10	3.11	12	3.36	11	4.04
Total losses at farm level	115	46.75	121	37.58	128	35.85	141	51.84
II. Local trader								
Packing	-	-	-	-	13	3.64	-	-
Transport	-	-	-	-	15	4.20	-	-
Total losses at Local trader	-	-	-	-	28	7.84	-	-
III. Wholesale Level Losses								
Packing	-	-	15	4.66	13	3.64	-	-
Transport	-	-	9	2.80	12	3.36	-	-
Storage	-	-	34	10.56	45	12.61	-	-
Total losses at wholesale level	-	-	58	18.01	70	19.61	-	-
III. Processor Level Losses								
Storage	37	15.04	26	8.07	29	8.12	33	12.13
Transport	14	5.69	18	5.59	14	3.92	15	5.51
Cleaning and grading	82	33.33	76	23.60	79	22.13	81	29.78
Total losses at Processor level	133	54.07	120	37.27	122	34.17	129	47.43
Total Post-harvest Losses	246	100.00	322	100.00	357	100.00	272	100.00

non availability of adequate number of processing units near production catchments.

Production Constraints

Production constraints faced by the gingelly farmers were analyzed and presented in Table 13.

Table 13. Production Constraints

S.No.	Constraints	Garrett's Score	Rank
1	Non availability of labour for timely field operation	98	I
2	Frequent failure of monsoon	94	II
3	Lack of adequate credit facilities and high cost of credit	86	III
4	Poor knowledge on the performance of the variety	74	IV
5	Problem of pest and disease	42	V
6	Non availability of quality seed	22	VI

From the table 13. it could be concluded that non availability of labour was the major problem for timely field operation followed by frequent failure of monsoon as well as uneven distribution of rainfall. Hence, trainings should be given to the farmers to use machinery to reduce the problem of labour scarcity during peak crop seasons.

Marketing Constraints

The data presented in Table 14. revealed the marketing constraints faced by the sample respondents.

The major marketing constraints were undue price fluctuation and non availability of market facilities to sell the produce followed by

Table.14 Marketing Constraints

S.No.	Constraints	Garrett's Score	Rank
1.	Undue Price fluctuation	88	I
2.	Non availability of proper market facilities	82	II
3.	Non availability of adequate number of processing units near the production catchments	66	III
4.	High Transportation cost	48	IV
5.	Difficulty in long term storage	35	V

CONCLUSION

The study focused on production and marketing of gingelly in Erode and Karur districts of Tamil Nadu. The primary data were analysed by various statistical tools besides the regular conventional analysis, Acharya's(2003) approach of marketing efficiency and Garrett's ranking technique were also used to analyse the data. From the results, it could be concluded that both in Erode and Karur districts about 48 per cent of the farmers were in the age group of 36-55 years and 40 per cent of farmers were under the medium category. In both the districts, about 72 per cent of the farmers were cultivating gingelly under irrigated condition and 47 per cent of the farmers purchased the seed from private dealers, and about 65 per cent cultivated brown variety. Four marketing channels were identified based on the selling behaviour of farmers. The results indicated that in Erode and

Karur districts, majority of farmers sold the produce through regulated market which accounted for about 58 per cent. The marketing efficiency was much higher in channel (I) and (II) and poor marketing efficiency was reported in the channels(III) and (IV). From the result, it is understood that the movement of gingelly from farmers to consumers was low in channel (I) even though both the farmers and consumers attained maximum benefits because intermediaries were absent. The major production constraints were non availability of labour and marketing constraints were undue price fluctuation. The post harvest losses were high in all the channels and the average post harvest losses of 10 -11 per cent were reported in the supply chain. The losses were mainly due to uneven maturity of grains in the field. At the processor's level, use of improper processing techniques and poor storage contributed to the huge post harvest losses of about 15 per cent. The study suggested that farmers should improve the production of gingelly under irrigated condition and sell the produce through regulated market, adopt post harvest management practices and value addition to make gingelly cultivation a profitable venture.

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