

## Study on cultivation and marketing of traditional rice varieties in Thiruvavarur and Nagapattinam districts, Tamil Nadu

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### ABSTRACT

India is endowed exceptionally with a rich biodiversity suited to rice ecosystem. Several varieties are unique to various states and also to ethnic groups. Indigenous varieties are still conserved for a variety of reasons. The present study analyzed the traditional rice cultivation and marketing in Thiruvavarur and Nagapattinam districts of Tamil Nadu. The two districts were selected purposively and 70 farmers were selected randomly from these districts for the study. Mappilai Samba, a leading variety was ranked first followed by Seeraga Samba, Thuyamalli, Sigappukavuni, Karuppukavuni, Poongar, Kuzhiyadichan and Kaivirai. The total cost of cultivation of traditional rice was worked out to be Rs 34235.4 per acre. Gross return realized from one acre of traditional rice grown by sample farmers was Rs 51000 and net return Rs 16764.60. Two types of marketing channels were identified in the study area. Channel I included the NGO-based FPO and channel II the millers and processors as market intermediaries. Price spread analysis was estimated for one ton of rice and the sample farmers received a higher consumer share of rupee (65.48%) in channel I and only 42.02 per cent in channel II. The constraints faced by the farmers in traditional rice production and marketing as per the order of importance were no support from government, absence of crop insurance coverage, duplicate products in market, non-availability of seeds, lack of awareness among consumers, large number of middlemen etc.

**Keywords:** Rice; cost of cultivation; marketing channel; price spread; constraints

### INTRODUCTION

Rice is the world's second most important cereal crop following only corn. Traditional rice varieties have maturity period of 60 to 200 days. India is endowed exceptionally with a rich biodiversity suited to rice ecosystem. Rice plays a central role in the socio-cultural life of our people. People across different parts of the country prefer different rice varieties. Several varieties are unique to states and also to ethnic groups. Farmers have deep knowledge of their own rice varieties, their environmental and nutritional requirements and their properties and peculiarities. Indigenous varieties are still conserved

for a variety of reasons. Hybrid varieties need more water, fertilizers and pesticides. They are not sustainable in coastal regions while traditional rice is adaptable to those conditions. They are rich in iron, protein and vitamin B, have medicinal value and are less input takers. Cultivation of traditional rice varieties followed in certain districts faces problems like low yield to meet the growing demand and less marketing opportunities. Traditional rice marketing has no support from the government even though it has great demand in urban cities from affluent consumers. The present study was conducted to analyze the cultivation aspects, costs involved, marketing channels, value-added products produced and constraints faced by farmers

in production and marketing of traditional rice varieties. The overall objective of the present study was to analyze the cultivation and marketing of traditional rice varieties in Thiruvavarur and Nagapattinam districts of Tamil Nadu.

In a study on marketing channel and marketing efficiency analysis for rice in Nalbari district of Assam (Bidyasagar and Nicra 2017) concluded that handling, assembling, transportation and storage were the stages at which constraints were faced by the farmers in the rice marketing. An empirical study on problems of paddy production and marketing conducted by Vinayagamoorthy and Bharathi (2016) with special reference to Cauvery delta farmers in Tamil Nadu concluded that high labour cost for cultivation of paddy and lack of labour supply prevailed in the study area. According to Nirmala and Muthuraman (2016) in their study on economics and constraint analysis of rice cultivation in Kaithal district of Haryana reported that total costs in rice production amounted to Rs 33778.68/ha. Average yield was 4.99 ton/ha and benefit-cost ratio was worked out to be 1.27. Pests and disease incidence, lack of remunerative price and labour shortage were the major constraints in rice production. Singh et al (2017) enumerated the constraints of paddy farmers in Azamgarh district of eastern Uttar Pradesh and stated that technical problems ranked first (48.13%) followed by management problem (30.09%), agro-climatic problem (15.56%) and miscellaneous problem (5.35%). Devi and Ponnarasi (2009) conducted an economic analysis of modern rice production technology and its adoption behavior in Tamil Nadu and inferred that adoption of SRI technique helped to increase the rice production without increasing the area and proved to serve as an alternative method for rice cultivation.

