A STUDY ON POKKALI PADDY CULTIVATION IN NAYARAMBALAM GRAMA PANCHAYATH IN VYPIN ISLAND, ERNAKULAM

Dissertation submitted to

MAHATMA GANDHI UNIVERSITY

in partial fulfilment of the requirement for the award of the degree of

MASTER OF ARTS IN ECONOMICS

By

UDAYA .K.U

Register No: AM14ECOO16

Under the guidance of

Dr. Nirmala Padmanabhan

DEPARTMENT OF ECONOMICS
ST.TERESA'S COLLEGE(AUTONOMOUS)
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CERTIFICATE

This is to certify that the dissertation titled "A STUDY ON POKKALI PADDY CULTIVATION IN NAYARAMBALAM GRAMA PANCHAYATH IN VYPIN ISLAND, ERNAKULAM" , submitted in partial fulfillment of the requirement of MA Degree in Economics to the Mahatma Gandhi University, Kottayam, is a record of bona fide research work done under my supervision and guidance.

Head of the Department
Dr. Nirmala Padmanabhan

Guide and Supervisor
Dr. Nirmala Padmanabhan

DECLARATION

I hereby declare that the dissertation titled "A STUDY ON POKKALI PADDY CULTIVATION IN NAYARAMBALAM GRAMA PANCHAYATH IN VYPIN ISLAND, ERNAKULAM" submitted for the M.A. Degree in Economics is my original work.

Signature of Supervisor

Dr. Nirmala Padmanabhan

Signature of Candidate

UDAYA.K.U

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Agriculture plays a vital role in India's economy. Over 58 percent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP).

Rice is one of the chief food grains of India. India is one of the world's largest producers of white rice and brown rice, accounting for 20% of all world rice production. It is the staple food of the people of the eastern and southern parts of the country.

In the state of Kerala, rice is the prime food source for 90% of the population. Rice, also has an aura of sanctity attached to it and is a prime 'ingredient' or element at important rituals like weddings, inaugurations, housewarming celebrations, social and religious ceremonies etc where it commands respect as a symbol of prosperity, success, mysticism, divinity etc. despite changes over the years, rice cultivation still remains the main occupation and income generator for about 18% of Kerala's population.

Pokkali is the oldest variety of rice in Kerala. It is a traditional flood resistant rice variety cultivated in the coastal regions of Ernakulum, Alappuzha and Thrissur districts in the state of Kerala. It is also among the oldest known crops cultivated by organic farming methodologies in the world. In the rice cultivation, the pokkali variant has remained a favourite among many farmers and now attained global recognition as well as exclusive cultivation and distribution rights to its Kerala growers, standing out as a befitting recognition of its superiority. The organic Pokkali Rice is famed for its special taste and high protein content as well. It also provides adequate energy to fishermen to stay in the sea the whole day without consuming any other food. Since the tidal flows make the fields highly fertile, no other manure or fertilizer needs to be in the water-logged fields, the rice plants usually grow up to a height of two meters. But as they mature, they bend over and collapse with only the panicles standing upright. 'Pokkali rice is cultivated in traditional and natural ways. It is also highly environment – friendly and poison free.

Pokkali is cultivated by organic methods, has high market value and also numerous medicinal properties attributed to it. Pokkali has been cultivated in the coastal fields of Kerala, bordering the Arabian Sea for the last 900 years and it is one of the traditional varieties of paddy in the South Asian continent. It is also known for its salt-resistant genes that have been studied using modern biotechnological tools and the University of Arizona in the United States has developed a DNA library of Pokkali rice.The Pokkali paddy, which to an extent is saline, flood resistant and acid-resistant, is the wonder crop cultivated in these regions.

Without Pokkali cultivation, its entire cultivated area would have been flooded and wasted; acidity and toxicity would be high and there would also be less oxygen and more hydrogen sulphide, which kills the prawn larvae. This makes the rice variety highly environment-friendly too. All these drawbacks are effectively removed by the farming operations which ensure good drainage. It is also cost effective because artificial feed is expensive and prawns are more prone to diseases. As Pokkali rice variety is cultivated using organic farming methods, it has high market value and many medicinal properties are also attributed to it.

The State Agriculture Department is planning to market Pokkali rice in a big way. Efforts are being made to launch a brand by the name Pokkali in the Indian market shortly. In Ernakulam district, Nayarambalampanchayat is one of the places where pokkali is cultivated. The present study is about problems faced by pokkali cultivation in NayarambalamPanchayat.

