



# A Study on Return on Investment among Tenancy and Owner Farmers of Paddy Cultivation in Tirunelveli District

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## Abstract

*The potential Return on Investment (ROI) from Managed Farmland: Returns on managed farmland investments vary based on factors like location, crop selection, and management expertise. In many cases, investors can expect returns in the range of 5 per cent to 10 per cent annually. A performance measure was used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. Return on Investment (ROI) measures the amount of return on an investment relative to the investment's cost. The study reveals that Return on Investment of tenancy and owner farmers of paddy cultivation are highly influenced by the variables land value per acre, human labour, loan outstanding irrigated area, production, yield are proved and valid. The remaining variables such as mechanical cost, seed cost, fertilizer cost and irrigation cost are not influencing the ROI.*

**Key Words:** Return on Investment, Tenancy, Owner and Farmers.

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## Introduction

Paddy is cultivated throughout Tamil Nadu. It is cultivated under diverse conditions and probably nowhere else the crop is cultivated under such situations. The major rivers flowing through Tamil Nadu are the Cauvery, Vaigai and Thaamaraparani. In different types of soil, paddy is being cultivated in Tamilnadu. There are different varieties, diverse agronomic characters and different methods of cultivation as there are different situations and conditions under which paddy is cultivated. It is cultivated in all the districts of the state.

According to the World Bank, agricultural commodities have outperformed global stocks and bonds in the long term, providing an average return of 10% per year over the past 50 years. Diversification: Investing in agriculture provides diversification, which can help reduce the risk of losses. The potential Return on Investment (ROI) from Managed Farmland: Returns on managed farmland investments vary based on factors like location, crop selection, and management expertise. In many cases, investors can expect returns in the range of 5 per cent to 10 per cent annually.



### Statement of the Problem

The return is the total income an investor gets from farmer’s investment every year and is usually quoted as a percentage of the original value of the investment. Usually the investor gets a return on their investment in shares or investment portfolio when they distribute dividends. The study is confined to return on investment among tenancy and owner farmers of paddy cultivation in Palayamkottai block, Tirunelveli district of Tamil Nadu.

### Objectives of the Study

1. To estimate the return on investment on paddy cultivation for two groups of farmers namely tenancy and owner
2. To identify the economics of paddy cultivation in the study area.

### Methodology

Tirunelveli District comprises of 13 blocks, out of which the Palayamkottai block is selected for this study. The field survey was conducted from October 2023 to December 2023 for the collection of primary data. The period of study was confined to a single agricultural year 2022-23, one Kharif season and one Rabi season.

Multistage stratified random sampling technique has been adopted for the study taking Tirunelveli district as the Universe, the block as the stratum, the village as the primary unit and paddy cultivators as the

ultimate unit. From 25 revenue village on this block, five per cent of the paddy cultivators were selected randomly for the study. Hence, a total of 280 sample paddy cultivators were selected.

### Result and Discussion

A performance measure was used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. Return on Investment (ROI) measures the amount of return on an investment relative to the investment’s cost. To calculate ROI, the benefit (or loss) of an investment is divided by the total; cost and the result is expressed as a percentage or a ratio. Return on investment (ROI) is the benefit to an investor resulting from an investment of some resource. A high ROI means the investment gains compare favourably to investment cost. As a performance measure, ROI is used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. In purely economic terms, it is one way of considering profits in relation to capital invested.

$$\text{Return on Investment} = \frac{\text{Profit or Loss}}{\text{Total Cost}} \text{ i.e. } \text{ROI} = \frac{P \text{ or } L}{TC}$$

The following table explains the total cost among the tenancy and owner farmers in paddy cultivation.

**Table: 1 - Cultivation Cost among Tenancy and Owner Farmers in Paddy cultivation**

Farmers Group	N	Mean	SD	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Tenancy	154	21740.60	2985.65	234.55	20865.56	24622.35	18954.50	34850.60
Owner	126	20885.49	2459.67	236.87	18569.84	22458.79	18650.50	25950.50
Total	280	20901.82	2610.23	190.68	19684.50	21985.56	18500.00	23650.40

### ANOVA – Total Cost

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63504540.13	19	3342344.22	13.760	0.000
Within Groups	63398518.87	261	242906.20		
Total	126903059	280			

Source: Survey data.



