



ECONOMIC ANALYSIS OF PADDY CULTIVATION IN CAUVERY DELTA REGION: A MICRO LEVEL EMPIRICAL STUDY

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Abstract

The present micro level empirical study is related to Economic Analysis of Paddy Cultivation and its Problems in the Cauvery Delta region, Mayiladuthurai Block. The specific objectives of this study are to know the Socio Economic Status of Farmers in the study area; to analyse the Farm Size wise and Component wise Cost and Returns of Paddy Cultivation in the study area; to explore the Problems faced by farmers in the Paddy Cultivation in the Study area; and to suggest possible policy measures for strengthening paddy cultivation in the Study area. The required data were collected from 66 sample farmer respondents consisting 40 Marginal Farmers; 20 Small Farmers and 6 Large Farmers. The data regarding the socio economic conditions such as age, religion, community, educational qualifications, family type, occupation and other related economic information viz, size of holding, cost and return structure have been gathered from the respondents through a well structured interview schedule. From the analysis, it is found that the farm size wise cost of cultivation, the average cost of cultivation per acre was Rs. 16495/- for Marginal Farmers, Rs. 18420/-, and Rs 19700/- for Small and Large Farmers. Further, there is a significant difference registered in the cost of cultivation as well as returns from cultivation of Kuruvai season as well as in the Samba season among different farm groups. It is also calculated that the Net Profit from the paddy cultivation for the marginal farmers is Rs.21905/- and it is Rs.22770/- and Rs. 22980/-for small farmers and large farmers respectively. It is suggested that an integrated approach to the farm planning and farm management is needed to strengthen paddy cultivation in general. The agricultural productivity, especially paddy productivity coupled with farm and non-farm diversification has to be increased in the study area among the large farmers and the existing technological has to be upgraded and disseminated in this area which in turn could increase the paddy productivity and income of farmers.

Key Words: Farm Size, Paddy Cultivation, Kuruvai Season, Samba Season, Farm Productivity.

Rationale

Agriculture in India is one of the most important sectors of its economy. Agriculture accounts for 15 per cent of India's GDP. Though, the share of Indian agriculture in the GDP has been steadily declining over the years. Yet it is still the single largest contributor to the GDP and plays a vital role in the overall socio-economic development of country. Agriculture is the primary and critical sector of our country giving livelihood and employment opportunities for vast majority of Indian population. India is still the home to the large number of poor and malnourished people in the world; higher priority to agriculture will achieve the goals of reducing poverty and malnutrition as well as of inclusive growth. Accelerating the growth of agricultural production is therefore necessary not only to achieve an overall GDP target of 8 per cent during the Twelfth Five Year Plan and meet the rising demand for food, provides food for more than 1 billion people and yields raw materials for agro- based industries. As per the Central Statistics Office's estimates, 2013 the Gross Domestic Product, agriculture and allied sectors grew at 3.6 percent during 2011-12, recording an average rate of growth of 3.6 per cent per year during the Eleventh Plan. Further, as per the advance estimates released by CSO on 2013, agriculture and allied sectors are estimated to grow at 1.8 per cent during 2012-13 as against 3.6 percent during the last year.

There is considerable increase in productivity of rice in India during the recent past. The productivity of rice was 668 kg/ha in 1950-51 and it has increased to 2,066 kg/ha during 2001-02. The increase in productivity of rice is about 209 percent and this increase is due to introduction of high yielding rice varieties responsive to high dose of fertilizers coupled with improved package of practices evolved by Agricultural Scientists for various regions. In fact, there is considerable increase in productivity of rice in the country but there are still certain areas, where rice productivity is low and very low. Rice productivity in such areas fluctuates significantly from region to region due to various factors such as soil type, soil fertility, rainfall pattern, flood, water logging and climatic conditions. India is one of the world's largest producers of white rice, accounting for 20 percent of all world rice production. In India, Rice Production has increased from 53.6 million tons in 2000 to 74.6 million tons in 1990, 39 percent increase over the decade. By 2012, rice production had reached 111 million tons, second in the world next to China (182 million tons). India's rice production declined to 89.13 million tonnes in 2009-10 crop years (July-June) from record 99.18 million tonnes in the previous year due to severe drought that affected almost half of the country. India could achieve a record rice production of 100 million tonnes in 2010-11 crop years on the back of



better monsoon this year. The India's rice production reached to a record high of 104.32 million tonnes in 2011-2012 crop years.

