MARKET STRUCTURE AND MARKETING EFFICIENCY OF PADDY CULTIVATION IN SIVAGANGAI DISTRICT

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Introduction

This study aims at an appraisal of marketing systems of paddy in Sivagangai district. This chapter goes into a close study of the marketing system in terms of marketing channels. Further, an attempt is made to analyse marketing cost, marketing margin, price spread and marketing efficiency.

Marketing plays a crucial and important role in accelerating the pace of economic growth by promoting agricultural marketing. Marketing and farm management are inter dependent. Efficient marketing system ensures remunerative prices to the farmers and motivates them to go in for higher investment and production. With the increase in earnings of the farmers because of efficient marketing, productivity will rise on account of higher investment and quality seed, fertilizer, other essential inputs and modern or improved technology. A healthy and efficient marketing system always yields a fair amount of return to the producers and quality products and safeguards the welfare of consumers.

Market Structure

Market structure includes the various marketing channels, agents intermediaries and traders involved in moving the produce from the producers to the consumers or users. In the present study, market structure includes different market channels, intermediaries such as village traders, wholesalers, retailers, millers and consumers. The most common marketing channels identified in paddy marketing in the Sivagangai district are:

Marketing Channels
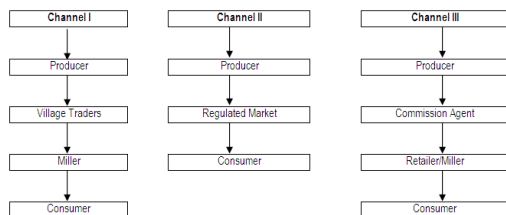
Methodology

Designing a suitable methodology and selection of analytical tools are important for a meaningful analysis of any research problem. This section is devoted to a description of the methodology, which includes choice of the study area, sampling procedure, period of study, collection of data and tools of analysis.

Collection of Data

The primary as well as secondary data were collected for the present study. In order to collect primary data, a well-designed pre-tested scheduled was used. Before undertaking the main survey, a pre-test schedule was administered tentatively to five farmers in each variety to test the validity of the schedule. This pre-test schedule helped in the removal of no-response and unwarranted questions and the modified final schedule was the result.

Even though the respondents did not maintain adequate farm records and accounts, they were able to furnish the particulars in view of their long association with farming. However, to minimize recall bias, suitable cross checks and rechecks were carried out.

Direct personal interview method has been adopted to collect the data pertaining to the structures, size of household, cropping pattern, cost and returns in farming operations. Relating to Paddy and other aspects relating to the overall objectives of the study.

Secondary data relating to location, climate, rainfall, soil type, land utilisation pattern, operational land-holding, demographic features, sources of irrigation, gross area irrigated, area under major crops, production and yield of major crops, livestock census, infrastructural facilities and the like were collected from the Assistant Director of Statistics and Joint Director of Agriculture, Sivagangai.

Objectives

To estimate the Marketable surplus of paddy among the small and large farmers of paddy cultivation in the study area.

Sampling Design

Multistage Stratified Random Sampling Technique has been adopted for the study, taking Sivagangai district as the universe, the block as the stratum, the village as the primary unit and paddy cultivators as the ultimate unit.

Sivagangai district comprises six blocks. Paddy is mainly cultivated in Sivagangai and manamadurai and hence the selection of sample villages was restricted to these two blocks. Five villages in each block, which account for the highest area under paddy cultivation in the descending order of magnitude were selected as the study unit for primary data collection.

A list of paddy cultivators in the selected villages was obtained from the records of the Joint Director of Agriculture, Sivagangai district. The proportionate random sampling technique was adopted to select 300 paddy cultivators and they were randomly selected for primary data collection. The list of selected villages and the number of cultivators selected are given in below

Number of Sample Cultivators and Names of the Villages

Block	Area Under Paddy in Sample Villages (in acres)	Number of Respondents Selected
I – Sivagangai		
Koothani	576	23
Sethur	543	21
Maravamangalam	500	20
Maranthai	440	17
Velarenthal	414	16
Kodikarai	986	37
Sakkur	650	26
II Manamadurai	550	23
Kelapasalai	474	19
Annavasal	460	18
Melapasalai	790	31
Kelamelkudi	333	13
Puthur	315	12
Sangamalam	285	11
Karisalkulam	280	11
Total	**7596**	**300**

Source: "General Returns", Office of the Joint Director of Agriculture, Sivagangai District.

In order to analyze the marketing costs, marketing margins and price spread, 30 intermediaries, 10 in each category namely village traders, commission agents, wholesalers and retailers were randomly selected. The selected respondents were contacted individually and required information was collected from them.