1.2 PROBLEM IDENTIFICATION

This simultaneous system of paddy cum prawn cultivation of Vypin, Ernakulum district is known as Pokkali Krishi. Pokkali fields are low-lying and immersed in water. The tidal flows have to be regulated to do the farming activities. These fields are naturally connected to the Arabian Sea through backwater and canals.

Despite good quality and properties of pokkali rice, government support through various schemes and good returns due to combination of Pokkali rice with prawn farming, the area under pokkali cultivation has shrunk considerably. Over the last decades the 25000 hectares in which pokkali was being cultivated in the state has now shrunk to about 5000 hectares. If this problem persist it will affect our food security and cause food scarcity in future. Hence this study aims at analyzing the issues related to Pokkali cultivation in Nayarambalam Grama Panchayat in Ernakulam District.

1.3 REVIEW OF LITERATURE

Tiwari(1993) observed that rice- fish/prawn cultivation could markedly increase rice yield and yield attributes by accreting the soil and promoting the release of nutrients from soil. The movement of fish/prawn in rice fields improved the oxygen exchange and enhanced the mobilization of dissolved nutrients, due to mechanical stirring of impounded water, resulting in better tills, the extra directly fertilise water in rich fields.(Tiwari , project for integrated farming research for sustaining food production, Nuclear Agricultural Biotechnology,Kerala 1993.)

Dr.C.G.Rajendran(1998)observed that without pokkali paddy, the entire area will be flooded, acidity will be more, and toxicity will be high and there will be less oxygen and more hydrogen, sulphide, which can kill the prawn larvae .All this is effectively removed by the farming operation, which ensures good drainage. (Dr. C.G. Rajendran, Rice Research Station Vytilla,1998.)

Dr .K.S. Shylaray(2001)plant breeder at the Rice Research Station Vyttila said that even if we have recommended this traditional method, most farmers just make the beds a little above the water to sow the seeds. Though pokkali paddy cultivation is comparatively less labour intensive than other varieties of paddy ,the farmers are disinterested in pokkali and do it just for the sake of feeding the prawns, which is by for more lucrative. (Dr.K.S.Shylaraj, Plant Breeder At The Rice Research Station Vyttila,2001)

Dr.P.Rajendran(2005) said that the paddy cultivation and prawn farming should be alternatively practiced in the pokkali regions. This system of rotation will increase the production of both paddy and prawns. (Dr.P. Rajendran, Pokkali Land Development Project-A Summary , Kerala Land Development Corporation 2005 P.4.)

Purushan(1987) studied the economics of traditional prawn farming in brackish water fields of Kerala and found that on recent advances in paddy cum fish culture observed that the cultivation of fish and paddy together could potentially increase and stabilize income on rice farms and also paddy post fish culture increased the total annual yield. (Purushan (1986) Recent Advance In Paddy- Cum Fish Culture And Its Scope In Kerala,Seefood Export , Journal, 8(5) P 1-4)

Senthadhas (1989) evaluated the economics of paddy cum prawn culture in Kerala during 1981-84 based on data generated through sample survey covering Ernakulum district. The cost of paddy cultivation worked out to about Rs. 2780 per hectares. Labour accounted for 81 percent of the total cost, seed to percent sluice gate7 percent and miscellaneous expenditure 2 percent. The average yield was 19 quintals per hectare, which gave gross secturn of Rs 3270 to 3900. (Sentiadas.R,Panicker K.P, Sathyavan,V.Kand Jacob .T(1989)Economic Evaluvation Of Paddy Prawn Integrated Farming In Kerala, Seafood Export, Journal8(2) P 8-21)

Padmakumar (1990) reported that simultaneous farming which requires several modifications to the rice fields to protect the fish from the inherent risk of pesticide applications, rotational farming of rice and fish was shown to more advantages.(Padmakumar, Kerala Agricultural University at regional agricultural research station,Kumarakom,1990)

Purushan (1987) found that the integration of paddy cultivation and prawn culture was encouraging of properly operated on comparing the two, it was seen that almost double the profit was released from traditional prawn cultivation over paddy cultivation .if improved methods of prawn production from paddy fields could be raised to at least one tone per hectare.(Purushan ,Export of traditional prawn farm in Kerala Seafood export, Journal.1987 p.15-19).

