STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

By

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(2017-25-001)

THESIS

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for the degree of**

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2022

DECLARATION

DECLARATION

I, hereby declare that the thesis entitled "**Structure, Conduct and Performance of Rice Market in Kerala**" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other university or society.

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CERTIFICATES

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Certified that the thesis entitled **"Structure, Conduct and Performance of Rice Market in Kerala"** is a record of research work done independently by **Ms. Divya Vijayan (2017-25-001)** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

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INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 Introduction

Rice is the staple food of the people of Kerala, and, traditionally, the cultivation of rice has occupied pride of a place in the agrarian economy of the state. The area under rice cultivation in Kerala during the agricultural year 2018-19 is 2,02,907.13 Ha. It has increased by 8,672 .13 Ha than the previous agricultural year 2017-18. There is 4,880.92 Ha dry land rice cultivation in Kerala during 2018-19. Wet land rice area during 2018-19 is 1,98,026.21 Ha. Wet land rice area during 2018-19 has increased by 8,940 Ha (4.73per cent) than the previous agricultural year 2017-18. In comparison with 2001-02 38.57per cent of wet land rice area decreased during 2018-19. Analyzing the area during last 10 years, area under rice cultivation was high during the agricultural year 2009-10 and the area is 2,34,013 Ha. Total area under rice cultivation accounted for 7.89per cent of the total cropped area in the state during 2018-19.There was only a marginal increase in the productivity of rice during the past four decades (Agricultural statistics 2018-19). Rice in their natural, unprocessed state is sometimes referred to as rough or the rice with husk.

The total area under rice cultivation during the year 1961-'62, was 7.53 lakh hectares and in 1975-'76 it was 8.76 lakh hectares. Thereafter a steady decrease in rice cultivation was observed and it reached to 2.29 lakh hectares during the agricultural year 2007-08. But in 2008-09, area of rice cultivation increased to 2.34 lakh hectares. The area of rice cultivation decreased by 76.49 per cent during the year 2018-19 as compared to that of 1975-76. From 2017-18 onwards area of rice is separately considered due to the growing importance of dry land rice cultivation.

The area under rice cultivation in Kerala in 2019-20 was 1.98 lakh ha of which 1.91 lakh ha was wetland rice. The wetland rice over the last ten years

recorded the highest production and productivity of 5.87 lakh tonnes and 3073 kg per ha respectively in 2019-20 which is an increase of 12.3 per cent and 25.3 per cent compared to 2010-11 levels. In 2019-20, the production and productivity of rice increased by 1.52 per cent and 5.24 per cent, respectively, compared to 2018-19. The area under upland rice increased by 46 per cent recording 7129 /ha.

1.1.1 Rice in Kerala

District wise area under rice cultivation and its percentage to total rice area in the state and the percentage of area under rice cultivation to the total cropped area of the state for the agricultural year 2018-19 are shown in the table 1.1.

Table 1.1 District wise details of area and production of rice for the year 2018-19

Sl.No	Districts	Area(ha)	Production (Tonnes)
1.	Thiruvanathapuram	2038.79(1.00)	8072.234(0.89)
2.	Kollam	2134.68(1.05)	7052.998(0.78)
3.	Pathanamthitta	3199.00(1.58)	18243.45(2.02)
4.	Alappuzha	42273.39(20.83)	200875.3(22.23)
5.	Kottayam	22222.89(10.95)	96745.53(10.71)
6.	Ernakulum	688.30(0.34)	2440.625(0.27)
7.	Idukki	5044.14(2.49)	17486.94(1.94)
8.	Thrissur	22131.45(10.91)	108520.7(12.01)
9.	Palakkad	77121.31(38.01)	336382.4(37.23)
10.	Malappuram	8339.63(4.11)	42161.63(4.67)
11.	Kozhikod	2329.09(1.15)	5373.063(0.59)
12.	Wayanad	7761.21(3.83)	34906.83(3.86)
13.	Kannur	5330.31(2.63)	17411.89(1.93)
14.	Kasarkode	2291.05(1.13)	7850.375(0.87)
	KERALA	202905.00	903524

Source: Department of Economics, Kerala state

Note: Figures in parentheses are a percentage of total

Table 1.1 depicts that Alappuzha, Palakkad and Thrissur are prominent among the agrarian districts in Kerala. They are principally recogonised for rice cultivation. Palakkad, Alappuzha, Thrissur, and Kottayam accounted for about 80 per cent of the total area of rice in the State. These Districts contributed 83 per cent of the total rice production in the State. Palakkad district has an area of 77121.31 ha under rice with production of 3.3 lakh tonnes i.e. 28 percent of total area under rice cultivation in the state with one third of the overall production of rice. Although the average rice yield in Kerala is only 2.7 tonnes per hectare, Palakkad, with 12 dams exclusively for irrigating rice fields, produced an average yield of 5 tonnes per hectare. Alappuzha district is also having 42273 ha area under cultivation and second in the rice cultivation in Kerala with a production of 2 lakhs of rice in the year 2018-19.

1.1.2 Rice market in Kerala

Rice market in Kerala can be defined that market for rice produced by farmers in Kerala and the externally sourced rice from other states. The external sourcing of rice was done by the private mills in Kerala for meeting the demand in the state. The farmers in Kerala were mainly depending on the Kerala State Civil Supplies Corporation Limited (SUPPLYCO) for handing over of the produce at the given MSP. Rice will get spoiled if it is not processed, thus procurement and processing are equally crucial. Rice's shelf life is shortened due to its high-water content. The produce should be dried and preserved as soon as possible after harvesting. Because of the heavy nature of the produce, a farmer is forced to sell it right away due to a lack of storage space. As a result, the Indian government intervenes in rice procurement. MSP (Minimum Support Price) is announced from time to time to assist farmers in avoiding distress sales. On behalf of FCI (Food Corporation of India), rice gets procured by SUPPLYCO, through private millers on the basis of tender. On receiving order from SUPPLYCO, mill collects the product from farm gate and process the rice and hand over back to SUPPLYCO. The details of area, production and procurement of rice by SUPPLYCO for the last 10 years are shown in the Table 1.2.

Table 1.2 Area, production and procurement of rice in Kerala

Year	Area (ha)	Average Annual Growth Rate of Area(%)	Production (Tonnes)	Average Annual Growth Rate of Production(%)	Productivity (Kg/ha)	Average Annual Growth Rate of Productivity (%)	Procurement by SUPPLYCO (Tonnes)	Average Annual Growth Rate of Procurement(%)	Share of procurement of rice by SUPPLYCO (per cent)
2010-11	213187	-	816779.7	-	3831.28	-	410937.50		50.31
2011-12	208160	-2.36	889051.6	8.85	4271.00	11.48	587500.00	42.97	66.08
2012-13	197277	-7.46	794217.2	-2.76	4025.90	5.08	375000.00	-8.75	47.22
2013-14	199611	-6.37	881757.8	7.96	4417.38	15.30	535583.84	30.33	60.74
2014-15	198159	-7.05	878268.8	7.53	4432.14	15.68	533318.22	29.78	60.72
2015-16	196870	-7.65	858242.2	5.08	4359.44	13.79	561888.29	36.73	65.47
2016-17	171398	-19.60	682004.7	-16.50	3979.07	3.86	473910.32	15.32	69.49
2017-18	194235	-8.89	814546.9	-0.27	4193.62	9.46	495465.45	20.57	60.83
2018-19	202905	-4.82	863525	5.72	4255.77	11.08	693811.95	68.84	80.35
2019-20	198180	-7.04	903524.4	6.19	4376.37	14.23	739396.69	72.63	81.79

Source: Department of Economics, SUPPLYCO online portal and SUPPLYCO Head office, Kochi

Fig 1.1 Area and production of rice in Kerala

Area and Production of rice in Kerala

(Chart with axes: y-axis "area (ha) and Production (tonnes)", x-axis "year")

Production values (orange): 816779.7, 889051.6, 794217.2, 8?1757?, ?82688?, ?8242?, 2004?, 4546?, ?6352?, ?57309.4

Area values (blue): 213187, 208160, ?9727?, ?9961?, ?9815?, ?9687?, ?71398?, ?9423?, ?02907?, ?9818?

Years: 2010-11, 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20

Legend: area, production
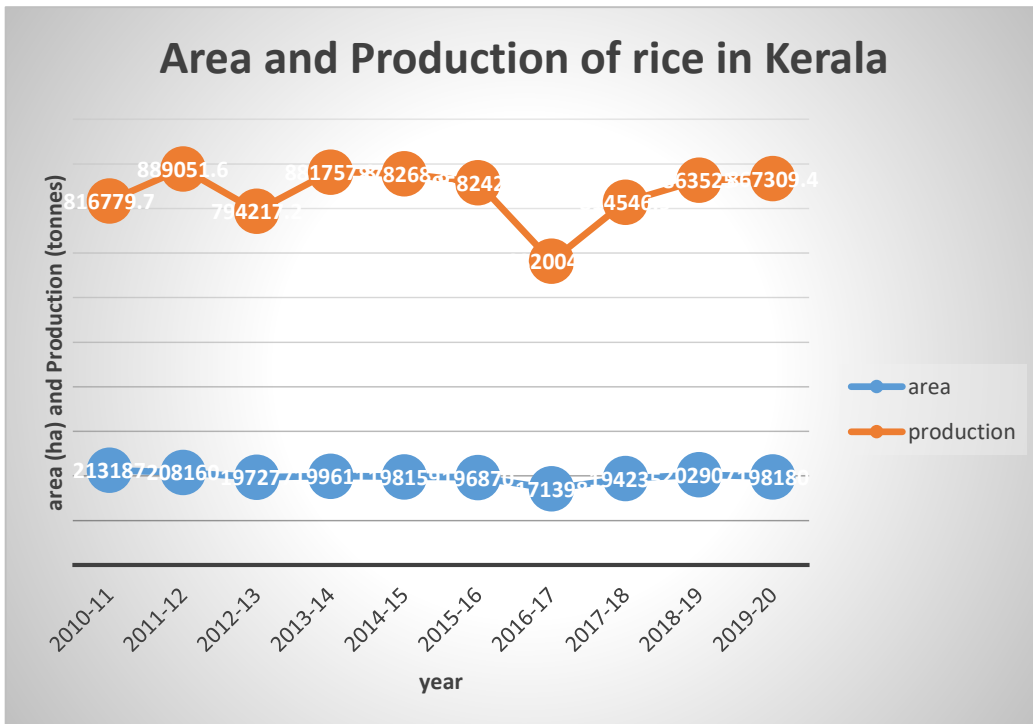
Fig 1.2 Procurement of rice by SUPPLYCO in Kerala

Procurement of rice by SUPPLYCO

(Chart with axes: y-axis "Procurement (Tonnes)", x-axis "Year")

Values: 410937.5, 587500, ?7500, ?5583?, ?3318?, ?01888, ?8910, ?95465?, 698811.9?, 709396.69

Years: 2010-11, 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20

5
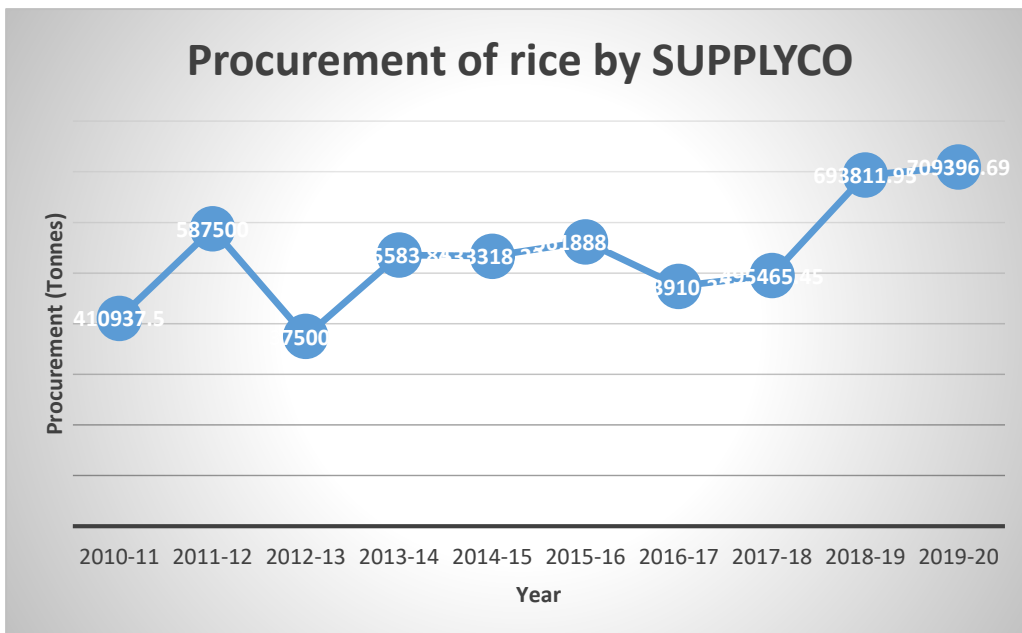
The table 1.2 and fig 1.1 clearly depicts that area of rice cultivation has decreased from 213187 ha in 2010-11 to 198180 in 2019-20. Still the production has increased over the years of reference. Productivity per hectare increased from 3831/ha in the year of 2010-11 to 4376 in 2019-20. The average annual growth rate of area, production and productivity shows a decreasing trend. Farmers were shifting their cultivation from rice to other agricultural or non-agricultural purposes.

Farmers in Kerala were depending on SUPPLYCO for procurement as it ensures assured market and steady income. A tremendous change can be noted in the procurement share of rice by SUPPLYCO from 50 per cent in 2010-11 to 81.79 per cent in the year 2019-20. Major portion of the produce were procured by The Kerala State Civil Supplies Corporation Limited (SUPPLYCO) in 2019-20. The growth rate in the procurement quantity of rice by SUPPLYCO is also increasing over the years. In 2005, the State government entrusted the SUPPLYCO with the job of procuring rice from farmers of Kerala. In the year 2020-2021 total of 252160 farmers were registered under the procurement scheme of SUPPLYCO. 7.54 lakh tonnes of rice were procured from farmers and processed rice of 4.93 lakh tonnes were distributed through Public Distribution System.

1.1.3 Structure-conduct-performance approach

The Structure, Conduct and Performance (SCP) model was first developed by Joe S. Bain. The model explores the relationship between market structure, conduct and performance and the effects of internal and external factors on all three. The market structure refers to the way the market is organized in terms of the concentration or market share of firms. It will determine conduct and performance of market. Market conduct refers to pattern of behavior of farmers and channel players in the rice market especially in relation to price setting policies, policies related to quality, competition and the way in which they coordinate their decisions. Market performance is the economic result of the rice market pursued by a particular line of conduct in terms of efficiency and

profitability (Bain, 2016). SCP model can identify the imperfections in the performance of rice market and the reasons for the failures.

1.2 Statement of the problem

Kerala is deficit in rice production and the demand- supply gap for rice in the market, which was around 45 percent in the year 1957, increased to more than 85 percent in 2009 due to the large scale decline in area (Leenakumari, 2010). A study by Athira (2017) also shows that rice produced in the state meets only 15 percent of the total consumption requirement. Therefore, the flow of rice from Andhra Pradesh, West Bengal, Tamilnadu and Karnataka has increased in order to meet the consumption needs. In spite of this, area under cultivation for rice has increasingly been converted either to cultivation of other crops or for non-agricultural purposes. This is mainly due to the relatively low profitability, the existence of large number of intermediaries, frequent fluctuations in price and other marketing constraints faced by farmers in rice market.

The existing structure of rice market in Kerala lack in efficiency mainly because of many intermediaries existing between the farmer and the rice processing company or the other end customers of rice, resulting in greater complexity, lower efficiency, reduced margin and increased cost of the rice production. A traditionally followed basic structure of rice market in Kerala generally follows the multi stage value chain system including farmers as the basic supplier of rice, middlemen or agents, government procurement agencies, rice processing industries, distribution agents etc as the interlinked upstream and downstream stages (Lisha, 2018).

After reviewing the relevant literatures it was found that there are few studies in India focused on the structure, conduct and performance of rice market. But in Kerala such studies are very limited and the existing studies have focused on production, productivity and marketing problems. In this situation an in-depth study of Structure, Conduct and Performance (SCP) of rice market is much significant. SCP analysis may provide a better understanding of the type of market structure, the participants and the overall performance of the rice market. The

findings of this study can also help to frame policies in order to reduce the price spread and to improve the margin for rice farmers.

1.3 Objectives of the Study

To analyse the structure and conduct of rice market in Kerala and to assess its performance as well as to identify the constraints faced by rice farmers and traders in rice market.

1.4 Scope of the study

The current study mainly focused on analysing structure and conduct of rice market in Kerala and to assess its performance as well as to identify the constraints faced by farmers and traders in rice market in Kerala. It will help the farmers and traders in the rice market to understand their role in the system and how to improve the particular system for better performance in the rice market in Kerala. SCP analysis of rice market in Kerala provides a better understanding of the type of market structure, the participants and the overall performance of the rice market. The identification of constraints of farmers and traders may help the government to frame policies on formulating various schemes which are favourable to farmers and traders in the rice market. By those policies more farmers may get attracted to rice cultivation and also the existing farmers can stick on to their cultivation.

1.5 Limitations of the study

Major limitations of the research work were as follows.

1. Even though the presence of few wholesalers were noted in the structure of rice market, only one wholesaler shared the related information.
2. Due to the pandemic situation created by Covid-19, availability of sample respondents of millers and agents were very less and collection of data were difficult.
3. The opinion of private traders may be biased and the accuracy of data were doubtful.

1.6 Organisation of the thesis

The report of the study has been presented in five chapters. The first chapter narrates the design of the study encompassing significance, statement of the problem, objectives, scope and limitations of the study and organisation of the thesis. The second chapter presents the review of available literature covering various aspects of the study. The third chapter explains the methodology and data sources adopted in conducting the study. The fourth chapter is reserved for the results and discussion of the study. The last chapter highlights the summary of findings, conclusions and the recommended strategies to improve the structure, conduct and performance of the rice market followed by references and abstract of the thesis.

REVIEW OF LITERATURE

CHAPTER 2

REVIEW OF LITERATURE

Review of literature is the inseparable component of all scientific investigations which would enable the researcher to understand the research gap and justify the study. Hence any research begins with an enquiry into the studies already conducted in and the related field of study. This chapter discusses the available literature relating to structure conduct and performance as well as constraints of farmers and traders in market so as to develop and establish a theoretical framework for the study, based on ideas and concepts expressed by various authors and researchers. The studies reviewed have been classified under five heads taking into consideration the main objectives of the study and presented below.

2.1 Rice production and marketing in world

2.2 Rice production and marketing in India

2.3 Structure, Conduct and Performance of markets

2.4 Constraints of agriculture markets

2.5 Constraints of Rice markets

2.1 Rice production and marketing in world

Brown and Celine (2001) have attempted to study about international rice market. Based on the secondary data, the study reached the results that rice prices have drastically fallen over the last 15 years with no significant increase in yields to compensate. Rice production in the US, Europe, and Australia highly undertaken farms and is highly mechanised. Relatively few large producers, with large farms of over 400 hectares dominated the US rice sector. In underdeveloped countries, growing rice by no means assures one of having enough to eat, as rice farmers can also be net food buyers. In Thailand, where rice is generous, a significant number of rice farmers and their families suffer from malnutrition.

Price stabilisation policies should be implemented by an internationally financed rice reserve which would moderate the extreme fluctuations that characterise the global rice market.

DucHai (2003) studies the organization of the Liberalized rice market in Vietnam. The result showed that the major rice market places in Vietnam were competitive. That is (1) no barriers to entry have existed; (2) there is no concentration of market shares in the hands of private companies; (3) product differentiation is the least discussing issue; (4) information is accessible for traders. However, in the case of large-scale millers, important barriers to entry were access to capital, an unstable output market, and proper milling technology.

"The Rice chain study in farmers' community in North Sumatra/Indonesia" a study by Harahep (2004), showed that rice distribution was one factor that determines the supply of riceatthe consumer level. The main actors in conventional rice chains were the capital owner both in village level (small rice chain owner, and paddy retailer) and in outside village level (whole seller and big rice mill owner). These owners controlling the chains implement strategies such as a) giving credit to peasant for production and even living cost, and (b) developing human relationship with peasant. Within these strategies, the owner of chain structurally, made peasant in a high dependency to them.

Feizabadi (2010) studied about rice marketing in Iran. The paper aimed to calculate rice marketing margin, market efficiency and marketing cost coefficient in seaside Mazandaran province over the period 2000- 2010. Secondary data were used for the analysis. Results showed that firstly HYV`s wholesale marketing margin is less than local varieties in 2000 while this trend is reversed in 2010. Secondly, retail marketing margin, total marketing margin, market efficiency and cost marketing coefficient for local varieties are all greater than of HYV. As a result, agricultural cooperative`s supportmay lead to decrease in rice marketing margin and role of traders and increase of rice farmers earnings.

Giraud (2013) was conducted a study on "The World Market of Fragrant Rice, Main Issues and Perspectives". A meta-analysis of data issued from published reports was collected and placed within ainclusive literature review

focused on fragrant rice. The study found that fragrant rice production was mainly dependent upon trade policy. In India, where inhabitants are fragrant rice eaters, rice cultivation is deeply related with respect to food sovereignty. Hence food policy may take the lead. In Pakistan, rice produce is a part of local diet and business trade, so food and trade policies should agree to compromise. Pakistani consumers are mainly wheat eaters, but their cultural identity includes basmati as staple food. For new players, such as USA, fragrant rice cropping is a rising issue for food sovereignty while other countries like Vietnam and Cambodia, fragrant rice may be considered as a good trade opportunity helping for an international exporting.The export standards in India, Pakistan and Thailand, should be revised and hastily implemented.

Thanh et.al (2013) was conducted a study aimed to understand rice production and marketing of farmers in mekong delta. Primary data were collected through interview schedule. Collected data were analysed using percentage method. Research results showed that the paddy yield and production on increased trend. For paddy and rice consumption, there are 65 percent of households having milled rice to eat and 90 percent of farmers selling rice to traders. There was a need for farmers in limiting to grow low-quality rice varieties and improve cultivation of high quality and special rice varieties for export. Training and transfer of new technologies, new proper varieties, modern machineries and facilities should be available to the farmers in yearly to reduce loss, heavy works, marketing constraints, production costs, and increase profit for farmers.

Hilal and Mubarak (2015) made an article on "Rice marketing: lesson and driver for Sri Lankan producers". Secondary data collected from various authenticated sources has been used for the study. The study highlighted that Sri Lanka achieved self-sufficiency in rice production and it always on surplus of rice. While increasing production and export of rice in international market, Sri Lanka had to find a way to market with excess production of paddy. As an ultimate way of making farmers more profitable, Sri Lanka has to enter into foreign markets and also with domestic marketbyselling rice products. For that, farmers and millers have to obtain assistance from the government in order to

produce rice varieties and rice products which have growing demand locally and globally.

2.2 Rice production and marketing in India

Job and Nandamohan (2004) have attempted to analyse the changes in the growth pattern of rice in Kerala across time and across seasons between the period 1975-76 and 1998-99. Secondary time series data on area, production and productivity were gathered. Methodology was based on the computation of compound growth rate, decomposition of growth, and measures of instability. Compound growth rates of area, production and productivity of rice in the three crop seasons for the state was estimated using exponential growth model. Rice production was decomposed into area and yield effect. Area effect and yield effect were computed using a multiplicative model. Result of the study revealed that area under rice and production showed significant negative trend and positive trend in productivity. The area under cultivation and paddy production had been declining in the state at alarming rates since the mid-70s. During the year 1975-76, paddy growing areas in Kerala amounted to 33.16 percent of its total cropped area (TCA). It decreased to 18.38 percent in 1990-91 and decreased further to 12.10 percent in 1998-99.

An article made on "Rice in India: Present Status and Strategies to Boost Its Production through Hybrids" Wanjari*et.al* (2006). This paper attempts to explain the current scenario, strategies and agro-techniques for seed as well as grain production, quality parameters and economic aspects of hybrid rice in India. The study found that as the seed production of hybrid rice is knowledge and labour intensive, different agro-techniques need to be adopted for successful marketing. Thus, sufficient back up of knowledge for production of good quality seeds should be disseminated to growers. Economically hybrid cultivation is very profitable still man-days should be utilized very efficiently to reduce the cost of seed production.

Lakshmi *et.al* (2009) made a paper on "Rice Production in India — Implications of Land Inequity and Market Imperfections". Secondary data were collected for the study. The analytical measures like simple tabular analysis,

growth rate, and fertilizer imbalance index were employed to evaluate accessibility and use of production resources by smallholders versus other farmers. Results have shown that smallholders' share in inputs like fertilizers, and irrigation has increased over time, but a large number of smallholders still lacked access to these resources. Study has established that policies like fertilizer subsidy, agricultural credit, and minimum support prices were helpingto recover market imperfections only to some extent. Hence, for improving productivity and profitability of rice production of smallholders in particular and other farmers in general, addressing of structural inequity needs attention besides a focus on technology development.

Thomas (2011) had explained the reasons for the long-term decline in paddy cultivation, looking at the long-term pattern of paddy cultivation in Kerala. Although Kerala only produces less than 15% of the requirements, the relatively efficient system of public distribution has ensured that food grains are available to the citizens of Kerala at reasonable rates. In addition, paddy cultivation in many regions is carried out in a way that enriches the unique geographical and ecological features of these regions. It also found that the area and output of paddy cultivation in Kerala increased by 5,000 hectares and 69,300 tons, respectively, between 2007-08 and 2009-10. The study found that the share of paddy crops in Kerala's gross cultivated area has continuously

Karunakaran (2014) conducted a study on "Paddy Cultivation in Kerala – Trends, Determinants and Effects on Food Security". This paper aimed to analyse trends and determinants of paddy cultivation in Kerala and the effects on food security. The study used secondary data which was collected from various publications of the Government of Kerala like Economic Review, Statistics for Planning and Agricultural Statistics. Compound Growth Rates of area, production and productivity of paddy were estimated with the exponential model. The results stated that there are fluctuations in the overall growth of paddy in Kerala over different periods. There is anobservable increase in the monetary growth and decline in the real growth of paddy in Kerala from and price factor is the major element in determining the relative contribution of different elements to the growth of produce. The situation of rice production in the state can be enlarged

only through increase in yield. Yield can be improved by adopting better technology involving adequate, efficient, effective right type of inputs.

Ray et.al (2014) was conducted a study on "Globally unique Kuttanadu Wetland paddy soil of South India: Soil fertility in relation to seasons and different stages of the crop". Based on the literature studies it came into the conclusion that Kuttanadu wetlands, one of the major landmass of huge carbon deposits in the world have unique physico-chemical characteristics.Special global attention to these wetland-soilscan generate information for sustainable soil fertility management in the region in particular and that of tropical wetland-paddy-fields in general. Moreover, it is a unique place for further experimentation on sustainable management of wetlands and paddy cultivation in general. Collective international attempts can maintain this scenically unique backwater system as a global asset of environmentally unspoiled tourist spot forever. Moreover, it will be scientifically highly interesting to reveal the exact details of the quite unusual pale history of these unique wetlands.

Richard Scaria and. Vijayan (2015) in their study examined the conversion of paddy fields to other uses and its impact on the food security. The main objective of the study is to estimate the conversion of paddy fields, and its impact on the food security status of Karrimpuzha watershed in Palakkad district. The study state that Current agriculture land is not sufficient for satisfying the existing dietary needs. Agriculture land use planning is necessary in Karrimpuzha watershed for satisfying the existing dietary needs. Nearly 2800 tons of rice is deficit per year the in Karrimpuzha watershed, hence people in this area are depending on other sources and neighboring states or region for receiving rice for their dietary needs. To overcome this issue, additionally 2000 hectors for agriculture land are required. Land use planning analysis point out that total 3463 hectors of paddy fields are mandatory for achieving the status of self sufficient watershed in rice. The study suggests that Government should implements sustainable land-use planning technique to manage the development of land within their jurisdictions. In doing so, the governmental can plan for the needs of the community and safeguarding natural resources.

Abhilash (2016) investigated about Rice cultivation in saline tracts of Kerala. Using secondary source of data, researcher found that salinity is the most serious threat to agriculture and to the environment in many parts of the state. Salinity management is required in most irrigated areas in the semi-arid regions of the country in order to sustain agricultural production. The wetlands of India, particularly of Kerala are currently subjected to acute pressure owing to rapid developmental activities and indiscriminate utilization of land and water. The major issues faced are mainly related to pollution, eutrophication, encroachment, reclamation, mining and biodiversity loss.

Athira and Kishore (2016) conducted a study on the "Scenario Analysis of Rice Cultivation in Kerala". This paper studied the changing trend in rice cultivation and provides the factors leading to shifting of rice cultivation. The primary data for the study were collected from paddy farmers. The secondary data for the study were collected from journals, publications by various academic organizations, research studies, and the data published in the official website of Economics and Statistics Department of Kerala. The study has revealed that labour shortage is one of the major problems in rice cultivation. Mechanization of agriculture operation may help to increase rice cultivation and curb the problems of labour shortage. Many had felt that the increase in the frequency of droughts and floods and also an increase in temperatures is likely to have a negative impact on rice yields. Developing and promoting the spread of rice varieties that are less sensitive to such climatic changes is the one of the options for thriving such situations. Greater investment in research and extension is inevitable to meet these challenges.

Maneesh and Deepa (2016) was conducted a research on "Trend Analysis of Area, Production and Productivity of Rice in Kerala in the Context of Food Security". The study is entirely relay on secondary data, has been collected from the web site of Directorate of Economics and Statistics, Kerala. Trend projection method was employed. The results showed that during 2011-12, the area under rice declined by 5027 ha, and during 2014-15, the area under rice declined by 1452 ha. The major reason for the changing agricultural land is found to be increasing cost of cultivation, shortage of labour, high price for input etc. so

appropriate small farm techniques like zero budget farming, encourage judicious use of inputs, link MGNREGS with farming activity, provide low interest loans with insurance coverage to the farmers, promote mechanization and water management technique should be implemented by government.

Mukesh (2016) discussed in his article on" Dynamics of paddy cultivation in Kerala" that Kerala economy is depending on central government share and other states like Karnataka and Andrapradesh for the sustainable food balance. The main Paddy production centers in Kerala are Palakkad and Alappuzha. Rice production in Kerala has given a declining trend during the last years. Main important reasons for the declining trend in rice production in Kerala were low price in output has given to farmers and there was not profitable. But the price of rice in market is increasing due to intervention of intermediaries. It is concluded that if government is not taking any initiatives in production and marketing of rice it may lead to continue the same declining trend in Kerala for rice production.

Shiji (2016) conducted a study aimed to analyse the factors which are responsible for shrinking of rice field in Kerala. The study is based on secondary data. The study revealed that significant structural changes in the form of decline in share indicating a shift from the agrarian economy towards a service sector dominated economy. Lack of interest in agriculture by young generation, urbanisation and infrastructure development, foreign remittance, seasonal shortage in labour supply, low levels of profitability, competition from other crops and wetland conservation laws are the major reasons identified for this drastic change in paddy cultivation.

Athira (2017) conducted a scenario analysis of rice cultivation in Palakkad district. It is aimed to assess the changing trends in rice cultivation, delineation of the factors leading to shifting of paddy cultivation, to study attitude of farmers and to identify their constraints in rice cultivation. The objectives were analysed by using correlation, quartiles, percentages and spearman's rank correlation coefficient. The study found that farmers are going away from rice cultivation due to tedious practices and less profitability of rice cultivation. It is also identified that irresponsibility of government in paddy procurement and lack of reasonable support price were the major constraints of rice farmers in district.

The Times of India (2017) reported that Palakkad, the rice bowl of Kerala has taken up an ambitious upland and fallow land paddy cultivation in district with central and state government support. The agriculture department encouraged by success upland paddy cultivation taken up in over 200 hectors in last year is planned to bring 2000 hectors in the current year before pre monsoon season.

Paddy cultivation in Kerala- a case study in Palakkad district was conducted by Kala (2018). The study used secondary data and analysed using time series method. The study examined the trend in acreage, production and productivity of rice in Kerala with special reference to Palakkad and Alappuzha districts in Kerala. The study clearly established the declining trend in area, production and productivity of rice and revealed the increasing demand for rice in Kerala in the coming years compared to the existing supply. Paddy area and rice production in the State show a decreasing trend due to high cost of production, attitudinal change, dominance of service sector, gulf migration, variations in the climatic conditions, soil fertility, irrigation facilities, labour availability, wetland conversion for dwelling and other construction purposes, and fast urbanization.

Lisha (2018) made an analysis of rice cultivation by joint liability groups of Kudumbashree in Palakkad. It is aimed to understand the conditions of production and sale of rice by joint liability groups (JLGs).data collected through group discussions and interview with cultivators. It is found that rice cultivation is yielded maximum and joint liability reduced the quantum of work and risk of loss. Collective farming by JLG is a fine example of grass root level interventions making remarkable difference in the local agrarian landscapes. Still the availability of inputs like fertilisers, seeds and other factors should reach to farmers and encourage women cultivators to enter into rice market.

Abraham (2019) made an article on "Paddy Cultivation in Kerala: A Trend Analysis of Area, Production and Productivity at District Level" aimed to analyse an agriculture scenario of Kerala. The study is conducted by using secondary data collected from official sources. Simple statistical tools are used to find out the values like average share of crops, percentage changes and growth rate. The highest negative growth rate in area under paddy is found in Kollam district and lowest in Palakkad district during the period 1980-81 to 2011-12. The highest

negative growth rate in paddy production is found in Kollam district and lowest in Alappuzha district. Major causes for the decline in paddy cultivation identified in Kerala are high land price in Kerala which leads to conversion of paddy lands for real estate purpose, high demand for land for infrastructure, residential and other non-agricultural purposes, non-profitability paddy cultivation and the resultant shifting of cultivation from food crops to cash crops, increasing pressure on land etc.

Business line (2019) reported that the area under paddy cultivation in Kerala has started increasing in the recent period, crossing more than two lakh hectares following the government's promotional efforts to this effect, said the State Food and Civil Supplies Minister, P.Thilothaman. It was more than 10 lakh hectares in the 70's, but dwindled to 1.96 lakh hectares over the period due to various reasons. However, the present government has taken earnest attempt to revive paddy cultivation and it has started yielding results especially in Palakkad, Thrissur and Kuttanad areas. There was substantial reduction in barren lands and the government is now utilising it for paddy cultivation.

The Hindu (2019) reported that farmers in Kuttanad and other places of Alappuzha district were getting average yield between 2.2 and 3.5 tonnes per acre in the puncha crop season after the flood. Therefore farmers are attracting to undertaken paddy farming in more than 30,000 ha in district, up from 23000 ha in last year and it almost covers kuttanad region. It is a positive vibe to the upcoming generation to do rice cultivation.