Analysis of variance was used to understand the cultivation costs variation between the farmers of paddy cultivation among different land groups. It was proved through the ANOVA test that the cultivation cost has varied among the tenancy and owner farmers of paddy cultivation. The result implies that the tenancy farmers paddy cultivation cost is more than the owner farmers paddy cultivation cost. Thus the ANOVA results suggest that there is a significant difference between the tenancy and owner farmers with respect to paddy cultivation cost.

**Table: 2 – Return on Investment among Tenancy and Owner Farmers in Paddy cultivation**

Farmers Group	Statistics	Total Income	Total Cost	Profit	Return on Investment
Tenancy	Mean	33096.00	21740.60	11355.40	0.52
	SD	3346.58	3055.67	2648.98	0.87
	N	154	154	154	154
Owner	Mean	32154.40	20885.49	11268.91	0.54
	SD	2865.22	2557.49	2214.65	0.87
	N	126	126	126	126
Total	Mean	32045.60	20901.82	11143.78	0.53
	SD	2965.77	2867.15	2565.45	0.89
	N	280	280	280	280

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Source: Survey data.

Table 2 represents that Return on Investment from tenancy farmers and owner farmers paddy cultivation for the year 2019. The paddy cultivation of the tenancy farmers earned agricultural income of ₹33,096, cost of cultivation is ₹21,740.60 and profit of paddy cultivation ₹11,355.40 and Return on Investment ₹0.52. Paddy cultivation of the owner farmers earned agricultural income ₹32,154.40, cost of cultivation is ₹20,885.40 and the profit of paddy cultivation is ₹11,268.91 and Return on Investment is 0.54.

The total respondents of the paddy cultivation farmers earned agricultural income of ₹32,045.60, the cost of cultivation is ₹20,901.82 and profit of paddy cultivation ₹11,143.78 and Return on Investment 0.53 per acre / per year.

From the table it was found that the overall total return on investment from all the land holders cultivating paddy was around 0.53 per acre / per year. Return on investment for the tenancy farmers who are

cultivating paddy was around 0.51 and the return on investment for the owner farmers who are cultivating paddy was around 0.54. From the table it was observed that the return on investment from paddy cultivation was high in the owner farmers and it was low in the tenancy farmers in the study area.

The rate of returns per rupee of investment was ₹ 0.52, ₹0.54 and ₹0.53 on tenancy, owner and pooled (Total) farms respectively, which showed that paddy cultivation, is more profitable on owner farms compared to tenancy farms.

Analysis of variance was used to understand the return on investment variation between paddy cultivation among the tenancy and owner farmers. It was proved through ANOVA test that the return on investment has been varied among the tenancy and owner farmers. Specially Duncan test was applied to test these differences and the results are given in the following tables.

**Table: 3 – One-Way ANOVA for Return on Investment**

N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		



Tenancy Farmers	154	0.52	0.108	0.009	0.486	0.557	0.31	0.83
Owner Farmers	126	0.54	0.647	0.005	0.616	0.619	0.48	0.82
Total	280	0.53	0.118	0.006	0.503	0.512	0.35	0.84

### ANOVA – ROI

	Sum Squares	df	Mean Square	F	Sig.
Between Groups	3.685	74	0.050	2.487	0.000
Within Groups	4.124	206	0.020		
Total	7.809	280			

### Duncan Test – Return on Investment per Year

Farmers Groups	N	Subset for alpha = .05	
		1	2
Tenancy	154	0.584	
Owner	126		0.612
Sig.		0.062	0.074

Means for groups in homogenous subsets are displayed.

- Uses Harmonic Mean Sample Size = 140.23
- The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Duncan test was grouped into two categories, the tenancy farmers and the owner farmers. It remains as a separate group and the rate of investment are high. The result implies that the return on investment was high for the owner farmers than the tenancy farmers. Thus ANOVA results suggest that there is significant difference between the tenancy and owner farmers of paddy cultivation with respect to return on investment.

### Economic Efficiency of Paddy Cultivation

Paddy is an important crop in India, earning foreign exchange through its trade. Thanjavur is hub of cultivation of paddy especially for different varieties of paddy cultivation. Paddy is produced in and around the neighboring district of Thanjavur where black soil is available. Paddy has been adopted for making profitability in agricultural sector by controlling pest and disease. In addition, the average cost has reduced comparing the paddy farming of owner farmers. This will considerably reduce the cost of production of tenancy farmers of paddy cultivation, which is

an important group in paddy cultivation. In order to realize the set of objectives, data from such relationship between paddy cultivation of tenancy and owner farmers were collected.