Pillai(1975) have reported that a fishery resource of any area is mainly dependent on the magnitude of primary and secondary production, which in turn are influenced by various physico-chemical and biological factors of water. However in integrated farming system, the contribution of bacteria as major feed source for fish filter feeding and omnivorous species has been illustrated.(Pillai (1959) "A study of the economy of Fisher Folk in Kerala',Kerala Economic Research Council)

Prabhakaran and Harikumar have revealed that Kerala's agriculture is in crisis today. Nearly 1500 farmers have committed suicide in the last five years, mainly in Wyanad and Palakkad. The two farms dominated backward districts. In the bowls of the state Palakkad and Kuttanad is alarming declining in the extent of area under paddy cultivation. Accordingly to Economic And Statistical Department, totally paddy cultivation in Kerala is 3, 10521 hectares, in Palakkad it is 1, 15,910 hectares in the three seasons. The drop in paddy cultivation is because farmers don't find it remunerative.(Prabakaran and Harikumar stated in their article "Agrarian Crisis", The Hindu(2006)

S.A. Sujatha (2010) in her study "socio-economic conditions of farmers in different farming systems" says that the analysis of the problems faced by farmers in the existing farming systems revealed that all the categories of farmers are facing scarcity of family labour due to involvements in non- farm activities and fragmentation of land. As dry land farming system is entirely dependent on rainfall, changes in the income level of farmers. Lack of transporttion and marketing facilities are also faced by all the categories of farmers.(S.A.Sujatha (2010)"Socio-Economic conditions of farmers in different farming systems;A Micro Study" Southern Economist, vol47,pp 23-27.)

According to V.Sreekumar (2013), the southwest monsoon and tidal action in the Arabian sea are the most critical factors in the pokkali farming system."The high salinity of waterlogged fields caused by the uptides is washed off during the heavy southwest monsoon. This wetland ecosystem is unique and fragile", says Mr.Sreekumar.(V.Sreekumar (2013),scientist with the Kerala Agriculture University's Rice Research Station at Vytila- Ernakulam.)

Prakash (2008) pointed out that Palakkad district is largest paddy cultivating district in Kerala, has found that the problem faced by the farmers was the acute shortage of labour and increase in wages of farm workers. As the major share of paddy cultivation depended on hired labour; youth especially those having school education considered the agriculture work is a dirty job. Kerala university field survey report said, employment opportunities in non-agricultural sector the youth shifted that sector. (Prakash (2008) Paddy cultivation in Palakkad: Problems and Prospects)

Agriculture department of Kerala (2007) has argued that the wetland of Kerala is mainly used for growing paddy and for prawn culture. About 3.5 Lakhs hectares of land are used for agriculture in the state. This accounts for nearly 50 per cent of total area under wetland in the state there are six major rice eco systems in the state midland malyoram Eco system, Kuttanad Agro Eco System, Pokkali Rice Eco System. Palakkad plain and chittur rice ecosystem and high range eco system.(Agriculture Department Kerala. "Trend analysis of paddy cultivation in Kerala, 2006)

1.4 OBJECTIVES

I. To analyse the present status of pokkali paddy cultivation in Nayarambalam Gramapanchayath in Ernakulam District.
II. To study the problems of pokkali paddy cultivation.

1.5 METHODOLOGY

AREA OF STUDY

This is a study specific to pokkali paddy cultivation in Nayarambalam Grampanchayathath in Vypin Island, Ernakulum.

PERIOD OF STUDY

The study is carried out during the period 2015-16

1.6 POPULATION OF THE STUDY

Data had been collected from 50 farmers who are engaged in cultivation of Pokkaili rice in Nayarambalam panchayat . The list was obtained from the Krishi Bhanvan in the Panchayat who reported that as on December 2015 there were 51 farmers engaging in such cultivation in the entire panchayat. Since information was not provided by one respondent, the subject of our study is 50s farmers in the Panchayat whose were engaged in Pokkali cultivation which was spread over three Paadashekarams. Thus the study can be perceived to represent the entire population of Pokkali rice cultivators in the Panchayat.

1.7 SOURCE OF DATA

The study is based on both primary data and secondary data. Primary data was collected through interview method from the population using a structured schedule. Secondary data have been collected from various government articles, website, journals, reports .

1.8 METHOD OF ANALYSIS

For analyzing the data, used both frequency tables, pie diagrams, bar diagrams etc were used.

1.9 LIMITATIONS

The area of the study was confined to Nayarambalam Grama Panchayath in Vypin Island

1.10 PLAN OF THE STUDY

The project report is divided into four chapters. The first chapter includes the introduction, review of literature, relevance, objectives, and methodology. The second chapter deals with an overview of production and consumption of paddy in Kerala and India against its trends at the Global level. The third chapter analyses pokkali paddy cultivation in Nayarambalam Gram Panchayath .. And the last chapter profiles the findings, conclusions and suggestions.