M S Swaminathan Research Foundation submitted a proposal on "Kuttanad below sea level farming system". It is clearly stated that Kuttanad Below Sea-level Farming System (KBSFS) is unique, as it is the only system in India that practices rice cultivation below sea level. They exist in three landscape elements: Karapadam (upland rice fields), Kayal (wetland rice fields) and Kari (land buried with black coal like materials). The rice fields are popularly known as "PunchaVayals". Farmers of Kuttanad developed and mastered the spectacular technique of below sea level cultivation. The conservation and refinement of KBSFS is particularly important in this era of global warming, leading to a rise in

sea level. Island States like Maldives as well as countries like Bangladesh are deeply interested in replicating the Kuttanad system.

2.3 Structure Conduct and Performance of markets

Bain (1968) defined that Market structure refers to a set of market characteristics that determine the economic environment in which a firm operates. Market conduct refers to the patterns of behaviours that firms follow in adapting or adjusting to the markets in which they sell or buy. The dimensions of conduct include methods employed by firms in determining the price of an output and sales promotion policy, the presence or absence of coercive tactics directed against either established rivals or potential entrants. Market performance refers to the economic results that flow from the industry and how well it performs in terms of efficiency and progressiveness or innovation, given its technical environment.

Fatimah (1982) have made an attempt to evaluate the paddy and rice market structure, conduct and performance; and secondly, to determine the impact of government's marketing programmes on market structure, conduct and performance, and the farmers. They used primary data for analysis purpose. Market margin, net profit and cost calculation were used in analyzing performance. The study found that market is efficient and the traders are not making excessive profits as alleged. However, the government's ceiling price for rice together with the inability to control market instability forced the traders to maintain their squeezed margin (in the period of excessive supply of rice) through excessive deduction. So it suggested that malpractices in the market need to be reduced through a higher enforcement of the licensing policy.

Margaret (2008) was conducted a study on "Structure, conduct and performance of commodity markets in south Sudan". Major marketing channels and market participants are characterized through a rapid diagnostic survey involving semi-structured questionnaires and informal interviews of key informants, as well as direct observation of market transactions. The findings showed that North-South Sudan and Kampala-South Sudan trade are characterized by three distinct marketing channels. Internal commodity sources are also important in supplying the urban markets. However, they are still

disadvantaged by relatively poorer road transport infrastructures, which pose major operational problems. Performance of the market depended on traders' level of access to commodity transportation services, the condition of transport and communication infrastructure,availability of storage, transaction costs,and marketing risks due to civil insecurity and cost of protecting the commodities.

Enibe *et.al* (2009) discussed about the policy Issues in the Structure, Conduct and Performance of Banana Market in Anambra State, Nigeria. The specific objectives were to describe the structure of the banana market, analyze the conduct of the banana market, determine banana market performance and examine the major problems of banana marketing in the area One hundred and twenty respondents spread in six major urban centers in the State and their concomitant major markets were randomly selected for interview. Descriptive statistics, Gini coefficient measure and the price spread analysis were used to analyse data. The study revealed that the activities of the banana market structure is almost optimum with a good conduct and performance as farmer's share of the consumer spending was 56 percent. The study also showed that lack of storage facilities and capital were the most pressing problems of the middlemen while the farmers were constrained from increased production by lack of capital, high yielding and disease resistant banana varieties.

Kang (2009) have made an attempt to study the world rice market with respect to S-C-P methods. Trend analysis and Lerner index of monopoly power were used for statistical analysis. Results showed that market power exists in the international rice market based on static calculation and hypothesis test. The international rice trade and economic growth for major rice exporting countries (which is a bi-directional relationship), and reductions of consumer surplus all combine to have a crucial effect on major rice importing countries due to the recent trends in export rice prices.

Saleem *et.al*.(2009) conducted a study to know how Stochastic frontier analysis can used in the SCP analysis of US trucking industry. An empirical application to U.S. trucking carriers over the period 1994-2003 is examined. They employed mean efficiency and stochastic frontier for analyzing SCP. Results reveal that the variables average haul, average load, debt-to-equity and market

concentration significantly affected technical efficiency. Capital, fixed andvariable input variables were significant in the production function equation. Market concentration had mixed signs but was positive and significant for dump trucking and other categories. The positive sign indicated a highly concentrated industry would lead to higher production efficiency and thus higher profits due to efficient use of inputs to produce output.

Tiku *et al*. (2009) examined the structure, conduct and performance of the palm oil industry in Cross River State of Nigeria using the SCP model. The objective was to understand the effects of Commodity Marketing Board (CMB) on the performance of the palm oil market. The board was established to organize the markets for efficiency, however, it was observed to be oppressive of primary producers because they paid lower prices relative to production cost. This troubled the expansion of palm oil production. They adopted the Gini coefficient and Lorenz curve to measure the degree of concentration post CMB. They found that processors, commissioned agents, merchants and retailers had Gini coefficients of 0.59, 0.54, 0.65 and 0.32 respectively. These implied that concentration was high among merchants and that few firms controlled trade at the merchant level. Other market participants showed that there existed sufficient competition among them such that no single individual or firm could influence the market. The conduct of the palm oil producers and trades revealed that the large merchants engaged in vertical integration in order to secure the supply of palm oil from producers.

Krishnan and Narayanakumar (2010) has examined the structure, conduct and performance of the value chain in seaweed farming in India. Value chain analysis, SHG model and loop diagroms illustrated for analysis of data. The value chain analysis of the sector has substantially proved that committed and synergistic production, marketing and institutional arrangements enabled by corporate leadership, offers considerable savings in transaction costs. The SHG model has also shown strong gender orientation in the initial years of seaweed culture in the district contributing to strong structural foundations to the movement. The seaweed sector in the coastal India has all the potential to rise from the low-income conditions normally associated with basic livelihood activities to higher levels of employment-income-consumption relationships.

Takele (2010) has made an attempt to study the structure, conduct and performance of rice market and to identify major constraints and opportunities in rice production and supply to market. Concentration ratio, Tobit model regression method and son used for analysis of data which is collected from farmers and traders. The market concentration ratio is 0.77, showing that the rice market is oligopsonsitic. High initial capital and prior control of farmers is a barrier to entry in rice trading. The cost benefit analysis of rice production shows that rice production is a profitable business for farmers. Strengthening market information and extension system, intervention to increase production and productivities by using improved agricultural inputs, promoting education and trainings about rice production and marketing are the recommended policy implications.

Bosenaet.al(2011) studied structure conduct and performance of cotton market: the case of Metema district, Ethiopia using SCP approach. This study is based on primary and secondary data. Cotton market at ginneries and textile factories were highly oligopolised by two ginneries and three textile factories. Buying, selling, and pricing strategies, which are indicators of market conduct showed deviation of cotton market from competitive market norms. The performance of cotton market chain analyzed using Marketing Margins supplemented with analysis of costs incurred and gross profits generated for different market chain actors, showed poor performance of the chain. In the chain farmers are the most disadvantaged chain actors.

A study conducted by Kizito (2011) on "The structure, conduct, and performance of agricultural market information systems in sub-saharan Africa" aimed to find how the different MIS models tried to address the generic design issues of any MIS and the relative advantages of different models of MIS in addressing those issues. The SCP analysis illustrates and reinforces several of the conceptual issues in the environment features that affect MIS performance on the supply side and on the demand side. Other environment features like macro-economic indicators (e.g., availability of storage and credit facilities), social-economic indicators (e.g., farmer voice), vertical coordination forms and price discovery methods used in the market, cultural factors, and lack of effective demand were affecting the performance of SCP of market information system.

Haruna *et al*. (2012) also used the SCP model to assess the structure, conduct and performance of tomato market in the Upper Eastern Region of Ghana. The study employed the Gini coefficient to determine the tomato market structure. It found market concentration ratios of 0.68, 0.58 and 0.64 for producers, wholesalers and retailers respectively. The ratios implied high market concentration among all the actors, especially producers. The study further revealed the presence of price discrimination in that tomatoes were sold at different prices to different consumers at various parts of the market due to lack of price information. Tomato marketing was highly profitable among the market actors, the market was not efficient as it was dominated by only a few firms.

Sultana (2012) studied about rice marketing in Bangladesh. The study identified the problems and prospects of rice marketing in Bangladesh. The findings revealed that there was a comparative advantage in the production of high yielding rice in Bangladesh but its marketing system was not suitable to the small farmers to get fair price. The major causes of price hike were natural disaster, inadequate supply of food grain in the market, less production, hoarding by traders and creating artificial food crisis in the market, problems of communication system and increase of middlemen in the market.

Bassey *et al.* (2013) made an article on "Rice Market Structure, Conduct and Performance in Nigeria: A Survey of AkwaIbom State Rice Marketers". Data sourced from sixty traders in four markets were analyzed using Gini coefficient, Herfindahl Index, Net returns and descriptive statistics. The result indicated that average share of imported rice across the markets was more than local rice. The study further revealed an average marketing efficiency of 392.9 percent and 405.1 percent for imported and local rice. The Gini Coefficient (GC) and Herfendahl Index (HHI) values of 0.683 and 0.295 showed that the rice markets were highly concentrated with non-competitive practices showing disparity in earnings. The study recommends the provision of storage facilities, improving the quality of our local rice as well as pursuing policies that would discourage importation as the way out.

Kumar and Nain (2013) conducted a SWOT analysis of agriculture in India. The study found that increase in contribution to GDP, use of labour force, increase in food grains and stability in times of global recession were the major strengths of agriculture. But post-harvest losses, food wastage, inaccessibility to technology etc caused for weaknesses in agriculture. Rainfed agriculture, organic farming, diversification and so on were opportunities of agriculture while size of holding, land degradation and climate change became the threats of agriculture.

A study conducted by Shankar (2013) on rice market structure, conduct and performance in Bangladesh and the impacts of technological change in the rice milling sector focused on employment, the financial viability of semi-automatic mills, market concentration, rice quality, and costs of milling. The study was conducted by adopting the structure, conduct and performance approach (SCP). He had employed concentration ratio, entropy index, gini coefficient and other different tests. They found that existing structure of paddy market is characterized as oligopolistic and atomistic from seller side at the market. Concentration of rice mills on the basis of installed capacity was low due to presence of large number of husking mills in the industry.

Eronmwon et.al (2014) conducted a study on"Structure, conduct and performance of Plantain Marketing in Edo State, Nigeria". The objectives of the study were to examine the structure and conduct of plantain marketing system, assess its performance and estimate the cost and returns in plantain marketing. Data for the study were collected using a well-structured questionnaire administered to 240 marketers of plantain. Data collected were analyzed using descriptive statistics, gross margin analysis, marketing margins, marketing efficiency and the Gini-coefficient. The results indicate that the market was characterized with many buyers and sellers reflecting a pure competitive structure, prices were determined mainly by factors such as purchase price, ability of the buyers to haggle, supply and demand forces and cost of transportation. The value of the Gini coefficient (0.677) indicates some level of inequality suggesting the presence of market concentration among the respondents. The results indicated a reasonably good performance by finding net profit, marketing margin and efficiency.

Nzima *et al.* (2014) aimed to explore and assess efficiency of the structure, conduct and performance of groundnuts markets in northern and central Malawi. Smallholder farmers and traders involved in groundnuts were interviewed. Using time series price data, the spatially distinct groundnuts markets were also examined. The researcher employed marketing margins, Marketing Efficiency Index (MEI), price spread, Cobbdouglas production function, and spatial market integration for SCP analysis. The study highlighted the need for organised groundnut seed systems to ensure supply of high quality seed to farmers, market oriented extension services, improved roads to production areas, improved and affordable technologies on production and value addition, vibrant farmer organisations and improved market information generation and dissemination to farmers and traders.

Radhika (2014) conducted a study on economic analysis of production and marketing of kaipad paddy in Kannur district with the objectives of cost return analysis of cultivation and marketing and to identify the constraints and also to document the cultural practices of kaipad paddy cultivation. Yield gap mode, benefit cost ratio, step herd's formula and garret ranking technique were used for analysis. The net income and cost ratio indicated that farming was a loss making preposition in kaipad region. The study found that high wage and scarcity of hired labour were the major constraints of farmers.

Abah *et.al* (2015) have made a research paper aimed to analyse the structure and conduct of rice marketing in Benue State, Nigeria. Primary data were collected and analysed using descriptive statistics and Lorenz Curve. The results showed that there is freedom of entry and exit into the market as well as, lack of adequate marketing information. There is inequality in the market power concentration. The Gini Coefficient for Zone A (0.53) is higher than Zone B (0.46) and Zone C (0.46). The market structure was found to be oligopsonistic. Majority of the respondents sell their paddy immediately after harvest, they rely on family or personal sources for business finance, they have attended training related to their business, they sell improved varieties of paddy and they do not collude to fix prices, nor advertise their paddy for sale. The study recommends

that government should provide financial support to foster farmer-operated rice processing facilities.

A research paper on "systemic approach to examine the structure, conduct and performance model of agriculture in Africa, evidence from Ghana" was conducted by Banson et.al (2015). This research used systems thinking tools including Casual Loop Diagrams (CLDs) and Bayesian Belief Network (BBN) modelling to develop new structural systems models where stakeholders determined the components and interactions between the Structure, Conduct and Performance (SCP) of the agricultural industry in Ghana using the Evolutionary Learning Laboratory (ELLab). The results illustrates how the SCP elements interact together to influence the survival and growth of the agricultural industry among driving forces. The study identified that stakeholders adopt several strategies to survive and compete, which lead to the overexploitations of the ecosystem. The results from BBN models indicate that the implementation of systemically determined interventions, policies and strategies could significant improve the rate of business survival and growth of the SCP.

Bukar*et al.* (2015) in their study on analysis of market structure, conduct and performance for pepper in Borno State, Nigeria highlighted that market structure is an important factor that influences the performance and efficiency of a market. The result also showed that information transfer was timely and satisfactory and some degree of product differentiation existed in the market. The study concluded that the market was a fairly efficient market with an efficient pricing system.

Sahoo and Mishra (2015) examined the structure-conduct-performance relationships in Indian banking sector. Using a panel dataset of 59 banks operating in India during 1999-2000 to 2008-2009 and applying the two-stage least squares (2SLS) method of estimation, the paper finds that there exist strong inter-linkages amongst structure of the market, banks' conduct and their financial performance. While market share of a bank depends directly on its market size, asset base, selling efforts, and past financial performance, its selling efforts vary directly with market share, asset base, and past financial performance. The regression results essentially suggest for multidirectional and dynamic SCP relationships in Indian

banking sector. It is also found that the nature of ownership has significant influence on market share, selling efforts and financial performance of the banks. As compared to the nationalised banks, market share of the private banks (both domestic and foreign) is found to be lower. But private banks make greater selling efforts and have better financial performance and their public sector counterparts.

Structure, Conduct and Performance Analysis of Indian Commercial Banks by Barua et.al (2016) conducted a different approach to SCP. The purpose of the study is to examine the impact of structural changes and conduct of Indian commercial banks on their profitability in the paradigm of structure– conduct– performance (SCP) framework. The regression results find a negative relationship between profitability and market concentration and reject SCP hypotheses. The study found that capitalization, credit risk, leverage and ownership structure are the most important determinants of the profitability of Indian banks. The study also found that financial crisis had no significant impact on the profitability of Indian banks.

Bime *et al*. (2016) analyzed the structure, conduct and performance of the rice market in north-west region of Cameroon. The analysis showed that the main actors involved in the rice market were farmers-producers, wholesalers, millers and retailers. The males generally dominated in the rice trade particularly wholesaling, milling and women dominated in the retail business. The millers and the wholesalers were the principal buyers of paddy. The rice market was oligopolistic in nature, prices were determined mainly by the forces of demand and supply. The millers obtained the highest margins amongst the trader. In terms of equity, the margins vary from one actor of the market to the other with the miller was getting the greatest share and closely followed by the farmer. The principal constraints identified by the study that affects actors of the rice market were lack of capital, poor quality of rice and the insufficient improved seeds for farmers as well as poor selling methods. The study recommended that more focus on enhancing production and productivity, facilitating extension services and enhancing marketing.

Zorinah (2016) conducted a study on Analysis of structure, conduct and performance of cabbage market in central district of Botswana in order to

elucidate the performance of the marketing system before any interventions are made to change the existing conditions. The data for the study were collected from both primary and secondary sources. The study employed descriptive statistics, Gini coefficient and the Lorenz curve to determine the degree of market concentration in the study area. The gross margin, marketing margin and marketing efficiency were used to measure the performance of the horticulture market in the Central District of Botswana. The results of the study showed that the Gini coefficient was 0.672 and 0.509 for wholesalers and retailers respectively, indicating a highly concentrated market hence an oligopoly market structure. The marketing margins revealed that retailers attained the highest marketing margin of 50 percent while wholesalers had 34 percent. The study concluded that cabbage production and trading in the Central District is profitable.

Habib (2017) analysed the market structure and concentration of rice market of Kano state in Nigeria. The study showed that there was freedom of entry and exit, large number of sellers and adequate market information on prices in the market. These characterised the market as a perfectly competitive market. Market concentration was shown by the percentage of Gini coefficient obtained which was 0.2 percent for retailers and 0.087 percent for wholesalers which implies that there was high competition in the wholesaler and retailer rice market. The study further recommended that favourable market conditions should be improved such that to attract more wholesalers that can be maintain a competitive price level.

Stephan et.al (2017) studied structure, conduct and performance of cabbage seed market in Hassan district of Karnataka. Descriptive statistics were used to analyse the market conduct and performance. The Herschman-Herfindal index, for determining the level of concentration in relation to the structure of the cabbage vegetable seeds in the market shown that there was high degree of market concentration in the district, this suggested no easy way for new firms to enter market. The promotional activities of different vegetables seeds companies were calculated by percentages and to know the market performance rank order scale were devised during the study. The study indicated that, the company had employed agricultural graduates in the district who had created good relationship

with the dealers, nurserymen and vendors in the market. The overall performance of Syngenta seeds was topmost, followed by Seminis seeds, Mahyco seeds and Nunhems seeds.

Yumnam et.al (2017) was conducted a study in Kangra district of Himachal Pradesh and Imphal-West district of Manipur to compare the economics of rice cultivation in the two states during the growing season of 2011-12. Stratified simple random sampling technique was used and data collected through primary sources.Gross returns were found to be higher on large farms than on small farms in both the states. Cobb-Douglas production function analysis revealed that the factors affecting paddy production on small farms were use of manures and fertilizers and plant variety in Himachal Pradesh and use of seed and plant variety in Manipur. The factors responsible for paddy production on large farms were use of seed, plant protection chemicals and plant variety in Himachal Pradesh, while they were use of manures and fertilizers, seed, plant protection chemicals and plant variety in Manipur.

Buhari et.al (2018) discussed about structure, conduct and performance of rice marketing in Kebbi state, Nigeria. The marketing information was randomly collected from the selected producers, consumers and market participants (traders) in rice marketing making a total of 120 respondents. The result was analyzed using descriptive statistic and Gini coefficient. The Gini coefficient result shows that 0.59 meant that the concentration of the market is relatively high, indicating the existence of the inefficiency of the market. The Conduct shows that 100% of the sampled traders agreed that the purchase price of rice is entirely dependent on demand and supply of rice market per day. It also shows that the purchase price of rice cannot be clearly identified until the final transaction took place.

Geremewe(2018) examined the structure, conduct and performance of potato marketing in West Gojjam Zone in a research paper. Primary data were collected using interview schedule. Data collected were analyzed using descriptive statistics, gross margin analysis, marketing margins, marketing efficiency and the concentration ratio. The results revealed that potato market characterized by weak oligopolistic market structure and Lack of capital, licensing problem and seasonal supply were identified as the major entry barrier to potato

marketing. Market conduct shows that the price of potato is set by traders while producers are price taker. When it comes to market performance analysis the highest total gross marketing margin was 30.25% when producers sold potato to wholesalers. The result showed that potato market in the district deviate from competitive market norm due to lack of perfect market information, price of potato being set by traders, weak oligopolized market structure and barrier to entry to potato market.

Girei *et.al* (2018) determined the structure and performance of cowpea marketing in Yola North and South Local Government Areas of Adamawa State, Nigeria. Primary data was used for the study which was generated using structured questionnaires. Inferential statistics using Gini Coefficient and Marketing Margin were employed and used for the analysis of the generated data. The research concluded that, cowpea marketing has been adjudged to be profitable as revealed by the positive sign and magnitude of the gross margin. A low marketing margin was obtained, an indication of efficiency in the pricing system by cowpea marketers. The market structure of wholesalers of cowpea in the study area was competitive, while that of retailers was not. It is therefore suggested that, strong marketing board for cowpea and other related agricultural products should be established to ensure stable and good market prices for the product and control of other marketing activities leading to increase marketing margin and efficient returns from the business. Modem storage facilities and the use of airtight containers should be encouraged among marketers for sustainable cowpea storage so as to improve it shelf life.

Abdul *et.al* (2019) made a research paper aimed to analyse market structure, market conduct and market performance on the marketing of corn in Kedung Malang Village, Papar District, and Kediri Regency East Java. The results of the study show that the market structure leads towards perfect competition. Market conduct is seen from the system of formation and pricing between merchants, where the most dominant marketing agencies village are collectors in determining purchase prices. Furthermore, from market performance calculated from the analysis of price efficiency, marketing in Kedung Malang

Village is efficient. However, from the analysis of the operational efficiency of marketing in Kedung Malang Village.

The study on "Structure, Conduct and Performance of Maize Markets in Malawi" was conducted by Dennis et.al (2019). Primary data were used. Statistical tools like grand seasonal index, lorenz curve were used for analysis of data. The result showed that maize market is pyramidal in structure and highly competitive at lower tiers of trade but 'oligopolistic' at higher tiers. The market channels vary across seasons with switches between trader types and instances of rural-urban trade reversals. A high ratio of marketing costs to revenue suggests marketing inefficiencies. Malawi maize prices were highly seasonal and more volatile than neighboring countries. The study suggests measures that to improving Malawi's maize marketing system like increased policy predictability to promote private-sector investment; institutionalization of quality grades and standardization of weights and measures; increased commercialization of smallholder maize production; investment in enabling infrastructure and the promotion of structured trading.

Kumar *et.al* (2019) aimed to find the structure, conduct and performance of fish markets of Khagaria district of Bihar. The Gini coefficient, Lorenz curve and marketing efficiency methods were used to assess the market structure, conduct and performance. The Gini coefficient value of wholesaler, retailer and producer were found to be 0.486, 0.493 and 0.5 respectively, indicates the existence of inequality among the market participants. The net margin for wholesaler was found to be far greater than retailers as well as producers. Gross total market margin (GTMM) was found to be 70.16%. Marketing channel-3 where producers directly sell their produce was found to be the most efficient channel among all the 3 channels. In order to make the fish markets of khagaria district more efficient, marketing board or state fisheries department intervention in fish marketing is necessary.

An Analysis of Indian Cement Industry Using Structure Conduct Performance (SCP) and Efficient Structure (ES) Paradigms was conducted by Manoj and Arpit (2019). The paper included a sample of top 11 cement firms in the Indian market. Annual and pooled data for a period of 15 years (2003-2017) is

analyzed and the measure applied for the firm's performance is Return on Assets (ROA). Concentration Ratio (CR) and market share are utilized to measure SCP hypothesis; advertising and R&D are used along with market share to check Efficient Structure (ES) hypothesis. The results indicate that market structure plays a significant role in determining the performance of cement firms. Indian cement industry is highly efficient to compete and earning high profit in the industry.

Neeraj and Pooja (2019) investigated the interdependence of market structure, conduct and performance in Indian automobile industry. Secondary data have been obtained from Centre for Monitoring Indian Economy (CMIE) from 1998 to 2014 and Two Stage Least Squares (TSLS) method is applied to examine the inter-relationship among structure, conduct and performance variables. The study found that the external factors dominantly affected the market structure, strategic behaviour and market performance of automobile sector in India. Therefore, in Indian automobile sector the SCP model showed weak interrelationship. Government policies regarding taxation, industrial policy and foreign direct investment may be the major factors which affect the structure, strategies and performance of this very important sector. Besides these factors, complex labour relations, labour unions and geographical diversities of India also might have affected the structure and performance of automobile industry.

Wubalem (2019) was conducted a study on "Structure, Conduct and Performance of Groundnut Markets: The Case of FogeraWoreda, South Gondar Zone of AmharaRegional State". Both primary and secondary sources of data were used to achieve the desired objectives. The descriptive statistics like mean, min, max, standard deviation, percentages and frequencies were employed. The analysis of the market structure indicates that the concentration ratio of 76.61% at Bahirdar market, which shows an oligopolistic market structure and which resulted in a groundnut market conduct characterized by a market strategy in which the traders have an upper hand in fixing the price of the groundnut as well as effecting payment by the time in favor of the traders. Concerning the market performance, the findings show that the benefit from groundnut marketing is skewed to few actors in the market chain. Notably, street vendors had the highest

gross marketing margin with estimated share of 51% found.The lowest producers' share is appropriated which accounts 35.19% of the consumer's price. The findings from this study, so strongly recommended that establishing well organized cooperatives for reducing the inefficiency due to high marketing margin as well as the oligopolistic market structure.

2.4 Constraints of agriculture markets

Rajendran and Mohanty (2004) was conducted a study on "Dairy Co-operatives and Milk Marketing in India: Constraints and Opportunities". This study reviews the existing status of milk marketing and dairy co-operatives in India and provides recommendations to meet future challenges. The results of the study indicate that 80 percent of the milk produced by the rural producer is handled by an unorganized sector and the remaining 20 percent is handled by an organized sector. Involvement of intermediaries; lack of bargaining power by the producers; and lack of infrastructure facilities for collection, storage, transportation, and processing are the major constraints which affect the prices received by producers in milk marketing. Milk quality, product development, infrastructure support development, and global marketing are found to be future challenges of India's milk marketing.

In order to identify challenges and constraints of marketing and export of Indian spices in India a study was conducted by Bhardwaj et.al (2011). Both primary and secondary data were used. The data collected were analysed and inferences drawn and interpreted on the basis of simple statistical tools like average, percentage, and graphical presentation. The major constraints identified were low productivity, poor post-harvest handling, insufficient mechanization of spice production and processing, competition, pest and disease problems and dependence on nature, inadequate price for producers and poor availability of inputs.

Parag *et.al* (2012) conducted a study on "Constraints and prospects of agricultural marketing in North-east India". The paper aimed to examine the existing position of agricultural marketing in North Eastern region with a view to ascertain its problems and prospects with a primary objective of suggesting lines

of development in future. The useful primary data were collected from randomly selected cultivators. The study highlighted that lack of basic infrastructure facilities such as transport and communication, power and electricity, capital overheads, credit and financial institution and lack of marketing infrastructure, shortage of storage facilities and poor road conditions are the major constraints of farmers in agriculture marketing. Lack of commercial knowledge and information results in exploitation of farmers by a handful of middlemen and traders are also obstacles in the marketing. The initiative of the Government as well as NGO's for improving market infrastructure and organizational support are not sufficient to develop the conditions of the villages of the districts of NER.

Rahman et.al (2013) studied problems and constraints in production and marketing of fish in West Bengal. Primary information collected from farmers and traders. For the analysis of market efficiency, conventional, Shepherd's and Acharya's methods are employed. For prioritizing the constraints faced by farmers and market intermediaries Garrett's ranking technique has been applied. The major constraints faced in production and marketing of fishes are theft and pilferages, non availability of quality fish seeds, lack of government support both technically and financially, quarrel and litigations among the owners of the pond, poor adaptability of fish seed in new environment, non availability of quality fish seeds, , lack of government support, labour crisis, high degree of perishability of the product, cut throat competition, inconsistent supply of fish, lack of storage facility etc.

Dhurwey et.al (2015) made a paper on "Constraints perceived by farmers in production and marketing of major cole vegetable crops in Bemetara district of Chhattisgarh state". Primary data were collected analysed using percentage method. The major constraints were scarcity of labour followed by problem of high infestation of different insects, pests and diseases in the crop, lack of adequate training facility to farmers, lack of technical knowledge, lack of soil testing, facilities and lack of information regarding crop cultivation. Major constraints in marketing of vegetables were lack of proper methods applied for harvesting of crop followed by lack of facilities regarding standardization grading, lack of post-harvest management and lack of regulated and co-operative market.

Vijayan (2015) studied constraints of organic and conventional vegetable farmers in the market. Primary data were collected using pre structured questionnaire. Likert scale were used for analysing constraints. Most important barriers perceived by conventional farmers were high cost of production, low yield, pest, disease and weather related production losses, huge capital investment, higher labour cost, lack of organic marketing networks and competition with non-organic vegetables. Organic farmers were experienced problems like pest related production losses, low yield and high cost of production , huge capital investment, lack of availability of funds, lack of subsidies, high labour cost in the initial stages and no marketing barriers were faced when they adopted organic farming.

Kumar *et.al* (2019) was conducted a study in Haryana to identify the constraints faced by farmers and middlemen in production and marketing of major vegetables. Primary data and hence data was collected through proper structured schedule for the production year 2014-15. Percentage method were used for data analysis. Major production related constraints expressed by vegetable growers were lack of information about cultivation of vegetables, higher cost of fertilizers, seeds and labour and their unavailability when needed, lack of suitable cold storage facilities, high cost of storage, costly weedicides, spurious plant protection chemicals, and lack of credit. Major marketing related constraints expressed in marketing of vegetables were lack of market information, higher price fluctuation, higher amount of price spread, malpractices in weighing and storing of vegetables, problem of storage facilities, lack of processing industries/units, higher price fluctuations, high cost of labour, high transportation cost, and delay in payments.

Patoju *et.al* (2019) made an article on "Challenges of Organic Produce Cultivation and Marketing: A Study in Mananthavady Block, Wayanad District of Kerala, India" aimed to study the problems of organic produce marketing, challenges of organic vegetable farming and to develop appropriate strategies to promote organic farming. For collecting data, a well-designed schedule was used. Simple statistical tools like percentage and average have been used in analyzing the collected data. The study found that the farmers are facing problems with the variety of suitable seeds, lack of agricultural extension services, increasing labour

cost, the low intervention of mechanization, climatic condition, the absence of certification and lack of branding due to the expensive certification process and no support for organic produce. After understanding all the challenges, the study proposed EVM Model (Extension, Value Addition, and Marketing Model).

Smitha *et.al* (2019) have made an attempt to evaluate the challenges of dairy farming at research, extension and farmers' level. Garret's ranking technique was adopted to analyse the constraints faced by the stakeholders in the study area. The major constraint faced by the dairy farmers were the high cost of cattle feed and high cost of veterinary service and medicine was the second major constraint experienced by the farmers. The important constraints faced by the officials involved in extension services included implementation of large number of schemes in Panchayat and block level followed by lack of transportation facilities to make field visit. In research system, the major constraint was the prioritized mandate of teaching and extension followed by time constraint for technology transfer.

Vishnu *et.al* (2019) made an article on "Price Behaviour and Constraints in the Small Cardamom" aimed to study the price behaviour of small cardamom along with that constraints faced by farmers also studied. Garrett Ranking Technique was used to identify major constraints in production and marketing of small cardamom. It could be found that labour shortage was the major production constraint followed by high variation in rainfall and high input cost. High price fluctuation was the major constraints in cardamom marketing followed by the absence of grading and inadequate quantity to market. Hence, the introduction of appropriate machinery in production and post-harvest operations may reduce the dependence of human labour. Training on the trading standards and promotion of grading practices among farmers and traders would be helpful to get a better price for cardamom.

2.5 Constraints of rice market

Thomas (1996) studied the state level analysis of area, production and current problems in paddy cultivation. The data was collected from Alleppy and Kottayam districts. Important problems of rice cultivation identified are decline in

the number full time dedicated farmers, Aversion of younger generation towards paddy farming, farmer's reluctance to take second crop, land leasing system, labour shortage, low wages, economic status of farmers, wage and nature of work, abnormal increase in input costs, indebtedness to non-institutional credit, lack of proper marketing system, lack of guidance from research institutes, inadequate infrastructure development etc.

Thomas (2002) explored Problems and prospects of paddy cultivation in Kuttanad region. The paper aimed to assess the economic viability of paddy cultivation in its present level and to identify the current problems in the paddy farm sector and to suggest remedial measures for its revival. Researcher used primary and secondary data for the collection of data. Cost calculations and frequency methods are used for analysing data. Compared to the other major rice producing areas in the state cultivation costs are found to be higher in Kuttanad and the difference is mainly due to higher costs on human labour. Labour shortage, frequent crop failure, declining profitability and inadequate research and extension services are major constraints identified in the kuttand paddy cultivation. The study suggested that as pointed out by the Shyamasundaran Nair Committee, the integration of aquaculture with traditional rice farming can be developed as a safe strategy to sustain rice production, increase profits and maintain ecological balance.

In order to understand the constraints of rice production promotion and export in India and Vietnam a study was conducted by Thanh and singh (2006). The study were used ranking method for data analysis. It found that the agro-ecological constraints faced by farmers, ranked from more to less serious were related to dependence on monsoon; land/soil problems; environmental pollution; lack of water and small land holdings. Under technical constraints, it was found that diseases (sheath blight, blast, and stem rot); pests; lack of proper varieties; post-harvest technology constraint; storage problems were the most serious constraints perceived by large percentage of respondents. Fertilizer problems; plant protection constraints; weed problems; lack of labours and poor processing were found to be other constraints as perceived by farmers. In case of socio-economic constraints, the study found that poor infrastructures; high cost of

inputs; credit problems; low rice price; inadequate inputs and lack of trainings were the most important constraints as perceived by large percentage of farmers. Other constraints as perceived by lower percentages of farmers were poor extension services; lack of information and lack of helpfulness from local authorities/governments.

Lau (2007) Identified barriers to entry into the organic market and possible strategies to increase the likelihood of success for potential organic producers. The number of certified organic operations in Texas has remained relatively stagnant while nationally the organic food sector has experienced double-digit growth. A survey was conducted. To determine if there are significant differences among producer groups, a one-way ANOVA was used for scaled items. The study found that financial risk from adoption or transitioning seems to be a common concern and Producers did not find any information service as "very useful." The important constrains in organic farming identified were high input cost, organic inputs, and organic processingfacilities.

Nirmala and Muthuraman (2009) was conducted a study on "Economic and Constraint Analysis of Rice Cultivation in Kaithal District of Haryana". The data on cost-returns aspects of rice cultivation were collected through pre-structured questionnaires. The study found that machine labour and human labour constituted major costs in the total variable costs. Since the benefit cost ratio was 1.27, rice cultivation is economical in the study area. Pests and disease incidence, lack of remunerative price, labour shortage were the major constraints in rice production in Kaithal district. Management of pests and diseases, and addressing the problem of soil salinity will help in enhancing the yield levels in Kaithal district.

Lakshminarayan *et al.* (2011) conducted a study in Nanjangudtaluk of Mysore in Karnataka state during 2010 to know the present farm technologies in paddy cultivation. Lack of technical knowledge, pest and disease problems of paddy, high cost of agricultural input and non–availability of inputs on time are the major constraints encountered by the paddy farmers. Farmers Ranks high cost and non availability inputs were the foremost problems faced by them.