Tamil Nadu has about 5.96 percent of the Nation's population, occupies 4 percent of the land area and has 3 percent of the water resources of the Nation. Agriculture still employs about 40 percent of the workforce in the State. As a basic input for agriculture, land occupies a predominant position among all the resources required for a modern economy. Competition between agricultural and non-agricultural sectors for land is intensifying due to the increasing pressure on land for food production, housing and industrial expansion. Between 1960-61 and 2009-10 the total cultivated area in Tamil Nadu decreased from 7.32 million ha to 5.57 million ha and the net sown area has decreased from about 6 million ha to 4.90 million ha during the same period. However, this reduction in cropped area has been compensated by the increase in productivity of crops so that higher production has been possible. Apart from agriculture, land is also required for afforestation purposes so as to maintain ecological balance, in view of the fact that the current share of forests in total geographical area of Tamil Nadu is only 16.3 percent as compared to the ecological norm of 33 percent. Further, the per hectare yield rate of paddy (in terms of rice) at 3,918 kgs during the year 2011-12 was the best. In 2012-13 it declined to 2,712 kgs. However, the yield rate of the crop also varied within the State as well as among the seasons significantly. Across the State the yield rate of paddy ranged between 588 kgs per hectare in Ramanathapuram and 4728 kgs per hectare in Kanniyakumari districts in 2012-13. Among the seasons, the normal yield (average or the 5 years ending 2011-12) obtained at 3,799 kgs per hectare in Kar/Kuruvai/Sornavari season was the highest as compared to 2,913 kgs in Samba/Thaladi/Pisanam and 3,552 kgs in Navarai/Kodai. In the light of limited scope for expanding area under cultivation and under irrigation, the only way to meet the growing food requirement, is to narrow down the vast gap in the yield rate among the districts as well as between the seasons. This calls for the need for renewed research effort to narrow down the yield gap. In 2013-14, it is anticipated to cover 18.49 lakh hectares under paddy and to produce 57.26 lakh tonnes of rice. Based on the above, the present study tries to analyse the aspects of Paddy Cultivation in one of the agricultural intensive areas and Cauvery Delta region of Tamil Nadu, Mayiladuthurai Block.

Objectives

The core objective of the present research is to empirically analyse the aspects of Farm Size and Productivity of paddy cultivation in Mayiladuthurai Taluk, Nagappattinam District, Tamil Nadu.. The specific objectives are to know the Socio Economic Status of Farmers in the study area; to analyse the Farm Size wise and Component wise and Season wise Cost and Returns of Paddy Cultivation in the study area; to explore the Problems faced by farmers in the Paddy Cultivation in the Study area; and to suggest possible policy measures for strengthening paddy cultivation in the Study area.

Hypotheses

Based on the objectives, the hypotheses that there is a significant difference registered among the farm size in relation to cost, production and yield; and it is also assumed that the farm size and yield is directly related have been formulated.

Materials and Methods

The Nagapattinam district has been purposively chosen as the study area since it is one of the Cauvery Deltaic region and trifurcated districts from the composite Thanjavur District, [The Rice Bowl of India] of Tamil Nadu. The Nagapattinam District consists of eight taluks viz, Nagapattinam, Kizvelur, Vedaranniyam, Mayiladuthurai, Sirkazhi, Thrangampadi, Thirukkuvalai and Kuttalam. Mayiladuthurai taluk has been chosen purposively since it is found as the River Cauvery Belt of the district and traditionally have been practiced for paddy cultivation. The present study makes use of Multi Stage Random Sampling technique. In the first stage the study area Nagapattinam district was chosen; then Mayiladuthurai taluk was chosen as the study taluk; followed ONE representative Revenue Villages of the Taluk viz, Kadalangudi on the basis of the number of farmers have been chosen in the Second stage. In the third stage, a total 66 farmers consisting 40 Marginal Farmers; 20 Small Farmers and 06 Large Farmers were selected at randomly. The present study has been based on the Primary data only. Survey Method has been adopted for the primary data collection and the data have been gathered through a well structured and pre-tested interview schedule.