CHAPTER-II

OVERVIEW OF PRODUCTION AND CONSUMPTION OF RICE

2.1 PRODUCTION AND CONSUMPTION OF RICE IN THE WORLD

Rice is a major food crop for the people of the world in general and Asians in particular; nearly 90% of the world's rice is produced and consumed in this region. Furthermore, rice is a staple food for nearly 2.4 billion people in Asia, and except for Pakistan and some parts of India and china, rice provides two thirds of calories for most Asians with rice based diets.

Rice cultivation originated in china over 4,000 years ago and remains an important agricultural commodity in many Asian diets. In addition, its low cost and the high caloric value make rice a staple commodity for many poor and developing countries.

Rice from the field is harvested and threshed to produce what is most often called paddy rice or rough rice. Rice is usually harvested at about 18% to 24% moisture and must be dried down to about 12% to 14% so that it can be safely stored. In most developing countries rice is somehow air-dried. The straw and rice can be dried in the field. It is sometimes stacked in a special manner to allow air to pass to through it and cause rain run off quickly. Most often, the paddy rice is spread on some sort of concrete or payment and raked over until dry. In some developing countries, the rice is dryed all over the roads during harvest season .In more developed countries, rice is dried in farm storage bins that have air chambers underneath that force air to pass up through the rice, or rice is dried in large column dryers where the rice makes two to five passes through the dryer in a continuous flow type system. Drying of the rice (including while in the field prior to harvest) is a critical component with regard to quality. Rice that is cracked during drying will have a lower percentage of head yield and will have a poorer quality after cooking.

The production and consumption of rice in the world was analyzed for the period from 2008-2009 to 2012- 2013. The production of rice for the above mentioned period is presented in the table 1.1.

TABLE 2.1 Production of Rice in the World: (000's Tons)

Sl. No .	Countries	2008-09	2009-2010	2010-2011	2011-2012	2012-2013
1	Bangladesh	31200	31000	31700	33700	34000
2	Brazil	8570	7929	9300	7888	8160
3	Burma	11200	11642	10528	10816	10666
4	Cambodia	3992	4056	4233	4268	4600
5	China	134330	136570	137000	140700	143000
6	Egypt	4673	4564	3100	4250	4675
7	India	99180	89090	95980	105310	104000
8	Indonesia	38310	36370	35500	36500	37500
9	Japan	8029	7711	7720	7646	7756
10	Korea south	4843	4916	4295	4224	4006
11	Nigeria	2632	2234	2818	2877	2370
12	Pakistan	6900	6800	5000	6200	6000
13	Philippines	10755	9772	10539	10700	11350
14	Thailand	19850	20260	20262	20460	202000
15	Vietnam	24393	24993	26371	27152	27650
16	United states	6546	7133	7593	5866	6334
17	Others	33298	35598	37360	37251	37952
18	World total	448701	440638	449299	465808	470219

Source:http://www.unido.org/fileadimin/user_media/UNIDO_worldwide/office

UNDIO-offices/rice.pdf,pp8-11

The data in the above table reveals the production of rice in the world for the past five years, that is, from 2008-2009 to 2012-2013.As such, the production of rice in the world, expect during 2008-09 to 2009-10, has increased gradually. The production of rice decreased by 1.79 per cent in 2009-10 d compare to its previous year and later on it increased by 1.97 , 3.67 and 0.95 per cent in 2010-11, 2011-12 and 2012-13 respectively indicating that in 2011-12 it had the highest percentage of increase when compared to other years from 2008-09 to 2012-13. At the same time in 2012-13, the production of rice in the world increased by 4.80 percent when compared to 2008-09. But with regard to India it is observed that in 2009-10and 2012-13 the production of rice has decreased compared to its respective previous years and in rest of the years it has recorded increase in rice production of rice in the world.