Raja Mohammed (2011) assessed the income and employment of farmers in relation with agricultural technology adoption of paddy cultivation in Thanjavur district of Tamil Nadu. Important problems faced by agriculture sector in the study area is water scarcity, low price of output, high price of input such as fertilizer, pesticides ,seeds etc Agricultural extension programmes were weak and it is in favour of large farmers and land lords. Further, many of the farmers are not aware of crop insurance schemes.

Totin *et al.* (2012) conducted an article on "Barriers and opportunities for innovation in rice production in the inland valleys of Benin" aimed to investigate the technical and institutional factors that hinder the effective use of irrigation water and the development of the local rice value chain in an inland valley of Benin. Primary data have been collected for the study. The study find out that barriers to innovation include an unclear division of responsibilities between local farmer groups and the government for canal maintenance, a lack of effective local rules for the distribution and maintenance of the irrigation infrastructure and distrust among farmers, related to privileges of the farmer leaders, as well as the constraining formal and informal credit systems and uncertain market outlets. The barriers depress rice output and the income of farmers.

Sharma *et al.* (2013) studied the economic analysis of rice productivity and factors affecting rice yield in Himachal Pradesh after the introduction of the improved variety of rice in the year 2005. The important problems and constraints responsible for yield gap are small and fragmented holdings, low use of farm yield manure, low level of mechanization, and lack of new varieties for different agro climatic regions, various biotic and abiotic stresses, inadequate seed multiplication mechanism in the state.

Singh (2013) explored the problems perceived in marketing of organic products by farmers in Uttarakhand state of India. Descriptive research design with survey method, wherein data were collected through face-to-face structured interviews farmers. Data were analyzed with descriptive statistics and Chi square test to provide additional information about the effect of the selected variables on perceived problems. The most prominent problem in marketing of organic crops reported by the respondents in the plain areas of the state of Uttarakhand was

related to 'High Production Cost' that led to low profit, or no profit; while the largest proportion of the respondents from the hills reported 'Unavailability of an earmarked market place/shop for organic crops' to be their biggest cause for concern.

Oinam and Sudhakar (2014) have made an attempt to identify constraints faced by the the farmers in adoption of improved paddy practices in Bishnupur district of Manipur state. The researcher followed interview method for data collection. The study identified major constraints were high cost of high yielding varieties, high cost of inputs and labour, week extension activities at bottom level and lack of conviction to farmers in advanced technology.

Churpal *et al.* (2015) conducted a study on "An economic analysis of rice cultivation and constraint in Dhamtari district of Chhattisgarh, India". Formal survey method was used to augment data from sample of Mahamaya rice variety growers. The simple averages and percentage statistical tools were applied to analyze the data. The findings of the study revealed that major constraints in production of rice have taken on types of rainfall distribution, occurrence of disease & pest, weed infestation & deficiency of soil fertility, drought faced. However, under input constraints, availability of seeds, labour, manure & fertilizer, irrigation were major constraints to the farmers.

Hari Kumar and Mageshwari (2015) examined the marginal farmer's socio economic conditions, their characteristics, living standards and their problems with special reference to Puduchery. Primary data were used by pre structured questionnaire. Data were analysed using percentage method. High labour cost and shortage of agricultural labourers are the important problems faced by marginal farmers in the study area.

Constraints experienced and suggestions offered by farmers in adoption of recommended paddy production technology was a paper made by Maheriya et al (2015). The paper aimed to identify the constraints by the farmers in adoption of paddy production technology. An interview schedule based on objective of the study was developed and respondents were personally interviewed for collection of information. The results showed that lack of knowledge in the practices namely

recommended dose of fertilizers, control measures of pests and diseases, identification of pests and diseases, recommendation of chemical weed control measures in paddy, high cost of fertilizers and pesticides, high labour charges at the time of transplanting and harvesting, labour shortage at the time of transplanting and harvesting and short supply of fertilizers at required time, low market price of paddy and poor contacts of extension workers with farmers were major constraints faced by paddy grower. Remunerative market prices of paddy, facility of crop insurance scheme in case of failure of season, minimum support price of paddy should be declared well in advance were important suggestion to overcome/minimize the constraints in adoption of new technology in paddy cultivation.

Mariya and Saji (2015) studied problems of farmers in paddy cultivation with special reference to Kerala. A structured questionnaire was formed to collect the feedback from the farmers involved in the paddy cultivation. Mean and Anova were employed for the analysis of data. The analysis result reveals that low price for paddy is considered as a major problem followed by low price for paddy, weeds problem, inadequate support price, labour shortage, and marketability problem among the list of problems considered for evaluation.

Rubzen *et al.*(2015) studied Challenges and Constraints in Production and Marketing Horticultural products in Timor Leste. The study involved interviews with farmers, government agencies, NGOs and other stakeholders. Both primary and secondary data were gathered. Statistical analysis employed included descriptive analysis such as frequency tabulations. One of the main challenges faced by farmers is the low productivity and quality of the produce. This is due to current farm management and post-harvest practices as well lack of farm inputs. Product quality is a problem due to poor product handling. Marketing is hampered by the poor transport and road network system, inadequate communication infrastructure, lack of storage facilities, and the lack of a grading and standardisation system in the industry.

Newle and James (2016) were examined the costs and returns, marketing margin, and constraints associated with rice production and marketing. The simple descriptive statistics and farm firm budget techniques were the major tools used in

analyzing the data. Result of the analysis showed that the rice Farmers made a 68 percent gross income while the net income was at 43percent which is indicative that the middlemen did not make excessive profit at the expense of the primary producers. Constraints associated with rice production include high cost of labour and inputs in terms of machinery while that of marketing included high cost of transportation and inadequate storage facilities. The study suggests an improvement of Farm inputs and equipment, the road network system and provision of agricultural credit to enable rice farmers and traders expand the volume of their operations.

Vinayagamoorthy and Bharathi (2016) conducted an empirical study on problems of paddy production and marketing with special reference to Cauvery delta farmers' in Tamil Nadu. Statistical tools like percentage analysis, Spearman Rank Correlations Coefficient and Krushkal Wallis Test were employed. The results showed that the farmers were effected by high labour cost for cultivation of paddy and lack of labour supply so the Government of Tamil Nadu should take immediate action of labour supply through on Rajiv Gandhi national employability scheme. Lack of storage facilities and lack of awareness about advanced practices are also hindrances in the way of farmers. The major suggestions made by the respondent paddy growers for minimizing (overcoming) the technological gap, Development of irrigation network with government aid, provision of quality seeds with technical know-how and training on major practices to needy farmers.

Lakra et al. (2017) investigated economic analysis of production, marketing and constraints of paddy in Dantewada District of Chhattisgarh, India. Primary data were collected from farmers through personal interview method with the help of pre-structured schedule.Overall on an average yield of paddy were 28.67 quintals, however, it was highest (29.80 qtl/ha) at medium farm and lowest (26.06 qtl./ha) at marginal farms in the district. Average cost of production per quintal of paddy was worked out to Rs. 456.31. Major constraints pertaining to cultivation of these crops were lack of soil testing facility (82.00 per cent) and scarcity of labour during peak season (81.25 per cent). Long distance of regulated market from the crop growing area (81.25 per cent) and lack of transportation

facilities (77.80 per cent) were some of the major constraints which were faced by the farmers of the study area.

Akshay et al. (2018) conducted a study on "Constraints Faced by Basmati Rice Growers and Suitable Extension Strategies in Adoption of Basmati Rice Production Technologies". Primary data was collected through structured questionnaire for the analysis. Rank order scale were used for identifying constraints. The major constraints observed in adoption of basmati rice production technologies were lack of knowledge about improved high yielding varieties, lack of knowledge about plant protection measurement, unavailability of critical inputs in government sales centres, poor roads and transportation facilities, less number of information centres, government tub well are not proper functioning, lack of knowledge about balances fertilizers and high prices of new seeds, untimely availability of electricity.

Jha et al. (2018) made an article on "Constraints of Rainfed Rice Production in Eastern India". The major rice production constraints and priority research problem areas of rainfed rice production in eastern India are drought and submergence, bacterial blight, leaf blast, weeds, brown plant hopper and poor soil fertility. Besides, low input use, inappropriate plant spacing, late sowing and selection of wrong cultivars are some of the other technical constraints, which can be effectively reduced through the diffusion of relevant technologies among ultimate users or farmers. It requires further strengthening of linkages between 'Research & Extension' that facilitates feed-backs and disseminates technical information.

Gohain and Singh (2018) aimed to study problems and constraints faced by farmers in marketing of agricultural produce in Punjab. A total sample of 180 farmers from 12 villages of six districts was selected for the study. Garrett's ranking technique is employed for ranking the preferences of respondents on different variables. The results from the study indicated that the most important problem identified by the farmers in the marketing of paddy and wheat was the delay in procurement of paddy in the markets followed by the deduction of payments by commission agents due to higher moisture content in the grains. However, the major problem during marketing of basmati was the exploitative

practices by the intermediaries followed by lack of public procurement. The problem faced by majority of farmers in the marketing of maize and cotton was the lack of public procurement of the produce and lack of remunerative price of the crop respectively.

Pramod (2018) evaluated the problems in paddy cultivation reference to Palakkad district. A structured questionnaire was formed to collect the feedback from the farmers involved in the paddy cultivation. Descriptive statistical tools like mean and ANOVA were used for analysing the problems. The result revealed that low price of paddy weeds problem, inadequate support price, labour shortage, and marketability problem, water scarcity, fertilizer problem, inadequate equipment problem, low quality of seeds, and flood were the major problems faced by farmers in the rice cultivation. The ANOVA result states that problem score has found significant difference among the type of farmer and type of seeds. Therefore, the sensitivity of the problem towards paddy cultivation varies based on the type of farmer and type of seeds used by the respondents.

Basyal *et al* (2019) studied Constraints of paddy production in Western Terai of Nepal. The objective of this paper is to identify the various constraints of paddy production in Nepal. This study utilizes the primary data collected through semi-structured questionnaires. A total 120 paddy growing household were surveyed for the study. The raw data collected were coded and entered into computer for analysis. They were analysed using M.S Excel and SPSS. Study identifies, that among the various constraints faced by farmers major constraints are lack of improved varieties, inadequate supply of chemical fertilizer, lack of proper farm equipment and dependence on monsoon rain for successful crop.

Fahad *et al*. (2019) discussed about constraints of global production on his article. The average yield in upland rainfed rice systems is normally very low due to the uneven pattern of rainfall, deprived weed control, low input use, and high disease incidence. Globally, fresh water scarcity and drought creates serious challenges for rice production. Salinity is the second major abiotic constraint in rice production, after drought. Temperature is a major production constraint in rice productivity, as both low and high temperature at high and low altitudes, respectively, reduce rice yield. Rice productivity is also harmfully affected by

social, economic, and policy constraints throughout the world: such as unfavourable input and output pricing policies, lack of education, poor rural infrastructure, and human health-related problems which are serious threats to increased rice production.

Zalkuwi (2019) have made a paper on "Economics analysis of rice marketing in Mubi North Local Government Area of Adamawa State, Nigeria". Constraints associated with cost and return of rice marketing and problem of rice marketing also were examined. A structured questionnaire was designed and both descriptive (frequency, tables and percentages) and inferential statistics (profitability analysis, total cost and return) were employed to analyse the data. The result showed that the major form of processed rice that is marketed in the area is regular milled white rice. The gross margin obtained showed that the marketing of rice is profitable. The major constraints associated with rice marketing include high cost of transportation and inadequate processing facilities. The study suggests an improvement of the road network system and provision of agricultural credit to enable rice traders expand the volume of their operations. It was also recommended that agricultural training workshop in rice marketing should be used from time to time to educate producers and marketers on storage and distribution processes.

This chapter focuses primarily on literatures related to the current study "Structure Conduct and Performance of Rice Market in Kerala". Specifically, studies of rice production and marketing in world and India, structure, conduct and performance of markets, constraints of agriculture markets and also constraints of rice market were collected and reviewed. It is obvious from this chapter that research into the structure, conduct, and performance of rice market of Kerala was limited. After analyzing the available literature in the study area, a research gap in the area of structure conduct and performance could be identified. Rice market is facing various constraints in Kerala and structure, conduct and performance of rice market is not clearly defined by these studies. The present study could provide a valuable contribution to this field of research.

MATERIALS AND METHODS

CHAPTER 3

MATERIALS AND METHODS

The present study entitled 'Structure, Conduct and Performance of Rice Market in Kerala' aimed to analyse the structure and conduct of the rice market in Kerala and to assess its performance as well as to identify the constraints faced by rice farmers and traders in rice market. This chapter provides the analytical frame work for the conceptualized research problem. The methods and tools of analysis adopted in examining the objectives are included here.

The methods and procedures adopted in conducting the research are presented under following heads.

3.1 Concepts used in the study

3.2 Location of the study

3.3 Study period

3.4 Sources of data

3.5 Sample design

3.6 Variables measured

3.7 Data analysis

3.1 Concepts used in the study

3.1.1 Rice

Rice in their natural, unprocessed state is sometimes referred to as rough rice or the rice with husk.

3.1.2 Rice market:

Rice market is defined as the market for unmilled rice from rice farmers (excluding registered seed growers and specialty rice growers) till the point of its sale for processing.

3.1.3 Rice market structure

The rice market structure refers to the way the rice market is organized in terms of the concentration or market share of firms. It will determine conduct and performance of rice market.

3.1.4 Conduct of rice market

Market conduct refers to pattern of behavior of rice farmers and channel players in the rice market especially in relation to price setting policies, policies related to quality, competition and the way in which they coordinate their decisions.

3.1.5 Performance of rice market

Market performance is the economic result of the rice market pursued by a particular line of conduct in terms of efficiency and profitability.

3.1.6 Traders

Traders represents the traders in rice market consisted of individual wholesalers, co-operative societies, millers and SUPPLYCO who are engaged in procurement of unmilled rice from farmers in Kerala and from the other states.

3.2 Location of study

The three districts in Kerala viz; Palakkad, Alappuzha and Thrissur were selected.

3.3 Study period

The survey was conducted during the period November to January 2020 for collecting the data from farmers and traders for the year of 2019-2020.

3.4 Sources of data

Both primary and secondary sources were used for the collection of data. Primary data were collected from rice farmers as well as traders. Data from farmers and traders were collected by adopting personal interview method using pre tested

structured interview schedule. Secondary data on area, production, productivity and procurement price of rice in Kerala were collected from published reports and official websites of Government of Kerala.

3.5 Sample design

For the purpose of study, data were collected from farmers and traders in the rice market. The selected traders in the rice market were SUPPLYCO accredited mills, private mills, co-operative societies and wholesaler.

3.5.1 Sample selection from farmers

The study area covered the major rice producing districts in Kerala viz; Palakkad, Alappuzha and Thrissur. From each district, one block having largest area under rice cultivation was selected and from each block, one panchayath with largest area under rice cultivation was also selected purposively (Based on the Agricultural Statistics Data 2017-18). From the three selected panchayaths, 60 farmers each were selected using simple random sampling, making a sample of 180 farmers. List of farmers were collected from Krishibhavan and the respondents were selected randomly from the list.

Fig 3.1 Selection of sample farmers for the study
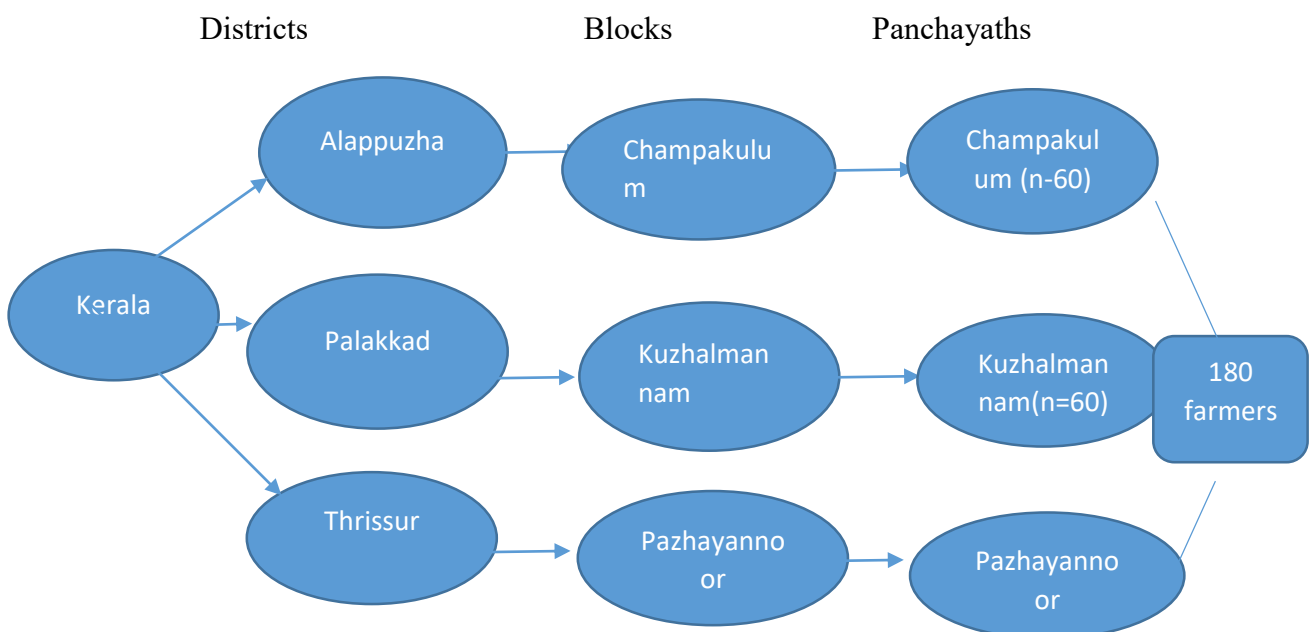
3.5.2 Selection of Traders

Traders of the rice market in Kerala were SUPPLYCO accredited mills, Private mills, Co-operative mills and wholesaler. The SUPPLYCO accredited mills were identified from information provided by farmers. The private mills and wholesalers were identified through personal sources. Sample respondents were selected based on their willingness to disseminate information. The sample selection of traders were given below.

Fig 3.2 Selection of traders in the rice market
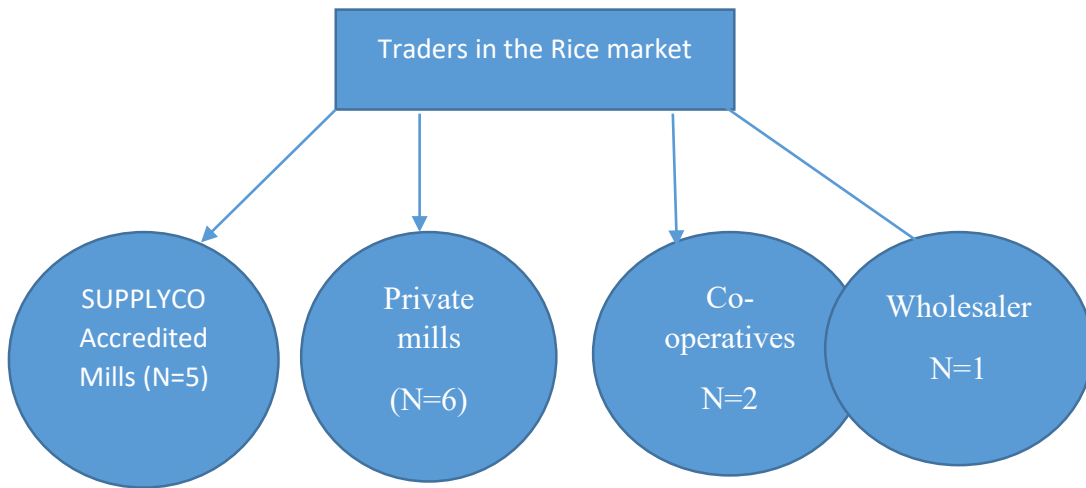
A sample of 14 traders consisted of 5 SUPPLYCO accredited mills, 6 private mills, 2 Co-operatives and one wholesaler were provided the information.

3.6 Variables and statistical tools used in the study

Variables were used for analysing each objectives of the study by using statistical tools which were given below.

Table 3.1 Variables and Statistical tools used in the study

Objectives	Variables	Statistical tools
To analyse the structure and	Structure • Profile of rice farmers and traders • Forms of business organisation	Percentage analysis

conduct of the rice market	• Volume and value of trade • Relative market share of farmers and traders • Types of rice • Variety of rice • Barriers of entry • Source and type of market information Conduct • Price setting methods • Price fluctuations • Product attributes • Sales promotion methods • Source and availability of credit • Terms of sale	
To analyse the performance	• Season wise production cost and post production cost incurred by rice farmers • Cost incurred by traders in rice marketing • Income earned by rice farmers and traders in rice market • Marketed surplus of rice farmers	Cost concepts developed by Commission for Agricultural Costs & Prices (CACP) of Government of India for farm management studies Marketing margin and Marketing efficiency
To identify the constraints faced by farmers and traders in the rice market	• Production constraints • Marketing constraints • Procurement constraints • Institutional constraints • Financial constraints	Garrett's ranking method And SWOC analysis

3.7 Data analysis

Structure and conduct of the rice market were analyzed by Percentage analysis. For assessing performance, cost concepts developed by Commission for Agricultural Costs & Prices (CACP) of Government of India for farm management studies was followed. To identify the constraints faced by farmers and traders, Garrett ranking method was used.

3.7.1 Percentage Analysis

Percentages. One of the most frequent ways to represent statistics is by percentage. Percent simply means "per hundred" and the symbol used to express percentage is %. One percent (or 1%) is one hundredth of the total or whole and is therefore calculated by dividing the total or whole number by 100. In the study, it is used for finding frequency of number of respondents for each parameter.

3.7.2 Cost of Cultivation

The cost of cultivation of rice in Kerala were estimated using the cost concepts of Commission for Agricultural Costs and Prices (CACP) *viz.*, Cost A, Cost B and Cost C (Y.K Alagh Committee Report, 2005). Cost A is made up of the cultivators' actual cash and in-kind expenses (paid out charges). Cost B is made up of Cost A added to interest on fixed assets, such as land, whereas Cost C is made up of Cost B plus the imputed value of family labour.

> ➢ **Cost A1:**
> - Casual labour:
> - Machine labour
> - Seeds
> - Manures & fertilisers
> - Plant protection chemicals
> - Loading charge
> - Packing charge
> - Transportation cost
> - Miscellaneous
> - Interest on working capital

- Land revenue
- **Cost A2: Cost A1+Rent paid for leased in land**
- **Cost B1: Cost A1+Interest on value of fixed capital assets (excluding land)**
- **Cost B2: Cost B1+rental value of owned land+ Rental value of leased land**
- **Cost C1: Cost B1+ Imputed value of family labour**
- **Cost C2: Cost B2+ Imputed value of family labour**
- **Cost C3: Cost C2+value of management input at 10 percent to total cost (C2)**

3.7.3 Marketing margin

Marketing margin is the difference between marketing cost and selling price. It is calculated for farmers and traders separately.

$$MM = SP - MC$$

MM= marketing margin

SP = Selling price

MC = Marketing cost

3.7.4 Modified Marketing Efficiency (Acharya's method)

It is the ratio of price received by the farmer to marketing cost and marketing margin.

$$\frac{P_f}{MC+MM}$$

P_f= price received by the farmer

MC = marketing cost

MM = marketing margin

3.7.5 Garret Ranking Method

The constraints of farmers were identified using Garrett's ranking method. Garrett's Ranking Technique was applied to study the preference, change of orders of constraints and advantages into numerical scores. The prime advantage of this technique over simple frequency distribution is that the constraints are arranged based on their severity from the point of view of respondents.

The Percent Position and Garret Value

The Garret ranks were calculated by using appropriate Garret Ranking formula. Based on the Garret ranks, the garret value was calculated. The Garret tables and scores of each constraints were taken and multiplied and finally by adding each row, the total Garret score were obtained.

$$\text{Percent position} = \frac{100\,(R_{ij} - 0.5)}{N_j}$$

R_{ji} = Rank given for the ith variable by the jth respondent

N_j = number of variables ranked by the jth respondent

Based on the ranks obtained, the highest score is considered as the major constraint of farmers and least score obtained constraint is considered as the less affected constraint for a farmer. A SWOC analysis also used for understanding the strengths, weaknesses, opportunities and challenges of rice market and also to recommend strategies.

This chapter focused on collecting materials and methods for conducting the study. It explained various operational definitions which are used in the study. The sample design and data collection methods were also explained in the session. The different statistical tools used for data analysis like percentage, Garrett's ranking method, and CACP cost concepts and SWOC were well described.

RESULTS AND DISCUSSIONS

CHAPTER 4

RESULTS AND DISCUSSIONS

Rice is the world's second most popular cereal, both in terms of production and consumption. In terms of output, India ranks second. India produces 20 per cent of the world's white and brown rice, making it one of the world's most important rice producers. Rice is Kerala's major food crop, and demand for rice is gradually increasing as the state's population grows. For the next few years, the government's challenge will be to feed the growing population while keeping prices low for low-income consumers and lowering production costs for low-income farmers.

There is a declining trend in the area under rice cultivation in the state. In 1961-62, the total area under rice cultivation was 7.53 lakh hectares, and in 1975-76, it was 8.76 lakh hectares. Following that, rice cultivation decreased steadily, reaching 2.29 lakh hectares in the 2007-08 crop year. However, rice farming expanded to 2.34 lakh hectares in 2008-09. When compared to 1975-76, the area under rice cultivation declined by 76.49 per cent in 2018-19.

The S-C-P (Structure-Conduct-Performance) model consists of three elements: structure, conduct, and performance. It was formulated by Harvard economist Edward Mason in the 1930s and dates back to that time period. After examining the industrial sector's market organisation, the SCP approach was utilised to evaluate the agriculture marketing system. (Scarborough and Kydd, 1992).

The market structure refers to the way the market is organized in terms of the concentration or market share of firms. It will determine conduct and performance of the market. Market performance refers to the combination of final results that firms reach on any market by pursuing whatever behaviour they take. The result is price, production, and selling dimensions, product design and so on (Bain, 1968). Because market performance is intrinsically multifaceted and hence

complicated, a complete assessment of market performance, the strategic result of market structure, and the conduct of the market is challenging.

SCP analysis will provide a better understanding of the type of market structure, the participants and the overall performance of the rice market. The findings of this study can also help to frame policies to reduce the price spread and to improve the margin for rice farmers.

The present study entitled "Structure conduct and performance of rice market in Kerala" is aimed to analyse the current structure and conduct of rice market in Kerala and to assess its performance as well as to identify the constraints faced by rice farmers and traders in rice market.

4.1 Rice market in Kerala

The total under area rice cultivation during the year 1961-'62, was 7.53 lakh hectares and in 1975-'76 it was 8.76 lakh hectares. Thereafter a steady decrease in rice cultivation was observed and it reached to 2.29 lakh hectares during the agricultural year 2007-08. But in 2008-09, area of rice cultivation increased to 2.34 lakh hectares. The area of rice cultivation decreased by 76.49 percent during the year 2018-19 as compared to that of 1975-76. From 2017-18 onwards area of rice is separately considered due to the growing importance of dry land rice cultivation. The production of rice increased from 5, 21,310 tonnes to 5, 78,256 tonnes over the previous year which was an increase of 11 percent (GOK:2018-19).

In Kerala, SUPPLYCO plays major role in rice market. For protecting rice farmers and to increase rice production, the State government entrusted the SUPPLYCO with the job of procuring rice from farmers of Kerala. For the year 2020-2021, 764885.39 tonnes of rice were procured by SUPPLYCO. 81 percent of total produced rice in the state were procured by SUPPLYCO. To support the farmers, Minimum Support Price is fixed jointly by the Central and State Government.In the year2020-2021 the minimum support price has reached to ₹2872 by the central government subsidy of ₹1940 and SIB of ₹932 to rice per quintal.

Kerala needs 40 lakh tonnes of rice annually but the production accounts for only 8 lakh tonnes. Kerala now gets its requirement of rice from Tamil Nadu,

Andhra, Bihar, and Madhya Pradesh (Financial Express, August 17 2020). The rice that SUPPLYCO procured for distributing through the Public Distribution System was insufficient to meet the needs of Kerala's population. As a result, private mills began trading rice from other states to Kerala. Co-operative societies are also involved in the rice market, both for obtaining rice for SUPPLYCO and for selling branded rice. Wholesalers are also present in the rice market.

Fig 4.1 Players in the rice market in Kerala

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                      ┌─────────────────┐
                      │ Rice market in  │
                      │     Kerala      │
                      └────────┬────────┘
             ┌─────────────────┴─────────────────┐
     ┌───────────────┐                   ┌───────────────┐
     │ Farmers in    │                   │ Rice from     │
     │   Kerala      │                   │ other states  │
     └───────┬───────┘                   └───────┬───────┘
      ┌──────┴──────┐            ┌───────────────┼───────────────┐
 ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
 │SUPPLYCO  │ │          │ │          │ │          │ │          │
 │and its   │ │Co-       │ │Private   │ │Co-       │ │Wholesalers│
 │Accredited│ │operatives│ │mills     │ │operatives│ │          │
 │mills     │ │          │ │          │ │          │ │          │
 └──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
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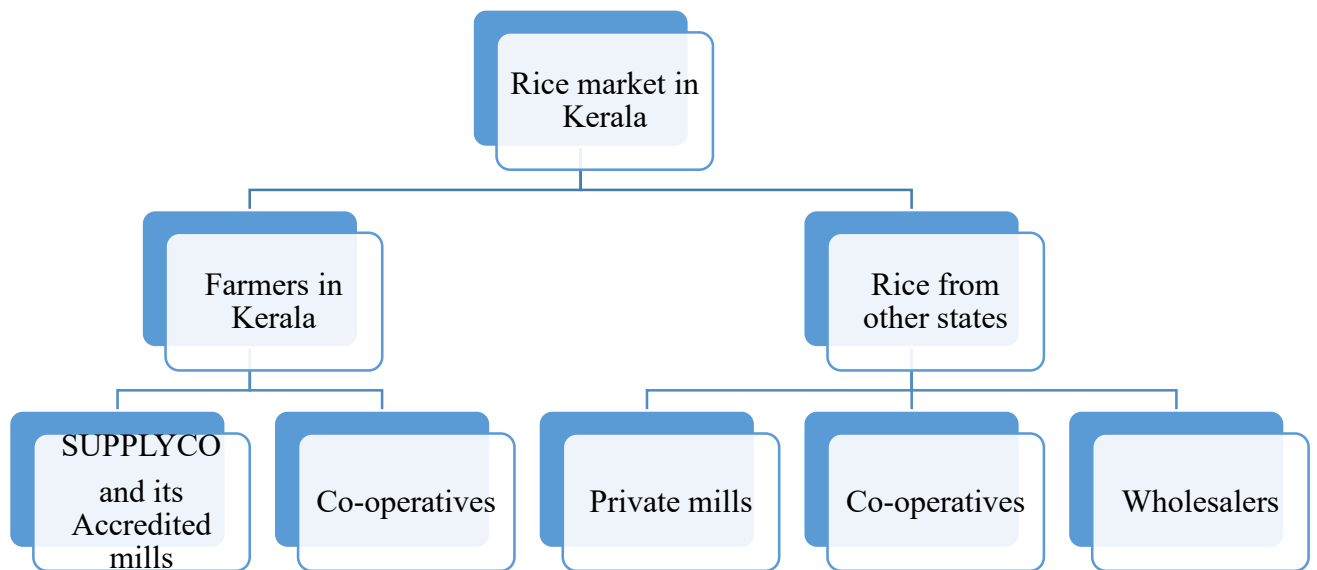
Players in the rice market in Kerala consisted of farmers, SUPPLYCO and their accredited mills, private mills, co-operative societies and wholesalers. An analysis of the structure conduct and preference of the players were made in the following subheads.

4.1.1 Socio-economic profile of rice farmers in the rice market

Rice farmer is the farmer who is engaging in the rice cultivation for food and income purpose. They are cultivating rice for personal and selling purpose. They are the major producers of rice and from the farmer's rice were reaching the rice market. In the study, 60 farmers each were selected from Alappuzha, Palakkad and Thrissur respectively with total of 180 farmers as these are the key producing centres of rice in Kerala.

Socio-economic status is the measure of the economic and social prospects of the individuals. It indicates the social position of an individual concerning education, income and occupation. In order to examine the socio-economic characteristics of the respondents, five indicators, viz., age, education, type of family, occupation, annual family income from rice and other sources were considered and they are given in Table 4.1.

Table 4.1. Socio-economic profile of farmers

Sl.No	Characteristics	Alappuzha (n=60)	Palakkad (n=60)	Thrissur (n=60)	Total (N=180)
	Age (Years)				
1.	Below 25	-	-	-	-
2.	25-40	4 (6.67)	12 (20)	3 (5)	19 (10.5)
3.	40-55	17 (28.33)	21 (35)	23 (38.33)	61 (33.89)
4.	55-70	35 (58.33)	21 (35)	27 (45)	83 (46.11)
5.	Above 70 years	4 6.67)	6 (10)	7 (11.67)	17 (9.44)
	Education				
6.	Below upper primary	27 (45)	21 (35)	6 (10)	54 (30)
7.	Upto 12th	22 (36.67)	27 (45)	31 (51.67)	80 (44.44)
8.	Graduation	10 (16.67)	12 (20)	22 (36.67)	44 (24.44)
9.	Post Graduation	1 (1.67)		1 (1.67)	2 (3.33)
	Type of family				
10.	Joint family	3 (5)	1 (1.67)	2 (3.33)	6 (3.33)
11.	Nuclear family	57 (95)	59 (98.33)	58 (96.67)	174 (96.67)
	Primary occupation				
12.	Agriculture	56 (93.33)	58 (96.67)	55 (91.67)	169 (93.89)
13.	Non-agriculture				
14.	Govt.employee	3 (5)		2 (3.33)	5 (2.78)
15.	Private employee	1 (1.67)		1 (1.67)	2 (1.11)

16.	Business		2 (3.33)	2 (3.33)	4 (2.22)
	Annual Income from rice(₹)				
17.	Below 50000				
18.	50000-100000			5 (8.33)	5 (2.78)
19.	100000-200000	50 (83.33)	55 (91.67)	45 (75)	150 (83.33)
20.	Above 200000	10 (16.67)	5 (8.33)	10 (16.67)	25 (13.89)
	Annual income from sources other than rice(₹)				
21.	Below 50000	45 (75)	47 (78.33)	52 (86.67)	144 (80)
22.	50000-100000	15 (25)	13 (21.67)	8 (13.33)	36 (20)

Source: Compiled from Primary data

Note: Figures in parentheses are a percentage of total

Table 4.1 reveals that the majority of the respondents (46.11 per cent) were in the age group of 55-70 years. Only 10.5 per cent of respondents were aged between 25-40 years. This can be inferred that old people are more interested in rice farming as it is part of their livelihood. The majority of the respondents (44 per cent) have education up to the 12th standard. Only 3 per cent of respondents were qualified above post-graduation. 24 per cent of the respondents having graduation were also engaged in rice farming. It shows that educated individuals are also having the interest in farming activities.