Analysis and Discussion

The Social Profile of the Sample Farmers

With regard to the gender status, out of 66 respondents, 58 respondents are male and 08 respondents are female. Thus it is found that the majority are, more than 88 percent of respondents are male categories; With regard to the age distribution 04 respondents are less than 25 years old. The majority 32 respondents fall under the age group 25-45 years, 24 respondents belong to the age group 45-65 years and rest of the 06 respondents are above 65 years old. The Religion Status of Sample Respondents witnessed that 88 Percent are Hindu followed by 09 Percent is Christian and 03 Percent belong to Muslim

community; 28 respondents (43 Percent) are BC community, 26 respondents (39 Percent) are MBC community, and 12 respondents (18 Percent) are SC community. It is also noticed that 55 respondents belong to the nuclear family which accounts to 83 percent and even now 11 respondents belonging to the joint family and they contribute about 17 percent and with regard to the family size distribution in the 24 per cent households the family size is less than 4, 64 per cent households have the family members in between 5 and 8 and rest of the 08 households the family size exceeds 8 among the sample respondents of the study area.

The distribution of educational status of the sample respondents infers that among the respondents majority i.e. 28% are secondary level educated and only 09% are higher level educated. Further it is noted that 25 percent are primary educated, followed by 09% are Higher secondary educated, Further it is to be noted that still 12% of the respondents are illiterate.

The Economic Profile of the Sample Farmers

The income distribution the sample farmers reveals that only 9 % of the respondents have earned less than Rs.50000/- annually followed by 38% belong to the income group of Rs.50001- 100000; 30 % belong to the income group of Rs.100001 – 150000/- and it is to be appreciated that 23 % belong to the income group of above Rs.150000. With regard to the consumption expenditure, 6% the respondents have spent on food items less than Rs.40000/- per annum, 35 % have spent in between Rs.40000 and Rs.80000, 44% of the households spent in between Rs.80000 and Rs.120000/- and 15% of the respondents spent above Rs.120000 per month on food items. Similarly, more than half of the respondents' i.e. 39 % spent less than Rs.10000/- on non-food items and only 13% of the respondents spent above Rs.30000 per month on non-food items. In the case of savings, it is found that 27 % of the respondents have not saved any amount and half of the respondents i.e. 44 % have saved less than Rs.10000 and on the other side only 8 % of the respondents have saved more than Rs.20000/- so far in the study area. The debt distribution reveals that 17% have borrowed less than Rs.25000/- and only 12 % have borrowed above Rs.1 Lakh . Among the sample respondents 39% have owned assets worth less than Rs.2 Lakhs and 9% of the respondents have owned assets worth of above Rs. 6 Lakhs.

Table 1 Social and Economic Profile of the Farmers

Sl. No	Social Profile	Respondents		Economic Profile	Respondents	
		Nos	Per cent		Nos	Per cent
1	Sex Total	66	100	Annual Income		
	Male	58	88	Below 50000	06	09
	Female	08	12	50001 to 100000	25	38
2	Religion			100001 to 150000	20	30
	Hindu	58	88	Above 150000	15	23
	Christian	06	09	Asset Position		
3	Muslim	02	03	Below 2 Lakhs	26	39
	Community			2 to 4 Lakhs	22	34
	SC/ST	12	18	4 to 6 Lakhs	12	18
	MBC	26	39	Above 6 Lakhs	06	09
4	BC	28	43	Consumption – Food Items		
	Total	66	100	Below 40000	04	06
	Age			40001 to 80000	23	35
	Below 25	04	06	80001 to 120000	29	44
	25- 45	32	48	120001 and Above	10	15
	45-65	24	36	Consumption-Non Food Items		
5	65& Above	06	09	Below 10000	26	39
	Total	66	100	10001 to 20000	16	25
	Family Type			20001 to 30000	15	23
	Nuclear	55	83	30001 &Above	09	13
	Joint Family	11	17	Indebtedness		
6	Family Size			Below 25000	12	17
	Less than 4	16	24	25001 to 50000	18	28
	5-8	42	64	50001 to 75000	15	23
	More than 08	08	12	75001 to 1 Lakh	13	20
7	Marital Status			Above 1 Lakh	08	12
	Married	54	82	Savings		

	Un-Married	08	12	No Savings	18	27
	Widow	04	06	Below 5000	13	20
				5001 to 10000	16	24
				10001 to 15000	08	12
				15001 to 20000	06	09
				20001& Above	05	08

Source: Primary Data

Economics of Paddy Cultivation

Among the different components of costs, farmers spent more on applying farmyard manures which accounts 13 percent which is followed by weeding 13 percent. Next farmers spent on pesticides 13 and 12 percent on fertilizers. About 10 percent was spent on nurse pulling which is followed by 9 percent on main field preparation and 9 percent was spent on harvesting. It was followed by plant protection which accounts about 8 percent and 5 percent was spent on seed cost.

