

Traditional paddy cultivation in the coastal villages of Nagapattinam District: An economic analysis

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Abstract

Traditional paddy and other varieties are frequently farmed by small-scale farmers and triable persons in distant locations because to its strong medicinal potential. Up till 1970, India had almost one lakh different varieties. There are currently only 6000 species of varieties left. All over Tamil Nadu, a number of NGOs and other organisations promoted traditional paddy cultivation. 42000 acres of traditional paddy are cultivated in Tamil Nadu's delta region. Specifically, for two decades, the Nagapattinam district was chosen with the intention for traditional paddy production. For this investigation, a snowball sampling technique was used. Six villages have been selected for the Nagapattinam district's Vedharanyam block. Each village had ten samples taken, for a total of 60 samples. The study's cultivation costs and garret ranking method. 12.4 quintals are the average yield from the study area, and farmers made a net revenue of Rs. 18252.15. Pests and diseases, lower returns, limited farming practices, a delay in processing certifying requests, and a lack of organic inputs are the main issues.

Key words : Traditional Paddy, Problems, Organic Inputs.

Traditional paddy varieties (TPVs) have long provided for the economic, cultural, ecological, and nutritional needs of the surrounding communities⁷ and also more environmentally and with stand the effects of climatic changes, included drought and floods²⁴. In historical records, where rice was described as a plant with medicinal qualities

capable of treating a variety of ailments and essential for life support, India's diversity of rice varieties have always received special attention²¹. Indian tribal people and small producers still grow more paddy varieties in rural areas where access to modern farming technology, enough food, and healthcare is a pipe dream¹⁹. In terms of both contemporary

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and traditional ideas, India is home to even more rice types with therapeutic qualities that satisfy the conditions of healthy food¹.

The Green revolution creates a sustainable food supply only high yielding and other short varieties, which lead to loss of its rich diversified rice varieties. The introduction of high yielding varieties paved the way for less and less area of traditional variety cultivation. Before 1970, India possessed around 1,10,000 different varieties of rice, but the green revolution's concentration on monoculture and hybrid crops has resulted in the loss of this diversity for future generations⁴. This is because individuals have forgotten approximately decades of conventional variety farming.

However, the recessions were responsible for a decline in the traditional because because of its poor yield, prolonged duration, and lengthy cooking times. There are currently only 6,000 species or varieties of rice left. The country's rich diversity being destroyed contributes to the green revolution²⁶.

The state Tamil Nadu has its own history on practicing the agricultural operation since ancient period, they categorized the land type based on geographical climatic and cultural aspects viz, Kurinchi (Hill), Mullai (Forest), Marutham (Farm land), Neithal (Sea), and Pallai (Sandy land). Each type of land is used to grow a different type of crop. Now, traditional paddy varieties are being grown in an area that is greater than 186 thousand acres across the state of Tamil Nadu. The delta region is responsible for cultivating 42,000 of those total acres. Traditional paddy cultivation in Tamil Nadu receives a significant boost from

the contributions of small-scale farmers. Different districts, particularly Cuddalore, Thiruvarur, Mayiladuthurai, Nagapattinam, Thanjavur, Kancheepuram, Krishnagiri, Tirunelveli, Dindigul, and Trichy, are known for cultivating traditional paddy varieties. The various nongovernmental organisations (NGOs), Farmer Producer Organizations (FPO) and other institutions, leading farmers provide for seed banks and other cultural activities for among districts (Dt Next, 2018). The ancient Tamils' dexterity in naming different landraces and varieties of traditional rice (Nature mils). Sathya (2014) identified that the traditional varieties are categories based on colour (40), size (24), shape (24), season (24), appearance (99), and honoring popular warriors kings, and heroes (65), and based on aroma (5).

The cultivation of traditional varieties in Tamil Nadu was first begun in the twentieth century by a number of different groups in response to the demand for them for medical purposes and the preservation of local seeds. According to Nammazhvar, an expert in organic farming, there were once more than 400 traditional varieties of paddy in fashion in Tamil Nadu. Jayaraman, who is considered to be one of the most prominent farmers in the Nagapattinam and Thiruvarur districts, is responsible for collecting more than 300 traditional varieties of paddy and supplying seed banks for these districts. Traditional rice varieties have a number of advantages, including nutrient benefits, medicinal value, and climate-resilient monetary help for farmers. Traditional red rice was discovered to have health benefits in terms of nutrition as well as several medical uses for some of the traditional varieties^{2,15,22}. Certain kinds have unique

qualities with a significant value on the market²³. In our people's sociocultural existence, rice is essential. Several rice varieties are preferred by various parts of the nation, and farmers have knowledge of their varieties, both nutritional and ecological needs, characteristics, and peculiarities. Huge genetic resource to draw on in the event of a disaster like a tsunami; the tsunami-affected areas in December 2004 could only support a few traditional varieties, which saved the farmers' crops⁵. Policy must be responsive enough to satisfy farmers' requirements and conserve traditional varieties; profit and demand should not take priority over healthy ingredients.