TABLE 2.2 Consumption of Rice in the World: (000"s Tons)

Sl. No	Countries	2008-09	2009-10	2010-11	2011-12	2012-13
1	Bangladesh	31200	31600	32400	34300	34500
2	Brazil	8400	8477	8200	7928	7900
3	Burma	10800	10890	101000	10200	10200
4	Cambodia	3220	3270	3370	3450	3615
5	China	133000	134320	135000	139600	144000
6	Egypt	4270	3940	3300	3620	3900
7	India	91090	85508	90206	93334	96100
8	Indonesia	37100	38000	39000	39550	40000
9	Japan	8326	8200	8200	8050	8250
10	Korea south	4789	4701	5175	4905	4612
11	Nigeria	2880	3060	2713	3224	3320
12	Pakistan	4220	4350	5000	5400	5700
13	Philippines	13100	13125	12900	12850	12925
14	Thailand	9500	10200	10300	10400	10500
15	Vietnam	19000	19150	19400	19650	20100
16	United state	4082	4016	4317	3470	3810
17	Others	50568	52370	53923	56188	57500
18	World total	437179	438108	445507	459477	469850

Source:http://www.undio.org/fileadmin/user_media/UNDIO_worldwide/offices/UNDIO_offices/rice.pdf,pp 8-11.

Data in the above table reveals that there is a gradual increase in the consumption of rice year by year. In other words, rice consumption increased by 0.21 per cent in 2009-10, 1.69 per cent in 2010-11, 3.14 per cent in 2011-12 and 2.26 per cent in 2012-13 compared to their respective previous years indicating that the percentage of increase in consumption of rice in 2011-12is more when compared with other years from 2008-09 to 2012-13. Similarly , the consumption of rice increased by 7.47 per cent from 2008-09 to 2012-13..

The average consumption of rice the world is around 450024 thousand tons with a standard deviation of 14229 thousand tons, which is just 1 percent less than the total production of rice in the world, for the above said period. Quite naturally, the consumption of rice is seen more again in Asian countries than the other countries of the world. Again the highest consumption of rice is recorded in china followed by India, Indonesia and Bangladesh. The average consumption of rice of these countries is accordingly 137184, 91248, 38730 and 32800 thousand tons. China consumes around 30 percent of the total rice produced in the world. Similarly India, Indonesia and Bangladesh consume around 20, 8.6 and 7.3 percent of the total rice produced in India. However, the consumption of rice in china and India is slightly more than its production while the consumption of rice in Indonesia and Bangladesh is slightly less than its production. Further, Nepal, Cambodia, Egypt and United States are the least rice 'consuming countries in the world by comparison.

2.2 AGRICULTURE IN KERALA

Agriculture remains one of the most important sectors of Kerala Economy. The forces driving the global growth in agriculture and associated risks pose significant challenges to Kerala agriculture. Commodity markets witnessed turbulent times in 2014 & 2015. Most commodity prices in the international market fell significantly and continued the downtrend from their peaks of 2011-12.In the agricultural raw material markets plentiful supply was a major issue. Natural rubber prices experienced a substantial decrease of 30 percent in 2014 resulting from over supply and high stocks (UNCTAD, 2015). It is a great challenge and formidable task to arrest the decline and reverse the slowing growth of agriculture sector.

2.3 Performance of Agriculture

At the national level, as against a growth target of 4 per cent for agriculture and allied sectors in the Twelfth Plan, the growth registered for 2012-13 at 2011-12 prices was 1.2 per cent, 3.7 per cent in 2013-14 and 1.1 per cent in 2014-15. The figures were 1.4 per cent for 2012-13 and 4.7 per cent for 2013-14 in 2004-05 series. (Kerala Economic Review, 2015) Thus there is a downward revision in the growth rates of agriculture and allied sectors at the national level as a result of the adoption of the new series by the Central Statistics Office. But even without the downward revision agricultural growth was considerably lower than the target.

2.4 PADDY CULTIVATION IN KERALA

Agriculture performance in Kerala is characterized by presence of various crops. The diverse topographic, climatic and soil conditions of the state enable its people cultivate a vide variety of seasonal and perennial crops. The various crops raised within the state are broadly classified into food crops, garden crops and plantation crops. Food crops include paddy, tapioca, other cereals and millets, banana and other plantains and pulses. Crops like coconut, arecanut, cashew nut and pepper are garden crops. The plantation crop include tea, coffee, cardamom, vanilla and rubber.

Even though the food habits of the people of Kerala had remarkably changed over the last few decades, rice still continues to be their stable food. Rice accounts for nearly 95 percent of the total amount of food grains produced within the state.

An analysis of the changes in the cropping pattern in Kerala during its post formation period clearly shows that there has been a persistent shift in favour of garden crops and plantation crops at the expense of food crops. Within a period of 40 years from 1960-61 to 1998-99 area under the principal food crops declined from 11.23 lakh to 5.65 lakh hectares showing an aggregate decrease of 49.69 per cent. Meanwhile area under the major garden crops increased from 6.55 lakh to 12.30 lakh hectares and area under plantation crops increased from 2.06 lakh to 6.32 hectares showing overall increases of 87.89 percent and 206.83 percent respectively.