With regard to the farm size wise cost of cultivation, the average cost of cultivation per acre was Rs. 16495/- for Marginal Farmers, Rs. 18420/-, and Rs 19700/- for Small and Large Farmers. It is also found that the average cost of cultivation during Kuruvai season for the marginal farmers is Rs.19155 and it is Rs.19650/- and Rs.21200/-for small farmers and large farmers respectively. The variations in the cost of cultivation is also found among the farm sizes since the SD value for marginal farmers is 245.67 and it is 445.18 and 605.45 for small farmers and large farmers respectively. It is clear that there is a significant difference registered in the cost of cultivation of Kuruvai season among different farm groups since the calculated F value is 47.85.

During Samba season in the study area among the sample farmers the average cost of cultivation for the marginal farmers is Rs.19675 and it is Rs.21650/- and Rs.23600/-for small farmers and large farmers respectively. The variations in the cost of cultivation is also found among the farm sizes since the SD value for marginal farmers is 268.55 and it is 483.10 and 715.45 for small farmers and large farmers respectively. It is clear that there is a significant difference registered in the cost of cultivation among different farm groups since the calculated F value is 56.15.

Table 2.a. Farm Size wise Cost of Cultivation of Paddy (Kuruvai Season)

S. No	Farm Size	Mean	SD	Std.Error	'F' Value
1	Marginal Farmers	17155	245.67	27.87	47.85
2	Small Farmers	19650	445.18	46.35	
3	Large Farmers	21200	605.45	58.85	
	Total	19335	523.25	52.45	

Source: Computed from the Primary Data

Table 2.b. Farm Size wise Cost of Cultivation of Paddy (Samba Season)

S. No	Farm Size	Mean	SD	Std.Error	'F' Value
1	Marginal Farmers	19675	268.55	35.85	56.15
2	Small Farmers	21650	483.10	42.35	
3	Large Farmers	23600	715.45	55.85	
	Total	21642	523.25	48.65	

Source: Computed from the Primary Data

With regard to the returns from paddy cultivation, the average returns from paddy cultivation is calculated to Rs.40757 consist of the Rs.39423 valued Paddy and Rs.1333 valued straw. Further, the average return from cultivation for the Marginal farmers is Rs. 38400/- and it is Rs.41190/- and Rs.42680 for the Small Farmers and the Large Farmers respectively. The average returns of cultivation of the farmers who are higher educated accounts to the maximum of Rs 32,395/- which it is followed by illiterate it is Rs.32,060/-. For primary educated it is Rs. 30,826/- .Farmers who have done their Secondary education it is Rs. 31,867/-. In the case of higher secondary it is Rs.32, 392/-.

There is a significant difference registered in the returns from the paddy cultivation. This fact is proved as the mean value of returns from the paddy cultivation for the marginal farmers is Rs.42600/- and it is Rs.44300/- and Rs. 45400/-for small

farmers and large farmers respectively. More variations in the returns from cultivation is also found among the farm sizes since the SD value for marginal farmers is 212.35 and it is 386.15 and 435.30 for small farmers and large farmers respectively. It is clear that there is a significant difference registered in the cost of cultivation among different farm groups since the calculated F value is 36.45.

During Samba Season, the mean value of returns from the paddy cultivation for the marginal farmers is Rs.34200/- and it is Rs.36980/- and Rs. 41060/-for small farmers and large farmers respectively. More variations in the returns from cultivation is also found among the farm sizes since the SD value for marginal farmers is 195.85 and it is 238.15 and 395.10 for small farmers and large farmers respectively. It is clear that there is a significant difference registered in the returns from cultivation among different farm groups since the calculated F value is 29.85.