The present part analysis revealed that the cause and effect relationship between the tenancy and owner farmers with respect to Return on Investment. The measurements of the ROI between the tenancy and owner farmers have the matter of concern to understand the economic efficiency. The linear regression model was used to estimate the determinants of ROI of paddy cultivation. The parameters such as ROI has been compared between the tenancy and owner farmers of the analysis. The ROI function describe the technical relationship and transforms independent factors into dependent factors and there by provides information about causal relationship. A mathematician defines the function as a rule for assigning to each value in one set of variables (the domain of the function) a single value in another set of variable (in the range of the function). In this function, variations in



the independent variables cause variations in the dependent variables (ROI of the tenancy and owner farmers).

**Determinants of ROI of Tenancy and Owner Farmers**

Theoretically a large number of independent variables are determining the dependent variable like the Return on Investment (ROI). The list of independent variables such as family years of education, land value, irrigated area, production, yield, loan outstanding. no. of spray for pesticide, mandays used for pesticides spray, different cost like seed cost, hiring cost of tractor, fertilizer cost, cost of water, transaction cost, land processing cost, operational maintenance cost and harvesting cost. It may not be necessary that all the independent variables shall have its influence in all the dependent variable uniformly. A certain set of variable may be dominant in particular parameters, while certain other is more influencing in other parameters. This can be the hypothetical situation as to which type of

variable exerts its influence significantly as the determinant factor is a matter to be taken for hypothesis testing.

Land value, irrigated area, production, yield, cost of water, land processing cost, operational maintenance cost, loan outstanding, no. of spray for pesticide, mandays used for pesticides spray, gestation period and harvesting cost are the key determinants of return on investment of tenancy and owner farmers of paddy cultivation of farming efficiency.

The charge number of variables has been identified. The variables such as Land value, irrigated area, production, yield, irrigation cost, seed cost, loan outstanding, human labour, mechanical cost and fertilizer cost were chosen these which exhibit a high percentage of correlation for running the regression against Return on Investment of paddy cultivation of tenancy and marginal farmers. The regression analysis brings forth the following results.

**Function: ROI of Tenancy Farmers in Paddy Cultivation**

$$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + e$$

where,

Y = Return on Investment of paddy cultivation of tenancy farmers, a = Constant, X<sub>1</sub> = Land Value per acre in lakhs, X<sub>2</sub> = Irrigated Area, X<sub>3</sub>= Production, X<sub>4</sub>= Yield, X<sub>5</sub> = Irrigation Cost, X<sub>6</sub> = Seed Cost, X<sub>7</sub> = Loan Outstanding, X<sub>8</sub> = Human Labour, X<sub>9</sub> = Mechanical Cost, X<sub>10</sub>=Fertilizer Cost and e = Error

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Table 4. reveals that out of the ten variables, seven variables like land value per acre in lakhs, irrigated area, production, yield, irrigation cost, loan outstanding and human labour are positively related with return on investment at 1% level of significance. The mechanical cost, seed cost and fertilizer cost are negatively related to 1% level of significance. The R square value is 0.524. This shows that 452.40 per cent of the variances are explained by these independent variables on return on investment of paddy cultivation and F ratio (14.358 is significantly showed the variations.

**Table: 4- The Determinants of Return on Investment of Paddy Cultivation on Tenancy Farmers**

Dependent Variable Independent Variables	Return on Investment		
	Coefficients	t Value	Sig.
Constant	5.265	1.846	0.001
Loan Outstanding	-0.168	-2.336	0.006
Human Labour	0.621	1.894	0.011
Land Value	0.169	5.235	0.000
Irrigated Area	0.734	2.612	0.005



Mechanical Cost	-0.158	-2.421	0.012
Irrigation Cost	0.362	3.145	0.001
Seeds Cost	-0.134	-1.724	0.004
Production	0.098	4.845	0.002
Fertilizer Cost	-0.106	-1.587	0.039
Yield	0.065	3.743	0.003
Multiple R	0.687		
R Square	0.524		
Adjusted R Square	0.427		
Std. Error	19.090		
F Ratio	14.358		0.000
No. of Respondnets	154		

Source: Survey data.