## METHODOLOGY

Thiruvavarur and Nagapattinam districts of Tamil Nadu were purposively selected as traditional rice cultivation is followed in these two districts only. The agro-climatic condition in Thiruvavarur is suitable for traditional rice farming. In Nagapattinam district traditional rice cultivation is followed under rainfed condition. Purposive sampling technique was used for selection of blocks, villages and farmers in each district for the collection of data. Totally 70 sample respondents were selected out of which 23 farmers belonged to Thiruvavarur and 47 farmers to Nagapattinam district. Cost of cultivation, percentage analysis, price spread

analysis, Likert scaling technique and Garrett's ranking technique were used for analysis of data.

## RESULTS and DISCUSSION

Sample farmers received seed of traditional rice varieties from the NGO, Center for Indian Knowledge System (CIKS) and Create Foundation to the extent of 80 per cent and remaining 20 per cent of the sample farmers practiced own multiplication of seeds. CIKS has developed farmer-producer organization, Vaznadu Urpathiazrgal Sangam to facilitate the traditional rice cultivation and marketing in Thiruvavarur district. Farmers were sowing traditional rice varieties for various reasons. They decided the variety based on duration, market value, medicinal properties, byproduct making etc. In this regard traditional rice cultivating sample farmers did the varietal selection using Garrett's ranking technique. As per Table 1 Mappilai Samba (high carbohydrate content) was the first preferred variety among sample farmers (70.40%). It was followed by a Seeraga Samba (very fine texture) and Thuyamalli variety (soft texture). Varieties Sivappu Kavuni and Karuppu Kavuni were opted by sample farmers for byproduct making scoring fourth and fifth ranks. Poongar, a short duration variety was preferred Kuruvai season variety. Kaivirai Samba was preferred by 31.71 per cent of them.

Table 1. Preference of people for different rice varieties

Traditional rice variety	Garrett score	Rank
Mappilai Samba	70.40	I
Seeraga samba	67.81	II
Thuyamalli	64.80	III
Sivappu Kavuni	52.21	IV
Karuppu Kavuni	46.04	V
Poongar	33.41	VI
Kuliyadichan	32.94	VII
Kaivirai Samba	31.71	VIII

The farmers while disposing off their paddy straw received higher price due to the fact that the traditional paddy straw was lengthier and could be used as roofing material for thatched houses, fodder for animals and for growth medium in mushroom production. Value addition of traditional rice was undertaken by sample farmers and they produced Avul, Appalam and some other traditional snacks. These products were sold by the farmers to the NGO supporting the traditional rice cultivation.

**Economics of traditional rice cultivation**

The cost of cultivation of traditional rice for both nursery and direct sown methods were worked out and the details are given in Tables 2 and 3.

**Cost of cultivation incurred in nursery method**

In Nagapattinam district nursery panning method was followed for cultivation of traditional rice. Under inputs highest cost was incurred on farmyard manure (Rs 2400) followed by seed cost (Rs 1200). The total cost of cultivation of traditional rice was worked out to Rs 34235.40 per acre. Gross return realized from one acre of traditional rice grown by farmers was Rs 51000. Net return realized from one acre of traditional rice was Rs 16764.60.

**Cost of cultivation of direct sowing method**

The total cost of cultivation of traditional rice was worked out to be Rs 30490.40 per acre. Gross

return realized from one acre of traditional rice grown by farmers was Rs 51000. Net return realized from one acre of traditional rice grown by them was Rs 20509.60.

**Sale of traditional rice through different marketing channels**

The selection of marketing channels is imperative for the farmers since the real benefit accrued for them is mainly dependent upon the choice of the agency or the channel for disposal of their produce. The channel selected by them must account for minimum marketing cost and ensure higher share of consumer rupee. The selection of marketing channel depends upon the quantity of marketable surplus available with the farmer with holding capacity of the farmer, price and availability of infrastructural facilities. The following two marketing channels were identified in the study area:

Table 2. Cost of cultivation per acre in nursery method

Operation (variable cost)	Cost (Rs)
<b>Land preparation</b>	
Land preparation hiring/using tractor 2 times for ploughing	2400.00
Labour cost for leveling of corner areas and bund formation after machine work	400.00
<b>Seed and seed sowing</b>	
Cost of seed @ 30 kg seed/acre (Rs 40/kg)	1200.00
Cost of seed treatment with bio-fertilizer (2 kg of <i>Azospirillum</i> /2 kg <i>Phosphobacteria</i> /1 kg of <i>Pseudomonas</i> ) @ Rs 220/acre	220.00
Mat nursery bed preparation by two women labourers (Rs 180/head)	360.00
Transplanting on 25 <sup>th</sup> day by 18 women labourers (Rs 180/head)	3240.00
<b>Manures and fertilizers</b>	
3 tippers of farmyard manure for 1 acre (Rs 800/tipper)	2400.00
3 l of Panchagavya/acre spraying at 40 <sup>th</sup> day after planting (Rs 80/l) with spraying cost of Rs 200/acre	440.00
<b>Inter-cultural operations</b>	
Weeding at 45 <sup>th</sup> day after planting @ 10 women laborers (Rs 200/head)	2000.00
<b>Harvesting</b>	
Mechanical harvesting (Rs 1800/hour/acre)	1800.00
Total variable cost	14460.00
Interest on working capital @ 7%	1012.20
<b>Cost A</b>	<b>15472.20</b>
Fixed cost	
Rental value of owned land	14560.00
Interest on fixed capital @ 12%	1747.20
<b>Cost B</b>	<b>16307.20</b>
<b>Imputed value of family labour per annum (Cost C)</b>	<b>2456.00</b>
Total cost of cultivation Cost A + B + C	34235.40
Cost of 1500 kg produce/acre (Rs 30/kg)	45000.00
Cost of paddy straw/acre	6000.00
Gross return	51000.00
Net return	16764.60

Table 3. Cost of cultivation per acre in direct sowing method

Operations (variable cost)	Cost (Rs)
<b>Land preparation</b>	
Land preparation with tractor for 2 times of ploughing	2400.00
Labour cost for leveling of corner areas and bund formation after machine work	500.00
<b>Seed and seed sowing</b>	
Cost of seed @ 30 kg seed/acre (Rs 40/kg)	1200.00
Cost of seed treatment with bio-fertilizer (2 kg of <i>Azospirillum</i> /2 kg <i>Phosphobacteria</i> /1 kg of <i>Pseudomonas</i> ) @ Rs 220/acre	220.00
<b>Manures and fertilizers</b>	
3 tippers of farmyard manure for 1 acre (Rs 800/tipper)	2400.00
3 l of Panchagavya/acre spraying at 40 <sup>th</sup> day after planting (Rs 80/l) with spraying cost of Rs 200/acre	440.00
<b>Inter-cultural operations</b>	
Weeding at 20 <sup>th</sup> day after planting @ 10 women laborers (Rs 200/head)	2000.00
<b>Harvesting</b>	
Mechanical harvesting (Rs 1800/hour/acre)	1800.00
Total variable cost	10960.00
Interest on working capital @ 7%	767.20
<b>Cost A</b>	<b>11727.20</b>
<b>Fixed cost</b>	
Rental value of owned land	14560.00
Interest on fixed capital @ 12%	1747.20
<b>Cost B</b>	<b>16307.20</b>
<b>Imputed value of family labour (Cost C)</b>	<b>2456.00</b>
Total cost of cultivation (A + B + C)	30490.40
Cost of 1500 kg produce/acre (Rs 30/kg)	45000.00
Cost of paddy straw/acre	6000.00
Gross return	51000.00
Net return	20509.60

**Channel I**

Producer/farmer → Farmers producer organization → Consumer

**Channel II**

Producer/farmer → Miller → Consumer

**Price spread of traditional rice**

After identifying the marketing channels and the quantity transacted in each channel an attempt was made to know the marketing functions performed by different intermediaries and cost incurred in each marketing function such as processing, loading, unloading, weighing, transportation, marketing and other miscellaneous activities. The price spread included marketing cost incurred by various intermediaries and farmers besides the profit margin of intermediaries. The net price received by the farmers was expressed as per cent of the consumer's rupee.

The price spread analysis estimated for one ton of produce (Table 4) indicated that the sample farmer received Rs 25550 and Rs 18700 as gross price from channels I and II respectively. In channel I the non-governmental organizations initiated Vazanadu farmer producer company was involved in procuring traditional paddy from the farmers and hence the farmers received higher price compared to channel II where millers acted as middlemen. The marketing cost incurred was Rs 850 and Rs 1250 in channels I and II respectively. In the next level FPO and millers were involved in channels I and II for processing the paddy into rice. The total marketing cost incurred by the FPO involved transportation, loading/unloading, milling or processing and packaging costs. These were 1.28, 0.51, 13.07 and 1.31 per cent respectively. The total marketing cost was worked out to Rs 6310. The total marketing cost incurred by the miller involved loading/unloading, milling or processing, packaging and

transportation costs. These were 0.67, 11.46, 0.02 and 4.38 per cent respectively. The total marketing cost was worked out to Rs 8200. The marketing margin in channels I and II was Rs 7154 and Rs 17600 respectively. The price received by the FPO and miller was Rs 39014 and Rs 44500 respectively.