Marketable Surplus of Paddy

Marketable surplus is the estimated quantity to be marketed by the producer after providing certain percentage for various items of retention. The items of retention include provision for seed purpose, payment of wages in kind and domestic consumption. In short, the marketable surplus is the difference between the total production of paddy and the total retention per acre. Hence, this section attempts to analyse the retention and marketable surplus of the selected farmers producing paddy. The marketable surplus and percentage of retention are given in TABLE 1.

Table 1: Marketable Surplus of Paddy

(Quintals per acre)

Size of Farmers	Total Production	Total Retention	Total Marketable Surplus	Percentage of total production
Small	24.15	1.98	22.17	91.80
Large	22.61	2.61	20.00	88.46
Overall	46.76	4.59	42.17	90.18

Source: Survey Data.

It is seen from TABLE 1 that the total production of sample farmers was 46.76 quintals with retention of 4.59 quintals per acre. The variation in the percentage of marketable surplus to production among the group was found to be minimum. The maximum was 91.80 per cent among small farmers and the minimum was 88.46 per cent among large farmers.

In order to identify the factors influencing the marketable surplus of paddy in the study area, a Multiple Linear Regression Model of the following forms was used.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu \qquad (1)$$

where

Y - Marketable surplus per farm in quintals

X_1 - Area under paddy of farm

X_2 - Family size

X_3 - Price received per quintals

μ - Error term.

$\beta_0 \beta_1 \ldots \beta_3$ are the parameters to be estimated. The above model (6.1) was estimated by the method of least squares and the results are given in TABLE 2.

Table 2: Determinants of Marketable Surplus of Paddy

Number of Sample	Regression Co-efficient				R^2	F
	β_0	β_1	β_2	β_3		
300	2.84	81.68* (6.19)	-0.59 (-1.03)	0.89* (4.75)	0.81	29.15

Source: Computed Data.

Figures in brackets are the t – values.

* Indicates that the co-efficient are statistically significant at the 5 per cent level.

It is inferred from Table 2 that as per R^2 value, all the three explanatory variables are jointly responsible for 81 per cent variation in the marketable surplus of paddy expressed in quintals per farm. Further, R^2 value indicates that the function was considered to be a good fit and the

interpretation was made for the significant variables only. The F value shows that the fitted regression is statistically significant at one per cent level.

Among the selected variables, the area under paddy and price of paddy were statistically significant at the 5 per cent level which was also found to be positively related to the marketable surplus. It indicates that an increase in acre under paddy cultivation, ceteris paribus, (other thinks by constant) would increase the marketable surplus by 81.68 quintals. Similarly one rupee increase in price of paddy per quintals would result in an increase of 0.89 quintals of marketable surplus per farm. Family size was not statistically significant.

Thus, it may be concluded from the analysis that an area under paddy was found to be highly significant and it had greater influence on marketable surplus compared to the variable, price per quintal.

Marketed Surplus

Marketable surplus is the estimated quantity to be sold or marketed by the paddy cultivators after retention. But the marketed surplus is the quantity actually sold in the market.

Marketable surplus and marketed surplus are estimated by using the following relation.

$$M_S = Q_P - Q_h$$
$$Md_s = Q_P - (Q_h + Q_i) \qquad (2)$$
$$Q_n = Q_c + Q_s + Q_r$$

where,

M_S - Marketable surplus
Md_s - Marketed surplus
Q_p - Quantity of paddy produced
Q_h - Quantity of paddy retained
Q_c - Quantity retained for domestic consumption
Q_s - Quantity retained for seeds
Q_r - Quantity given to relatives, labourers and others
Q_i - Quantity lost in storage.

The marketed surplus is analysed and presented in table 3.

Table 3: Marketed Surplus of Paddy

(Quintals per acre)

Size of Farmers	Marketable Surplus	Storage Loss	Marketed Surplus	% of marketed surplus to marketable surplus
Small	22.17	0.88	21.29	96.03
Large	20.00	1.09	18.91	94.55
Overall	42.17	1.97	40.20	95.28

Source: Computed Data.

It is observed from table 3 and Figure 6.3 that the marketed surplus per acre was 21.29 quintals and 18.91 quintals for small and large farmers respectively. The percentage of marketed surplus to marketable surplus was 96 per cent and 94.55 per cent in small and large farmers respectively. The difference between marketable and marketed surplus was mainly due to the storage loss.

Sale to Village Traders

It is one of the important channels preferred by the farmers to sell paddy. The number of farmers who sell their product and the quantity of paddy sold through village traders are presented in TABLE 4.

Table 4: Number of Farmers and Quantity of Paddy Sold through Village Traders

(Quintals per acre)

Size of Farmers	Number of Farmers	% of group concerned	Average quantity of paddy sold (in quintals per acre)	% of marketed surplus of the group concerned
Small	186	18.75	3.91	18.36
Large	114	32.61	5.86	30.99
Overall	300	23.00	9.77	24.30

Source: Computed Data.