Small farmers who grow rice for their own families and to meet the small-scale needs of target groups often use traditional farming methods. In the last 3–5 years, demand and prices for traditional rice varieties and organic foods have been going up (Prasanth Kumari, 2016). Traditional rice varieties and organic foods have better market potential than traditional paddy varieties^{6,10}. India also has the potential for growing more popular, as long as enough is made to meet the needs of the target market. Before the covid pandemic and after it, people had a high demands for traditional rice. This changed after the covid time, when people had different health and nutrition needs. As more people want to eat food that is healthy and good for the environment, there are more chances for speciality rice that deserves organic fair-trade labels. One important thing that farmers should do is market their produce directly to consumers and other enterprises. Farmer groups market their products together to meet demand at the national as well as global levels.

The Nagapattinam district of Tamil Nadu is 50% influenced by the Bay of Bengal, the source of all cyclones. The Nagapattinam district was seriously damaged by the tsunami during 2004, and seawater entered the agricultural land. On November 10, 2018, the Gaja cyclone significantly damaged homes and caused financial loss. Combat soil salinity and a lack of irrigation water over time; salinity has increased as a result of the entry of seawater. So, one of the goals of the research is to evaluate the economics of traditional paddy farming and the value of traditional paddy, while also identifying local varieties and unique qualities in coastal villages. The district of Nagapattinam was selected as the universe. For the study, a snowball sampling technique was used. The Vedharanyam block was chosen in the second stage. At the third stage, when the traditional paddy was cultivated, villages such as Periyakuthagai, Nalluvethapathy, Pushpavanam, Maliyadipattu, Thethakudi, and Thopputhrai were chosen. A sample size of 60 was calculated by choosing 10 samples from each village. The study period was from November to December 2021, and the sample respondents' answers were randomly chosen to gather information on socioeconomic characteristics, cultivation costs, and the techniques used in traditional paddy cultivation.

Objectives :

1. To learn about the situation of traditional paddy in Nagapattinam district
2. To estimate to cost of traditional paddy cultivation in the study area
3. To examine issues with traditional paddy farmers in the study area.

Tools of Analysis :**Descriptive analysis :**

Descriptive statistics and simple percentage analysis are used for the sample characteristics like age, education, family size, educational level, income level, occupational pattern, income, expenditure pattern, and asset position.

Cost of cultivation :

The cost of cultivation of a commodity is the total cost incurred on various inputs that are used in the production of the commodity

Cost A1 – It includes all actual expenses in cash and kind in production by the owner farmer given below: Wages of hired human labour, hired bullock labour, machine labour, owned and hired, bullock labour, machinery, hired machinery, cost of seed (a) farm produced & (b) purchased, organic insecticides and pesticides, manure (owned and purchased), organic fertilizers, Depreciation of implements and machinery, irrigation charges, land revenue, interest in working capital and misc. expenses (artisans etc.).

Cost A1 = All actual expenses in cash and kind incurred in production.

Cost A2 = Cost A1+ Rent paid for leased in land

Cost B1 = Cost A1+ Interest on value of owned capital assets

Cost B2 = Cost B1+ Rental value of owned land and rent paid for leased in land

Cost C1 = Cost B1+Imputed value of family labour

Cost C2 = Cost B2+Imputed value of family labour

Cost C3 = Cost C2+10% of Cost C2 on account

(Source: eands.dacnet.nic.in)**Garrett's ranking technique**

Garrett's ranking technique was used to analyze the constraints faced by the farmers in the commodities value chain. The study of constraints faced by the farmers is an important aspect of research from a policy point of view. The respondents were asked to rank (in the order of severity) the constraints, and these ranks were converted into scores by referring to Garrett's Table. The order of the merit given by the respondents was changed into ranks by using the following formula (4).

$$\text{Per cent position} = 100 (R_{ij} - 0.50) / N_j$$

Where,

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

N_j = Number of items ranked by j th individual.

The per cent position of each rank was converted into scores by referring to tables given by Garret and Woodworth⁹. Then for each factor, the scores of individual respondents were summed up and divided by the total number of respondents for whom scores were gathered. The mean scores for all the factors were ranked, following the decision criterion that lower the value; the more serious is the constraint to farmers.

The collected data is analyzed and presented in the following Tables.

Socio-economic characteristics of the study area :

Socioeconomic characteristics, which include gender, age distribution, education level, job pattern, income distribution, and details of landholding, are indicators of sample respondents in the study area (Table-1).