In recent years, the performance of the paddy farm sector in the state has been quite disappointing since the mid- seventies both the area under the crop and production of paddy had

been declining in the state. Paddy growing areas in Kerala amounted to 33.26 per cent of its total cropped area during the year 1960-61. It declined to 18.38 percent in 1990-91 and further decreased to 12.10 percent by the year 1998-99.

Table 2.3 *Share of crop in gross cropped area in Kerala State, selected years* in per cent

	1965-66	1985-86	1995-96	2003-04
Rice	32.1	25.5	16.4	12.01
Coconut	22.5	24.7	30.3	35.1
Tapioca	8.6	7.8	4.1	4.3
Rubber	5.9	10.8	14.5	18.4
Pepper	4.0	4.0	6.1	8.0
Cashew	3.4	5.0	3.6	3.4
Arecanut	2.4	2.1	2.3	3.6
Banana	1.8	1.8	2.3	4.2
Tea	1.6	1.2	1.1	1.4
Cardamom	1.2	2	1.4	1.6
Coffee	0.9	2.3	2.7	3.2
Others	15.6	12.8	15.2	4.8
Gross cropped area	100.0	100.0	100.0	100.0
Gross cropped area, in '000 hectares	2,051	2,807	3,052	2,584

Source: Data from Department of Economics and Statistics, Government of Kerala cited in Krishnadas (2009).

The relative share of the state both in area and production of paddy showed positive growth trends in the past decades. But it began to decline since the early years of the seventies. By the year 1980-81 the state share in area under the production of paddy declined and further decrease showed in the 1990-91 while the population of state increased.

The comparison of the performance of Kerala and India in the area, production and productivity of paddy during the period 1970-71 t 1998-99 is shown in the table below;

Table 2.4 Area, Production and Productivity of Paddy cultivation

Year	Area		Production		Productivity	
	Kerala	India	Kerala	India	Kerala	India
1970-1971	875	37286	1292	38051	1477	1021
1980-1981	802	40152	1272	53631	1587	1336
1990-1991	559	42690	1083	74290	1942	1740
1995-1996	471	42910	1953	79618	2023	1855
1999-2000	353	44598	727	85995	2061	1930

Source;(2000) Basic Statistics Relating to the Indian Economy- 200.SPB (various issues) Economic Review.

In terms of kg per hectare productivity of paddy, the state's position had been comparatively better. During the year 1970-71 the average productivity of paddy in the state, which stood at 1477 kg per hectare was higher than that of national level productivity. Thereafter the relative advantage of the state in this respect has been gradually narrowing down. It is pointed that even though the productivity of paddy in the state at the current level is still higher than the national average, it lags behind the levels achieved by the major rice producing states of Punjab, Tamilnadu and West Bengal.

Paddy cultivation in Kerala has witnessed a steady decline since the 1980s. The sharp fall in the area under paddy cultivation as well as in the quantity of rice produced in the State has had important implications for Kerala's economic, ecological and social development.

Over the last five years, however, there have been commendable signs of a revival in rice production in Kerala. A new sense of purpose and enthusiasm is visible now among paddy cultivators in Palakkad, a region that is referred to as the "rice bowl" of Kerala. The following section gives an account of some of the long-term challenges facing paddy cultivation in Kerala. It also attempts to review the policy initiatives of the State and local Governments over the last few years that have helped revive rice cultivation in Kerala.

With regard to Kerala, growth performance of the agriculture and allied sectors has been fluctuating across the Plan period. It witnessed a positive growth of 1.8 percent in Xth Plan period but a negative growth rate of -1.3 percent in XIth Five Year Plan. In the Twelfth Plan based on the new series brought out by the Directorate of Economics and Statistics (DES) with 2011-12 as base year, the agriculture and allied sectors recorded a positive growth rate of 1.43 per cent in the first year(2012-13), and a negative growth rate of -2.13 per cent in second year(2013-14). In 2014-15, the sector has recorded a negative growth rate of -4.67 per cent. Consequently, the share of agriculture and allied sectors in total GSDP of the State has also declined from 14.38 per cent in 2011-12 to 11.6 per cent in 2014-15. But, the switch from 2004-05 to new series with 2011-12 as base has resulted in higher share of agriculture and allied sectors in the total GSDP of the State from 8.83 per cent to12.9 per cent for 2013-14. (Table 1.3)