Considering the occupation of sample respondents, 93 per cent of those interviewed were mostly in agriculture and the rest were taking up farming as a subsidiary job. It shows that the majority of respondents (93.89 per cent) devote their entire workday to farming activities and are extremely committed to agriculture. The three sample districts are enriched with nutrient soil, water and all the suitable weather conditions. The farmers were utilising all these resources for many years. So, neglecting the constraints, they were fully engaged in rice cultivation. Of those surveyed, 96.67 per cent belonged to a nuclear family and only 3.33 per cent were living in a joint family. While examining annual revenue from rice, the majority of the respondents (83 per cent) fell into the category of ₹ 100000-

200000. But income from other sources is less than ₹50000. It is clear that most of them depending on rice cultivation for their livelihood.

4.1.2 SUPPLYCO

The Kerala State Civil Supplies Corporation Limited, also known as SUPPLYCO, is a government-owned institution situated in Kochi, India. It is the Kerala government's Department of Food and Civil Supplies' execution arm. SUPPLYCO's avowed purpose is to keep open market pricing of essential items under control. Under the government's market intervention programme, rice, pulses, and spices are purchased and delivered to customers at subsidised prices determined by the government. The Kerala government supports to this activity every year by providing financial support. SUPPLYCO has also started selling Civil Supplies Corporation-branded pulses, spices, and other branded products at a discount through a network of 2000 ration stores.

The state governments' rice purchase policies have also proven excellent. In the first part of the 2000s, primary cooperative societies in Kerala bought rice from farmers, but they lost money because they lacked the organisational and financial competence to do so. Due to a lack of effective procurement by the government or its agencies, rice farmers were at the mercy of private dealers, particularly a small group of contemporary rice mill proprietors in Ernakulam district. In 2005, the State government entrusted SUPPLYCO with procuring rice from farmers of Kerala. In the year 2020-2021 total of 252160 farmers have registered under the procurement scheme of SUPPLYCO. A total of 7.54 lakh tonnes of rice were procured from farmers and processed rice of 4.93 lakh tonnes by SUPPLYCO accredited mills.

SUPPLYCO has created a web-based platform called www.supplycopaddy.in to document the entire rice procurement scheme's activities. The online farmer registration and data gathering process for rice farmers in Kerala were the first of its type. Farmers visit the website after sowing to register their cultivation details. The agricultural office validates the cultivated area, and each applicant is assigned a unique number. Farmers are given Paddy Receipt

Sheets (PRS) to acknowledge SUPPLYCO's receipt of rice. The hand-held service keeps track of the amount of rice harvested and where it will be stored. SUPPLYCO began collecting rice from farmers through new rice mills. Each miller is given a password to access information about rice allocation, lifting, transportation, storage, processing, and release. The Paddy Marketing Officer (PMO) is in charge of all rice procurement field operations. All mill-level processes under rice procurement are overseen by the Paddy Quality Assurance Officer (PQAO). Payments to farmers are handled by the Paddy Payment Officer (PPO). Farmers' accounts are promptly credited with the procurement rate via electronic fund transfer. SUPPLYCO's top management consists of Chairman, Managing Director, and General Manager. The senior management of the SUPPLYCO rice procurement system included the other managers in charge of government schemes, administration, finance, and audit and accounts.

4.1.3 Millers

SUPPLYCO make arrangements with modern rice mills for procurement of rice and the quantity a mill can procure from the farmers depends on the Bank Guarantee provided by them. Currently 54 millers are working on behalf of SUPPLYCO for procuring rice from fields in Kerala. Based on the availability, 5 SUPPLYCO accredited mills were chosen as traders. Among those mills, 2 mills operated in Palakkad district and one mill each working in Alappuzha and Thrissur districts and one from Kalady.

However, the rice market is made up of both domestically grown rice and rice bought from other states such as Andhra Pradesh, Tamil Nadu, and Karnataka. As a result, private millers involved in rice purchase from outside sources were also chosen. Total six private millers were selected for the study which includes four mills from Palakkad district and 2 mills from Kalady as it is the consortium of mills where they are procuring the rice from other states and milling and branding in Kerala. No private mills were available from the Alappuzha district.

Socio-economic characters of mills were analysed by using the indicators like form of organisation, experience in milling, experience in SUPPLYCO, annual turnover and milling capacity of the organisation. Details were given in the table 4.2.

Table 4.2 Socio-economic profile of SUPPLYCO accredited mills

Characteristics	Number of respondents (N=5)	Percentage
Form of organisation		
Sole proprietorship	4	80
Partnership	1	20
Years of establishment		
Less than 15 years	2	40
15-30 years	2	40
More than 30 years	1	20
Experience in procurement of rice for SUPPLYCO		
Less than 5 years	2	40
5-10 years	3	60
Annual turnover(₹)		
5- 10 crore	4	80
10-20 crore	1	20
Milling capacity (tonnes/day)		
50- 150t	4	80
150t-300t	1	20

(Source: Compiled from primary data)

Table 4.2depicts that among 5 mills which are engaged in the rice marketing, 4 mills were sole proprietorship firms. Only one mill was formed by limited shares and the family members were participating and contributing share into the working of business. They were actively participating in all the business operations of mill.

While considering experience in the procurement and processing of rice in the mills, 40 percent ofthe respondents were working in the milling industry for less than 15 years and 15-30 years. One mill was working for more than 30 years. They are well established and experienced firms in the milling industry.

Procurement and milling of rice for SUPPLYCO is different from the private procurement of rice. There are rules and regulations for the procurement and processing of rice like registration through online website, penalty for delay in procurement, separate storage and milling facility for SUPPLYCO procure rice and so on. So the experience in this sector is important for continue their business under SUPPLYCO. Majority of the mills (60 per cent) were procuring rice from farmers for the SUPPLYCO for more than 5 years. It shows that they were also experienced with the SUPPLYCO rice procurement system.

Annual turnover in the case of SUPPLYCO accredited mills depending on the processing charge fixed by government (currently it is ₹214/quintal) and the income from broken rice, bran, husk and wastage. An average annual turnover of ₹5 to 10 crore is acquired by mills from rice milling for SUPPLYCO. But they opined that this turnover is not sufficient to meet the expenses incurred in the rice procurement and processing.

The SUPPLYCO allocating padasekharams to mills for procuring rice from farmers based on their milling capacity. From the selected mills, majority of the mill were having 50-150 tonne milling capacity.

Table 4.3 Socio-economic profile of private mills

Characteristics	Number of respondents (N=5)	Percentage
Form of organisation		
Sole proprietorship	4	66.67
Partnership	2	33.33
Years of establishment		
Less than 15 years	2	33.33
15-30 years	3	50
More than 30 years	1	16.67
Annual turnover(₹)		
Less than 10 crore	2	33.33
10-20 crore	2	33.33

Above 20 crore	2	33.33
Milling capacity (tonnes/day)		
50-150	4	66.67
150-300	2	33.33

(Source: Compiled from primary data)

Majority of the mills are under sole proprietorship. They are working on their capital without any shares from other individual partners. Mills were having 15-30 years of experience in the rice procurement and processing. Among the selected mills, 33 percent respondents were having annual turnover of less than ₹10 crore, ₹10-20 crore and more than ₹20 crores.

4.1.4 Co-operative societies

Co-operative societieswere procuring and milling rice on their own by purchasing rice from other states and they are also registered as supplyco accredited mills.

For the study, one co-operative mill each working in Palakkad and Thrissur districts were selected i.e,PADDYCOfrom Palakkad district and Trichur District Paddy Marketing and Processing Co-Operative Society ltd (TDPMPCS) from Thrissur district.

Table 4.4Socio-economic profile of co-operative mills

Characteristics	Paddyco	TDPMPCS
Year of establishment	1997	2010
Area of operation	Palakkad	Thrissur
Membership	363	120
Annual turnover	1.5 crore	60 lakhs
Milling capacity (tonnes/day)	120t	100t

(Source: Compiled from primary data)

PADDYCO started in 1997 with the aim of procuring and processing of rice in the brand name of PADDYCO. Annual turnover of 1.5 crores were the asset of the organisation. They were planting a mill on the capacity of 120 t per day production of rice. TDPMPCS started functioning in 2010. Initially they started

procuring rice from farmers directly and sold the branded rice in the name 'Karthika'. Later, as farmers were selling major portion of their rice to

SUPPLYCO, to utilise their milling capacity, they also registered as SUPPLYCO accredited mills and procuring rice for SUPPLYCO.

4.1.5 Profile of Wholesaler

Wholesalers are also a part of the structure of the market. Most of them are procuring rice from other states and sold to the private mills in Kerala. However, they are reluctant to share the details for the purpose of the study. Only one wholesaler has responded who was from Palakkad district. He was trading rice from other states like Karnataka and Tamil Nadu for the Kalady rice millers. Average of 10000 tonnes quantity of rice procured from other states annually at the rate of average price of ₹1850/quintal. In the Kalady market he was selling at the average rate of ₹2050/quintal.

SESSION - II

4.2 Structure and Conduct of Rice market in Kerala

Market structure refers to those characteristics of the market organization that are likely to affect the behaviour and performance of firms such as the number of sellers, the extent of knowledge about each other's action, the degree of freedom of entry and the degree of product differentiation (Lipsey and Steiner, 1981). Conduct implies the behaviour of the firms whether competitive or collusive. It refers to the behaviour of the firms in a market; to the decision firm make and the way in which such decisions are taken (Ferguson and Ferguson, 1994).

The first objective of the study was to analyse structure and conduct of rice market in Kerala. The structure of rice market were analysed using variables like profile of rice farmers and traders, forms of business organisations, volume and value of trade, relative market share of farmers and traders, types of rice, variety of rice, barriers of entry and source and type of market information. The conduct of rice market is analysed through price setting methods, price fluctuations, product attributes, sales promotion methods, source and availability of credit and terms of sale.

4.2.1 Role of farmers in the rice market

Farmers are the key stone of rice market as they are the producer of rice in Kerala. For the purpose of study, 60 farmers each were selected from three major rice producing districts viz., Alappuzha, Palakkad and Thrissur. Role of farmers in the structure and conduct of rice market in Kerala were analysed using the variables like area under cultivation, landholdings, seasons of cultivation, variety and type of rice cultivated, farming experience, production and volume of sales, barriers of entry, price policies, procurement details, source of information for farmers and their credit details.

4.2.1.1 Area under cultivation

The area under rice cultivation and the total area under cultivation are useful in determining major agriculture and rice-producing districts. The importance of rice in the selected districts can be determined by calculating the proportion of rice

in total agriculture land. Production, productivity, and cost are all tied to the area of land under cultivation. So it is important to find out the area in the study. Table 4.5 shows the details of area under cultivation for rice and other agriculture purpose.

Table 4.5 Area under cultivation

Area under cultivation(ha/farmer)	Alappuzha (n=60)	Palakkad (n=60)	Thrissur (n=60)	Total (N=180)
Average area under cultivation	2.07	1.25	1.1	1.47
Average owned area under rice cultivation	1.8	1.1	0.7	1.23
Average leased area under rice cultivation	1.1	0.6	0.7	0.9
Average area under rice cultivation	1.9	1.2	0.80	1.31
Percentage of the area of rice cultivation to the total area	94.02	96.22	73.21	89.48

(Source: Compiled from primary data)

Table 4.5 shows that average area under cultivation in Kerala was 1.47 ha and area under rice cultivation was 1.31 ha. Percentage of the area under rice cultivation to total area was 89.48 per cent. Alappuzha district has the most of the average area under agriculture (2.07 ha), followed by Palakkad and Thrissur. Alappuzha has a large rice-cultivating area (1.9 ha). However, when comparing the ratio of rice-cultivating land to total land, Palakkad had the greatest share (96.22 per cent). It appears that farmers in the Palakkad area were cultivating rice on the majority of their agricultural land because the soil is more conducive to the crop. Rice farming accounted for only 73.21 percent of the total land in the Thrissur district, because they were cultivating vegetables such amaranthus, cowpea, and snake gourd in the rest region of the examined area as it was more productive and profitable for them. In the area, the soil is also suitable for vegetable growing. As a result, the proportion was smaller than in other districts.

Farmers in the Alappuzha district cultivated on an average 1.8 ha of their land and 1.1 ha of leased land. They are ready to extent their cultivation into rented

land due to the high yield from the land. Farmers in the Palakkad and Thrissur districts were cultivating on an average of less than 1 hectare. Farmers in the three districts were farming an average of 1.23 hectares of own land and 0.9 hectares of rented land. Farmers stated that rice production is their primary source of income and that they are willing to cultivate on leased land by paying rent.

4.2.1.2 Landholding position of farmers under rice cultivation

Based on NABARD guidelines, farmers are classified into marginal, small, and large based on landholdings. Farmers having landholding of less than 1 hectare are called marginal farmers, farmers who are having landholding of 1-2 hectares is coming under the category of small farmers, and the farmers who possess land above 2 hectares is coming under the class of large farmers. The same classification is followed here and the land holding of the farmer under rice cultivation is considered for the classification. Table 4.6 given an account of small, marginal, and large farmers in the study area.

Table 4.6 Landholdings of farmers under rice cultivation

Category of farmers	Alappuzha (n=60)	Palakkad (n=60)	Thrissur (n=60)	Total (N=180)
Marginal farmers	16 (26.67)	29 (48.33)	50 (83.33)	95 (52.78)
Small	24 (40)	25 (41.67)	8 (13.33)	56 (31.11)
Large	20 (33.33)	6 (10)	2 (3.33)	28 (15.56)

Source: Primary data

Note: Figures in parentheses are a percentage of total

Table 4.6 depicts that majority of the rice farmers in the study area were marginal farmers (52.78 per cent) and small farmers (31.11 per cent). It inferred that they can access to subsidies provided by the government as the financial support. Rice farmers in Alappuzha were mainly small farmers (40 per cent) followed by large farmers (33 per cent). Only 26.67 per cent of respondents have belonged to marginal farmer category. But in the Palakkad district most of the

respondents were marginal (48 per cent) and small farmers (41 per cent). Whereas in Thrissur district, the majority of the farmers (83 per cent) were marginal farmers and only 3 per cent were large farmers. Among the total respondents, the majority of the farmers (52.78 per cent) were marginal farmers followed by small farmers (31 per cent). It can be also inferred that the landholding pattern is different in the three selected districts.

4.2.1.3. Seasons of rice cultivation

In Kerala rice cultivating mainly on three seasoni.e.Virippu (Autumn), Mundakan (Winter) and Puncha (Summer). Over these seasons there is an additional crop season in Alappuzha district. The seasons will vary over different districts based on their geographical and weather conditions. Table 4.9is showing the number of sample farmers cultivating rice in different seasons in the selected districts.

Table 4.7 Seasons of rice cultivated by farmers

Type of rice	Alappuzha(n=60)	Palakkad(n=60)	Thrissur(n=60)	Total (N=180)
Virippu	-	51 (85)	30 (50)	81 (45)
Mundakan	-	53 (88.33)	50 (83.33)	83 (46.11)
Puncha	51 (85)	-	-	51 (28.33)
Additional crop	11 (18.33)	-		11 (6.11)

Source: Primary data

Note: Figures in parentheses are a percentage of total

Table 4.7 revealed that major seasons of rice cultivation in Kerala were Virppu, Mundakan and Puncha. Majority of the farmers in the study area were cultivating rice in mundakan season (46 per cent) followed by virippu season (45

per cent). Number of farmers who cultivated in puncha season was only 28 percent and in additional crop it was only 6 percent of the total number of farmers.

In Alappuzha district, farmers were cultivating in puncha and additional crop only. Farmers generally believe that leaving their properties fallow throughout the autumn and winter seasons will increase agricultural yield during the puncha (summer). Local farmers have been induced to limit their farming efforts to a single season of puncha crop due to the opportunity of making more income with greater consistency, and the majority of farmers in the study area now cultivate a single crop annually. Number of farmers cultivating in additional crop is less. Rice yields per hectare during the additional crop season were significantly lower than the puncha crop, and it is more sensitive to crop failures owing to floods.

Farmers in Palakkad and the Thirssur district are cultivating during the virippu and mundakan seasons. During the puncha season, they will fallow their land for pre-cultivation operations in order to increase productivity for the following season. The majority of farmers in Palakkad were cultivating mundakan (88.33 percent), which was followed by virippu season (85 percent). The majority of them cultivating in both seasons. In the district, the soil and geographical conditions are ideal for cultivating in both seasons. Farmers claim that producing in both seasons is a traditional practice. However, in the Thirissur district, 83 percent of respondents were cultivating during the mundakan season, but just 50 percent were doing so during the virippu season.According to them, profit is lower in the virippu season and costs are nearly the same as in the mundakan season.

4.2.1.4 Variety of rice cultivated

Different varieties of rice are existing in the rice market like white grain, Uma, Jyothi, matta, red grain and other types of rice for cultivation. But in the surveyed area, Uma and Jyothi are the commonly used varieties of rice for cultivation.

Table 4.8 Variety of rice cultivated by farmers

Variety of rice	Alappuzha (n=60)	Palakkad (n=60)	Thrissur (n=60)	Total (N=180)
Uma	56 (93.33)	58 (96.67)	58 (96.67)	172 (95.56)
Jyothi	4 (6.67)	2 (3.33)	2 (3.33)	8 (4.44)
Total	60(100)	60(100)	60(100)	180(100)

Source: Primary data

Note: Figures in parentheses are a percentage of total

Table 4.8 shows that the most common rice types in the studied area were Uma released by Rice Research Station, Moncompu followed by Jyothi, released from Regional Agricultural Research Station, Pattambi.These are the high-yielding varieties of rice. Uma was used by the majority of farmers (95.56 per cent) in selected districts for cultivation. It may be due to the fact that Jyothi is a low-weight grain, hence the lower yield may result in a lower return. Not much difference could be noticed with respect to selected districts.

4.2.1.5 Type of rice cultivated

Farmers may cultivate traditional, high-yielding, or specialty rice. In all three districts, all of the respondents cultivated high-yielding type of rice as it provides high yield and hereby high income.

4.2.1.6. Benefits as a member of padasekharasamithi

Padasekharams are also play a major role in the rice market by co-ordinating the activities of farmer members by facilitating training, providing information on inputs, market trends and finance. An attempt was made here to analyse whether the farmers availed the services of padasekharasamithis.

Table 4.9 benefits received from padasekharasamithis

Benefits of padasekharasamithi	Alappuzha (n=60)	Palakkad (n=60)	Thrissur (n=60)	Total (N=180)
Financial support	45 (75)	-	5 (8)	50 (28)
Information source	60 (100)	35 (58)	25 (42)	120 (67)
Training	-	5 (8)	-	5 (3)
Co-ordination	48 (80)	30 (50)	30 (50)	108 (60)

Source: Primary data

Note: Figures in parentheses are a percentage of total

According to table 4.9, majority of the farmer respondents (67 per cent) were considered padasekharasamithis as a vital source of information. They are always seeking information regarding production, procurement information of SUPPLYCO, and all the subsidy details. About 60 per cent respondents have opined that they were getting benefit of co-ordination in the form of submission of registration forms in Krishibhavan, common fund raising for bund protection and to address the problems of farmers in Krishibhavan or SUPPLYCO. Coordination is required at every stage, from rice planting to loading and payment procedures. As a result, it ensures that farmers in a samithi work together. In Alappuzha district, Padasekharasamithis acts as a financial support by providing funds for bund preparation. So overall the padasekharasamithi were helping the farmers in different stages of rice cultivation.

4.2.1.7. Farming experience

The experience in farming is an important aspect to be examined. Farming experience referred to the number of years that farmers had spent engaging, coordinating, and systematically carrying out all aspects of rice production. It indicates their understanding of rice cultivation as well as their attachment to it.

Higher the experience higher will be the knowledge in farming practices and marketing of produce. Table 4.10 presents the farming experience of rice farmers.

Table 4.10 Years of experience in rice production

Years	Alappuzha(n=60)	Palakkad(n=60)	Thrissur(n=60)	Total (N=180)
Less than 15	5 (8.33)	21 (35)	16 (26.67)	42 (23.33)
15-30	25 (41.67)	31 (51.67)	33 (55)	89 (49.44)
30-45	25 (41.67)	8 (13.33)	11 (18.33)	44 (24.44)
Above 45 years	5 (8.33)	0	0	5 (2.78)

Source: compiled from Primary data

Note: Figures in parentheses are percentage to total

Fig. 4.2 Years of experience in rice production
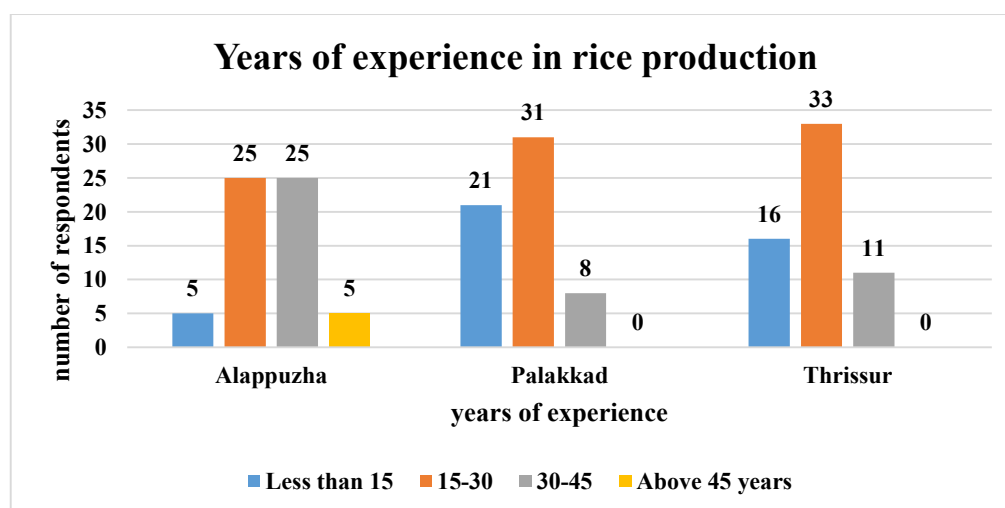
The majority of the rice farmers (49 percent) have 15 to 30 years of experience. Farmers with experience of more than 45 years were meagre percentage (2.78 per cent) in the study area. When comparing the districts, rice farmers in

Alappuzha revealed that most of the respondents (41 percent) had 15-30 and 30-45 years of experience in rice production. However, the majority of respondents in Palakkad and Thrissur had been cultivating rice for 15 to 30 years. As a result, it can be seen that Alappuzha farmers were gaining expertise and experience in rice farming.

4.2.1.8. Volume and Value of Sale

Area and production of rice in different season in the selected districts were varying in each year. The average area used for rice cultivation may change in different season. The productivity is also changing because of climate change, natural calamities and other environmental issues. The quantity which are produced may not be fully sold in the market. The marketed surplus i.e.,quantity of the produce which the producer farmer actually sells in the market, irrespective of the requirements for family consumption, farm needs and other payments may be different. The table showed the area, production and volume of sale of farmers in each season.

Table 4.11 Volume and Value of sale of rice by farmers

Volume and value	Alappuzha		Palakkad		Thrissur		Total Kerala
Area and production	**Puncha**	**Additional crop**	**Virippu**	**Mundakan**	**Virippu**	**Mundakan**	
Average area	1.90	2.38	1.25	1.01	0.68	0.83	1.77
Output/ha(qtl)	72.98	46.01	47	53.18	46.71	49.76	56.53
Marketed surplus(qtl)	72.91	46.01	46.7	52.84	46.52	49.54	56.38
Value of sale (₹/ha)	**125786**	125353.4	125150.2	142396.8	133533.22	139394.4	196491.1

(Source: compiled from primary data)

The table 4.11 showed that average area under rice cultivation in Kerala is 1.77 ha with average production of 56.53 quintal/ha. All the farmers were selling

their produce to SUPPLYCO as it is given the highest price for the farmers in Kerala. An average of 56.38 quintal rice with a value of ₹19649 wassold by farmers.

Average area in Alappuzha district is different in puncha and additional crop season. In puncha, average area was 1.90 ha and in additional crop season it was 2.38 ha. Most of the farmers were doing single crop in area because of risk of climate and soil salinity.Additional crop season is not suitable for cultivation as the rain and flood may damage the rice. Average of 72.98 quintal of rice were produced from this area in puncha season and in additional crop it is very less i.e. 46.01 quintal per hectare.

In Palakkad 1.25 ha of land is used for the cultivation of rice in virippu season with the average yield of 47 quintal/ha. In mundakan season, average area of 1.01 ha of land were utilized for rice cultivation with the average output of 53.18 quintal per hectare. In Thrissur district, farmers were cultivating in an average area of 0.83 ha with an output of 49.76 quintal/ha in mundakan season. In virippu season, average area of 0.68 ha was cultivated and 46.71 quintal/ha were produced. The major point is that marketed surplus is not highly changed from the output produced in three districts. The main reason noted that the attractive price of rice and the cost of processing of rice, they were not supposed to keep the rice for their personal purpose.

4.2.1.9. Frequency of sale of produce

The frequency of sale refers to how frequently a typical farmer sells his or her produce to buyers. In the case of rice, farmers may sell their crop on an annual or seasonal basis, or whenever demand increases.

In the study after each harvest season, all farmers sold their produce to SUPPLYCO, as previously stated. As per SUPPLYCO policy, millers will procure rice from farmers in each season. Based on the quantity specified on the receipt slip issued by agents, rice is handed over to millers by farmers on a seasonal basis.

4.2.1.10. Barriers of entry

All the farmer respondents have opined that there is freedom to enter and exit from the rice market. No legal restriction was controlling the entry to market.

4.2.1.11. Mode of payment

In the present study, payment can be made either spot or credit. As per the SUPPLYCO purchase policy, they procure rice on credit and they will receive the payment after clearing the procurement procedures of SUPPLYCO which may take one or two weeks time.

4.2.1.12. Setting of price for rice

Price is an important factor influencing the conduct of rice market. Price fixing is an agreement between participants on the same side in a market to buy or sell a product, service, or commodity only at a fixed price, or maintain the market conditions such that the price is maintained at a given level by controlling supply and demand.

The study revealed that the price for rice of farmers in Kerala are fixed by the government. SUPPLYCO is procuring entire rice from the farmers and the Minimum Support Price (MSP) is their procurement price fixed by central and state government.

Farmers also opined that they were receiving adequate price for their produce by SUPPLYCO compared to when they are selling in the open market. Currently the open market offering maximum of ₹20/kg for uma and ₹22/kg for jyothi varieties of rice, whereas SUPPLYCO is offering 26.95/kg.

4.2.1.13. Promotional methods of rice

As their produce is exclusively procured by SUPPLYCO, there is no question of promotion of their produce.

4.2.1.14. Rice procurement of SUPPLYCO

From 2005 onwards SUPPLYCO started to procuring rice directly from farmers. In the initial years the delay in procurement and payment resulted in selling rice in the open market by farmers. Later they recogonised the importance of SUPPLYCO guarantying a sustained market with fair price. So more farmers started to sell their produce to SUPPLYCO and now the study showed that all the sample respondents were selling to SUPPLYCO.

4.2.1.15. Source of information on procurement procedures of SUPPLYCO

The farmers were asked whether they know about procedures of procurement. All the respondents are aware. The table 4.12 showed the source of information on these procedures.

Table 4.12 Source of information on procurement procedures of SUPPLYCO

Source	Alappuzha (n=60)	Palakkad(n=60)	Thrissur (n=60)	Total (N=180)
Krishibhavan	0	56 (93.33)	47 (78.33)	103 (57.22)
Padasekharasamithi	54 (90)	4 (6.67)	13 (21.67)	71 (39.44)
Online portal of SUPPLYCO	6 (10)	0	0	6 (3.33)
Media	38 (63.33)	30 (50)	25 (41.67)	93 (51.67)

Source: Primary data

Note: Figures in parentheses are a percentage of total

The table 4.12 inferred that Krishibhavan and Media were the major source information on procurement procedures of SUPPLYCO. Majority of the farmers (57.22 per cent) were getting information regarding procurement of procedures of SUPPLYCO through Krishibhavan. In Alappuzha district padasekharasamithis (90 per cent) and media (63 per cent)were the major source of information regarding procurement procedures of SUPPLYCO. In Palakkad and Thrissur district krishibhvan plays the major role in disseminating information to farmers about updations of procedures of SUPPLYCO.

4.2.1.16. Delay in procurement

Farmers were expecting immediate procurement of rice after harvest because of there is a risk of early monsoon and other quality issues like increased moisture content or low weight in grain etc if procurement is delayed. The opinion of farmers regarding the delay in procurement is shown in the below table.

Table 4.13 Delay in procurement by SUPPLYCO

Yes/no	Alappuzha(n=60)	Palakkad(n=60)	Thrissur(n=60)	Total (N=180)
No	15 (25)	20 (33.33)	18 (30)	53 (29.44)
Yes	45 (75)	40 (66.67)	42 (70)	127 (70.56)
If yes number of weeks delayed				
Less than 2 weeks	36 (80)	19 (47.5)	28 (66.67)	83 (65.35)
2-4 weeks	9 (20)	12 (30)	10 (23.81)	31 (24.41)
More than 4 weeks		9 (22.5)	4 (9.52)	13 (10.24)

Source: Primary data

Note: Figures in parentheses are a percentage of total

Table 4.13 revealed that majority of the respondents (70 percent) that opined there is a delay in procuring rice by SUPPLYCO. It may be due to the fact that there are problems with millers and agents of SUPPLYCO. 70 percent of the farmer respondents opined that procurement of rice by SUPPLYCO is delayed. Among those respondents, 65 percent respondents were complaining that the procurement delayed upto 2 weeks. In the selected districts majority of the farmers were facing delay in procurement for less than 2 weeks. In Palakkad and Thrissur district a few number of farmers (9 and 10 per cent) have faced delay in procurement for more than 1 month.

Every year, the government holds a state-level conference with millers to discuss the procurement of rice from farmers. If the government does not accept the millers' terms, they will refuse to participate in procurement. Mills originally were

reluctant to procure in the additional crop season after failing to reach an agreement with the government over compensation for rice procured but damaged in the 2018 floods. As a result, the government decided to enlist the help of cooperative societies to buy rice directly from farmers. However, the procurement was delayed due to a lack of storage, among other facilities, for cooperative societies in the selected districts. After an agreement was struck between SUPPLYCO and mill owners, the standoff came to an end.It may be the reason for delay in procurement.

Moreover, millers' agents may not always collect rice from farmers properly. In the case of long-distance areas, millers will be delayed in procuring due to a lack of transportation. SUPPLYCO has established quality standards for rice procurement. Farmers of Alappuzha opined that agents were purposefully delaying procurement to display the high moisture content. In Palakkad, number of padasekharams were more so it may lead to procure rice from farmers on time.

4.2.1.17. Farmers opinion on delay in payment

After procurement based on the receipt slip PRS loan will be issued for farmer for their produce through their bank accounts. Only after depositing the cash by government banks can credit the amount to farmers accounts. The study made an attempt to know that whether there is any delay in payment of cash and explained in the study (Table 4.14).

Table 4.14 Farmers opinion on delay in payment

Yes/ no	Alappuzha(n=60)	Palakkad(n=60)	Thrissur(n=60)	Total (N=180)
No	42 (70)	35 (58.33)	39 (65)	116 (64.44)
Yes	18 (30)	25 (41.67)	21 (35)	64 (35.56)

Source: Primary data

Note: Figures in parentheses are a percentage of total

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From Table 4.14 it is inferred that majority of the respondents (64 percent) were not concerned about the delay in payment as it is government assured amount and trust worthy source of payment. Normally the payment should be credited in the farmer's accounts within one or two weeks after the procurement of rice. Still 36 percent respondents were opined that the payment is delayed for 1-2 months. This is mainly because of delay in final settlement of agreement between government and bank.

4.2.1.18. Source of information of farmers

Researcher asked farmers about whether they received information concerning rice farming, such as cultivation practices, training, credit, subsidies, and so on. All of the farmer respondents stated that they had access to all the information which they require for their farming at all times. However, the farmers in each district have diverse sources of information on several aspects. Their level of interaction with each source varies as well. As a result, the following tables will highlight the various information sources used by farmers for rice cultivation.

Table 4.15 Source of information for farmers in Alappuzha District

Type Information	Source of information						
	Krishi bhavan	KVK	Padasekha rasamithi	Media	Bank	Millers	Online portal
Cultivation practices	4(6.67)	0	56(93.33)				
Inputs and technology	8(13.33)	0	52(86.67)				
Training	4(6.67)		56(93.33)				
Price	4(6.67)		50(93.33)	40(66.67)			
Subsidies	4(6.67)		50(93.33)	10(16.67)			
Credit	4(6.67)		52(86.67)		4(6.67)		
Quality standards			35(58.33)			30(50)	40(66.67)
Terms of sale			35(58.33)			30(50)	
Mode of payment			35(58.33)			30(50)	
Government policies	25(41.67)			35(58.33)			

Source: Primary data

Note: Figures in parentheses are a percentage of total

Table 4.15 showed that different sources of information were used by farmers in Alappuzha district. Farmers have prior experience with rice cultivation. Still, information such as sowing time, pre-production practices such as ploughing, tillering, and so on are required for padasekharams to work together. Farmers relied heavily (93 per cent) on padasekharasamithis for information on cultivation practices. The main reason, according to them, is a communication gap between Krishibhavan officers and farmers. They believe that the main reason for farmers' non-cooperation is the frequent transfer of officials and officers' lack of interest in visiting the field.

All farmers require information on inputs and technology for rice cultivation. The main information required by a farmer was the source of availability and supply of inputs such as seeds, labour, fertilisers, and so on. In this case, Padasekharasamithis is providing information to the majority of farmers (86.67 per cent). Padasekharasamithi's secretaries were up to date on all information from Krishibhavan. They were not using any other source to gather information.

Institutions such as the Rice Research Station, Monkompu, the International Research and Training Centre for Below Sea Level Farming (IRTCBSLF), and the Agriculture Development and Farmers Welfare Department provided training on new cultivation technologies or mechanisations of rice cultivation on a frequent basis. The informations on these trainings disseminated to farmers through Padasekharasamithis (93 percent).

The minimum support price fixed by government for rice varies from year to year. Padasekharasamithis (93 per cent) and the media (66.67 per cent) played a significant role in disseminating information to farmers.

Government subsidies may be change district wise and pachayath wise. As a result, farmers were gathering information about these subsidies from local institutions such as Krishibhavan and Padasekarasamithis. Sustainable development of rice scheme provides fertilizer and seed subsidy. Royalty scheme for small and medium farmers were granted. Farmers, like in any other situation, relied on Padasekharasamithi for information.

Farmers must follow the quality standards, terms of sale, and mode of payment established by the SUPPLYCO as all of them were selling their produce to the SUPPLYCO. There are specific criteria for determining the quality of rice, such as moisture content, foreign particles, and so on. The terms of sale also describe the quality standards that millers must meet in order to procure rice. The terms of sale describe the quality of the produce, the procurement details, the mode of payment, and the price of the produce, among other things. As a result, all of these informations are available on SUPPLYCO's online portals. Majority of the respondents were seeking information through the online portals of SUPPLYCO (66.67 per cent) and padasekharasamithis (58 per cent).