It is seen from TABLE 4 that the percentage of quantity sold as the marketed surplus to the group concerned is 18.36 and 30.99 per cent of their respective totals.

In order to rank the reasons for selling paddy through various intermediaries like village traders, commission agents and regulated market, the Garrett's Ranking Technique was adopted.

The respondents were given the reasons and asked to rank them according to their choice. The order of merit given by the respondents was converted into ranks by using the formula:

$$PercentPosition = \frac{100(R - 0.50)}{N} \qquad (3)$$

where,

R = Rank given for the factor by an individual
N = Number of individuals ranked.

The percentage position of each rank thus obtained was converted into scores using the table given by Garrett. The scores of individuals representing each reason were added together and divided by the total number of farmers for whom the scores were added. The mean scores for all the reasons were analysed in the ascending order, the ranks assigned and the important factors identified.

Table 5: Reasons for Selling Paddy through Village Traders

Reasons	Rank	Mean score
No storage cost	63.15	I
Easy method of sale	56.31	II
No price difference	51.61	III
Long term practice	46.16	IV
No transport cost	39.46	V
No Commission charge	32.15	VI
Immediate payment	28.61	VII

Source: Computed Data.

Table 5 shows that among the reasons to sell the paddy through village traders immediate payment ranks first. Other attractions are absence of price difference, transport cost, and commission charges. Easy methods of sale, long-standing practice and the elimination of storage cost are the additional incentives.

Decision Regarding the Selection of Storage and Intermediaries

It could be observed from the analysis that the storage is an important factor for farmers in realizing a higher net price for paddy. This section attempts to analyse the extent to which the decision to resort to storage influences net price of paddy. Further, an attempt has been made to study whether there existed differences in the net prices realized by farmers in the sale through agency so as to enable the farmers to select the middlemen for marketing of paddy.

For this, a Multiple Linear Regression of the following model is fitted:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 D_1 + \beta_4 D_2 + U \qquad (4)$$

where,

Y = Net price received in Rupee/quintal

X_1 = Quantity of paddy transacted in quintals

X_2 = Number of days stored

D_1 and D_2 = Dummy variables

D_1 = 1, if sold through commission agents

D_1 = 0, otherwise

D_2 = 1, if sold through village traders,

D_2 = 0, otherwise

U = Error term

β_0, β_1, β_2, β_3 and β_4 are the parameters to be estimated.

The model 9 was estimated by the Method of Least Squares and the results are presented in Table 6.16.

Table 6: Estimated Regression Results of Decision Behaviour of Farmers

Number of Sample	Regression Co-efficient						
	β_0	β_1	β_2	β_3	β_4	R^2	F
300	69.15	0.1821 (0.7161)	1.1341* (3.1921)	1.9961 (1.1173)	2.7411 (1.0811)	0.71	73.15**

Figures in brackets are the t-values.

* Indicates that the co-efficient are statistically significant at the 5 per cent level.

** Indicates that F value is statistically significant at the 1 per cent level.

It is seen from TABLE 6 that all the explanatory variables jointly account for 71 per cent variation in net price received by the farmers in the study area. The estimated results of regression co-efficients have shown that the number of days alone had a significant positive influence on the net price realized. It indicates that for every one day storage of paddy, the net price realized would be increased by Rs.1.1341 per quintal in a maximum storage period not exceeding four months keeping other factors constant. It is noticed from the estimated results that none of the dummy coefficients (β_3 and β_4) were found to be significant. It indicates that the net price realized was found to be not influenced by the middlemen to / through whom paddy is sold. The F-value shows that the fitted regression model was statistically significant at one per cent level. Thus it may be concluded from the analysis that decision – behaviour of the farmers was influenced by increase in net price realized per day of storage. There were no differences existing in net prices realized by sale through / to middle or commission agents.

Table 7: Marketing Efficiency Index of Small Farmers

(Rupees per quintal)

Marketing Channel	Marketing Cost (M.C)	Marketing Margin (M.M)	Efficiency Index = 1 + M.M / M.C
I	202.54	92.37	1.46
II	206.35	68.53	1.33
III	148.19	119.67	1.81

Source: Computed Data.

It is observed from Table 7 that the marketing efficiency in channel III is better than in channels I and II due to the lesser marketing cost and higher marketing margin.

Table 8: Marketing Efficiency Index of Large Farmers

(Rupees per quintal)

Marketing Channel	Marketing Cost (M.C)	Marketing Margin (M.M)	Efficiency Index = 1 + M.M/ M.C
I	146.22	65.55	1.45
II	189.01	66.12	1.35
III	125.76	85.39	1.68

Source: Computed Data.

It is inferred from TABLE 8 that channel III is operating more efficiently than channel I and II. The Efficiency Index of channels I and II are 1.45 and 1.35 respectively. Channel III is more efficient because of its lesser marketing cost compared to the other channels. There is no difference in marketing efficiency in different channels between small and large farmers.