The price spread in channels I and II for marketing the traditional rice to the consumer was estimated to 34.51 and 57.97 respectively (Table 5). The farmer received a higher consumer share of rupee (65.48%) in channel I and 42.02 per cent in channel II. This was mainly due to involvement of FPO in channel I and the market intermediaries like miller and processors involved in channel II. Hence it could be inferred that channel I was the better channel for marketing the traditional rice by the farmers.

#### Constraints faced by the farmers in traditional rice cultivation

The major constraints faced by the sample farmers in production and marketing of traditional rice are given in Table 6. The constraints as per the order of importance were no support from government side, no coverage of crop insurance, duplicate products in

market, non-availability of seeds, lack of awareness among consumers, large number of middlemen, poor market information, low demand, lack of availability of FYM, long duration, high labour cost, malpractices in weighing, late payments, large part of produce taken as sample and pest and disease problems.

#### CONCLUSION

The traditional rice varieties are suitable to rainfed, saline and coastal regions and hence could be promoted in those areas though the yield from these varieties is comparatively less. These are tolerant to drought, flood, pests and diseases and also consume less inputs and hence farmers could be encouraged to cultivate these varieties. Traditional rice seed availability for cultivation could be increased through government seed department; awareness and spread among farmers could be improved by extension agencies along with the NGOs; mechanization of various operations in traditional rice cultivation could be encouraged as it saves time and labor. Government support in the form of subsidy in production and marketing will be a boon to the traditional rice cultivating farmers. Research on

Table 4. Price spread (Rs per ton)

Market functionary	Component	Marketing channel	
		I	II
Farmer	Net price	24700 (63.31)	17450 (39.21)
	Marketing cost	850 (2.17)	1250 (2.80)
	Gross price received	25550 (65.48)	18700 (42.02)
Vaznadu Urpathiazrgal Sangam (FPO)	Marketing cost		
	Transportation cost	500 (1.28)	-
	Loading and unloading cost	200 (0.51)	-
	Milling/processing cost	5100 (13.07)	-
	Packaging cost	510 (1.31)	-
	Sub-total	6310 (16.17)	-
	Marketing margin	7154 (18.33)	-
	Price received	39014 (100.00)	-
Miller	Marketing cost		
	Loading and unloading cost	-	300 (0.67)
	Milling/processing cost	-	5100 (11.46)
	Packaging cost	-	850 (0.02)
	Transportation cost	-	1950 (4.38)
	Sub-total	-	8200 (18.43)
	Marketing margin	-	17600 (39.55)
	Price received	-	44500 (100.00)
Consumer		39014 (100.00)	44500 (100.00)

Figures in parentheses indicate the percentages to the price received by consumers

Table 5. Farmer's share in consumer's rupee (Rs per ton)

Component	Marketing channel	
	I	II
Farmer's rupee (F) (selling price) (Rs)	25550	18700
Consumer's price (purchasing price) (Rs)	39014	44500
Farmer's share in consumer's price (%) $(C/F \times 100)$ (%)	65.48	42.02
Price spread (%) $C - F/C \times 100$ (%)	34.51	57.97

Table 6. Constraints faced by the farmers in traditional rice cultivation

Constraint	Mean score	Rank
No support from government side	4.28	I
No coverage of crop insurance	3.00	II
Duplicate products in market	3.68	III
Non-availability of seeds	3.61	IV
Lack of awareness among consumers	3.11	V
Large number of middlemen	2.84	VI
Poor market information	2.75	VII
Low demand	2.61	VIII
Lack of availability of FYM	2.59	IX
Long duration	2.21	X
High labour cost	1.95	XI
Malpractices in weighing	1.84	XII
Late payments	1.68	XIII
Large part of produce taken as sample	1.37	XIV
Pest and disease problem	1.29	XV

improving the yield of traditional rice varieties and protection of endangered varieties are essential. Farmer-producer companies operating in various regions could be encouraged in the traditional rice cultivation in order to increase production and decrease the price spread.

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