There are different government policies related to rice cultivation. Especially in Alappuzha, kuttanad packages declared by government as part of flood mitigation measures. The Kerala State Rice Land Conversion Act, 2008 is in place to prevent land from becoming fallow or being used for other purposes. The minimum support price policy is also updated on a yearly basis. So these information were mainly acquired through media (58 per cent).

From the above inferences it is clear that padasekharasamithi is very close to farmers for providing information regarding various components. Presence of an active participation of Krishibhavan was lacking in the district. As a result, the role of local institutions in information dissemination must be expanded.

Table 4.16 Source of information for farmers in Palakkad District

Information	Source of information						
on	Krishi bhavan	KVK	PS	Media	Bank	Millers	Online portal of SUPPLY CO
Cultivation practices	55(91.67)	1(1.67)	4(6.67)				
Inputs and technology	50(83.33)		52(86.67)				
Training	55(91.67)	1(1.67)	4(6.7)				

Price	12(20)		4(6.67)	55(91.67)			
Subsidies	50(83.33)		52(86.67)				
Credit	13(21.67)				47(78.33)		
Quality standards	5(8.33)		7(11.67)			30(50)	35(58.33)
Terms of sale	5(8.33)		7(11.67)			30(50)	35(58.33)
Mode of payment	5(8.33)		7(11.67)			30(50)	35(58.33)
Government policies	35(58.33)		7(11.67)	30(50)			

Source: compiled from primary data

The majority of farmer respondents(91.67 per cent) in the district relied on Krishibhavan for information on cultivation practices. They claimed that because they had been involved in rice cultivation for many years, clarifications on cultivation practices were not heavily needed for them. Krishibhavan is willing to provide farmers with information if necessary in any situation.

Inputs and technology were also necessary for rice cultivation and the information regarding price and availability of these provided by Krishibhavans (83 percent). They are also providing details of 'thozhilsena' group of agricultural labourers willing for cultivation in fields for farmers. New technologies in rice cultivation also updated by farmers through Krishibhavan. Padasekharasamithi also provided the information to farmers.

Training information also reached into farmers through Krishibhavan. Krishibhavan provides training information and also runs training programmes for farmers. As a result, the farmers relied highly on Krishibhavan to obtain this knowledge. About the price, it is already discussed that it is fixed by government for rice. Farmers were looking for the price updates in each season. In the district, media (91 percent) is the primary source of information regarding price of rice.

The government provided subsidies through Krishibhavan. The farmers were informed of the subsidies through the officer since the role of Krishibhavan is

highly valued in the study area. Padasekharasamithi was also instrumental in getting information to farmers.

Banks offered information on the different types of credit facilities they offer. They had gone straight to the bank to resolve any doubts. Farmers, on the other hand, were not overly reliant on loans. When farmers visit banks, the institutions continue to tell them about credit options.

SUPPLYCO's online portal highlights their quality standards, terms of sale, and payment procedures. Farmers were looking for information on the website of SUPPLYCO (58.33 per cent). Miller agents also provide information to farmers (50 per cent) in order to clear up any doubts about quality standards. Krishibhavan is the major source of information dissemination to farmers in the district. Padasekharasamithi also actively participating in the diffusion of information among the farmers.

Table 4.17 Source of information for farmers in Thrissur District

Information	Source of information							
	Krishi bhavan	KVK	PS	ATIC	Media	Bank	Millers	Online portal of SUPPLYCO
Cultivation practices	12(20)	48(80)						
Inputs and technology	31(56.67)	29(48.33)	11(18.33)					
Training	11(18.33)	42(70)	3(5)	4(6.67)				
Price	12(20)		15(25)		48(80)			
Subsidies	31(56.67)		29(48.33)					
Credit	9(15)	15(25)				51(85)		
Quality standards	10(16.67)		12(20)				27(45)	42(70)
Terms of sale	10(16.67)		12(20)				27(45)	42(70)
Mode of payment	10(16.67)		12(20)				27(45)	42(70)
Government policies	42(70)		12(20)			27(45)		

Source: compiled from primary data

Farmers in the Thrissur district were also gathering information from different sources. The most important point to mention is that Krishi Vigyan Kendra (KVK) plays an important role in disseminating information about cultivation practices. KVK was used by 80 per cent of the respondents in the study area to gather information. The institution is farmer-friendly and always willing to help. As a result, it became the primary source of information for farmers seeking knowledge on farming practices. Padasekharasamitis and Krishibhavan were also approached by farmers for acquiring information.

KVK is providing training information to the farmers. 70 percent of the respondents were aware about the training from KVK. ATIC (Agricultural Training and Information Centre) is also giving training to the farmers in the district. Price of the produce is exposed to farmers mainly through media (80 per cent). Through newspaper and television they first know about of price of rice. Krishibhavan and padasekharasamitis also approached by the farmers for the additional information.

As in the case of Palakkad district, here also the banks were informing farmers about the credit facilities available to rice farmers. 85 percent respondents were relied on bank for the information on credit. Padasekharasamitis also providing information to farmers whenever they needed. The information regarding quality standards, terms of sale and mode of payment mainly available from online portal of SUPPLYCO (70 per cent). Miller agents also play an important role in the dissemination of information to the farmers regarding these areas. Krishibhavan is providing information to farmers about the government policies. Policies regarding the development of agriculture and farmers were properly informed by Krishibhavan. Media were also exposing this information to the farmers.

When analysing the source of information used by farmers in the three districts, in Alappuzha district, the role of padasekharasamitis is appreciated. They are providing farmers with reliable information. Farmers also expressed their discontent with Krishibhavan. However, in the districts of Palakkad and Thrissur, Krishibhavan is actively concerned in disseminating knowledge to farmers. KVK is also expanding its service in the district of Thrissur. If local institutions, padasekharasamitis, and other government organisations collaborate in this process, it will aid farmers in receiving accurate information.

4.2.1.19 Source of Information for famers in Kerala.

After analyzing the source of information in three districts, the overall possession of source of information for farmers in Kerala were shown in Table 4.18.

Table 4.18 Source of information for farmers in Kerala

Type Information	Source of information							
	Krishibhavan	KVK	PS	ATIC	Media	Bank	Millers	Online portal
Cultivation practices	71 (39)	49 (27)	60 (33)					
Inputs and technology	89 (49)	29 (16)	115 (64)					
Training	70 (39)	43 ((24)	63 (35)	4 (2)				
Price	28 (16)		69 (38)		143 (79)			
Subsidies	85 (47)		131 (73)		10 (6)			
Credit	26 (14)	15 (8)	52 (29)			102 (57)		
Quality standards	15 (8)		54 (30)				87 (48)	117 (65)
Terms of sale	15 (8)		54 (30)				87 (48)	77 (43)
Mode of payment	15 (8)		54 (30)				87 (48)	77 (43)
Government policies	102 (57)	12 (7)	19 (11)		65 (36)			

The table 4.18 showed that the sources of information which is used by the farmers for the rice cultivation and related activities. Krishibhavan, Padasekharasamithis and KVK are the majour source for disseminating information of cultivation practices, inputs and technology and training. To seek the information on price updates, majority of the farmers (79 per cent) were watching news in media. Government is providing various subsidies to the farmers through Krishibhavan. These information were communicated by Padasekharasamithis (73 per cent) with farmers or directly by the Krishibhavan officers. For the credit

information, most of the farmers (57 per cent) were depending on commercial banks. Quality standards fixed by SUPPLYCO, terms of sale and mode of payment details were collected by farmers through Krishibhavans, padasekharasamithis, millers and online portals of SUPPLYCO. The government policies may be changed from time to time. These updated informations were mainly provided by Krishibhavan to the farmers. The role of Krishibhavan and Padasekharasamitis in the dissemination of information to farmers were inevitable.

The importance of farmers in the structure and conduct of rice market in Kerala is unavoidable. They are the producers of rice in Kerala and most of them were either marginal or small farmers. All the farmers were handover their produce to SUPPLYCO as the government provides high procurement price for farmers. They are following the pricing policies and procurement procedures of the SUPPLYCO for the selling purpose. There is no legal barriers for entering into rice cultivation. The interference of intermediaries were absent in the study area. They were getting rice related informations from various sources such as Krishibhavan, Padasekharasamitis etc.

4.2.2 Role of traders in the rice market

The study identified that mills (SUPPLYCO accredited and private mills), co-operative societies and wholesalers were the traders in rice market in Kerala. Millers in the rice market were SUPPLYCO accredited mills and private mills. SUPPLYCO accredited mills were procuring rice from farmers within Kerala. Private mills were procuring rice from other states such as Andhra Pradesh, Karnataka, and Tamil Nadu. They are engaged in processing and sold branded rice in the open market. In the rice market, they were procuring and processing rice for SUPPLYCO and also selling branded rice by procuring rice from other states.

4.2.2.1. Varieties of rice procured by traders

Traders like mills, co-operatives and wholesaler dealt with various varieties of rice from farmers. Most common varieties procured by SUPPLYCO were uma, jyothi and other red grain varieties. Private millers were purchasing white grain rice like AST, Kranti, Kurava and CR from the Karnataka, Andrapradesh and Tamilnadu.

Co-operative societies also procuring red uma and jyothi from farmers for SUPPLYCO and for branding white grain varieties of rice were using. Wholesaler were mainly traded Andrajaya and ponni rice from Andrapradesh and Tamilnadu respectively.

4.2.2.2 Volume and value of trade

The mills were procuring rice for SUPPLYCO and also from other states. Co-operative societies also procuring for SUPPLYCO and from other farmers. Details of volume of trade of mills and co-operatives were given below.

Table 4.19 Procurement and market share of traders (2019-20)

Volume of trade	SUPPLYCO accredited mills	Private mills	Co-operatives			Wholesaler	Total
			For SUPPLYCO	For branding	Total		
Procurement of rice (quintal)	1100000	2400000	190000	21500	211500	100000	3811500
Value of rice procured (million)	2964.5	4920	512	41.9	516.24	185	8623.48
Market share of traders	34.38	57.05	5.94	0.49	5.98	2.15	100

Source: compiled from primary data

Table 4.19 showed that SUPPLYCO accredited mills were procured total of 11 lakhs quintal of rice per year for SUPPLYCO with a market share of 34.38 per cent.Private mills were procuring an average of 24 lakhs quintal of rice from other states into Kerala with a market share of 57.05 per cent. Co-operatives were procuring 1.9 lakhs quintal rice for SUPPLYCO and for branding 21500 quintal were procured. Wholesaler is procured about 1 lakhs quintal per year. SUPPLYCO is essential for the procurement of rice in Kerala for protecting farmers at the same

time for meeting consumption needs of population private mills are necessary in the rice market.

4.2.2.3. Source of Information of traders

Traders were always searching for information related to product attributes, price of rice, the source of rice, mode of payment, government policies. The source of these information was listed in Table 4.20.

Table 4.20 Types and source of information for traders

Type of information	SUPPLYCO accredited mills	Private mills	Co-operatives	Wholesaler
Product attributes	SUPPLYCO	Kalady mills consortium	SUPPLYCO	Kalady mills
Price of rice	SUPPLYCO	Kalady mills consortium and brokers	SUPPLYCO and Kalady mills consortium	Kalady mills and Supplier mills
Source of rice	SUPPLYCO	Brokers and online source	SUPPLYCO	Brokers
Market for milled rice	SUPPLYCO	Research and development unit	SUPPLYCO and other mills	-

Source: compiled from primary data

Mills were gathering information on different aspects rice market. For SUPPLYCO authorized millers, informations were passed through SUPPLYCO institution. Product attributes meant that quality parameters like moisture content of rice, purity degree, varietal purity, cracked grains, immature grains, discolored/fermented grains and damaged grains were measured before procurement of rice by mills. SUPPLYCO clearly mentioned about these quality measures for procure rice. For private mills and co-operative societies also, these quality information were following.

Private mills were collecting rice from other states. This price determined by Kalady mill consortium by identifying the market rate of rice in the other state.

These information were given by Kalady mills or the brokers of the supplier state. Source of information on rice were collected through online searching or brokers of supplier state. In other rice producing states, private mills were collecting rice from farmer at less than market price. Mills in Kerala whenever need rice; they were contacting brokers or mills directly through online information.

Information on market for milled rice was provided by SUPPLYCO to cooperatives and mills. It can be only distributed through Public Distribution System. Private mills were collecting information through their R&D department by the different market research. Wholesaler is getting information from Kalady mills and supplier mills. Wholesaler is selling their produce in Kalady market. So based on the information collected from Kalady mills, he will procure rice from other states.

4.2.2.4. Product attributes

All the traders were following the product attribute or quality criteria of rice fixed by the SUPPLYCO. The details of attributes of rice procured by mills were given below.

Moisture content: Moisture content has a marked influence on all aspects of rice and rice quality and it is essential that rice be milled at the proper moisture content to obtain the highest head rice yield. Rice is at its optimum milling potential at moisture content of 14%. Grains with high moisture content are too soft to withstand hulling pressure without undue breakage and may be pulverized. Grain that is too dry becomes brittle and has greater breakage. Moisture content and temperature during the drying process is also critical as it determines whether fissures and/or full cracks are introduced into the grain structure.

Degree of purity: Purity is related to the presence of dockage in the grain. Dockage refers to material other than rice and includes chaff, stones, weed seeds, soil, rice straw, stalks, etc. These impurities generally come from the field or from the drying floor. Unclean rice increases the time taken to clean and process the grain. Foreign matter in the grain reduces milling recoveries and the quality of rice and increases the wear and tear on milling machinery.

Variety Purity: A mixture of varieties causes difficulties at milling and usually result in reduced capacity, excessive breakage, lower milled rice recovery and reduced rice Different sizes and shaped grains makes it more difficult to adjust the hullers and polishers to produce whole grains. These are results in low initial de-hulling efficiencies, a higher percentage of re-circulated rice, non-uniform whitening, and lower grade of milled rice.

Grain dimensions: Grain size and shape (length-width ratio) is a very stable varietal property. Long slender grains normally have greater breakage than short, bold grains and consequently have a lower mill rice recovery. The grain dimensions will also dictate to some degree the type of milling equipment needed. Overexposure of mature rice to fluctuating temperature and moisture conditions leads to development of fissures and cracks in individual kernel. Cracks in the kernel are the most important factor contributing to rice breakage during milling. This results in reduces milled rice recovery and head rice yields.

Immature grains: The amount of immature rice grains in a sample has a major effect on head rice yield and quality. The immature rice kernels are very slender and chalky and this results in excessive production of bran, broken grains and wastage. The optimal stage to harvest grain is at about 20-24% grain moisture or about 30 days after flowering. If the harvest is too late, many grains are lost through shattering or dry out and are cracked during threshing, which causes grain breakage during milling

Damaged grains: Rice deteriorates through biochemical change in the grain, the development of off-odors and changes in physical appearance. These types of damage are caused from water, insects, and heat exposure.

These are the quality criteria of rice recommended by SUPPLYCO. Mills were strictly following these criteria otherwise the quantity of milled rice may reduce.

4.2.2.5 Price Setters in the rice market

From the study, it can be inferred that MSP fixed by the government is the procurement price paid to the farmers in Kerala through SUPPLYCO. Whereas, for the rice sourced from the outside states, the price is determined by Kalady mills

consortium based on the open market price of the state and the price of supplier state.

4.2.2.6. Procedure of setting of price by SUPPLYCO

The study found that in Kerala, the rice market is a government-regulated market. All respondents in the studied areas sold their produce to SUPPLYCO because they knew they would obtain a guaranteed market and a fair price. Rice prices in the open market ranged from ₹19 to ₹22 for farmers.

Government is the ultimate agency for fixing price and it is based on central and state government policy. Minimum support price will be determined by central government with the help of Commission for Agriculture Cost and Price (CACP). By analysing the cost of cultivation incurred by farmers for producing rice, government may fix a support price for produce to help farmers. State Intensive Bonus also added with MSP by state government for fixation of final support price for rice.

In the agriculture year 2019-2020 price of rice is fixed at the rate of ₹2695 per quintal rice. Central Government subsidy of ₹1815 with State Incentive Bonus (SIB) subsidy of ₹880 jointly added into the final subsidy of ₹2695 per quintal rice to farmers. Currently (year 2020-2021) the minimum support price is reached into ₹2872 by the central government subsidy of ₹1940 and SIB of ₹932 to rice per quintal.

4.2.2.7. Procedure of setting price for rice by Private mills

The selling price of rice is determined by each individual enterprise. When determining the selling price, it is customary practise to take into account the cost of rice, as well as processing and handling costs and a particular amount of profit per unit of product. In Kerala, price of rice traded from the other states were determined by Kalady mill consortium based on the market price and price in the supplier state. Negotiation between the selling firm and the buyer determines the market price. Both parties investigate the current market pricing. Currently the market price for imported rice is an average of ₹1900-2100/quintal.

4.2.2.8. Procedure of setting price for rice by co-operative societies

Rice was procured by co-operative societies for SUPPLYCO and for grinding of branded rice. When it came to rice purchase, pricing policies of SUPPLYCOwere followed. In the event of private procurement, the price of the Kalady mill was being monitored and may alter as a result. Farmers in Kerala, as well as mills in other states, were paid an average of ₹1900-2100/quintalfor rice procured. Wholesaler also following the price of rice prevalent in the supplier state.

4.2.2.9. Procedures of Procurement by SUPPLYCO accredited mills

Rice would spoil if it is not processed, thus procurement and processing are equally crucial. Rice's shelf life is shortened due to its high-water content. The produce should be dried and preserved as soon as possible after harvesting. Because of the heavy nature of the produce, a farmer is forced to sell it right away due to a lack of storage space. As a result, the Indian government intervenes in rice procurement. MSP (Minimum Support Price) is announced from time to time to assist farmers in avoiding distress sales. On behalf of FCI (Food Corporation of India), rice gets procured by SUPPLYCO, through private millers on the basis of tender. On receiving order from SUPPLYCO, mill collects the product from farm gate and process the rice to rice and hand over back to SUPPLYCO.

The farmers need to register at the official website of SUPPLYCO about the cultivation details. The printed form should be submitted at Krishibhavan and the agricultural office verifies the area of cultivation and applicant will be given unique number. When rice is given to SUPPLYCO - contracted mill, the farmer is given a Paddy Receipt Sheet (PRS) in duplicate. One copy of the PRS is given to the concerned Paddy Payment Officer (PPO) of SUPPLYCO and the other copy is kept by the farmer. The PRS details will be entered online by the miller. The PPOs will verify the PRS entry with the PRS received by them and the payment is made to the farmer's bank account. The rice procured by the mill is processed and the quality of the rice will be inspected by the Paddy Quality Assurance Officers (PQAO) and the qualified rice is then distributed to consumers through Ration Shops and SUPPLYCO out-lets.

In Alappuzha district, on the basis of opinion of farmers and Rice Procurement officer, SUPPLYCO, rice cultivation in district is completely depended on the SUPPLYCO. They did not believe in any other source of procurement. They were against the decision on procurement by co-operative societies, as it cannot procure and store these much quantity of rice at right time. So now the farmers were highly trusted in government market other than open market.

Farmers in the districts of Palakkad and Thrissur were also selling their produce to SUPPLYCO. Rice was procured from farmers in Palakkad after the drying and cleaning process was completed. However, this practise is not followed in other districts. According to Millers, the farmers in Palakkad were willing to dry the harvest rather than reduce in their quantity of sale because of the moisture level of the rice. The majority of them have been dried and cleaned at home or in the field side. However, the environment in the Alappuzha district is not conducive to storing and drying produce. In Thrissur, production is comparatively lower, and millers procure from the farm as the farmers were not ready to dry their produce.

4.2.2.10. Procedures of Procurement by private mills

Private mills were procuring rice from other states like Karnataka, Tamilnadu and Andra Pradesh. Mills in Kerala may already be in contact with mills in other states, or they will identify a suitable mill for delivering rice to Kerala by searching online. Kalady mills may set the price based on the market price of the supplier state. Mills negotiated based on these prices, and the supplier mill may deliver rice directly or through brokers in their state. From the supplier mill's warehouse to the mills' depots in Kerala, the supplier state was responsible for all risks and responsibilities. As a result, private mills' risk in rice procurement is reduced.

4.2.2.11 Procedures of Procurement by Co-operatives and wholesalers

Co-operatives were procuring rice from farmers in Kerala for the SUPPLYCO and also procuring for branding. As discussed earlier, the procedures followed by the SUPPLYCO accredited mills are same for the co-operatives in the case of procurement of rice for SUPPLYCO. For branding of rice, they are procuring rice from other states. They are purchasing rice through the brokers of supplier mills who are already connected. Wholesaler is procuring rice from other states based on

the demands in Kalady rice mills. Through the brokers of supplier state, they will procure rice and transportation cost will be held by the wholesaler.

4.2.2.12 Barriers of entry in the market

There is no legal barriers for the traders to enter into rice market. Government is ensuring the participation of traders in the rice market for meeting the consumption needs of population in Kerala.

4.2.2.13. Sales promotion methods

Neither the farmers nor traders were following any promotional methods for the sale of rice. Processed or branded rice only promoted by the firms.

4.2.2.14. Terms of sale

In Kerala, the term of sale of rice is different for government agencies and private agencies. SUPPLYCO accredited mills were needed to follow the government's conditions for delivering the produce to SUPPLYCO. They were procuring rice for SUPPLYCO only and hence are unable to sell it on the open market. The other rice cannot be processed in the mill when the rice for SUPPLYCO is being milled. A mill must have at least three years of experience in the milling business to obtain a procurement licence. The millers should verify the quality and quantity of rice procured. They are responsible for all costs associated from procurement to delivering rice to ration stores. The government has the authority to seize the mill if it fails to deliver the required amount of rice. As a result, the terms of sale should be scrupulously adhered to.

Regarding the terms of sale of private mills they are procuring rice from other states for which they have specific certain quality standards by the Kalady mill consortium, who will fix the price by taking into consideration the open market price and supply price. Spot payment will be made by the private mills and suppliers. The differences in the procurement price and the selling price of branded rice after deducting the operational expenses constitute less margin for private mills.

For the co-operatives they are following the terms of SUPPLYCO for the procurement of rice from farmers in Kerala and for the open market they are taking into the terms of Kalady Mills Consortium. Wholesaler is also trading the rice based on the price fixed by the consortium.

The session of the structure and conduct of the study revealed that farmers, SUPPLYCO, private millers, and co-operatives which are the players in the rice market in Kerala. SUPPLYCO is the major procurement agency of rice from farmers of Kerala whereas private millers procure from other states. The market share of SUPPLYCO in procurement from Kerala farmers is average of 34 percent and the rest share was from the farmers of other states. Government by deciding the MSP play a major role in selling up the rice of farmers of Kerala whereas the role of Kalady mills consortium is dominating in the setting of price for procured rice from others. Number of sellers and buyers are limited in the rice market. Only farmers are the sellers and SUPPLYCO, private millers and the wholesalers constitute the buyers. However, SUPPLYCO in the case of rice produced in Kerala and Kalady mills consortium for the rice procured from other states are the major players in the rice market. The dominance of the group was evident in the fixation of price, determining the volume of trade, fixing the quality standards, and acting as an information source.

4.3 Performance of rice market in Kerala

Market performance refers to the combination of profitability and efficiency that firms reach on any market by pursuing whatever behaviour they take the result is price, production, and selling dimensions, product design and so on (Bain, 1968). Because market performance is intrinsically multifaceted and hence complicated, a complete assessment of market performance, the strategic result of market structure, and the conduct of the market is challenging.

The performance of the rice market is evaluated by measuring the cost and income of farmers and other traders. Using the cost principles of the Commission for Agricultural Costs and Prices (CACP), the researcher calculated the cost of farming for farmers. Each district's cost analysis was calculated independently each season. Further cost and income of the traders in the market was also analysed.

4.3.1. Cost of Cultivation of rice

The cost of cultivation of rice in Alappuzha, Palakkad and Thrissur districts were estimated using the cost concepts of Commission for Agricultural Costs and Prices (CACP) *viz.*, Cost A, Cost B and Cost C. Cost A is made up of the cultivators' actual cash and in-kind expenses (paid out charges). Cost B is made up of Cost A added to interest on fixed assets, such as land, whereas Cost C is made up of Cost B plus the imputed value of family labour. In this study, the entire cost of rice crop cultivation is calculated as the sum of material costs, labour costs, and other expenses such as land lax, irrigation costs, and so on.These were worked out for all the sample respondents and in the present study, Cost B1 constitute a small amount of cost because farmers included in the sample did not use much fixed assets other than land for cultivation. The labourers bring their own implements to the field and the wages paid included the rent for the implements also.

Table 4.21 Season wise cost of cultivation (₹/ha) in Kerala

Sl.No	Cost concepts	Virippu (₹/ha)		Total Virippu (₹/ha)	Mundakan(₹/ha)		Total Mundakan (₹/ha)	Puncha(₹/ha)	Additional crop(₹/ha)	Total (Kerala) (₹/ha)
		Palakkad	Thrissur		Palakkad	Thrissur		Alappuzha		
	Cost A$_1$									
1	Casual labour	23098.67	36493.18	26342.93	29109.66	39024.35	33337.11	42392.49	25498.09	**33606.47**
2	Machine labour	16083.18	16865.99	16272.78	15950.07	18814.08	17171.23	15227.47	19152.67	**16475.16**
3	Seeds	1452.98	935.07	1327.54	1527.28	1474.53	1504.79	2548.16	885.50	**1734.20**
4	Manures &fertilisers	7282.33	9301.44	7771.37	7804.87	8931.62	8285.30	10795.78	7900.76	**8908.30**
5	Plant protection chemicals	2243.10	5373.53	3001.32	2382.36	4184.85	3150.91	8118.80	8305.34	**5133.05**
6	Loading charge	2206.47	907.71	1891.90	2641.87	1256.51	2051.18	4379.08	5340.17	**3030.54**
7	Packing charge	791.38	595.58	743.96	797.68	631.52	726.83	2189.54	1725.95	**1282.72**
8	Transportation cost	5127.74	514.91	4010.48	5073.58	307.84	3041.55	84.13	1019.47	**2195.11**
9	Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.00	2089.13	823.47	**735.22**
10	Interest on working capital	2665.50	3212.86	2798.08	2974.48	3391.11	3152.12	4313.61	3592.90	**3461.45**
11	Land revenue	695.48	595.58	671.28	625.00	500.00	571.70	500.00	500.00	**570.28**
12	Credit	250.78	78.46	209.05	305.10	236.61	275.90	**0.00**	**0.00**	**145.91**
13	Irrigation cess	159.87	147.12	156.78	190.24	120.72	160.60	0.00	0.00	**94.65**
	Total of cost A$_1$	**62058.74**	**75022.10**	**65197.46**	**69383.18**	**78874.57**	**73429.21**	**92640.09**	**74746.72**	**77373.05**
14	Rent paid for leased in land	3291.54	0.00	2494.30	3050.97	2655.85	2882.50	3183.13	1221.37	**2727.66**
	Cost A$_2$ (Cost A$_1$+14)	**65350.28**	**75022.10**	**67691.76**	**72434.15**	**81530.42**	**76311.71**	**95823.22**	**75968.09**	**80100.71**
15	Interest on value of owned capital assets	22.93	14.43	20.87	27.64	20.34	24.53	2.86	**0.00**	**14.52**

	Cost B$_1$(Cost A$_1$+15)	62081.67	75036.53	65218.33	69410.82	78894.91	73453.74	92642.95	74746.72	77387.56
16	Rental value of owned land	47358.93	25000.00	41943.42	46949.03	22585.59	36560.87	51816.87	44980.92	43626.31
	Cost B$_2$ (Cost B$_1$+14+16)	112732.10	100036.50	109656.05	119410.80	104136.40	112897.11	147643.00	120949.00	123741.53
17	Imputed value of family labour	947.49	409.47	817.18	812.10	732.77	778.27	3654.40	9190.84	2427.95
	Cost C$_1$ (Cost B$_1$+17)	63029.16	75446.00	66035.51	70222.91	79627.69	74232.02	96297.36	83937.56	79815.51
	Cost C$_2$ (Cost B$_2$+17)	113679.60	100446.00	110473.23	120222.90	104869.10	113675.39	151297.40	130139.80	126169.48
	Cost C$_3$(C2+10% of Cost C$_2$)	125047.60	110490.60	121520.55	132245.20	115356.00	125042.92	166427.10	143153.80	138786.43

Table 4.21 showed that cost of cultivation in Kerala consisted of paid out costs, rental value of owned land and leased land, imputed value of family labour and interest on value of owned capital. The major portion of cost A1 or paid out costs ₹33606/ha were spending for hiring human labours by farmers. Labour as an input is very important. It cannot be eliminated from any production process. Even in the most heavily mechanized systems of production, labour cannot be entirely substituted for by machinery. People are still employed to operate the machines. Labour is employed to make sure that all other inputs are applied. That is, labour in fact makes it possible that all activities that need to be performed in the production of the rice are performed. Labour cost is highest in the puncha season. Machine labour and fertiliser cost also very high for the farmers in Kerala. The major portion of paid out cost is constituted by hired human labour, machine labour and fertilisers (Department of Economics and Statistics, 2019). Total cost A1 is ₹77373/ha paid by the farmers for rice cultivation. Rental value of owned land is another major expense for the farmers in Kerala i.e about ₹43626/ha. The cost of cultivation in Kerala is ₹138786/ha and highest cost is carried out by farmers in the puncha season.

Puncha and additional crop are the two main seasons for rice cultivation in Alappuzha district. Labour cost in the district was about ₹42392/ha in puncha season. It is high productive season so the farmers more invest in fertilising, weeding, and pesticides. Hence it requires more man power than in additional crop season.Farmers were facing shortage of labour in district. So at any rate they are ready to acquire labour for the cultivation.

Cost of machine labour ₹15227/ha in puncha and ₹19152/ha in additional crop season is the next highest cost under cost A1 in both seasons. In the study area machine labour is used for dewatering, ploughing, threshing and harvesting. Dewatering operations in large padasekharams are more economical as per acre pumping expenses can be reduced by using high power electric pump sets.

Even though the recommended quantity of seeds needed per acre is 40 kilograms and it is freely provided by Krishibhavan, sample farmers in the study area, guided by their past experience, use 50 to 60 kilograms of seed per acre in their fields at the rate of ₹40/kg. Rice seeds fall in excess in some areas of the field

due to poor sowing quality, while the rate of seed fall in other portions of the field is significantly lower than what is required. It causes an uneven distribution of seedlings, which has a negative impact on agricultural output. As a result, extra seedlings are transported from densely growing areas to sparsely growing areas of the field, a process known as transplanting or nattu.Soit was increasing the cost for purchasing additional quantity of seed and also labour cost for transplantation.All of the sample farmers in area use chemical fertilizers in their fields. The average per hectare use of chemical fertilizers (N + P + K) of 426 kilograms and other chemicals like microfood and vivaye also used. These are extremely expensive fertilisers. Farm yard manures such as cow dung or ash are used by a small percentage of farmers in the area. Agricultural research shows that the use of lime in right quantities is imperative to neutralise the high level of acidity in kayal lands. In additional crop season, the quantity of lime is more used. Comparatively fertiliser cost is more in the district compared to other districts.

Since the early days leaf rollers, rice stem borers, rice bugs and rats were the important pests that destroyed the rice crop in the study area. Cost of plant protection methods like pesticides and weedicides are the next high cost after fertiliser cost. On an average of ₹8000 were incurred in both seasons.Farmers are charged a loading fee by SUPPLYCO at the time of procurement. Average cost of ₹4379 and ₹5340 per hectare is incurred for farmers in puncha and additional crop respectively. In the area where farmers doing additional crop were paying two times of loading charge because of market centre is at a long distance.Packing charge is carried by farmers based on quantity of rice sold to SUPPLYCO. For a quintal it costs about ₹30 and based on the quantity produced from hectare packing charge is calculated. The puncha season yields more than the additional crop season. As a result, the farmers in the puncha pay a high packaging fee.During the puncha season, farmers do not expressly mention transportation costs. It is covered by the input cost. Farmers were paying for road and water transportation to give over their produce to SUPPLYCO during the additional crop season. During the puncha season, however, millers' vehicles were able to access the majority of the farmer's fields.

Miscellaneous expenses included charge for bund protection fee and contract fee for the pumb set used for dewatering. In puncha season average cost of ₹2089 were incurred. In the case of additional crop season it was ₹823 only. Land revenue in the area was ₹500. When calculated interest on capital, it is also high in the puncha season.For cultivating rice by farmer in a hectare, ₹166427/ha is the cost incurred in puncha season and ₹143153/ha in additional crop season.

In Palakkad district Cost A1, the paid out cost actually incurred by the farmer, the major share of the cost component was hired human labour. Average cost of ₹2300/ha were incurred in virippu season and in mundakan season it is little more i.e ₹29000. In mundakan season, farmers were more preferring transplantation and it needs more man power. Compared to Alappuzha district, wage of labour was less in palakkad district. Land preparation and transplantation needs more labour power in the mundakan season. Machine labour cost is varying with the time taken for the field activity by the machine to complete. In virippu season, an average of ₹16083 incurred for the machine operations. Farmers opined that, if the government machineries like tractor and winnover, cost of machines can be reduced. The majority of the farmers were using uma variety of seed for the rice cultivation. Krishibhavan is offering seed at a subsidised rate of ₹21/kg up to 100 kg for a total of 2 ha. Compared to Alappuzha farmers, in Palakkad farmers were using less quantity of seeds. Hence, there is no additional purchase of seed required for farmers. Farmers in this district used manures and fertilisers at a lower rate than in other districts. Common fertilisers such as NPK and lime were utilised, while other chemicals were employed in modest amounts. An average cost of ₹7282 was spent by farmer for fertiliser in puncha season. It is slightly greater in mundakan than in puncha because more fertiliser will be used in case it is washed out of the field by rain.

Plant protection chemicals were applied by farmers were less in the district. They were using man power to remove weedicides from the rice. Even though insecticides and pesticides were applying, the quantity is less. So the cost of plant protection chemical is comparatively less. In both seasons, an average cost of ₹2243 and ₹2382 were spent by farmer for the pesticides. At the time of procurement, the farmer pays a loading fee for the trade unions for the quantity (quintal) carried over to miller's vehicle. During the mundakan season, production and sale volume per

hectare are higher. As a result, the loading charge per hectare is higher at that time about ₹2641/ha.Packing charge of rice per hectare is about ₹790 in both seasons. Millers either provide gunny bags or reimburse farmers for the cost of gunny bags. Transportation cost is also similar in both seasons. Here the farmers mainly pointed the transportation cost is mainly for bring the produce to home. In the district, after drying and cleaning only the produce will be procured by SUPPLYCO. So the farmers bring the produce to home for the drying process. For this purpose, average cost of ₹5000/ha incurred by the farmers in both seasons. The costs of other modes of transportation are factored into the input costs.The area's land revenue was ₹695 and ₹625 per hectare in two seasons. Farmers don't take advantage of the credit option too often. The interest-free loans were only for a period of six months. So it's difficult to repay if they don't get the expected produce from the field. As a result, the credit amount has the least impact on the cost computation.Farmers can use irrigation to use the panchayath's water facility system in rice farming. In the virippu and mundakan seasons, the average cess paid by farmer was₹159 and ₹190. During the virippu season, irrigation is especially important. A total of 12 dams were being actively utilising for agricultural irrigation.