Table 2.5 Share of Agriculture and allied sectors in GDP at the National and State level (Base 2011-12)

SL NO	Year	share of agriculture and allied sectors in GDP(India)	Share of agriculture and allied sectors in GSDP(Kerala) #
1	2011-2012	18.4	14.38(9.1)
2	2012- 2013	18.0	13.76(9.5)
3	2013-2014	18.0	12.9(8.83)
4	2014-2015	NA	11.6

**Provisional ** Quick # figure with 2004-05 base in brackets*
Source: Directorate of Economics and Statistics

In order to revive the agriculture in the country as a whole, NITI Ayog had asked all the states to constitute Task Force for Agriculture Development. Consequently the Government of Kerala had constituted a Task Force with Vice Chairman, State Planning Board as Chairman and Government Secretaries as Members. The Task Force had accordingly suggested approach and strategies for revitalization of agriculture and allied sectors as well as requested for various support measures from the Government of India. The best practices in agriculture followed in the State were also mentioned in the report. The salient recommendations among them are presented below

Task Force on Kerala Agriculture Development

Recommendations :

A. Support requested from GOI for the revitalization of agriculture in Kerala

Support for Risk Management in Agriculture such as addressing price stability of perennial crops and vegetables, a high density weather station network for effective crop insurance, Credit risk guarantee fund by GoI to encourage banks to extend loan to farmers for short term and investment credit, designing an income guarantee program for the farmers, a new interest subvention scheme for investment credit, announcement of minimum support price for horticulture crops like vegetables, implement pilot projects for the revitalization of agriculture based on the agro ecological delineation of the State, support to set up network of farmers market in the State, support for food processing and value addition.

B. Best practices in Kerala

1. The adoption of online farmer registration data base and e-payment using Direct BenefitTransfer during 2012-13 onwards facilitated faster service delivery in Agriculture by the Department of Agriculture. A data base of 18.77 lakh farmers has been createdthrough the online software developed and maintained by NIC. Assistance worth `.912.33 crore has been transferred to farmers during 2012-13 to 2014-15, through DBT.

2. Supplyco, the implementing agency for paddy procurement, has developed a web based platform to document the entire activities in the supply chain of paddy procurement scheme, through online farmer registration and paddy receipt sheet computerization for the electronic management of payment process.

3. The extension support to farmers under support to state extension program for extension reforms is provided through Agriculture Technology Management Agency (ATMA) plus model of extension under the overall framework of ATMA.

4. Plant health clinics were established in the State for providing adequate diagnostic and advisory facilities to farmers online to promote diagnostic services along with eco friendly and scientific pest management strategies.

5. Farmer markets of vegetable and fruit promotion council saves the farmers from the exploitation of middlemen in agriculture marketing. There are 270 farmer markets in the State and it undertook trading of fruit &vegetables worth `259 crore.

6. Kerala State Planning Board has initiated a project on soil based plant nutrient management plan for agro ecosystem of Kerala. The scheme was implemented by Department of Agriculture under the leadership of National Bureau of Soil Survey & Land Use Planning(NBSS & LUP) with the support of other 12 institutions and 27 laboratories. Over 1.75lakh soil samples had been collected and analyzed for micro, macro and secondary nutrients. Soil test based health cards were generated using the software developed by Indian Institute of Information Technology and Management, Kerala (IIITM-K) and issued to the farmers. Nutrient Management Plan for 900 Panchayats were prepared based on the soil analysis data from each Grama Panchayat and distributed to Krishi Bhavans.

C. Strategies recommended for the revitalization of agriculture and allied sectors

The strategic framework recommended for revival of Kerala agriculture is promotion of green economy based on agro ecology principles, through improving agriculture productivity, investment in infrastructure and strengthening livelihood and assured income through service delivery.

D. Adoption of Agro ecological approach

The core approach in agriculture planning is driven by recognition that growth to a new plateau of performance cannot be achieved by continuing existing approaches and practices in the state. It is essential to prepare strategies and action plan for each Agro Ecological Zone and Agro

Ecological Units for the development of Agriculture and allied sectors. The State has been divided into 5 Agro Ecological Zones and 23 Agro Ecological Units based on climate and soil in a recent study coordinated by the State Planning Board. All issues in Agriculture needs to be addressed on Agro Ecological Zone /Agro Ecological Unit wise for the growth and development of the sector.(Source: Task Force on Kerala Agriculture Development, State Planning Board, 2015)

The implementation of the recommendations of the Task Force report along with substantial financial and policy support from Government of India is expected to revitalize Kerala agriculture to a higher growth trajectory.