To understand the implications of the results a detailed discussion is necessary in the case of positive coefficient of land value per acre was found with rate on investment of paddy cultivation followed by production, yield, irrigation cost, irrigated area and human labour. According to Ricardo cross section model, the agricultural land values are determined by 'marginal productivity of land'. It is obviously stated that high marginal productivity land always have high land value. This implies that the return on investment goes up when there is high land value. In other words, higher the land values higher the return on investment respectively.

The variables such as loan outstanding, mechanical cost, seed cost and

**Function: ROI of Owner Farmers in Paddy Cultivation**

$$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + e$$

where,

Y = Return on Investment of paddy cultivation of owner farmers, a = Constant, X<sub>1</sub> = Land Value per acre in lakhs, X<sub>2</sub> = Irrigated Area, X<sub>3</sub> = Production, X<sub>4</sub> = Yield, X<sub>5</sub> = Irrigation Cost, X<sub>6</sub> = Seed Cost, X<sub>7</sub> = Loan Outstanding, X<sub>8</sub> = Human Labour, X<sub>9</sub> = Mechanical Cost, X<sub>10</sub> = Fertilizer Cost and e = Error

fertilizer cost are negatively related with ROI of paddy cultivation in tenancy cultivators. Besides the field survey witnessed that loan outstanding, mechanical cost, seed cost and fertilizer vs lue are increased the results return on investment to decline.

In order to analyse the determination the dependent variable in the case of ROI of the owner paddy cultivators, forthcoming linear model was applied. While the independent variables included land value per acre, irrigated area, production, yield, irrigation cost, seed cost, loan outstanding, human labour, mechanical cost and fertilizer cost are included in this model to express the causal relationship between independents with dependent.

**Table: 5 - The Determinants of Return on Investment of Paddy Cultivation on Owner Farmers**

Dependent Variable / Independent Variables	Return on Investment		
	Coefficients	t Value	Sig.
Constant	6.985	1.265	0.000
Loan Outstanding	0.197	3.132	0.001
Human Labour	0.687	2.287	0.001
Land Value	0.132	1.816	0.006



Irrigated Area	0.868	3.201	0.007
Mechanical Cost	0.187	2.957	0.211
Irrigation Cost	0.214	3.089	0.614
Seed Cost	-0.194	-2.147	0.011
Production	0.087	0.188	0.000
Fertilizer Cost	-0.093	-1.346	0.002
Yield	0.068	0.587	0.000
Multiple R	0.722		
R Square	0.521		0.000
Adjusted R Square	0.411		
Std. Error	19.264		
F Ratio	16.045		0.000
No. of Respondnets	126		

Source: Survey data.

Out of the 10 variables only eight variables turned out to statistically significantly they include land value per acre, irrigated area, production, yield, irrigation cost, seed cost, fertilizer cost and human labour and rest of them are not significant with the dependent variables which have highly exhibited the correlation with ROI of owner farmers. Out of the six independent variables, two of them are negatively significant with ROI of owner farmers. The 'r' square was 0.521 and F ratio 16.045 was significant one. It shows that 52.10 per cent of the variations were explained by these independent variables on ROI of the owner paddy cultivators and F ratio has significantly shown the variation. The implications are interesting as land value per acre, irrigated area, production, yield, irrigation cost and human labour increases the ROI of owner farmers also increases. In regard to seed cost and fertilizer value variables are turned to negative with owner farmers in paddy cultivation. It implies that higher the seed and fertilizer cost lower the ROI of the owner farmers in paddy cultivation.

The other variables such as mechanical cost and irrigation cost were not statistically significant in relation to ROI. However, these two independent variables highly exhibited positively or negatively correlation with ROI of the owner farmers in paddy cultivation.

Therefore, the hypothesis that "Return on Investment of tenancy and owner

farmers of paddy cultivation are highly influenced by the variables land value per acre, human labour, loan outstanding irrigated area, production, yield are proved and valid. The remaining variables such as mechanical cost, seed cost, fertilizer cost and irrigation cost are not influencing the ROI and it is disproved and invalid.

#### Conclusion

A performance measure was used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. Return on Investment (ROI) measures the amount of return on an investment relative to the investment's cost. The study reveals that Return on Investment of tenancy and owner farmers of paddy cultivation are highly influenced by the variables land value per acre, human labour, loan outstanding irrigated area, production, yield are proved and valid. The remaining variables such as mechanical cost, seed cost, fertilizer cost and irrigation cost are not influencing the ROI

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