Interest on working capital is ranged from ₹2500 to ₹3000 per hectare. When finding total cost A1 by adding all these costs, an average cost of ₹62058 in virippu season and ₹69383 in mundakan season incurred for farmers. These cash were directly paid by the farmer throughout the cultivation. An average cost of ₹3291 and₹3050 rental value of leased land is paid by farmers. Owned capital assets are limited to farmers in the district. So it is not an important component in the cost calculation. Rental value of owned land is about ₹47000/ha in the study area. The value of land increasing day by day. So it reflect in the cost B2 i.e about ₹112732/ha in virippu and ₹119410 in mundakan season. So finally the total cost C3 showed the cost is more in the mundakan season i.e ₹132245/ha. When the cost of cultivation of rice in Palakkad and Alappuzha is compared, Palakkad is less expensive because to cheaper labour costs, plant protection, and rental costs.

Total cost A1 in the Thrissur district showed an average cost of ₹75022 and ₹78874 in virippu and mundakan season respectively. The major portion of this cost is made by hired human labour cost. The average cost of labour was ₹36493 in virippu season and ₹39024 in mundakan as the transplantation and weeding requires

more labour in mundakan season. The shortage of labour is observed in the district so the wage determined by labour is high.

The next component is machine labour. It is mainly used for land preparation and harvesting. Machine labour cost is normal compared to the machine rates in other districts. The cost may vary depending on how long it takes to complete the field operation. Average cost of ₹16865/ha in virippu season and ₹18814 in mundakan season were showed in table. Seeds were available to farmers through Krishibhavan at a subsidy rate of ₹12/kg upto 200kg for 2 ha. For additional quantity of seeds, they need to pay 38/kg in local market. But the farmers were using standard rate of 30 kg or less in a hectare. Hence, the subsidy rate seed is enough for their land. The seed cost is only ₹935 and ₹1474 in the virippu and mundakan season. It included transportation cost of bring seeds into field.Manures and fertilizer cost paid by farmers in virippu season (₹9301/ha) were more than in mundakan season (₹8931/ha). They were purchasing fertilisers from private traders. Subsidy of ₹4200/ha for fertilizer and seed is reimbursed by Krishibhavan into farmers account. The major fertilisers used were NPK and lime in the area. The other fertilisers are very less quantity applied in the field.Plant protection chemicals were applied in the fields as the pests and weeds are high in the area especially in virippu season. Averge cost of ₹5373/ha was spent by a farmer in virippu season for plant protection chemicals. It was slightly less in mundakan season with average cost of ₹4184/ha.

For loading the rice into miller's vehicle, trade union members were charging per quintal about ₹30/quintal. When calculating loading charge per hectare, average cost of ₹907 and ₹1256 were incurred by farmersduring virippu and mundakan season respectively. Packing charge also incurred around ₹500-600 for farmers per hectare. Transportation cost is not much considered by the farmers in their cost calculation. Average cost of ₹500/ha was the land revenue of the area. Irrigation cess also paid by the farmer in both seasons. Interest on working capital is worked out and ₹3212 in virippu season and ₹3391 in mundakan season.By adding all these costs, a farmer need to spend total paid out cost (A1) of ₹75022 in virippu season and ₹78874 in mundakan season. There is no farmer leased the land for cultivation in virippu season. In mundakan an average cost of rent of leased land ₹2655 occurred. Rental value of owned land in the area was ₹22000-₹25000. So the

cost B2 finally showed an amount of ₹100036/ha in virippu season and ₹104136/ha in mundakan season without considering owned labour. The cost of cultivation per hectare was 110490 in virippu season and 115356 in mundakan season.

4.3.2 Cost of Production of rice (₹/quintal)

Cost of cultivation showed the different costs carried by the farmer for an entire process of rice cultivation in a hectare. Cost of production meant that an average cost carried by the farmer for the production of a quintal rice from the cultivation. The cost of production of each district in each season were estimated using the cost concepts of Commission for Agricultural Costs and Prices (CACP) *viz.*, Cost A, Cost B and Cost C.

Table 4.22 Season wise cost of production (₹/Quintal) in Kerala

Sl.No	Cost concepts	Virippu (₹/Quintal)		Total Virippu Kerala (₹/Quintal)	Mundakan (₹/Quintal)		Total Mundakan Kerala (₹/Quintal)	Puncha (₹/Quintal)	Additional crop(₹/Quintal)	Total (Kerala) (₹/Quintal)
	Cost A$_1$	Palakkad	Thrissur		Palakkad	Thrissur		Alappuzha		
1	Casual labour	493.67	804.94	567.27	547.40	784.16	644.53	580.84	554.17	594.4896
2	Machine labour	343.73	372.02	350.42	299.94	378.05	331.98	208.64	416.26	291.4413
3	Seeds	31.05	20.63	28.59	28.72	29.63	29.09	34.91	19.25	30.67756
4	Manures &fertilisers	155.64	205.17	167.35	146.77	179.47	160.19	147.92	171.71	157.5854
5	Plant protection chemicals	47.94	118.53	64.63	44.80	84.09	60.92	111.24	180.51	90.80224
6	Loading charge	47.16	20.02	40.74	49.68	25.25	39.66	60.00	116.06	53.60941
7	Packing charge	16.91	13.14	16.02	15.00	12.69	14.05	30.00	37.51	22.69092
8	Transportation cost	109.59	11.36	86.36	95.41	6.19	58.80	1.15	22.16	38.83092
9	Miscellaneous			0.00			0.00	28.62	17.90	13.00577
10	Interest on working capital	56.97	70.87	60.25	55.93	68.14	60.94	59.10	78.09	61.2322
11	Land revenue	14.86	13.14	14.46	11.75	10.05	11.05	6.85	10.87	10.08812
12	Credit	5.36	1.73	4.50	5.74	4.75	5.33			2.58117
13	Irrigation cess	3.42	3.24	3.38	3.58	2.43	3.10			1.674273
	Total of cost A$_1$	1326.30	1654.77	**1403.97**	1304.71	1584.90	**1419.65**	1269.28	1624.47	**1368.709**
14	Rent paid for leased in land	70.35	0.00	53.71	57.37	53.37	55.73	43.61	26.55	48.25161
	Cost A$_2$ (Cost A$_1$+14)	1396.65	1654.77	1457.68	1362.08	1638.27	1475.38	1312.90	1651.02	**1416.96**
15	Interest on value of owned capital assets	0.49	0.32	0.45	0.52	0.41	0.47	0.04	0.00	0.256783

	Cost B$_1$(Cost A$_1$+15)	1326.79	1655.09	1404.42	1305.23	1585.31	1420.13	1269.32	1624.47	**1368.966**
16	Rental value of owned land	1012.16	551.43	903.22	882.86	453.84	706.85	709.97	977.60	771.7379
	Cost B$_2$ (Cost B$_1$+14+16)	2409.30	2206.52	2361.35	2245.46	2092.51	2182.71	2022.90	2628.62	**2188.955**
17	Imputed value of family labour	20.25	9.03	17.60	15.27	14.72	15.05	50.07	199.75	42.94974
	Cost C$_1$ (Cost B$_1$+17)	1347.04	1664.12	1422.02	1320.50	1600.03	1435.17	1319.39	1824.22	**1411.915**
	Cost C$_2$ (Cost B$_2$+17)	2429.55	2215.56	2378.95	2260.73	2107.24	2197.76	2072.98	2828.37	**2231.905**
	Cost C$_3$(C2+10% of Cost C$_2$)	2672.50	2437.11	2616.84	2486.80	2317.96	2417.53	2280.27	3111.21	2455.095

Table 4.22 showed the cost of production of rice farmers in different season in in three districts. While considering cost of production, cost A1 per quintal was ₹1368. Casual labour constitutes the highest cost among cost A1 i.e ₹594/quintal. Machine labour and fertilizer cost is also added the expense of farmers. Rental value of owned land was ₹771/ha. The cost of production C3 in Kerala showed that on an average of ₹2455 cost carried out by farmers for one quintal of production. Cost of production is highest in the additional crop season i.e ₹3111/quintal of rice for farmers.

When considering cost of production in Alappuzha district, it is obvious that all production costs are higher during the additional crop season. The production from the additional crop season was lower than the puncha season, as previously stated. Casual labour requires an average of ₹580 and ₹554, which covers the majority of the expense. Seeds are utilised in greater quantities in the puncha season to produce one quintal of rice, hence the cost is higher in comparison to the puncha season. Because of disease and insect attacks on rice, the cost of manures, fertilisers, and plant protection methods was very high in the additional crop season. Cos A1 was high for producing one quintal of rice in additional crop season. In the additional crop season, the rental value of owned land and the imputed value of owned labour were both high. As a result, the cost C3 or cost of production per quintal in the additional crop was ₹3111, which was higher than the ₹2280/quintal in the puncha season.

In the Palakkad district, the cost of production in the virippu season is slightly higher than in the mundakan season. This is because rice farming yields are high during the mundakan season, lowering production costsThemundakan has a higher labour cost since it requires more manpower for transplantation and weeding. However, machine costs were considerable during the virippu season, averaging ₹343 per quintal. Fertilizer and pesticide prices are also high during the virippu season. In the virippu season, total paid up cost or cost A1 was ₹1326, and in the mundakan season, it was ₹1304.

The final cost C3 or cost of production calculation shows that in the virippu and mundakan seasons, respectively, an average amount of ₹2672 and ₹2486 is required to produce one quintal of rice in Palakkad district.

Farmers in the Thrissur area also had to spend extra during the virippu season to produce one quintal of rice. This is due to the virippu season's lower productivity compared to the mundakan season. The district's labour costs are considerable, with an average of ₹804/quintal for rice production during the virippu season. In both seasons, machine labour was nearly identical. All other costs, such as seeds, fertilisers, and plant protection agents, were significantly higher during the virippu season. The total cost of production in the virippu season was ₹2437/quintal, whereas in the mundakan season it was ₹2317/quintal.

4.2.3. Income from Rice and byproduct of rice

All the farmers were selling their produce to SUPPLYCO at the common price 2695/quintal. The residual product of rice is straw. Straw may be sold by the farmers to the individuals or left in the fields. The value of rice traded or income of farmers from the sale of rice and byproducts in terms of per hectare and per quintal are shown in Table4.23 and Table 4.24 respectively.

Table 4.23 Income of farmers from rice and byproducts of rice (₹/ha)

Value (Rs)	Virippu (₹/ha)		Total (₹/ha)	Mundakan(₹/ha)		Total(₹/ha)	Puncha(₹/ha)	Additional crop(₹/ha)	Total in Kerala(₹/ha)
	Palakkad	Thrissur		Palakkad	Thrissur		Alappuzha		
Value of rice(₹/ha)	**125786**	125353.4	125150.2	142396.8	133533.22	139394.4	196491.1	124000.9	152348.23
Value of straw(₹/ha)	3243	3134.37	3217.84	4356.425	5000	4630.83	287.3088	381.6794	2492.84
Gross returns(₹/ha)	**129029**	128487.8	128368	146753.22	138533.22	144024.83	196778.4	124382.5	154841.07
Net income (Value of rice -Cost of cultivation) (₹/ha)	738.4	14862.8	3629.65	10151.6	18177.22	14352.4	30064	-19152.9	13561.8
Farm business income (Value of rice-cost B1)	63704.33	50316.87	59931.87	72985.98	54638.31	65940.66	103848.2	49254.18	74960.67

Rice is the major produce and straw was the residual product the farmers received as output from rice cultivation. Net income of farmer is the return from production of rice after meeting cost of cultivation. The value is calculated at the rate of the price of total produce cultivated by farmers in hectares. In Kerala average value of ₹152348.23 of rice/ha were hand over by the farmers to SUPPLYCO and an average of ₹2492.84 straw /ha were also traded. The farmers were earning net income of ₹13561.8/ha and when calculating farm business income, it shows a favourable profit of ₹74960.67/ha.

The main point is to be noted that in Alappuzha district, farmers were facing a loss in the additional crop season. It is because of the poor quality of grain, the yield is less and the value of rice was also less. But the cost is almost same as in other district. In Palakkad district, the cost of cultivation was less compared to Alappuzha. But the net income also low in the district as the yield is comparatively lesser than Alappuzha district. In virippu season only ₹738 was the profit and in mundakan season it was ₹10151 from the rice cultivation for farmer. For the effort of farmers, this profit is very less. During the mundakan season, the net profit in the Thrissur district is higher. Farmers can earn an average of ₹18177/ha during the mundakan season and ₹14862/ha during the virippu season.

Farmers profited from rice production in general, with the exception of the additional crop season. Farmers, on the other hand, believe that the rate of return is insufficient for their efforts, and that crop failure is not covered by insurance, and that these profits are not obtained in those situations. However, they are content with price given by SUPPLYCO. Their condition is that subsidies be increased and made available in hand, or that they be able to purchase subsidised inputs. Farmers are skeptical about the computerized transfer of subsidies. Local entities in the panchayath should establish a common wage structure for labourers. It could aid farmers in lowering labour costs. Farmers have expressed concern that if the SUPPLYCO withdraws from rice procurement, rice farming may come to an end because of low price of produce.

Table 4.24 Income of farmers from rice and residual products of rice (₹/quintal)

Value (Rs)	Virippu (₹/qtl)		Total (₹/qtl)	Mundakan(₹/qtl)		Total(₹/qtl)	Puncha(₹/qtl)	Additional crop(₹/qtl)	Total Kerala(₹/qtl)
				Palakkad	Thrissur		Alappuzha		
	Palakkad	Thrissur							
Value of rice(₹/qtl)	2695	2695	2695	2695	2695	2695	2695	2695	2695
Value of straw(₹/qtl)	69	69.44	69.29	82.45	100.1	89.53	3.91	8.26	44.10
Gross returns(₹/qtl)	**2764.48**	2764.44	276429	2777.45	2795	2784.53	2698.94	2703.3	2739.1
Net income (Value of rice-Cost of cultivation)(₹/qtl)	22.499	257.89	78.16	208.199	377.04	377.04	414.73	-416.21	239.9
Farm business income(Value of rice-Cost B1)	1368.21	1039.91	1290.58	1389.77	1109.69	1274.87	1425.68	1070.53	1326.04

Source: Compiled from Primary data

Value of rice per quintal is fixed by government ₹2695 for all the farmers. Value of residual product i.e straw was very less in Alappuzha district, as they are leaving them in the field. For bundling the straw, it needs about ₹120 per bundle and the price will be less than the cost. So, they are not selling the straw after the harvest. But in Palakkad and Thrissur, the farmers were selling straw to wholesalers or other farmers. In mundakan season, more bundle of straw was available.

When calculating net income per quintal of rice, it is high in the Alappuzha district in puncha season. In additional crop season, it shows net loss as the production cost was high in the season. In Palakkad district, in virippu season, the income was only ₹22/quintal because of the rental value of land.

When calculating farm income without considering value of land imputed family labour, the farmers were earning income of ₹1425/quintal of rice in puncha season in Alappuzha district followed by Mundakan season of Palakkad district (₹1389/quintal).

On an average income of ₹1326.04 from rice cultivation were earned by farmers in Kerala.

4.3.4. Costs of Procurement and Processing by Traders

Millers were the authorized processors of SUPPLYCO with all the requirement and exclusively procured processed and distributed to SUPPLYCO. Various costs are included by the millers in this public procurement of rice. Private mills and co-operative societies were also carrying the costs of procurement rice from other states and for processing branded rice. The fixed capital and operational costs of traders are given in Table 4.25.

Table 4.25 Cost of traders in rice market

Costs of traders (₹)	SUPPLYCO accredited mill	Private mill	Co-operative societies		Wholesaler
			For SUPPLYCO	For branding	
Purchase price	-	2050	-	1950	1850
Processing charge(electricity and staff) (₹/quintal)	129.17	145	125	125	
Agent commission(₹/quintal)	10.33				
Gunny bags(₹/quintal)	150.00	40	140	40	50
Transportation and storage (₹/quintal)	59.17	12	39	15	100
Loading of rice (₹/64.5 kg rice)	32	25	30	30	
Unloading of rice (₹/64.5 kg rice)	11.33	12	15	15	
Total cost(₹/quintal)	392	2284	349	2175	2000

Source: Compiled from Primary data

Table 4.25 showed the total costs of millers for procuring and processing rice for SUPPLYCO and for branding. The bank guarantee is based on the milling capacity of the mill and on the basis of the security government allowed to procure rice from farmers. If the miller fails to process adequate quantity for the government, it may be seized by the government.

Price of rice was given by government directly to the farmers. So there is no purchase price for the SUPPLYCO accredited mills. SUPPLYCO determined the gunny bag in which rice should be packed and stored. It is costly for millers to spent ₹ 150 per quintal of rice. Transportation and storage cost also varying with the districts and panchayath in which SUPPLYCO allotted to millers. So the final operational cost of mills was an average of ₹ 392 per quintal of rice.

Private Mills were paying ₹2050 per quintal for rice from other states. The expense was carried by the supplier mills from their warehouse to the Kerala buying mills' depot. As a result, the cost of transportation is quite low. For private mills, the overall cost is ₹2284. Co-operative societies did not spend money on transportation because they bought rice directly from farmers. They were spending ₹2175 for the per quintal production of rice.

Table 4.26 Income from the procurement and processing of rice

Income sources	SUPPLYCO accredited mill	Private mills	Co-operative societies		Wholesalers
			For SUPPLYCO	For Branding	
Processing fee by government	₹214		₹214		
Income from rice		₹2176		₹2048	**₹2050**
Broken rice (from 1 quintal of rice)	₹56	₹48	₹36	₹36	
Bran (from 1 quintal of rice)	₹100	₹96	₹115	₹115	
Wastage (from 1 quintal of rice)	₹16	₹16	₹12	₹12	
Total income(from 1 quintal of rice)	₹386	₹2336	₹377	₹2211	**₹2050**
Net income/loss(from 1 quintal of rice)	₹-6	₹52	₹28	₹36	**₹50**

The table 4.26 showed the income sources for millers in the processing of rice for SUPPLYCO. The mill should return 64.5 kg rice processed from 1 quintal

of rice. If the rice is good quality, it is not difficult to process that quantity. But in almost all situation the mill fails to reach the quantity recommended by SUPPLYCO. SUPPLYCO is granting ₹214 for processing of the rice. Other than this the broken rice, bran and wastage are the source of income for the millers. Husk will be used in boiler unit.

But if the broken rice is increased, it meant that the quantity of processed rice is lower than prescribed quantity. So it is risk for millers. 3-5kg broken rice may incur in the processing of rice. Bran and wastage also constitute 4-5 kg of rice after processing. Husk is the major portion of processed rice about 20-25 kg from 1 quintal of rice. After all these, mill should get 64.5 kg milled rice from one quintal of rice. But the net income/loss of mill showed that the SUPPLYCO accredited mills were running on loss with an average loss of -₹6/quintal. Private Mills were procuring rice from other states and after processing the rice will be branded at an average price of ₹34/kg. So they were running their firm on profit of ₹52/quintal. Co-operative societies also shows profit of 36/quintal in the case of procured privately and selling branded rice and earned a profit of ₹28/ quintal when procure for the SUPPLYCO. Wholesaler is earning ₹50/quintal as profit when selling rice in open market.

4.3.5. Marketing Margin of farmers and traders

Marketing margin of farmer is the difference between marketing cost incurred from the field to handover the product to SUPPLYCO and selling price of rice. Marketing margin of trader is the difference of total payments up to selling rice in market and the selling price of rice and residual products. The marketing margin of farmers and traders were given in Table 4.27.

Table 4.27 Marketing cost, Marketing margin and Marketing efficiency of farmers and traders in the rice market.

Players in rice market	Marketing cost(₹/quintal)	Selling price	Marketing margin
Farmers	₹114.63	₹2695	₹2580
SUPPLYCO accredited mills	₹392	₹386	₹-6
Private mills	₹2284	₹2336	₹52
Co-operative society	₹2175	₹2211	₹36
Wholesaler	₹2000	₹2050	₹50
Marketing efficiency of channel- 1 per cent			

The result showed that farmers in Kerala were earning about ₹2580 per quintal as marketing margin. The main reason of this high margin is that all the farmers were selling their produce to SUPPLYCO and the transportation, gunny bag and unloading charges were taken by mills. So the marketing cost is comparatively less. The selling price is fixed by government and it is obviously higher than open market price. So the margin is highly satisfied to farmers.

In the case of traders, SUPPLYCO accredited mills were running on loss or negative margin. Their cost of processing is high and the ₹214/quintal procurement price given by the government is not sufficient to meet all the expenses. Their major sources of income were selling broken rice, husk and wastage. For private mills, they were earning margin of ₹52/quintal from rice processing. They were brought rice from other states at lower price and upto depots all the cost were held by supplier mills. So the marketing cost is very less for the private mills. For wholesalers also ₹50/quintal margin earned because there is no particular storage or processing cost. Co-operative societies also earning margin of ₹36 from the rice procurement and marketing.

The marketing margin of farmers and traders showed that except SUPPLYCO accredited mills, farmers and other traders can earn margin from the rice market. Even though the earning is negative, SUPPLYCO accredited mills were procuring rice and processing for the government for the existence. If the government can increase the amount given for processing charge or the reduction

in the quantity criteria of 64.5kg milled rice from one quintal of rice, it may help the millers to make a profit.

The findings revealed that mills which are procuring rice for SUPPLYCO are running on loss. Millers cannot function for long with the processing charge given by the government since the amount is not sufficient for earn income from rice after meeting the cost. But for withdrawing from these agreements, millers facing problems like lack of continuous market. SUPPLYCO is procuring rice throughout the year and the mills can actively function regularly. All the farmers were selling to SUPPLYCO and so they were not expecting to get an open market for rice in Kerala. Mills are not allowed to process branded rice in their mills unless it is procured forSUPPLYCO. If the government allows them to process other rice in the mill for a limited time, they will be able to make a profit and cover their losses. Increased processing fees are a strong suggestion for the government to support rice mills and the rice market.

This session can be concluded that the performance of rice market is mainly depended on cost and income of the farmers and traders. In the structure and conduct, farmers were selling their produce to SUPPLYCO and the price is fixed by the government by declaring the minimum support price from year to year. So the performance shows that due to this structure and conduct of rice market in Kerala, farmers were earning income ₹13561/ ha from the rice cultivation. The farm business income shows that without considering the value of land the farmers are profited from the rice cultivation including under additional crop season. When comparing the marketing margin SUPPLYCO accredited mills cannot earn margin from the rice market. Private mills, co-operatives and wholesalers were receiving margin from the sale of rice.If the government can increase the amount given for processing charge or the reduction in the quantity criteria of 64.5kg milled rice from one quintal of rice, it may help the millers to make a profit. Open market for the rice produced in Kerala is very less because of SUPPLYCO procurement system. Importing of rice required more cost and sophisticated equipments needed for milling of imported rice. So for the millers in Kerala government can give subsidies on equipment cost or interest free borrowing for the initial investment.

SESSION – IV

4.4 Constraints of farmers and traders in the rice market

In this session, the researcher identified various constraints faced by farmers and traders in rice market in Kerala. The study already discussed that farmers in Kerala were producing and marketing their rice to SUPPLYCO. From production towards marketing, they were confronted with a variety of market constraints. SUPPLYCO and their mills have also faced a variety of challenges. External rice was coming into the state via private millers and traders from neighbouring states.

4.4.1. Constraints of farmers in the rice market

In this session, the researcher identified various constraints faced by farmers in rice cultivation. Those constraints were categorized into production, procurement, marketing, institutional and financial constraints. The respondents have ranked their problems and using Garrett Ranking method. The constraints of each district were identified separately.

4.4.1.1. Production Constraints

From land preparation to rice harvesting, rice production goes through several stages. It is beset by issues such as a lack of inputs, irrigation, high labour costs, natural disasters, weed development, pests and illnesses, and so on. Production limits for farmers in three districts may alter depending on local conditions. Rice producers' difficulties in rice production are shown in the table 4.28.

Table 4.28 Production constraints of farmers

Constraints	Alappuzha (n=60)			Palakkad (n=60)			Thrissur (n=60)			Total (N=180)		
	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank
High cost of inputs	2552	42.53	10	2462	41.03	11	3185	53.08	6	8199	45.55	8
Non availability of quality inputs	2640	44.00	9	2317	38.62	12	3041	50.68	7	7998	44.43	9
Scarcity of labour	4265	71.08	2	4629	77.15	1	4568	76.13	1	13462	74.79	1
High cost of labour	4526	75.43	1	4307	71.78	2	4521	75.35	2	13354	74.19	2
Inadequate supply of seeds	3566	59.43	4	3438	57.30	4	3277	54.62	4	10281	57.12	4
Insufficient availability of irrigation	1580	26.33	12	3141	52.35	5	2298	38.30	10	7019	38.99	10

Untimely availability of irrigation	1176	19.60	13	3049	50.82	6	2249	37.48	11	6474	35.97	12
Excessive weed growth	3601	60.02	3	3612	60.20	3	3299	54.98	3	10512	58.40	3
Occurrence of pests ad diseases	3019	50.32	7	2919	48.65	7	3253	54.22	5	9191	51.06	6
Natural calamity	3338	55.63	5	2791	46.52	8	3018	50.30	8	9147	50.82	5
Uneven rainfall pattern	3307	55.12	6	2624	43.73	9	2582	43.03	9	8513	47.29	7
Difficulties related to machanisation	2429	40.48	11	2584	43.07	10	1917	31.95	12	6930	38.50	11
Salinity of soil	2934	48.90	8	1263	21.05	13	1454	24.23	13	5651	31.39	13

The table 4.28 clearly showed that how the farmers were identified and ranked their problems that occurred in production times. The major constraints of rice farmers in Kerala were scarcity of labour, high cost of labour, excessive weed growth and inadequate supply of seeds. However, the extent of constraints may vary due to the unique features of each selected districts. In the Alappuzha district, the high cost of labour and scarcity of labour were considered major problems for farmers followed by excessive weed, inadequate supply of seeds and natural calamity respectively. They were also having issues with the quality of seed provided by Krishibhavans. The number of seedlings produced from seeds will be minimal, and some seeds will not germinate. Therefore, it was necessary to acquire more seeds in addition to the subsidised seed. It is expensive for farmers to either buy seed or make seed at home.

Farmers do not have to worry about irrigation in alappuzha because the Kuttanad region has enough water. However, the salinity of the soil makes it difficult for farmers to produce high-quality rice yields. In Alappuzha, various ponds or backwaters cover a huge region and are connected to the sea. Deltaic areas near river mouths and reclaimed backwaters are either at sea level or 1.0 to 1.5 metres below MSL in most of the coastal terrain. These fields, which are occasionally flooded with saline water, lead to production difficulty. The 'Thannirmukkam-barrage' created to safeguard rice farming from saline intrusion during the summer season has partially reduced such natural saline water incursion in recent decades, but it is still reducing soil output. In other districts, salinity is not considered as an issue for the farmers.

In the Palakkad district, scarcity and high cost of labour make rice cultivation difficult as it is highly labour intensive. Farmers in Palakkad have observed that it is often difficult to recruit labourers during transplanting and harvesting, procedures that require immediate labour availability. Furthermore, wage levels are very high, owing to the recent surge in construction activity, which has created a significant need for labour (Thomas,2011). Most of the labours were going for the MNREGA scheme of employment as it is providing continuous jobs to labours. Excessive weed and pests and diseases were also major problems

identified by the farmers. Stem boarer, leaf roller and mealy bugs are cause damage to rice. Brown spot and downy mildew were also affected rice leaves. Farmers were opined that good quality seeds can prevent diseases and if the subsidy available for organic pesticides it may reduce the intensity of the problem. Palakkad soil is highly nutrient content and also less salinity so it is not triggering any problems in rice cultivation.

Farmers in the Thrissur district also considering labour shortage and cost of labour as their major problems (Nithin,2021). Lack of supply of high-quality seed is also complained about by farmers. Excessive weed and attack of pests and diseases also adversely affect the growth of rice. Attack of wild boar was the major constraint in the rice cultivation in the selected area. They were unconcerned about soil salinity and the reach of mechanisation. Their soil type is favourable for rice farming, and they used limestone to remove impurities from the soil.

4.4.1.2. Procurement Constraints

Procurement is an unavoidable aspect of the rice market since it ensures the right purchase of rice from farmers and its distribution to consumers based on SUPPLYCO. However, farmers, millers, and SUPPLYCO are having issues since rice procurement requires distinct methods. The difficulties may be conflicts between millers and farmers, as well as delays in procurement and other challenges with rice drying and cleaning. The constraints were identified in Table 4.29.

Table 4.29 Constraints related to procurement

Constraints	Alappuzha (n=60)			Palakkad (n=60)			Thrissur (n=60)			Total (N=180)		
	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank
Lack of demand	2570	42.83	5	2858	47.63	5	2439	40.65	5	7867	43.70	5
Delay in procurement by agents	4113	68.55	1	3609	60.15	2	3773	62.88	2	11495	63.86	2
High loading/unloading charges	3472	57.87	2	3366	56.10	3	5059	84.32	1	11897	66.10	1
Favourable terms of sale with procurement agency	1536	25.60	6	1357	22.62	6	1676	27.93	6	4569	25.38	6
Inadequate facilities for drying and cleaning	2791	46.52	4	4092	68.20	1	3575	59.58	3	10458	58.10	3
Conflicts between procurement agents and farmers	3375	56.25	3	2916	48.60	4	2715	45.25	4	9006	50.03	4

From the table 4.29 based on ranks, it can be clear that delay in procurement and high loading charge and inadequate facility of drying and cleaning are the major constraints of farmers in Kerala. They were not much differences in the procurement constraints to the farmers in Kerala. In Alappuzha district the district's geographical situation differs from that of other districts in that rain might cause flooding. Due to the farmers' practice of storing rice in the field, any delays in procurement may have an impact on the yield's quality and quantity. As a result, the government should concentrate on procuring rice from Alappuzha as soon as it is harvested. In the district, the loading fee is likewise very high. When farmers are required to use water transportation to reach marketplaces, the cost of loading may be doubled because of two time loading in boat and from boat to tipper of miller. Even though the price is set by the government, there are disagreements between agents and farmers on quality and quantity of produce. They claimed that the agents were conducting the fraudulent activities impact on produce quality standards on purpose. As a result, they seek to make compromises by giving their produce to millers who will count it as less than what they sold. Farmers in the Palakkad district were mainly experiencing a lack of drying and cleaning facilities and delays in procurement. Here the farmers were drying and cleaning rice before hand over to rice millers. In the district the common system is after harvest, rice will be dried and cleaned at home or field itself. Only after these processes agents will check the quality and procure the product. So lack of adequate facilities may adversely affect the sale of rice. Farmers in the Thrissur district faced exorbitant loading fees and procurement delays. Rice millers engage agents to procure rice from the field. Procurement may be delayed in some cases due to a disagreement with agents for the quality criteria recommended bySUPPLYCO. Because drying and cleaning are additional charges to the cultivation cost, they lacked suitable facilities.

4.4.1.3. Marketing constraints

As previously stated, all of the farmers sold their produce to SUPPLYCO. As a result, farmers do not need to look for traders to sell their produce. Farmers continue to face challenges such as transportation availability and expense, payment delays, product loss, and so on. Millers are also limited by a shortage of vehicles, distance from procurement hubs, and other factors

Table 4.30 Marketing constraints of farmers

Constraints	Alappuzha (n=60)			Palakkad (n=60)			Thrissur (n=60)			Total (N=180)		
	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank
Delay in payment	2612	43.53	5	2339	38.98	7	2472	41.20	5	7423	41.24	6
More distance to marketing centers	2112	35.20	7	2471	41.18	6	2145	35.75	7	6728	37.38	7
Lack of transportation	3303	55.05	2	2898	48.30	3	3274	54.57	3	9475	52.64	3
Transportation cost	3082	51.37	4	2859	47.65	5	2797	46.62	4	8738	48.55	4
Losses occurred in transit	4258	70.97	1	3290	54.83	2	4096	68.27	1	11644	64.69	1
Undue interference of agents	3284	54.73	3	2865	47.75	4	3715	61.92	2	9864	54.80	2
Lack of storage facility	2148	35.80	6	4095	68.25	1	2321	38.68	6	8564	47.58	5

From the table 4.30, losses in transit and a lack of transportation was the most prominent limitations mentioned by farmers in the Alappuzha district when it came to the marketing of rice. Losses occurred means when agents procured the entire quantity of produce but recorded a lower quantity on the receipt slip for the quality adjustments of produce. The amount is reduced to compensate for quality requirements that have been compromised. As a result, it is a huge issue for farmers.

Farmers in the Palakkad and Thrissur districts are mostly concerned about a shortage of storage facilities and interference of agencies. It has already been mentioned that procurement is delay in schedule. So, until the time of procurement, farmers have a tough time keeping rice, especially in the first crop season. Conflicts and complexities arise as a result of agent interference in produce marketing. As a result, accredited millers or SUPPLYCO officers may need to inspect these issues to ensure market harmony.

4.4.1.4. Institutional constraints

Institutional constraints meant that legal and political constraints involved in the rice market. Law and politics may influence a market and it can make hindrances to farmers by unnecessary intervention or negligence in their needs. Those constraints are identified and shown in Table 4.31.

Table 4. 31 Institutional constraints of farmers

Constraints	Alappuzha (n=60)			Palakkad (n=60)			Thrissur (n=60)			Total (N=180)		
	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank
MGNREGA not covering rice	3773	62.88	1	4058	67.63	1	3932	65.53	1	11763	65.35	1
Ineffectiveness of Kerala Paddy Land and Wetland Conservation Act, 2018	1553	25.88	5	1699	28.32	5	1667	27.78	5	4919	27.33	5
Intervention of political parties in the procurement industry	3353	55.88	2	3005	50.08	3	3081	51.35	3	9439	52.44	3
Political influence in rental government machineries	2997	49.95	4	3357	55.95	2	3254	54.23	2	9608	53.38	2
Communication gap between institutions and farmers	3235	53.92	3	2761	46.02	4	2946	49.10	4	8942	49.68	4

Table 4.31 revealed that the farmers were opined that MGNREGA doesn't cover the rice in their operation list. Political influence rental government machineries and intervention of political parties were also the major institutional constraints of farmers in Kerala. When considering the farmers in the district of Alappuzha, they believe that MGNREGA does not cover the rice and therefore insufficient labour and more labour costs are incurred in farming. Farmers also pointed to the intervention of the political party. This resulted in unfairness in procurement, such as early procurement of produce from politically influenced padasekharasamitis and the availability of government machinery only in their preferred locations. Farmers in Palakkad and Thrissur districts have raised similar concerns. They believe that political interests play a role in the rice market. The government can be more circumspect in its political intervention and avoid unnecessary interference of intermediaries who are suspected in the rice market. If MNREGA can include rice in their conditions, farmers can reduce the cost of production and thereby better income.