Table-1. Socio-economic characters of sample respondents

Sl.no	Particulars	No of the sample respondents	Per cent
1	Gender		
i)	Male	51	85.00
ii)	Female	09	15.00
2	Age		
i)	20 to 35	11	18.33
ii)	36 to 50	17	28.33
iii)	Above 51	32	53.33
3	Household size		
i)	Less than 4	21	35.00
ii)	05 to 07	27	45.00
iii)	More than 08	12	20.00
4	Education		
i)	Primary	18	30.00
ii)	Secondary	11	18.33
iii)	Higher Secondary	09	15.00
iv)	Degree	07	11.67
v)	No Education	15	25.00
5	Occupation		
i)	Agriculture	35	58.33
ii)	Secondary	19	31.67
iii)	Service	06	10.00
6	Average Income		
i)	10000 to 25000	13	21.67
ii)	25001 to 50000	36	60.00
iii)	More than 50001	11	18.33
7	Landholding		
i)	Marginal	21	35.00
ii)	Small	14	23.33
iii)	Semi Medium	11	18.33
iv)	Medium	08	13.33
v)	Large	06	10.00

* Average 60 sample respondents

Males predominate by around 85% of the research area's 60 total sample responses. 53.33 per cent of the respondents, who were divided into several age groups, are over the age of 51. This is followed by the age groups of 36 to 50 (28.33 per cent) and 20 to 35 (18.33 per cent). The sample respondents' average household size is the largest, with 5-7 members at 45%. It is followed by the categories with four or less members (35%), and eight or more members (40%). (20 per cent). Understanding newly introduced technologies requires education. Primary education makes up 30% of the study area's educational attainment, whereas illiteracy makes up the largest percentage of educational

attainment (25%). This shows that the sample respondents only hesitantly adopt the novel technologies. Small farmers (25.33%) and marginal farmers (35%) hold the majority of the landholding.

According to Table-2, those varieties are cultivated among the sample of respondents who are from coastal regions in the Nagapattinam districts. Popular varieties including Karuppukowni, Neelan samba, Mappilai samba, Kuzhiadichan, and Thooyamalli.

Organic inputs usage level among sample farmers :

Table-2. Cultivation of traditional paddy among the sample farmers

Sl. no.	Name of The Traditional Varieties	No of farmers	Area in (Acre)	Market Price/Kg
1	AnaiKomban	14	8.53	65
2	Arubatham Samba	18	11.56	70-80
3	Kaliyan Samba	27	16.04	70-80
4	Kallurundaikaar	31	28	70-80
5	Garudan Samba	09	4.60	70-80
6	Karuppukowni	41	38	100-150
7	Kattuyanam	28	24.65	90-110
8	Neelan Samba	32	28	70-80
9	Kuzhiadichan	36	38	90
10	Mappilai Samba	33	16	80-120
11	Poompalai	11	07	50-65
12	Puzhithi Samba	17	10.5	70-80
13	Samba Mosanam	14	09	80
14	Thooyamalli	37	28	65
15	Vellai poonkar	24	17	50-80
	Total		284.88 Acre	

Source: Field Survey

Table-3. Owning of organic inputs

Sl. no	Organic Inputs	Preparation by		The average cost of Inputs per kg/ L
		On farm	Off-farm	
1	Green manure(Moth been) (kg)	24	26	80
2	Seed (kg)	48	12	100
3	Azolla in (kg)	53	07	15
4	Fish amino acid in litre	36	24	300
5	FYM (tonne)	46	14	2000
6	Organic insecticide (litre)	29	31	250

Source: Field Survey

Ramanjaneyulu *et al.*,²⁰ found that organic inputs for enhancing soil health and promoting sustainable agriculture in the country, as well as organic inputs for retaining such products locally, are successful. Using organic inputs like Dashparni, Agnistra, and Jeevamrut, Ganvir *et al.*,⁸ will help organic farming fight pests and illnesses and improve plant development. Table-3 summarizes the inputs used on the farm, how they are produced, how much they cost on average, and how to make them manually.

The cost incurred from traditional paddy cultivation :

The cost of cultivation of traditional paddy is described in the table. There are various costs mentioned in the table. Comparing the modern varieties of paddy and traditional paddy, they have different application methods to prepare the field for the end of harvest.

Local farmers in these types of farming systems keep the traditional rice varieties because they know how good they are and how well they adapt to different agro-

ecological situations caused by different seasons and land conditions⁷. Traditional paddy cultivation utilises the moth as green manure when preparing the land. Utilizing green manure costs Rs 400, while ploughing costs Rs 2,000. Levelling the land requires the labour of three workers and costs Rs 1,500. An acre of seed costs Rs 1,000, which is a significant amount of money. In addition, establishing up the nursery and relocating the plants cost approximately 2400 rupees. Azolla is used as the primary fertiliser in the study area, and two-cono weeding is performed. Two to five tonnes of farm manure are also utilised. Each of harvesting and threshing costs Rs 4,000 per acre, more than any other operation. Traditional ways of farming show that they are useful for growing rice at a low cost and with the limited resources of farmers¹.