Table 3.a Farm Size wise Returns from Cultivation (Kuruvai Season)

S. No	Farm Size	Mean	SD	Std.Error	'F' Value
1	Marginal Farmers	42600	212.35	29.15	36.45
2	Small Farmers	44300	386.15	38.80	
3	Large Farmers	45400	435.30	51.55	
	Total	44100	465.15	48.25	

Source: Computed from the Primary Data

Table 3.b.Farm Size wise Returns from Cultivation (Samba Season)

S. No	Farm Size	Mean	SD	Std.Error	'F' Value
1	Marginal Farmers	34200	195.85	39.40	29.85
2	Small Farmers	36980	238.15	28.10	
3	Large Farmers	41060	395.10	56.30	
	Total	37410	365.15	41.30	

Source: Computed from the Primary Data

Table 4. Farm Size wise Net Profit from Cultivation of Paddy

S. No	Farm Size	Mean	SD	Std.Error	C-B Ratio	'F' Value
1	Marginal Farmers	21905	638.15	69.33	2.32	31.05
2	Small Farmers	22770	585.35	61.87	2.24	
3	Large Farmers	22980	485.55	69.45	2.16	
	Total	22552	465.15	42.28	2.10	

Source: Computed from the Primary Data

The Net profit earned from paddy cultivation in the study area reveals inverse relationship between the Farm Size and Profitability. Net Profit from the paddy cultivation for the marginal farmers is Rs.21905/- and it is Rs.22770/- and Rs. 22980/-for small farmers and large farmers respectively. It is also found that it is clear that there is a significant difference registered in the cost of cultivation among different farm groups since the calculated F value is 31.05. Further the Benefit Cost ratio for the Marginal Farmers is calculated to 2.32 and it is 2.24 and 2.16 for the Small Farmers and Large Farmers respectively. i.e. the profitability of Marginal Farmers is comparatively higher than the Small farmers and which is higher than the Large Farmers.

Table. 5 Problems Faced in the Paddy Cultivation

S.No	Particulars	Mean Score	Rank
1	Irrigation Problem	63.18	I
2	Non Remunerative Price	59.62	II
3	Shortage of Power	56.13	III
4	Poor Quality of Inputs	50.41	IV
5	High Price and Non Availability of Fertilisers	48.43	V
6	Poor Marketing	45.67	VI
7	Middlemen Exploitation	42.41	VII
8	Lack of Credit Crop Production	41.12	VIII
9	Lack of Financial Availability	40.45	IX
10	Scarcity of Labour during Peak Periods	40.27	X

Source : Computed Primary Data.

It is found that nearly two-third of the farmers is facing problems in the paddy cultivation. Among the problems, about 63 % of the farmers are suffering from the problems in the lack of availability of irrigation, more than 50 % of the farmers are suffering from the problems of non remunerative price to paddy, power shortage and inputs availability, quality and price; and more than 40 % of the farmers are facing the problems of fertilizers availability and it prices, poor marketing, middlemen exploitation, problems in the credit and financial availability, and labour shortage during the peak season.

Policy Recommendations and Conclusion

Based on the present micro level empirical study, it is suggested that an integrated approach to the farm planning and farm management is needed to strengthen paddy cultivation in general.

The agricultural productivity, especially paddy productivity coupled with farm and non-farm diversification has to be increased in the study area among the large farmers and the existing technological has to be upgraded and disseminated in this area which in turn increase the paddy productivity and income of farmers.

It is also suggested that the existing infrastructure facilities like irrigation, roads, market etc. has to be improved and new facilities has to be created and the focus may be on paddy cultivation since the study area is located in between Cauvery delta and Kollidam River basin..

It is strongly suggested that a balanced use of organic nutrients, chemical fertilizers, bio-fertilizers and other agro chemicals will ensure sustainability in the paddy cultivation in the study area. Further cropping pattern may be changed according the current needs and availability of inputs and other infrastructures.

It has also been emphasized to adopt superior agricultural technology in respect of crop rotation, selection of quality seeds, use of proper manure, treatment of soil, selection of crops etc. In this regard, Government has initiated Intensive Agricultural Area Programme. Moreover, several Agricultural Research Centers and Universities have also been established. In this regard, Tamil Nadu Agricultural University, Annamalai University, Central University of Tamil Nadu, Jawaharlal Nehru Agricultural Research Institute, Karaikkal in addition a number Higher educational institutions have been functioning around the study district, they can play a productive role in strengthening the paddy cultivation in the study area.



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