4.4.1.5. Financial constraints

Financial constraints may occur in rice cultivation as it is a costly process. it is inevitable for the cultivation and the farmers were looking for the support from the government. Table 4.32 identified the financial constraints observed in the study area.

Table 4.32 Financial constraints of farmers.

Constraints	Alappuzha (n=60)			Palakkad (n=60)			Thrissur (n=60)			Total (N=180)		
	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank	Score	Average	Rank
Lack of adequate subsidy from government	3303	55.05	1	3655	60.92	1	3544	59.07	1	10502	58.35	1
Lack of sufficient quantum of credit	2827	47.12	5	3336	55.60	2	3458	57.63	2	9621	53.45	2
Untimely availability of credit	3206	53.43	2	2843	47.38	3	2980	49.67	4	9029	50.16	3
Lack of information on source of credit	2943	49.05	4	2623	43.72	6	2677	44.62	5	8243	45.80	5
Lack of financial support for recovering loss	3050	50.83	3	2731	45.52	4	2982	49.70	3	8763	48.68	4
Resistance of bank to provide credit	2551	42.52	6	2669	44.48	5	2239	37.32	6	7459	41.44	6

The table 4.32 indicates that all the farmer respondents were experiencing a shortage of suitable government subsidies, lack of sufficient quantum of credit, and untimely availability of credit as the financial constraint for rice cultivation. Government is providing various subsidies directly to the farmer's bank accounts. But they are not completely aware about that or not believing in the online transfer. Regarding the credit the farmers were completely dissatisfied. They opined that the credit is not sufficient and not available at the time of necessary.

Cultivation is quite tough in the Alappuzha district due to the topographical conditions. As a result, it is both risky and costly. As a result, the government has announced numerous subsidies to farmers to help them overcome these challenges, such as free seeds, fertiliser subsidies, and subsidies for bund formation and pump installation for lift irrigation. However, they claimed that the subsidies they were receiving were insufficient. Financial assistance for loss recovery is insufficient and not available on time, particularly during floods and other natural disasters.

Farmers in the Palakkad district are disappointed with the subsidies, the amount of credit available, and the delay with which credit is made available. Rice cultivation is highly cost complex and risky, and hence requires a larger quantum of interest-free finance to continue the process in the coming years. Farmers in the Thrissur district had the same financial issues as other farmers, such as a lack of subsidies, financial support, and access to sufficient credit. They believe that the limit on the amount of interest-free loans should be raised.

4.4.2. Constraints of millers in rice market

Traders of the rice market especially millers were going through various production, processing and financial constraints. All these constraints were illustrated in table 4.33.

Table 4.33 Constraints of millers in rice market

Constraints	SUPPLYCO accredited mills(N=5)	Private mills(N=6)
Product constraints		
Non-availability of rice		2(33.33)
Low quality grain	3(60)	3(50)
Low quantity of milled rice	3(60)	3(50)
Procurement constraints		
Lack of transportation	2(40)	
High storage cost	4(80)	4(66.67)
High transportation cost	4(80)	
High loading/unloading charge	5(100)	4(66.67)
High cost of gunny bags	5(100)	
Financial constraints		
High depreciation cost	5(100)	6(100)
Lack of subsidies	5(100)	
Less processing fee from the Government	5(100)	
Low profit margin	3(60)	

All of the millers were dealing with different challenges when it came to obtaining and processing rice for SUPPLYCO. The mills were under a lot of financial strain. Initially, the bank guarantee should be sufficient, and if they fail to return the required quantity of rice, their firm may be seized. The cost of mill equipment, as well as its repair, is extremely high. Rice must be purchased individually in a godown for SUPPLYCO, which is both times consuming and costly. The SUPPLYCO-recommended gunny bag is likewise costly. 64.5 kg milled rice should be returned from a quintal of rice. However, they were unable to achieve the requirements due to insufficient grain quality.

When procuring from the farmers also were facing the problem of quality issues in rice with farmers. The moisture content of rice did not exceed more than 17 percent. But in an area like Alappuzha, the moisture content may be high. So the mill suggests either to dry the product and keep less than 17 per cent moisture content or the mill may reduce the quantity of rice for each percent of the increase in moisture content. But the

farmers were not ready to accept these adjustments and make the problem. So it may be made the conflict between farmers and millers.

Millers opined that they are also treated unfairly by the government when it comes to funding distribution. There is no financial assistance provided. The millers were only get₹214 for procurement and processing of per quintal of and the mill will not be able to profit from it.As a result, they propose that the government take them into account and raise the processing price for them. Otherwise, the amount of milled rice produced may be determined by the quality of rice obtained from farmers. The processing charge is not being collected correctly. After one or two years, the government would clear millers' monetary transactions. So, if the government can appropriately allocate this money, millers will be able to operate more efficiently.

For private mills, comparatively fewer constraints were observed. Due to expensive equipment was operating within the mill, high repairing expense was an issue for all mills. Non availability of rice for production may occur in off seasonal. Due to the farmers in Kerala selling rice to SUPPLYCO, private mills were depending other states. But the transportation and cost of gunny bags were carried by the supplier of rice. Sothe unloading charge, storage cost and processing charge were the main cost in the mill other than fixed costs.

4.4.3. Constraints of co-operatives

Co-operatives are important players in the rice market in Kerala. They were also undergoing some constraints in the rice market when procuring rice for SUPPLYCO and from other states. Co-operative societies have identified staffing as a major impediment. Employees' work schedules of 8 hours are incompatible with rice milling time. A batch of grain takes about 16 hours to grind. Milling capacity cannot be used appropriately and milling efficiency suffers as a result of the lack of a shift system in job hours.

4.4.4. Constraints of wholesaler

The surveyed wholesaler mainly pointed out the non-availability of rice from Kerala. So he needs to import rice from other states. Hence the storage and transportation of rice need more facilities and costs were high in the case of procurement from other states. It reduces the profit margin from the sale of rice in the market. The wholesaler had

little trouble in marketing of the rice because it was procured in response to millers demand from Kalady.

4.4.5. Constraints of SUPPLYCO in the rice market

SUPPLYCO is a government organization. Even though, they were also facing constraints in the rice market. In Alappuzha, SUPPLYCO is a very farmer and miller friendly institution. So all the problems may require the presence of a rice procurement officer.In the district, the rice production is high on the field but because of the geographical condition, the moisture content of the rice may be high. In these situations, the millers may be ready to adjust by reducing the quantity in the receipt slip. Then the conflict between mill and farmers may start and the complaints may reach into SUPPLYCO. The issues with the registration of millers and farmers in the online portal also made confusion in the functions. The allocation of the mill is computerized. So, if there is any internet delay or site damage, it will affect the entire process. Because of the flood situation after harvesting, the farmers are always fear of procurement of rice so it may affect the functions of SUPPLYCO to ensure the proper procurement. The other major constraints were not observed in the functioning of SUPPLYCO in Kerala.

4.5 SWOC analysis of the rice market in Kerala

SWOC analysis (strengths, weaknesses, opportunities, and challenges) is a framework for assessing a company's competitive position and developing strategic plans. Internal and external elements, as well as existing and future potential, are all included in a SWOC study. A SWOC analysis is intended to allowa realistic, fact-based, data-driven assessment of an organization's, initiatives, markets, or industry's strengths and weaknesses. The SWOC study of the rice market is carried out here by identifying the rice market's internal and external elements. The SWOC matrix was created to better understand the rice market's SWOC and to provide ideas for improving the rice market in Kerala.

There are mainly four strategies suggested by the matrix. Maximise the strengths and opportunities of the rice market and also strengths can be maximised and challenges can be minimised by maxi-mini strategies in the system. The weaknesses of the rice market can be minimised and maximise the opportunities that existed in the market. The important strategy is focused on how to minimise both internal weaknesses and external challenges in the rice market in Kerala.

Table 4.34 SWOC matrix of rice market in Kerala

SWOC matrix of rice market	Opportunities (O) 1. Continuous demand and assured market for rice 2. The SUPPLYCO procurement system 3. High procurement price 4. No barriers of entry in the market 5. Sufficient supply of rice from other states 6. Hi-tech processing facilities 7. Supportive government policies	Challenges (C) 1. Shortcomings in communication between Krishibhavan and farmers in some areas 2. The intervention of political parties in the procurement and rental of government machinery 3. Inadequate and untimely subsidy from the government 4. Delay in procurement 5. Insufficiency of processing charge paid by the government to SUPPLYCO accredited mills 6. Server breakdowns in the online website of SUPPLYCO
Strengths (S) 1. Experienced farmers 2. Timely and adequate Irrigation facility 3. Fertile soil 4. High yield varieties of seeds 5. High market margin 6. Regular supply of rice to mills 7. Experienced mills in the rice market 8. Skilled labours in the mills 9. Modern equipment in the mills	SO (Maxi-Maxi strategy) 1. Improving awareness about government support including subsidies 2. Ensure the continuous availability of high-quality seeds and the other inputs to farmers through Krishibhavan	SC (Maxi-Mini strategy) 1. Ensure the timely procurement of rice by SUPPLYCO 2. The processing fee of the mills can be increased 3. The efficiency of mills can be increased by providing hi-tech machinery and financial support by the government

Weaknesses(W)	WO (Mini-Max strategy)	WC (Mini-Mini strategy)
	3. Ensure steady margin for farmers and traders by SUPPLYCO.	
1. Scarcity of labour 2. High cost of labour 3. Excessive weed growth 4. Inadequate supply of seeds 5. High loading charge 6. Quantity reduction in rice to farmers for compromising quality criteria 7. Lack of transportation 8. Low out turn ratio 9. High maintenance cost of machinery 10. Low-profit margin for SUPPLYCO accredited mills 11. Single shift in co-operatives	1. Uniform charges to trade unions members 2. Increase processing charges to SUPPLYCO accredited mills	1. Minimise the labour shortage by checking the scope of MNREGA in labour supply. 2. Minimise political interference in the rice market 3. Shift system may be introduced to improve the mill capacity

The SWOC matrix clearly showed the strengths, weaknesses, opportunities, and challenges of the rice market in Kerala. The matrix showed the strengths in the market like experienced farmers, high yield varieties of seeds, high market margin, better yield, the staff in the mills, the availability of rice etc. Most of the farmers were highly experienced farmers in Kerala. The yield from the cultivation is another strength of farmers and high margins were also earned by the farmers. In the case of mills also they are experienced, and the strong staffing of the mills was helping the organisation. They are using modern equipment for rice processing.

Weaknesses of the rice market are showing labour shortage, cost of labour, losses in the transit, high loading charges, lack of transportation, low outturn ratio of rice to the mills and so on. The labours are not enough for rice cultivation and the cost is very high. So the farmers were facing constraints in the rice market. For the mills, also because of poor quality grains the out turn ration may be reduced. The mills were getting low profit and the cost of depreciation is high for the mills.

In the rice market, there are external factors like opportunities and challenges. The major opportunities in the rice market were continuous demand and assured market for rice, availability of imported rice, the minimum support price of rice etc. Besides these opportunities, the major challenges like the intervention of political parties, inadequate subsidies, and delay in procurement of rice and so on cannot be unnoticed.

Based on the analysis, the study suggested strategies for the improvement of rice market like, improving awareness about government support including subsidies, ensure the continuous availability of high-quality seeds and the other inputs to farmers through Krishibhavan, ensure steady margin for farmers and traders by SUPPLYCO, common wage structure for labours, uniform charges to trade unions members and increase processing charges to SUPPLYCO accredited mills. For minimising challenges and weaknesses of rice market, minimise the labour shortage by checking the scope of MNREGA in labour supply, minimise political interference in the rice market and shift system may be introduced to improve the mill capacity.

The researcher identified various constraints faced by farmers and traders in rice market. Farmers were confronted with production constraints such as scarcity and high labour costs, excessive weed growth and inadequate supply of seeds which results in rice cultivation challenging. High loading charge and delay in procurement came into the major procurement constraints of rice market. Losses in transit, lack of transportation, shortage of storage facilities and undue interference of agents were the major marketing constraints faced by the farmers in Kerala. Institutional constraints identified were MGNREGA does not cover the rice and intervention of the political parties in the area of machine allocation. Therefore, insufficient labour for the rice cultivation and through that high labour costs are incurred in farming. Intervention of the political parties in the area of machine allocation and procurement of rice were also faced by farmers. The government can be more circumspect in its political intervention and avoid unnecessary interference of intermediaries who are suspected in the rice market. Financial restrictions were identified in the rice market, including inadequate and untimely subsidies, financial support, of recover loss and access to sufficient credit.

Traders in the rice market were also found to be facing a variety of obstacles, as per the study. Quality issues, financial instability, and high processing costs were the key problems in the rice market for SUPPLYCO authorised millers. They are also treated unfairly by the government when it comes to funding distribution. There is no financial assistance provided. The government provides ₹214/quintal for the entire operations for the millers which covers only the cost of operations and sometimes it is not sufficient. For private mills, comparatively less constraints were observed. Co-operative societies have identified staffing as a major impediment. As an authorised institution in rice market, SUPPLYCO also facing issues like, the issues with the registration of millers and farmers in the online portal, farmer complaints on procurement and to solve the issues between mill and padasekharasamithis.

SUMMARY OF FINDINGS AND CONCLUSION

CHAPTER 5

SUMMARY OF FINDINGS AND CONCLUSION

The current study entitled "Structure Conduct and Performance of rice market in Kerala" aimed to analyse the structure and conduct of rice market in Kerala and to assess its performance as well as to identify the constraints faced by rice farmers and traders in rice market. Both primary and secondary data were used for the study. Primary data were collected from the rice farmers as well as traders. The study area covered the major rice producing districts in Kerala viz; Palakkad, Alappuzha and Thrissur. From each district, one block having largest area under rice cultivation was selected and from each block, one panchayath with largest area under rice cultivation was selected. From the three selected panchayaths, 60 farmers each were selected randomly, making a sample of 180 farmers. List of farmers were obtained from Krishibhavan and the respondents were selected randomly from the list. Traders consisted of SUPPLYCO, co-operatives, millers and wholesaler were selected from the selected districts. Data from farmers and traders were collected by adopting personal interview method using pre-tested structured interview schedule. Secondary data on area, production, productivity and procurement price of rice in Kerala were collected from published reports and official websites of Government of Kerala. Structure and conduct of rice market were analysed using percentage and average method. For the calculation of cost, cost concepts developed by Commission for Agricultural Costs & Prices (CACP) of Government of India for farm management studies isused. Constraints were identified by using Garrett's ranking method.

The findings of the study were classified based on the objectives and presented below.

5.1 Socio-economic profile of farmers and traders

1. Majority of the farmer respondents (46.11 per cent) were in the age group of 55-70 years. The old people are more interested in rice farming as it is

part of their livelihood. The majority of the respondents (44 per cent) have education up to the 12th standard.

2. Considering the occupation of farmer respondents, 93 per cent of those interviewed were mostly in agriculture and the rest were farming as a subsidiary job. Of those surveyed, 96.67 per cent belonged to a nuclear family and only 3.33 per cent were living in a joint family. While examining annual revenue from rice, the majority of the respondents (83 per cent) fell into the category of ₹ 100000-200000. But income from other sources is less than ₹50000. It is clear that most of them depending on rice cultivation for their livelihood.

3. In 2005, the State government entrusted the SUPPLYCO with the job of procuring rice from farmers of Kerala, mostly in the key rice-producing districts. In the year 2020-2021 total of 252160 farmers have registered under the procurement scheme of SUPPLYCO. A total of 7.54 lakh tonnes of rice were procured from farmers and processed rice of 4.93 lakh tonnes by SUPPLYCO accredited mills.

4. Among 5 SUPPLYCO accredited mills which are engaged in the rice marketing, 4 mills are under sole proprietorship firms. While considering experience in the procurement and processing of rice in the mill, 40 percent of the respondents were working in the milling industry for less than 15 years and 15-30 years.

5. Majority of the SUPPLYCO accredited mills (60 per cent) were procuring rice from farmers for the SUPPLYCO for more than 5 years. An average annual turnover of ₹5 to 10 crore is acquired by mills from rice milling for SUPPLYCO.

6. Majority of the private mills are under sole proprietorship. Mills were having 15-30 years of experience in the rice procurement and processing. Among the selected mills, 33 percent respondents were having annual turnover of less than ₹10 crore, 10-20 crore and more than 20 crores.

7. Two co-operative societies such as PADDYCO in Palakkad district and Trichur District Paddy Marketing and Processing Co-Operative Society ltd (TDPMPCS) were procuring rice from farmers. Paddyco started in 1997 with the aim of procuring and processing of rice in the brand name of paddyco. Annual turnover of 1.5 crores were the asset of the organisation.

They were planting a mill on the capacity of 120 t per day production of rice. Trichur District Paddy Marketing and Processing Co-Operative Society started functioning in 2010. The plants were having 100t milling capacity.

8. Only wholesaler has responded for study from Palakkad district. He was trading rice from other states like Karnataka and Tamil Nādu for the Kalady rice millers. Average of 10000 tonnes quantity of rice procured from other states annually at the rate of average price of ₹1850/quintal.

5.2 Structure and conduct of farmers and traders in rice market

1. In the study area, average area under cultivation was 1.47 ha and area under rice cultivation was 1.31 ha. Percentage of the area under rice cultivation to total area was 89.48 per cent.

2. The area of cultivation in the study was high in Alappuzha district. It has a large rice-cultivation area (1.9 ha). However, when comparing the ratio of rice-cultivating land to total land, Palakkad had the greatest share (96.22 per cent).

3. Rice farmers in Alappuzha were mainly small farmers (40 per cent) followed by large farmers (33 per cent). Only 26.67 per cent of respondents have belonged to marginal farmer category. But in the Palakkad district most of the respondents were marginal (48 per cent) and small farmers (41 per cent). Whereas in Thrissur district, the majority of the farmers (83 per cent) were marginal farmers.

4. Among the total respondents, the majority of the farmers (52.78 per cent) were marginal farmers followed by small farmers (31 per cent).

5. Farmers in the study area were cultivating rice in mundakan season (46 per cent) followed by virippu season (45 per cent). Number of farmers who are cultivated in puncha season was only 28 percent and in additional crop it was only 6 percent of the total number of farmers.

6. The most common rice types in the studied area were Uma developed by Rice Research Station, Moncompu followed by Jyothi, developed from Regional Agricultural Research Station, Pattambi.Uma was used by the majority of farmers (95.56 per cent) in selected districts for cultivation.

7. In all three districts, all of the respondents cultivated high-yielding varieties because it will increase their yield and income.

8. Majority of the farmer respondents (67 per cent) were considered padasekharasamithis as a vital source of information. They are always seeking information regarding production, procurement information of SUPPLYCO, and all the subsidy details. About 60 per cent respondents were opined that they were getting benefit of co-ordination

9. All the respondents in alappuzha, considered padasekharasamithis as source of information due to they were getting benefit of co-ordination like submission of registration forms in krishibhavan, common fund raising for bund protection and to address the problems of farmers in krishibhavan or SUPPLYCO

10. In Palakkad, farmers were depending padasekharasamithis for seeking information (58 percent) and co-ordination activities (50 percent). Padasekharasamithis were useful for farmers in the Thrissur district mainly to coordinate activities (50 percent) and as a source of information (41 per cent).

11. The majority of rice farmers (49 per cent) have 15 to 30 years of experience. When comparing the districts, rice farmers in Alappuzha revealed that most of the respondents (41 per cent) had 15-30 and 30-45 years of experience in rice cultivation. However, the majority of respondents in Palakkad and Thrissur had been cultivating rice for 15 to 30 years.

12. Average area under cultivation in Kerala was 1.47 ha and area under rice cultivation was 1.31 ha. Percentage of the area under rice cultivation to total area was 89.48 per cent. Alappuzha district has the most of the average area under agriculture (2.07 ha), followed by Palakkad and Thrissur.

13. In puncha, average area was 1.90 ha and in additional crop season it was 2.38 ha in Alappuzha district. Average of 72.98 quintal of rice were produced from this area in puncha season and in additional crop it is very less i.e., 46.01 quintal per hectare.

14. In Palakkad 1.25 ha of land is used for the cultivation of rice in virippu season with the average yield of 47 quintal/ha. In mundakan season,

average area of 1.01 ha of land were utilized for rice cultivation with the average output of 53.18 quintal per hectare.

15. In Thrissur district, farmers were cultivating in an average area of 0.83 ha with an output of 49.76 quintal/ha in mundakan season. In virippu season, average area of 0.68 ha was cultivated and 46.71 quintal/ha were produced.

16. Marketed surplus is not highly changed from the output produced in three districts due to the attractive price of rice and the cost of processing of rice, they were not supposed to keep the rice for their personal purpose.

17. Regarding the frequency of sale, all of the farmers were selling rice to SUPPLYCO in each season.

18. All the farmer respondents have opined that there is freedom to enter and exit from the rice market. No legal barrier was controlling the entry to market.

19. As the SUPPLYCO were purchasing on credit, all the farmers were selling their produce on credit and cash may receive after clearing the procurement procedures of SUPPLYCO.

20. All farmers in three districts were selling rice at the price set by Government. SUPPLYCO procured rice at the price fixed by state and central government directives.

21. All the farmer respondents were affirmed that they were receiving adequate price for their produce by SUPPLYCO compared to the open market.

22. No farmer respondents were promoting their produce as it is procured as per the direction of SUPPLYCO.

23. All the farmer respondents were satisfied with online portal of SUPPLYCO. In their opinion it is user friendly and simple to understand and can be operate easily.

24. Most of the farmers (57.22 per cent) were getting information regarding procurement of procedures of SUPPLYCO through Krishibhavan.

25. In Alappuzha district padasekharasamithis (90 per cent) and media (63 per cent) were the major source of information regarding procurement procedures of SUPPLYCO. In Palakkad and Thrissur district krishibhvan

plays the major role in disseminating information to farmers about updations of procedures of SUPPLYCO.

26. Majority of the respondents (70 percent) have opined that SUPPLYCO is not procuring rice on time because of the problems with millers and agents. Among those respondents, 65 percent respondents were complaining that the procurement delayed upto 2 weeks.

27. Majority of the respondents (64 percent) were not concerned about the delay in payment as it is government assured amount and trust worthy source of payment. Still 35 percent respondents were opined that payment is always delayed upto 1-2 month after procurement.

28. Krishibhavan, Padasekharasamithis and KVK are the major sources for disseminating information of cultivation practices, inputs and technology and training in Kerala. To seek the information on price updates, majority of the farmers (79 per cent) were watching news in media. Government is providing various subsidies to the farmers through Krishibhavan. These information were communicated by Padasekharasamithis (73 per cent) with farmers or directly by the Krishibhavan officers. For the credit information, most of the farmers (57 per cent) were depending on commercial banks. Quality standards fixed by SUPPLYCO, terms of sale and mode of payment details were collected by farmers through Krishibhavans, padasekharasamithis, millers and online portals of SUPPLYCO.

29. Farmers in Alappuzha district relied heavily on padasekharasamithis for information on cultivation practices, inputs and technology, training, minimum support price and subsidy. Majority of the respondents were seeking information through the online portals of SUPPLYCO (66.67 per cent) and padasekharasamithis (58 per cent) regarding quality standards and terms. The informations on government policies were mainly acquired through media (58 per cent).

30. The majority of farmer respondents (91.67 per cent) in the Palakkad district relied on Krishibhavan for information on cultivation practices. Inputs and technology were also necessary for rice cultivation and the information regarding price and availability of these provided by krishibhavans (83 percent). Training informations also reached into

farmers through Krishibhavan. Media (91 percent) is the primary source of information regarding price of rice. Banks offered information on the different types of credit facilities they offer. Farmers were looking for information on the website of SUPPLYCO (58.33 per cent).

31. Krishi Vigyan Kendra (KVK) plays an important role in disseminating information about cultivation practices in Thrissur district. 70 percent of the respondents were aware about the training from KVK. Price of the produce is exposed to farmers mainly through media (80 per cent). 85 percent respondents were relied on bank for the information on credit. Padasekharasamithi also providing credit information to farmers whenever they needed. The information regarding quality standards, terms of sale and mode of payment mainly available from online portal of SUPPLYCO (70 per cent). Krishibhavan is providing information to farmers about the government policies.

32. The study identified that millers, co-operative societies and wholesalers were the traders in rice market in Kerala. Millers in the rice market were SUPPLYCO authorized mills and private mills.

33. Most common varieties procured by SUPPLYCO and co-operatives were uma, jyothi and other red grain varieties. Private millers were purchasing white grain rice like AST, Kranti, Kurava and CR from the Karnataka, Andrapradesh and Tamilnadu.

34. Wholesaler were mainly traded Andrajaya and ponni rice from Andrapradesh and Tamilnadu respectively.

35. SUPPLYCO accredited mills procured a total of 11 lakhs quintal of rice per year for SUPPLYCO with a market share of 34.38 per cent. Private mills were procuring an average of 24 lakhs quintal of rice from other states into Kerala with a market share of 57.05 per cent.

36. Co-operatives were procuring 1.9 lakhs quintal rice for SUPPLYCO and for branding 21500 quintal were procured. Wholesaler is procured about 1 lakhs quintal per year.

37. Regarding source of information for traders, for SUPPLYCO accredited millers, information were passed through SUPPLYCO institution.

38. Information on rice like product attributes, price, and source were collected through online searching or brokers of supplier state.

39. Information on market for milled rice was provided by SUPPLYCO to cooperatives and mills. It can be only distributed through Public Distribution System. Private mills were collecting information through their R&D department by the different market research.

40. All the traders were following the product attribute or quality criteria of rice fixed by the SUPPLYCO like optimum milling potential at moisture content of 14%, degree of purity, variety purity, and grain dimensions, avoiding the mix of immature grains and damaged grains in the procurement of rice.

41. Regarding the price setting policy, in the agriculture year 2019-2020 price of rice is fixed at the rate of ₹2695 per quintal rice. Central Government subsidy of ₹1815 with State Intensive Bonus (SIB) subsidy of ₹880 jointly added into the final subsidy of ₹2695 per quintal rice to farmers..

42. In Kerala, price of rice traded from other states was determined by Kalady mill consortium based on the market price of price in the supplier state. Negotiation between the selling firm and the buyer determines the market price. Both parties investigate the current market pricing. Currently the market price for rice is an average of ₹1900-2100/quintal.

43. Rice was procured by co-operative societies for SUPPLYCO and for grinding of branded rice. When it came to rice purchase, pricing policies of SUPPLYCO were followed. In the case of private procurement, the price of the Kalady mill was being monitored and may alter as a result. Wholesaler also following the price of rice prevalent in the supplier state.

44. The procurement procedures of SUPPLYCO accredited mills and private mills are different. The farmers need to register at the official website of SUPPLYCO about the cultivation details. The printed form should be submitted at Krishibhavan and the agricultural office verifies the area of cultivation and applicant will be given unique number. When rice is given to SUPPLYCO - contracted mill, the farmer is given a Paddy Receipt Sheet (PRS) in duplicate. One copy of the PRS is given to the concerned Paddy Payment Officer (PPO) of SUPPLYCO and the other copy is kept by the farmer. The PRS details will be entered online by the miller. The PPOs will verify the PRS entry with the PRS received by them and the payment is made to the farmer's bank account. The rice procured by the

mill is processed and the quality of the rice will be inspected by the Paddy Quality Assurance Officers (PQAO) and the qualified rice is then distributed to consumers through Ration Shops and SUPPLYCO out-lets.

45. Private mills were procuring rice from other states like Karnataka, Tamilnadu and Andrapradesh. Mills in Kerala may already be in contact with mills in other states, or they will identify a suitable mill for delivering rice to Kerala by searching online. Kalady mills may set the price based on the market price of the supplier state. Mills negotiated based on these prices, and the supplier mill may deliver rice directly or through brokers in their state. From the supplier mill's warehouse to the mills' depots in Kerala, the supplier state was responsible for all risks and responsibilities. As a result, private mills' risk in rice procurement is reduced.

46. No legal barriers faced by traders for the entry into rice market.

47. No mill or co-operatives followed any promotional methods for the rice.

48. SUPPLYCO accredited mills were needed to follow the government's conditions for delivering the produce to SUPPLYCO. They were procuring rice for SUPPLYCO only and hence are unable to sell it on the open market. The other rice cannot be processed in the mill when the rice for SUPPLYCO is being milled. A mill must have at least three years of experience in the milling business to obtain a procurement licence. The millers should verify the quality and quantity of rice procured. They are responsible for all costs associated from procurement to delivering rice to ration stores. The government has the authority to seize the mill if it fails to deliver the required amount of rice. As a result, the terms of sale should be scrupulously adhered to.

49. For the sale of rice to private mills, there are no specific legal terms. The general terms established by the Kalady mill consortium were followed by private mills in Kerala.

5.3 Performance of rice market in Kerala

1. The calculation of cost of cultivation in Kerala, major portion of cost A1 or paid out costs ₹33606/ha were spending for hiring human labours by farmers. Machine labour and fertiliser cost also very high

for the farmers in Kerala. The major portion of paid out cost is constituted by hired human labour, machine labour and fertilisers. Total cost A1 is ₹77373/ha paid by the farmers for rice cultivation. Rental value of owned land is another major expense for the farmers in Kerala i.e about ₹43626/ha. The cost of cultivation in Kerala is ₹138786/ha and highest cost is carried out by farmers in the puncha season.

2. Puncha and additional crop are the two main seasons for rice growing in Alappuzha district. During the puncha season, the average area of rice cultivation was 1.90 ha, and during the additional crop, it was 2.38 ha. Labour cost in the district was about ₹42392/ha in puncha season. Cost of machine labour ₹15227/ha in puncha and ₹19152/ha in additional crop season is the next highest cost under cost A1 in both seasons. Total cost A1 showed difference in both season as more field operations is carrying in the puncha season. ₹92640 /ha were paid by a farmer for the operational costs. Because the farmers in the sample did not employ many fixed assets other than land for cultivation, Cost B1 is a tiny sum of money. For cultivating rice by farmer in a hectare, ₹166427/ha is the cost incurred in puncha season and ₹143153/ha in additional crop season.

3. In Palakkad district, when calculating cost of cultivation, average cost of ₹2300/ha were incurred in virippu season and in mundakan season it is little more i.e ₹29000. . In virippu season, an average of 16083 incurred for the machine operations. An average cost of ₹7282 was spent by farmer for fertiliser in puncha season. Total cost A1 by adding all these costs, an average cost of ₹62058 in virippu season and ₹69383 in mundakan season incurred for farmers. Rental value of owned land is about ₹47000/ha in the study area. The value of land increasing day by day. So it reflect in the cost B2 i.e about ₹112732/ha in virippu and ₹119410 in mundakan season. Finally the total cost C3 showed the cost is more in the mundakan season i.e ₹132245/ha.

4. The cost of cultivation incurred for farmers in Thrissur was 110490 in virippu season and 115356 in mundakan season. Total cost A1 in the district showed an average cost of ₹75022 and ₹78874 in virippu and

mundakan season respectively. The major portion of this cost is made by hired human labour cost. The average cost of labour was ₹36493 in virippu season and ₹39024 in mundakan. Manures and fertilizer cost paid by farmers in virippu season (₹9301/ha) were more than in mundakan season (₹8931/ha). . Rental value of owned land in the area was ₹22000-₹25000. So the cost B2 finally showed an amount of ₹100036/ha in virippu season and ₹104136/ha in mundakan season.

5. Farmers in the Alappuzha district were carried out high cost of cultivation. The district's cost components are all relatively high. In comparison to other districts, their costs were high due to high labour wages and the use of expensive chemicals. The cost C3 or cost of production per quintal in the additional crop was ₹3111, which was higher than the ₹2280/quintal in the puncha season.

6. In the Palakkad district, the cost of production in the virippu season is slightly higher than in the mundakan season. The final cost C3 or cost of production calculation shows that in the virippu and mundakan seasons, respectively, an average amount of ₹2672 and ₹2486 is required to produce one quintal of rice in Palakkad district.

7. Farmers in the Thrissur area also had to spend extra during the virippu season to produce one quintal of rice. This is due to the virippu season's lower productivity compared to the mundakan season. The district's labour costs are considerable, with an average of ₹804/quintal for rice production during the virippu season. In both seasons, machine labour was nearly identical. All other costs, such as seeds, fertilisers, and plant protection agents, were significantly higher during the virippu season. The total cost of production in the virippu season was ₹2437/quintal, whereas in the mundakan season it was ₹2317/quintal.

8. In Kerala average value of ₹152348.23/ha rice were hand over by the farmers to SUPPLYCO. Straw is the residual product from rice and an average of ₹2492.84/ha were traded. The farmers were earning net income of ₹13561.8/ha and when calculating farm business income, it shows a favourable profit of ₹74960.67/ha.

9. For the calculation of cost of traders, different type of costs were included. Price of rice was given by government directly to the

farmers. So there is no purchase price for the SUPPLYCO accredited mills. The average cost of mills was an average of ₹ 392 per quintal of rice.

10. Private Mills were paying ₹2050 per quintal for rice from other states. The expense was carried by the supplier mills from their warehouse to the Kerala buying mills' depot. As a result, the cost of transportation is quite low. For private mills, the overall cost is ₹2284. Co-operative societies did not spend money on transportation because they bought rice directly from farmers. They were spending ₹2160 for the per quintal production of rice.

11. But the net income/loss of mill showed that the SUPPLYCO accredited mills were running on loss with an average loss of -₹6/quintal. Private Mills were procuring rice from other states and after processing the rice will be branded at an average of 34/kg. So they were running their firm on profit of 52/quintal. Co-operative societies also shows profit of 36/kg in the case of procured privately and selling branded rice.

12. Marketing margin of farmers were high as the mills were procuring rice from field and no transportation cost were incurred. For all the other traders except SUPPLYCO accredited mills were earning profit.

5.4 Constraints of farmers and traders in the rice market

1. In Kerala, the high cost of labour and scarcity of labour were considered major production problems for farmers followed by excessive weed, inadequate supply of seeds and natural calamity. Excessive weed and attack of pests and diseases also adversely affect the growth of rice. Attack of wild boar was the major constraint in the rice cultivation in the selected area.

2. Delay in procurement and high loading charge are the major procurement constraints of farmers in Kerala. The loading fee is likewise very high. Even though the price is set by the government, there are disagreements between agents and farmers on quality and quantity of produce.

3. Losses in transit and a lack of transportation was the most prominent limitations mentioned by farmers in the Alappuzha district when it came to the marketing of rice. Losses occurred means when agents procured the entire quantity of produce but recorded a lower quantity on the receipt slip for the quality adjustments of produce.

4. The farmers in study area were opined that MGNREGA doesn't cover the rice in their operation list. Political influence rental government machineries and intervention of political parties were also the major institutional constraints of farmers in Kerala.

5. All the farmer respondents were experiencing a shortage of suitable government subsidies. They opined that the subsidies they were receiving were insufficient. Financial assistance for loss recovery is insufficient and not available on time, particularly during floods and other natural disasters.