The marketing efficiency of the three channels is measured by Shepherd's Method, Acharya and Agarwal's Method and Composite Index Method.

Marketing Efficiency by Shepherd's Method

The marketing efficiency is measured with the help of the following formula given by Shepherd.

$$ME = \frac{V}{I} - 1 \qquad (5)$$

where,

ME = Index of Marketing Efficiency

V = Value of goods sold or consumer price and

I = Total marketing cost or marketing cost per unit.

In the present analysis, the consumer price and marketing cost per quintal of paddy are taken into account. The computed results are given in TABLE 9.

Table 9: Marketing Efficiency Analysis Using Shepherd's Method (Rupees per quintal)

Particulars	Channels					
	I		II		III	
	Small Farmers	Large Farmers	Small Farmers	Large Farmers	Small Farmers	Large Farmers
ConsumerPrice (V)	854.02	854.02	854.02	854.02	854.02	854.02
Total marketing cost (I)	202.54	146.22	206.35	189.01	148.19	125.76
Shepherd's Marketing Efficiency ME = (V/I) – 1	3.21	4.84	3.14	3.52	4.76	5.79

Source: Computed Data.

It is observed from TABLE 9 that the marketing efficiency in channel III for small and large farmers (4.76 and 5.79) is greater than that in channel I (3.21 and 4.84) and in channel II (3.14 and 3.52). The marketing efficiency of channel II is very poor because of its higher marketing cost at Rs.206.35 and Rs.189.01 per quintal for small and large farmers respectively.

Acharya and Agarwal's Method

The marketing efficiency is measured by using the following formula given by Acharya and Agarwal.

$$E = \frac{O}{I} X 100 \qquad (6)$$

where,

E = Marketing Efficiency

O = Output of the marketing system (value added, that is, Difference between consumer's price and producer's price) and

I = Inputs used in the marketing process (marketing cost)

Table 10: Marketing Efficiency Analysis Using Acharya and Agarwal Method (Rupees per quintal)

Particulars	Channels					
	I		II		III	
	Small Farmers	Large Farmers	Small Farmers	Large Farmers	Small Farmers	Large Farmers
Total Marketing Cost I	202.54	146.22	206.35	189.01	148.19	125.76
Value added (o) (consumers price -producers price)	294.91	211.77	274.88	255.13	267.86	211.15
Marketing Efficiency ME = (O / I)	1.46	1.45	1.33	1.35	1.81	1.68
Marketing Efficiency Index (ME x 100)	146	145	133	135	181	168

Source: Computed Data.

It is observed from table 10 that the marketing efficiency index of channel III is greater than that of channel I and channel II. The marketing efficiency of channel III is greater than that of channel I and II. The marketing efficiency index of small farmers (178) is greater than that of large farmers (165) in channel III. The 'value

added' of the small farmers is also greater than that of the large farmers under channel III.

Composite Index Method

The marketing efficiency was also analysed by using composite Index Method. The percentage of producer's price, marketing cost and marketing margin to consumer's price per quintal were calculated and these were assigned ranks. Total scores were found by adding the respective ranks in each channel. The mean score was calculated for each channel. Where the mean score is less, it showed the real marketing efficiency of the channel. The computed results are given in TABLE 11.

Table 11: Marketing Efficiency Analysis Using Composite Index Method

(Rupees per quintal)

Particulars	Channels					
	I		II		III	
	Small farmers	Large farmers	Small farmers	Large farmers	Small farmers	Large farmers
Producer's share Rank	65.473	75.202	67.812	70.133	68.641	74.101
Marketing cost Rank	202.542	146.222	206.353	189.013	140.191	125.761
Marketing Margin Rank	92.372	65.552	68.531	66.121	119.673	85.373
Total Score	7	6	6	7	5	5
Mean score	2.33	2	2	2.33	1.67	1.67

Source: Computed Data.

It is observed from Table 8 that of the three channels, channel III has more marketing efficiency than channel I and II. Even though the producers' share in channel II is greater than that in channel I, the marketing cost is higher in channel II than channel I. There is no variation in the results of marketing efficiency of large and small farmers.

Conclusion

To sum up, a long term arrangement should be worked out by the Government of Tamil Nadu, to protect the interest of both producers and consumers and also to improve the production and marketing of paddy in the study area, It is also very essential to see that the price offered to farmers is related to the cost of production. Further, a new mechanism has to be innovated to break the stagnation in the production of paddy through adoption of most modern methods of cultivation and to ensure stable remunerative prices to the farmers. The Government should initiate action to improve market information system and market intelligence. Existing techniques disseminating marketing information should be reviewed. Visual media like television can be used for providing market information to farmers of rural areas. Modern devices such as computers may be employed wherever necessary to make a meaningful estimate of marketable surplus and daily average price.

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