The cost of cultivation is mentioned in table-5, Cost A₁ is Rs 27808.05 per acre and Cost B₁ for Rs 28648.05 & Cost B₂ is 29898.05 and Cost C₃ for traditional paddy is Rs 35307.85. The average gross income for traditional paddy is Rs 54550.00 and net return obtained from the farm is Rs 19242.15.

Table-4. Expenditure items for traditional paddy cultivation

Cost Per acre					
Sl. No	Particulars	Quantity	Price/ Unit	Total amount	Per cent
I	Input Cost				
1	Green manure (moth been)	5 kg	80	400	5.69
2	Seed Cost	10 kg	100	1000	14.22
3	Azolla	15 kg	30	450	6.40
4	Fish amino acid	300 ml	80	80	1.14
5	Farm Yard Manure	3 tonnes	2500	5000	71.12
6	Organic Insecticide	1	100	100	1.42
	Total Input Cost (1+6)			7030	25.28
II	Labour Cost				
1	Application of Green Manure	1 (W)	200	200	1.04
2	Nursery Preparation	2 (M)	500	1000	5.21
3	Ploughing charges			2000	10.42
4	Land Levelling charges	3 (M)	500	1500	7.81
5	Transplanting charges	7	200	1400	7.29
6	Cono weeding practice charges			3000	15.63
7	Application of fish amino acid	1 (M)	400	400	2.08
8	Application of organic insecticide charges	1 (M)	200	200	1.04
9	Harvesting	8 (M)	500	4000	20.83
10	Threshing	8 (M)	500	4000	20.83
11	Drying straw	3 (M)	500	1500	7.81
	Total Labour Cost (1+11)			19200	69.04
III	Others/ Land Revenue			48	0.17
IV	Interest on Working Capital			1530.05	5.50
	Total Expenditure cost			27808.05	100
	Yield				
1	Yield of Traditional Paddy	12.4	4500	49600	90.93
2	Paddy Straw	45	110	4950	9.07

Source: Field Survey

Table-5. Cost of cultivation for Traditional Paddy

Sl.no	Particulars	Cost (in Rs)
1	Cost A1	27808.05
2	Cost A2	27808.05
	Interest on value of owned capital assets	840.00
3	Cost B1	28648.05
	Rental Value for Owned Land	1250.00
4	Cost B2	29898.05
	Imputed Value for Family Labour	3200.00
5	Cost C1	31848.05
6	Cost C2	32098.05
7	Cost C3 (Total Cost of Cultivation)	35307.85
	Returns	
8	Main Product	49600.00
9	By product	4950.00
	Price Received by farmer per kg	44.00
10	Gross Income	54550.00
11	Net Income	19242.15

Source: Field Survey

Problem faced by farmer producing traditional paddy :

Table-6. Problems in the cultivation of traditional paddy

Sl.No	Problems on Production	Mean Score	Rank
1	Pest & Disease Problem	83.31	I
2	Low Yield	79.17	II
3	Less cultivation practice	69.39	III
4	Delay in certification processing time	61.94	IV
5	Non-Availability of organic inputs	56.03	V
6	Lack of Technical guidance	52.02	VI
7	Non-Availability of labour	47.98	VII
8	Weed Management	40.01	VIII
9	Non-Availability of pure seed materials	36.15	IX
10	Non-Availability of water for irrigation	34.15	X

* Average 60 sample respondents

The study finds that farmers have problems cultivating traditional paddy, which are listed in the table above.¹⁶ Traditional rice varieties are becoming less popular because they are less productive, take a long time to grow, lack a premium price for some varieties, and require considerable time to cook. Pests and diseases are a big problem, so they are first on the list. Low yields are second because farmers no longer grow rice in the traditional way and are now comparing varieties with high yields. The third-ranked factors are less cultivation practice in the region, a smaller area under cultivation, a longer certification period, the lack of organic inputs, and a lack of technical rules, all of which substantially impact the production of traditional paddy.

The study found that the main problem with traditional paddy farming in coastal villages in Nagapattinam District, which was hit by the tsunami and the Gaja cyclone, is that salinity has gotten worse over the past few years. To fight against salinity, the different NGOs work to get people in this village to grow traditional paddy. There are many various types of growing villages. Traditional paddy has been cultivated in different ways and at different costs. C3 found that traditional rice farming in the study area costs Rs 35307.85. Traditional paddy gives an average of 12.4 quintals per hectare, and each quintal sells for Rs 4,500. The total income from the respondents was Rs 54,550. Paddy has been grown for a long time, but farmers have become more involved in the last five years. People are always looking for healthy food that is also good for them. The way rice is grown impacts its nutritional value, and each variety has its own unique trait.

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