6. Regarding the constraints of traders in the market, the SUPPLYCO accredited mills were under a lot of financial strain. The cost of mill equipment, as well as its repair, is extremely high. They were facing the problem of quality issues in rice with farmers. There is no financial assistance provided. The millers were only get₹214 for procurement and processing of per quintal of and the mill will not be able to profit from it.

7. For private mills, comparatively fewer constraints were observed. Due to expensive equipment was operating within the mill, high repairing expense was an issue for all mills. Non availability of rice for production may occur in off seasonal. Due to the farmers in Kerala selling rice to SUPPLYCO, private mills were depending other states.

8. Co-operative societies have identified staffing as a major impediment. Employees' work schedules of 8 hours are incompatible with rice milling time. A batch of grain takes about 16 hours to grind. Milling capacity cannot be used appropriately and milling efficiency suffers as a result of the lack of a shift system in job hours.

9. The surveyed wholesaler mainly pointed out the non-availability of rice from Kerala. So he needs to import rice from other states. Hence

the storage and transportation of rice need more facilities and costs were high in the case of procurement from other states.

10. SUPPLYCO also facing the issues with the registration of millers and farmers in the online portal also made confusion in the functions.

11. Based on the SWOC analysis strengths were identifies in the market like experienced farmers, high yield varieties of seeds, high market margin, better yield, the staff in the mills, the availability of rice etc. Weaknesses of the rice market are showing labour shortage, cost of labour, losses in the transit, high loading charges, lack of transportation, low outturn ratio of rice to the mills and so on.

12. In the rice market, there are external factors like opportunities and challenges. The major opportunities in the rice market were continuous demand and assured market for rice, availability of traded rice from other states, the minimum support price of rice etc. Besides these opportunities, the major challenges like the intervention of political parties, inadequate subsidies, and delay in procurement of rice and so on cannot be unnoticed.

5.6 Recommendations

1. Farmers in the selected districts were facing the problem of high cost of labour and scarcity of labour. If scope of MNREGA can consider in rice cultivation for supply enough labour for the production and post-production operations of rice and thereby better income can be assured.

2. The farmers were not satisfied with the quality and quantity of seed provided by Krishibhavan. Hence, they are forced to purchase quality seeds and additional quantity of seeds at a higher price from open market. Necessary steps may be taken by the Krishibhavan to supply quality seeds in required quantity for the farmers in time.

3. Steps may be taken to ensure the timely procurement of rice by SUPPLYCO through frequent inspection.

4. For avoiding the conflict between farmers and mills on the quantity discounts at the time of procurement, a system of quality-based price may be determined by government.

5. Drying and storage facility is a problem for the farmers in Kerala. If the government can provide temporary warehouse services or rural storage facility to farmers, it will help them to store the produce and can retain the quality.

6. Communication gap between Krishibhavan and farmers were identified by farmers especially in Alappuzha district which is mainly due to the frequent transfers of officers in the Krishibhavan. Moreover farmers were not satisfied with the information provided by office. Therefore at most care may be taken by Krishibhavan for avoiding the communication gap and to provide adequate information by conducting trainings and seminars to farmers.

7. Crop insurance scheme is not efficient and sufficient to meet the losses due to natural calamities. Moreover, they are not getting the insurance amount in time. Therefore, the crop insurance scheme may be restructured so as to get actual benefit to farmers.

8. The government fixed procurement and processing charge of ₹214 per quintal of rice for SUPPLYCO accredited mills is currently insufficient to make profit. If there is increase in the incentives given to mills, it will help them to provide services to SUPPLYCO effectively.

5.7 Thrust in future study

- Structure, conduct and performance of milled rice market
- Market structure of rice traded from other states into Kerala

5.5 Conclusion

The study can be concluded that the rice market in Kerala consisted of farmers, mills including SUPPLYCO accredited mills and private mills, co-operatives and wholesalers. The rice produced in the state was flowing from farmers to SUPPLYCO through authorised mills. In Kerala, the majority of farmers were marginal/small farmers, followed by small farmers. virppu, mundakan and puncha are the major seasons in the rice cultivation in Kerala. Farmers in the Alappuzha district were cultivating puncha and additional crops only. Because of the risk of climate and soil salinity, most farmers in Alappuzha

grew a single crop only. Uma and Jyothi rice were the most common varieties cultivating in Kerala. Farmers have been cultivating high-yielding rice varieties in order to boost their output and profitability. During the puncha season, rice production and sales are at an all-time high in the Alappuzha district. They were not supposed to keep the rice for personal use because of the government's attractive rice price and the high cost of rice processing. There is no restriction on entering and exiting the rice market. SUPPLYCO is the only agency that purchases rice from respondents. Farmers in all three districts were selling rice at the government-set price (MSP). SUPPLYCO procured rice at a Minimum Support Price.

Regarding the traders in the rice market, rice was procured from farmers in Kerala through SUPPLYCO accredited mills and co-operatives. Rice was also brought from other states by private millers. While procuring the rice, they are mainly considering product characteristics such as rice type, moisture content, foreign particles and grain quality. SUPPLYCO was the primary source of information for SUPPLYCO accredited mills and co-operative societies, whereas Kalady Mills Consortium was the primary source of information for private mills. For SUPPLYCO procured rice, the ultimate price-fixing is based on central and state government policy. In Kerala, the Kalady mill consortium set the price of brought rice based on the open market price in the supply state. In terms of entry obstacles, the mills in the rice market in Kerala were not subject to any legal restrictions. However, the mills' ability to enter the market was hampered by their large capital investment high rice processing cost. When compared to SUPPLYCO accredited mills, transportation costs were significantly lower for private mills. Businesses are also hampered by a scarcity of skilled labour in the milling industry. The terms of sale for SUPPLYCO accredited mills are fixed by the government whereas for the private mills, they were following the terms of Kalady mills consortium.

The cost and income of farmers and traders determine the performance of the rice market. Farmers sold their produce to SUPPLYCO and the price was set by the government by announcing the minimum support price from year to year. Farmers were able to make a profit from rice farming, with the exception of the additional crop season in Alappuzha district. Despite the high expense of

cultivation in Alappuzha, the district's yield is significantly higher. In comparison to Alappuzha, the cost of cultivation was lower in Palakkad and Thrissur districts. However, the district's net income is also low. When comparing the marketing margins of SUPPLYCO accredited mills and the performance of the rice market, SUPPLYCO accredited mills cannot earn margins from the rice market. Private mills, co-operatives, and wholesalers profited from the sale of rice. If the government can raise the processing charge or lower the quantity criterion of 64.5kg milled rice from one quintal of rice, millers may be able to make a profit. Importing of rice required more cost and sophisticated equipments needed for milling of rice brought from other states. So for the millers in Kerala government can give subsidies on equipment cost or interest free borrowing for the initial investment.

The researcher identified a number of constraints that farmers and traders face in the rice market. Farmers faced production constraints such as scarcity and high labour costs, attack of pesticides, diseases and weed growth. High loading charges and procurement delays were the major procurement constraints in the rice market. Farmers in Kerala faced major marketing challenges due to transit losses, lack of transportation, lack of storage facilities, and undue interference of agents. Institutional constraints identified included MGNREGA not covering rice and political party intervention in machine allocation. As a result, there is insufficient labour for rice cultivation, resulting in high labour costs in farming. Farmers were also subjected to political party intervention in the areas of machine allocation and rice procurement. Financial restrictions were identified in the rice market, including an inadequate and untimely subsidy, financial support for recovery of loss and lack of access to sufficient credit.

According to the study, traders in the rice market face a number of challenges. For SUPPLYCO authorised millers, the main problems in the rice market were quality issues, financial instability, and high processing costs. The government also treats them unfairly when it comes to funding distribution. There is no financial assistance available. The government provides ₹214/quintal for millers' entire operations, which only covers the cost of operations and is sometimes insufficient. Private mills were found to have fewer constraints. Staffing has been identified as a major impediment by cooperative societies. As

an authorised institution in the rice market, SUPPLYCO is also addressing issues such as miller and farmer registration issues in the online portal, farmer complaints about procurement, and resolving issues between mill and padasekharasamithis.

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APPENDICES

KERALA AGRICULTRURAL UNIVERSITY

COLLEGE OF CO-OPERATION BANKING AND MANAGEMENT

STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

SURVEY SCHEDULE FOR RICE FARMER

Socio-Economic Profile

Name of panchayath:

I. **Individual details**

1. Name :

2. Address :

3. Age :

Less than 25 ☐

25-40 ☐

40-55 ☐

55-70 ☐

Above 70 years ☐

4. Religion/caste :

5. Tel .no :

6. Educational qualification:

Below SSLC ☐

UP to 12th standard ☐

Graduate ☐

P G ☐

Others ☐

II. **Family details**

1. Type of family: Nuclear ☐ Joint ☐

2. Household information:

Sl.no	Name	Relation with respondent	Sex	Age	Education	Primary occupation
1						
2						
3						
4						

3. Primary occupation

   Agriculture   ☐

   Non agriculture (specify) ☐

   Govt.employee   ☐

   Private employee   ☐

   Business   ☐

   Others(Specify)   ☐

4. Details of annual income:

From agriculture other than rice	Other sources	Rice cultivation

Structure and conduct of rice market

III. Farming details

1. Total area under cultivation:
2. Area under rice cultivation:
3. Variety of rice cultivated:

4. Type of rice cultivated:

5. Seasons which are cultivated (in the year of 2019-2020): Virippu ☐ Mundakan

   Puncha ☐ Additional crop ☐

6. Land particulars

Particulars	Garden land (ha)	Wet land (ha)	Dry land (ha)	Total area (ha)
Area owned				
Area leased in				
Area leased out				
Total				

7. Are you a member of any padasekhara samithi?

8. If yes what are the benefits you are getting?

   Financial support ☐

   Information source ☐

   Training ☐

9. How many years have you been in rice production?

10. Have you faced any problem in getting financial assistance from government or other institutions?

    Yes ☐   No ☐   if yes specify…….

11. How frequently will you sell your produce?

    Yearly ☐

    Seasonal ☐

    On demand ☐

12. Which type of sales method you are following?

    Spot sale ☐   Credit sale ☐

13. Who sets the prices of the rice? Please indicate below

Yourself ☐ Buyer ☐ Supplyco ☐ Other (specify)

14. What are the bases of fixing price for rice?

Based on Market demand ☐ Price fluctuation ☐ Government policy ☐

15. Are you getting adequate procurement price for the rice?

Yes ☐ No ☐

If no specify reason……….

16. Are you using any promotional methods for marketing rice?

Yes ☐ No ☐

If Yes Specify…

17. Production details of rice

Particulars	Total quantity produced in Kg	Used for seed purpose if any	Self-consumption if any	Marketed surplus
Virippu				
Mundakan				
Puncha				
Additional crop				

18. Do you know about the procurement procedures of Supplyco for rice?

Yes ☐ No ☐

If yes give your answer for following?

19. How do you know about procurement procedures of supplyco?

Krishibhavan ☐

Online portal of supplyco ☐

Traders ☐

Padasekharasamithis ☐

others (specify) ☐

20. Are you satisfied with online portal of Supplyco

Yes ☐   No ☐

21. Have you selling your produce to Supplyco?

Yes ☐   No ☐

22. Is there any delay occurred in procurement?

Yes ☐   No ☐

If yes how many days?

23. Is there any delay occurred in payment after procurement?

Yes ☐   No ☐

If yes how many days?

24. Through which bank you are receiving payment?

Co-operative bank ☐

Grameen bank ☐

Commercial bank ☐

Others ☐

25. Are you getting cash back for gunny bags and loading charge?

Yes ☐   No ☐

26. Do you face any problem due to Supplyco in rice market?

Yes ☐   No ☐

IV.   Source of information/Linkages

27. Are you getting adequate information for the rice cultivation?

Yes ☐   No ☐

28. Details of type of information receiving from different sources

Type of information	KB	KVK	PS	Media	Bank	Millers	Online portal of SUPPLYCO
Cultivation practices							
Inputs like seeds, fertilizer, machines etc							
Technology							
Training							

Price of rice							
Minimum Support Price							
Subsidy for inputs							
Credit							
Quality standards							
Market demand							
Terms of sale							
Mode of payment							
Government policies							

(KB-Krishibhavan, KVK- Krishi Vigyan Kendra, PS-Padasekharasamithi,)

Performance of rice market

I.   Cost of labour and machine (season wise)

Season	Machine power			Family labour		Hired labour	
	Yes/No	No of hours	Rate/hr	M	F	M	F
Virippu							
Mundakan							
Puncha							
Additional crop							

II.   Input details

1. Are you getting inputs adequately?

   Yes ☐   No ☐

2. Do you getting inputs timely?

Yes ☐   No ☐

3. Details of input used in rice farming:

Items	Quantity(Kg)			Source of supply			Price(Rs)			Subsidy		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Seed HYV Traditional												
Fertilizer a) organic b) inorganic												
Pesticides												
Credit												
Tools and equipments												
Irrigation												
Insurance services												
If leased land, rent												
Others (specify)												

III.   Cost involved for post harvesting

1. Have you process the rice after harvesting?

xvi

Yes ☐   No ☐

   If yes which form of process?

2. Quantity of rice kept for processing?

3. Details of cost in post harvesting

Seasons	Machine		Hired labour		Family labour	
	Hr	Rate	M	F	M	F
Virippu						
Mundakan						
Puncha						
Additional crop						

4. Marketing cost of rice

Seasons	Marketed surplus	Storage cost	Loading/unloading charges	Transportation charge	Total Cost
Virippu					
Mundakan					
Puncha					
Additional crop					

5. Income from the sale of rice (season wise)

Seasons	Quantity sold(Kg)	Price (₹)
Virippu		
Mundakan		
Puncha		
Additional crop		

6. Income earned from the sale of hay

Season	Quantity (no of bundle)/acre	Price (₹)/bundle
Virippu		
Mundakan		
Puncha		
Additional crop		

IV. Constraints in rice farming

1. Production constraints

Sl.no	Problem	Rank
1.	High cost of inputs	
2.	Non availability of inputs	
3.	Scarcity of labour	
4.	High cost of labour	
5.	Inadequate supply of quality seeds	
6.	Insufficient availability of irrigation	
7.	Unimely availability of irrigation	
8.	Excessive weed growth	
9.	Occurrence of pests and diseases	
10.	Natural calamities	
11.	Uneven rainfall pattern	

12.	Difficulties related to mechanization	
13.	Salinity of soil	

2. Procurement constraints

Sl.no	Problem	Rank
1.	Lack of demand	
2.	Delay in procurement by agents	
3.	High loading/unloading charges	
4.	Favourable terms of sale with procurement agency	
5.	Inadequate facilities for drying and cleaning	
6.	Conflicts between procurement agents and farmers	

3. Marketing constraints

Sl.no	Problem	Rank
1.	Delay in payment	
2.	More distance to marketing centers	
3.	Lack of transportation	
4.	High transportation cost	
5.	Losses occurred in transit	
6.	Undue interference of agents	

7.	Lack of storage facility	

4. Institutional Constraints

Sl.no	Problem	Rank
1.	MGNREGA not covering paddy	
2.	Ineffectiveness of Kerala Paddy Land and Wetland Conservation Act, 2018	
3.	Intervention of political parties in the procurement industry	
4.	Political influence in rental government machineries	
5.	Communication gap between institutions and farmers	

5. Financial Constraints

Sl.no	Problem	Rank
1.	Lack of adequate subsidy from government	
2.	Lack of sufficient quantum of credit	
3.	Untimely availability of credit	
4.	Lack of information on source of credit	
5.	Lack of financial support for recovering loss	
6.	Resistance of bank to avail credit	

KERALA AGRICULTRURAL UNIVERSITY

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STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

SURVEY SCHEDULE FOR RICE MILLERS

1. Name of the Unit
2. Address
3. Name of the Person
4. Name of the panchayath

   Where institution is located:
5. Phone number

I.   Structure and Conduct

1. Year of establishment
2. Form of organization: sole proprietorship [ ]   Partnership [ ]

3. What is the outturn of your factory?
4. Whether your factory functions throughout the year? Yes [ ] No [ ]
5. Years of experience in rice Market:
6. Years of experience in the procurement of SUPPLYCO:

7. Details of procurement of rice (in the year 2019-2020)

Season	Variety	Quantity procured(quintal)	Source and place of procurement	Procurement price (₹/quintal)

8. Details of processing and sale of rice

Channel of sale	Quantity processed (quintal)	Selling price (₹/quintal)	Quantity sold(quintal)
Directly to SUPPLYCO			
To the other private mills			
For branding the rice			
For the individual traders			

9. Which parameters you look for purchasing rice from farmers?

10. What are the procedures for procuring and marketing rice in Kerala?

11. Who is fixing price for the rice?   Farmer ☐   Government ☐

   Private mills ☐   Other supplier states ☐   Other source (specify) ☐

12. What are the price setting policies followed by mills in the rice market

13. Source of information for the mills in rice market

Type of information	Source of information	Adequate or not
Product attributes		
Price of rice		
Source of rice		
Market for milled rice		

14. Do you have promoted the rice in Market? If yes, which method you are used for promotion of rice……

15. Are there any barriers to mills to enter in the rice market? If yes, what are the barriers?

Huge capital investment ☐   Non-availability of rice ☐

Delay in payment ☐   Lack of subsidy ☐

Competition ☐   Procedures of obtaining Government permission ☐

Shortage of skilled man power ☐

16. Is there any particular terms of sale for rice in the market?   Yes ☐   No ☐

17. If yes, what are the terms to be followed?

II.   Performance of mills

18. Details of cost involved in processing of rice.

Sl.No	Costs	Amount (₹)
1.	Bank security	
2.	Building cost	
3.	Equipment cost	
4.	Purchase cost	
5.	Processing charge	
6.	Labour charges	
7.	Agent commission	
8.	Gunny bags	
9.	Transportation and storage	
10.	Loading of rice (₹/64.5 kg rice)	
11.	Unloading of rice (₹/64.5 kg rice)	

19. Details of income from rice

Sl.No	Income sources	Quantity(kg)	Price/quintal

			(₹)
1.	Price for quintal		
2.	Broken rice		
3.	Bran		
4.	Wastage		
5.	Husk		

III.   Constraints in the rice market

20. Please mark your constraints in the below table

Sl.No	Constraints	Mark
	Product constraints	
1.	Non-availability of rice	
2.	Low quality grain	
3.	Low quantity of milled rice	
	Procurement constraints	
1.	Lack of transportation	
2.	High storage cost	
3.	High transportation cost	
4.	High loading/unloading charge	
5.	High cost of gunny bags	
	Financial constraints	

1.	High depreciation cost	
2.	Lack of subsidies	
3.	Less processing fee from government	
4.	Low profit margin	
	Government policy	
1.	Rules and regulations of government	

21. If there is any suggestion, please specify

KERALA AGRICULTRURAL UNIVERSITY

COLLEGE OF CO-OPERATION BANKING AND MANAGEMENT

STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

SURVEY SCHEDULE FOR CO-OPERATIVE SOCIETIES

1. Name of the Unit

2. Address

3. Name of the Person

4. Name of the panchayath
   Where institution is located:

5. Area of operation:

6. Number of members:

7. Share capital of the society:

8. Phone number

IV.   Structure and Conduct of Millers

9. Year of establishment

10. Form of organization: sole proprietorship ☐   Partnership ☐

11. What is the outturn of your factory?

12. Whether your factory functions throughout the year? Yes ☐ No ☐

13. Details of procurement of rice (in the year 2019-2020)

Season	Variety	Quantity procured(quintal)	Source and place of procurement	Procurement price (₹/quintal)

14. Details of processing and sale of rice

Channel of sale	Quantity processed (quintal)	Selling price (₹/quintal)	Quantity sold(quintal)
Directly to SUPPLYCO			
To the other private mills			
For branding the rice			
For the individual traders			

15. Which parameters you look for purchasing rice from farmers?

16. What are the procedures for procuring and marketing rice in Kerala?

17. Who is fixing price for the rice?   Farmer ☐   Government ☐

    Private mills ☐   Other supplier states ☐   Other source (specify) ☐

18. What are the price setting policies followed by co-operative societies in the rice market

19. As a co-operative society, what are the benefits received from government?

    Credit facilities ☐   Market for rice ☐ Government share in investment ☐

    Financial subsidies ☐

20. Source of information for the mills in rice market

Type of information	Source of information	Adequate or not
Product attributes		
Price of rice		
Source of rice		

Market for milled rice		

21. Do you have promoted the rice in Market? If yes, which method you are used for promotion of rice……

22. Are there any barriers to mills to enter in the rice market? If yes, what are the barriers?

Huge capital investment ☐   Non-availability of rice ☐

Delay in payment ☐   Lack of subsidy ☐

Competition ☐   Procedures of obtaining Government permission ☐

Shortage of skilled man power ☐

23. Is there any particular terms of sale for rice in the market? Yes ☐   No ☐

24. If yes, what are the terms to be followed?

25. Details of loan taken:

Type of loan	Amount of loan (₹)	Subsidy	Due amount (if any)

V.   Performance of mills

26. Details of cost involved in processing of rice.

Sl.No	Costs	Amount (₹)
12.	Bank security	
13.	Building cost	
14.	Equipment cost	
15.	Purchase cost	
16.	Processing charge	
17.	Labour charges	

18.	Agent commission	
19.	Gunny bags	
20.	Transportation and storage	
21.	Loading of rice (₹/64.5 kg rice)	
22.	Unloading of rice (₹/64.5 kg rice)	

27. Details of income from rice

Sl.No	Income sources	Quantity(quintal	Price/quintal (₹)
6.	Sale of rice		
7.	Broken rice		
8.	Bran		
9.	Wastage		
10.	Husk		

VI. Constraints in the rice market

28. Please mark your constraints in the below table

Sl.No	Constraints	Mark
	Product constraints	
4.	Non-availability of rice	
5.	Low quality grain	
6.	Low quantity of milled rice	
	Procurement constraints	
6.	Lack of transportation	

7.	High storage cost	
8.	High transportation cost	
9.	High loading/unloading charge	
10.	High cost of gunny bags	
	Financial constraints	
5.	High depreciation cost	
6.	Lack of subsidies	
7.	Less processing fee from government	
8.	Low profit margin	

29. If there is any suggestion, please specify

xxx

KERALA AGRICULTRURAL UNIVERSITY

COLLEGE OF CO-OPERATION BANKING AND MANAGEMENT

STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

SURVEY SCHEDULE FOR WHOLESALER

1. Name of the Person

2. Address

3. Phone number

4. years of experience in rice Market:

5. Annual turnover

I.   Structure and Conduct

6. Details of procurement of rice (in the year 2019-2020)

Season	Variety	Quantity procured(quintal)	Source and place of procurement	Procurement price (₹/quintal)

7. Which parameters you look for purchasing rice from farmers?

8. What are the procedures for procuring and marketing rice in Kerala?

9. Who is fixing price for the rice?   Farmer ☐   Government ☐

   Private mills ☐   Other supplier states ☐   Other source (specify) ☐

10. What are the price setting policies followed by wholesalers in the rice market

11. Source of information for the wholesalers in rice market: ☐

    Private mills ☐   Government ☐   Brokers ☐   Other states ☐

12. Do you have promoted the rice in Market? If yes, which method you are used for promotion of rice……

13. Are there any barriers to mills to enter in the rice market? If yes, what are the barriers?

Non-availability of rice ☐ Delay in payment ☐ Competition ☐

II. Performance of wholesaler

14. Details of cost involved in rice market

Items	Costs (₹)
Purchase Price	
Transportation	
Packaging	
Gunny bags	
storage	
Agent commission	
Loading and unloading	

15. Details of sale of rice

Channel of sale	Quantity sold(quintal)	Selling price (₹/quintal)
To the other private mills		
To the other states		
For the individual traders		

III.   Constraints of wholesalers

16. Please rank your constraints in the rice market

Constraints	Rank
Non-availability of rice	
High storage cost	
High transportation cost	
Lack of demand	

17. If there is any suggestion, please specify

STRUCTURE, CONDUCT AND PERFORMANCE OF RICE MARKET IN KERALA

By

Divya Vijayan

(2017-25-001)

ABSTRACT OF THE THESIS

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ABSTRACT

Structure, Conduct and Performance of Rice Market in Kerala

Rice is the major food crop cultivated in the State occupying 7.37 per cent of the total cultivated area. During the period of the 13th Five Year Plan, the downward slide in the area since the early 1970s, in the area under rice cultivation may be arrested. In 2015-16, 1.97 lakh hectares were cultivated with rice in the State which marginally increased to 1.98 lakh hectares in 2019- 20. This was in contrast to earlier plan periods, where the area cultivated with rice consistently depicted a declining trend. Palakkad, Alappuzha, Thrissur, and Kottayam accounted for about 79.9 per cent of the total area of rice in the State with a contribution of 83 per cent of the total rice production in the State (GOK, 2019:20).

Kerala is deficit in the rice production and the demand- supply gap for rice in the market, which was around 52 percent in 1970's, increased to more than 85 percent in 2016 due to the large scale decline in area under cultivation and the rice produced in the state meets only 15 percent of the total consumption requirement (Athira, 2017). Therefore, the flow of rice from Andhra Pradesh, West Bengal and Tamil Nadu to be increased in order to meet the consumption needs. The conventional structure of rice market in Kerala generally follows the multi-stage value chain system including farmers as the basic supplier of rice, middlemen or agents, government procurement agencies, rice processing industries, distribution agents etc as the interlinked upstream and downstream stages resulting in greater complexity, lower efficiency, reduced margin and increased cost of the rice production (Lisha, 2018). After reviewing the relevant literatures it was found that only a few studies in India focused on the structure, conduct and performance of rice market. However, in Kerala such studies are very limited and the existing studies have focused on production, productivity and marketing problems. In this situation an in-depth study of Structure, Conduct and Performance (SCP) of rice market is much significant.

The study mainly aimed to analyse the structure and conduct of rice market in Kerala and to assess its performance as well as to identify the

constraints faced by the rice farmers and traders in the rice market. Both primary and secondary data were used for the collection of data. Primary data were collected from rice farmers as well as traders. Data from farmers and traders were collected by adopting personal interview method using pre tested structured interview schedule. Secondary data on area, production, productivity and procurement price of rice in Kerala were collected from published reports and official websites of Government of Kerala.

The study is conducted among the major rice producing districts in Kerala viz; Palakkad, Alappuzha and Thrissur. From each district, one block having largest area under rice cultivation was selected and from each block, one panchayath with the largest area under rice cultivation was also selected. From the three selected panchayaths, 60 farmers each were selected using simple random sampling, making a sample of 180 farmers. To analyse the structure and conduct of the rice market variables like profile of rice farmers and traders**,** forms of business organisation**,** volume and value of trade**,** types of rice**,** variety of rice**,** barriers of entry**,** source and type of market information price setting methods, price fluctuations, product attributes, sales promotion methods, source and availability of credit and terms of sale were used. To analyse the performance of rice market, the variables such as season wise production cost and post production cost incurred by rice farmers, cost incurred by traders in rice marketing, income earned by rice farmers and traders in rice market and marketed surplus of rice farmers were selected. The constraints faced by farmers and traders in the rice market were identified by using variables such as production constraints, marketing constraints, procurement constraints, legal and political constraints and financial constraints were find out. Structure and conduct of the rice market were analyzed by percentage analysis. For assessing performance, cost concepts developed by Commission for Agricultural Costs & Prices (CACP) of Government of India for farm management studies was followed. To identify the constraints faced by farmers and traders, Garrett ranking method was used. Based on the problems a SWOC matrix also employed.

From the analysis of structure and conduct of the rice market, it was found that in Kerala, farmers and SUPPLYCO are the major players and the presence of millers and co-operative societies are also found in the study. The market is concentrated by the SUPPLYCO accredited mills for the procurement of rice from farmers in Kerala and also by the private mills to purchase rice from other states. The co-operatives were also important in the market and they procured rice from Kerala and also from other states. The majority of the farmers were marginal farmers (52 percent) followed by small farmers in Kerala. The Virippu and Mundakan were the major seasons of rice cultivation in Kerala. In Alappuzha district, farmers were cultivating in puncha and additional crop only. Most of the farmers were doing single crop in Alappuzha because of risk of climate and soil salinity. Farmers in Palakkad and the Thrissur district were cultivating during the virippu and mundakan seasons. The most common rice types in the studied area were Uma (95.56 per cent) and Jyothi (4.44 per cent). Farmers were cultivating high-yielding varieties of rice as it will increases their yield and income. Production and volume of sale of rice is high in the Alappuzha district in puncha season. Because of the attractive price of rice given by government and the high cost of processing of rice, they sell it to the SUPPLYCO. There is freedom to enter and exit from the rice market. No legal barriers in the market entry. All the farmer respondents in three districts were hand over the rice to SUPPLYCO at the procurement price set by Government. SUPPLYCO is procured rice at the MSP fixed by the state and central government directives. The major source of information for the farmers in the Alappuzha district was padasekharasamithi. In Palakkad and Thrissur district, farmers were depending Krishibhavans for information. The role of Krishibhavan and Padasekharasamitis in the dissemination of information to farmers were inevitable in Kerala.

SUPPLYCO accredited mills procured a total of 11 lakh quintals of rice per year, accounting for 34.38 percent of the market. With a market share of 57.05 percent, private mills were trading an average of 24 lakh quintal of rice from other states into Kerala. Cooperatives purchased 1.9 lakh quintals of rice for SUPPLYCO and 21500 quintals for branding. Each year, roughly 1 lakh quintal is procured by wholesalers. SUPPLYCO is critical for rice procurement

in Kerala since it protects farmers. In the rice market, private mills are required to suit the population's consumption needs. All the procurement agencies focus on product attributes like, type of rice, moisture content, foreign particles, grain quality and so on. The major source of information for SUPPLYCO accredited mills and co-operative societies were SUPPLYCO and for private mills, Kalady mills consortium was the source of information. The Minimum Support Price is fixed by the central government and the state is adding the State Intensive Bonus to the farmers in Kerala for SUPPLYCO procured rice (in the year 2019-20 MSP was ₹2695/quintal). It is mainly aimed to help farmers for covering the cost of cultivation and continue in the rice market. In Kerala, the price of rice supplied from other states was determined by the Kalady mill consortium based on the market price of rice in the supplier state. Regarding barriers of entry, the legal barriers have not existed in Kerala for the mills in the rice market. SUPPLYCO accredited mills were following specific terms of sale recommended by the government. For the private mills, there are no particular terms of sale but they were following the terms of the Kalady mills consortium.

The performance of the rice market is assessed by considering the cost and income of the farmers and traders. Farmers were selling their produce to SUPPLYCO and the price is fixed by the government by declaring the minimum support price from year to year. The farmers were earning net income of ₹13561.8/ha and when calculating farm business income, it shows a favourable profit of ₹74960.67/ha. Even though the cost of cultivation is high in Alappuzha about ₹161465 per hectare, the yield is comparatively higher in the district. In Palakkad and Thrissur districts, the cost of cultivation was less compared to Alappuzha. But the net income is also low in the district as the yield is comparatively lesser than the Alappuzha district. In puncha season, average of ₹30064/ha income is earned from rice cultivation. The farm business income shows that the farmers are profited from the rice cultivation including under additional crop season. The highest income is earned by the farmers in the Alappuzha district with an average of ₹103848/ha area of rice cultivation. When calculating net income per quintal of rice, it is high in the Alappuzha district in puncha season. In additional crop season, it shows net loss as the production cost was high in the season. In Palakkad district, in virippu season, the income was

only ₹22/quintal of rice because of the rental value of the owned land. When calculating farm income without considering the value of land imputed family labour, the farmers were earning an income of ₹1425/quintal of rice in puncha season in Alappuzha district followed by Mundakan season of Palakkad district (₹1389/quintal of rice). The farmers in three districts were earning a marketing margin of ₹2500 per quintal of rice as SUPPLYCO procured rice from the field.

Considering the performance of the traders in the rice market, there is no purchase price for the SUPPLYCO accredited mills. The final operational cost of mills was an average of ₹ 392 per quintal of rice. Private Mills were paying ₹2050 per quintal for rice from other states. All the expenses incurred in the delivery of rice from the warehouse of supplier mills of other states to the depots of private mills in Kerala were paid by the supplier mills. As a result, the cost of transportation is quite low. For private mills, average cost of ₹2284/quintal were incurring for the purchase and processing of rice. Co-operative societies did not spend money on transportation because they bought rice directly from farmers. They were spending ₹2175 for the per quintal production of rice. The wholesaler is paid about ₹2000/quintal for purchasing rice from the other states. But the net income/loss of mill showed that the SUPPLYCO accredited mills were running on loss with an average loss of -₹6/quintal. Private Mills were procuring rice from other states and after processing the rice is branded at an average ₹34/kg. So they were running their firm on the margin of ₹52/quintal. Co-operative societies also showed a profit of ₹36/quintal in the case of procuring privately and selling branded rice. When comparing the marketing margin, private mills, co-operatives, and wholesalers were receiving a margin from the sale of rice but SUPPLYCO accredited mills cannot earn a margin from the rice market. Despite this, they continued their operations in order to avert mill closures.

The researcher identified various constraints faced by farmers and traders in rice market. Farmers were confronted with production constraints such as scarcity and high labour costs, excessive weed growth and inadequate supply of seeds which results in rice cultivation challenges. High loading charge and delay in procurement came into the major constraints of the rice market. Losses in transit, lack of transportation, shortage of storage facilities and undue

interference of agents were the major marketing constraints faced by the farmers in Kerala. Institutional constraints identified were MGNREGA does not cover the rice which in turn resulted into high labour cost and intervention of the political parties in the allocation of the rental agriculture machinery provided by the government. Financial constraints were identified in the rice market, were inadequate and untimely subsidies, financial support for recovery of loss and lack of access to sufficient credit.

Traders in the rice market were also found to be facing a variety of obstacles, as per the study. Quality issues, financial instability, and high processing costs were the key problems in the rice market for SUPPLYCO accredited mills. In the perception of the traders, they are also treated unfairly by the government when it comes to funding distribution. The traders are not in receipt of any kind of financial assistance from the Governmnent. The government provides ₹214/quintal of rice for the entire operations for the mills which cover only the cost of operations and sometimes it is not sufficient. For private mills, comparatively fewer constraints were observed. Co-operative societies have identified staffing as a major impediment. As an authorised institution in the rice market, SUPPLYCO also faced issues with the registration of millers and farmers in the online portal, farmer complaints on procurement and solving the issues between mill and padasekharasamithis.

Based on the SWOC matrix, the study suggested strategies for a better rice market system. The major suggestions were to improve awareness about government support including subsidies to farmers, ensure the continuous availability of high-quality seeds and the other inputs to farmers through Krishibhavan, ensure steady margin for farmers and traders by SUPPLYCO, ensure the timely procurement of rice by SUPPLYCO, the efficiency of mills can be increased by providing hi-tech machinery and financial support by the government, common wage structure for labours, uniform loading charges, increase the amount of processing charges to SUPPLYCO accredited mills, minimise the labour shortage by checking the scope of MNREGA in labour supply, minimise political interference in the rice market, minimise the communication gap between farmers and institutions by ensuring participation

of both in training programmes and also shift system may be introduced to improve the mill capacity in co-operatives