2.5 Trends in Paddy Cultivation

Rice is the staple food of the people of Kerala, and, traditionally, the cultivation of rice has occupied pride of place in the agrarian economy of the State. The lush green of paddy fields is one of the most captivating features of Kerala's landscape. The area under paddy cultivation increased substantially during the first fifteen years after the State's formation – from 7,60,000 hectares in 1955–56 to 8,80,000 hectares in 1970–71. In 1965–66, rice accounted for the highest share of gross cropped area in Kerala (32 per cent of the total). There was, however, a steady decline in the area under rice cultivation from the 1980s onwards – from 8,50,000 hectares in 1980–81 to 5,60,000 hectares in 1990–91, 3,20,000 hectares in 2001–02 and 2,30,000 hectares in 2007–08. Today, rice occupies only the third position among Kerala's agricultural crops with respect to area under cultivation, and it is far behind coconut and rubber.

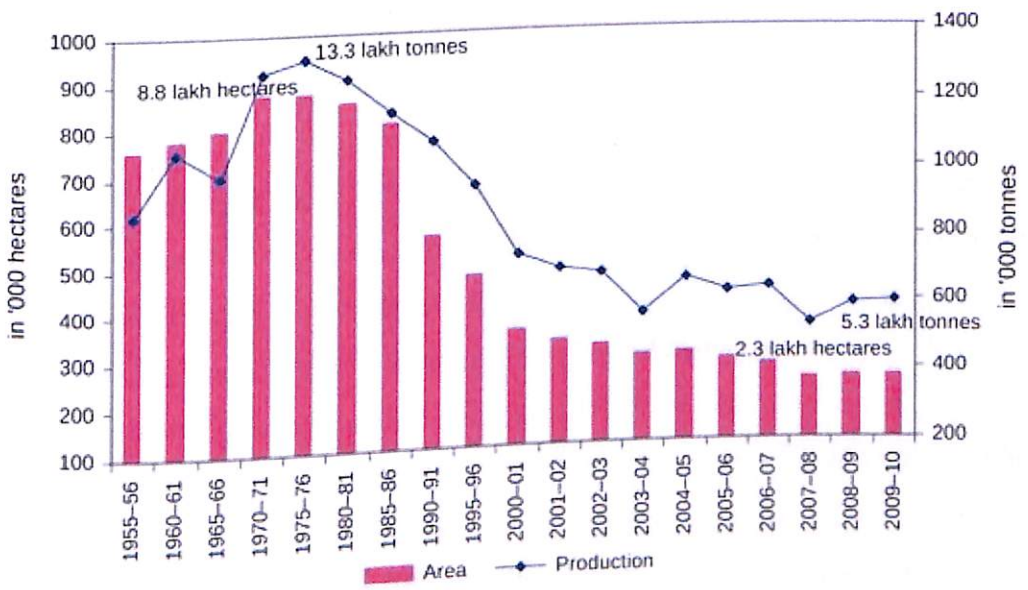
A reversal of this trend of long-term decline in paddy cultivation in Kerala is necessary for at least two reasons. First, because, as the Government of Kerala's *Economic Review 2010* notes, foodgrains produced in the State account for only 15 per cent of its total consumption of foodgrains (GOK, 2010, p.106). Kerala imports foodgrains from Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Bihar and Gujarat to fully meet its consumption needs. It is the State's relatively efficient public distribution system that has so far ensured availability of foodgrains at reasonable rates to the population of Kerala.

Secondly, paddy fields are a vital part of Kerala's environment and ecological systems. They provide natural drainage paths for flood waters, conserve ground water, and are crucial for the preservation of a rich variety of flora and fauna. In several regions of Kerala, paddy cultivation is carried out in a manner that enriches the specific geographical and ecological features of these regions. For instance, in *kaipad* fields in Kattampally in Kannur district, paddy has been

traditionally cultivated in fields filled with saline water. In *pokkali* fields in the Kochi area, farmers alternate the cultivation of prawn with paddy cultivation. Other such examples include*kole* fields in Thrissur and Ponnani, as well as paddy fields in Meppayar in Kozhikode and Kabani in Wayanad.

Between 2007–08 and 2009–10, the area under rice cultivation in Kerala increased by 5,000 hectares and the production of rice in the State increased by 69,300 tonnes. The average productivity of rice cultivation in Kerala rose from 2,218 kg/hectare in 2002–03 to 2,557 kg/hectare in 2009–10 (GOK, 2008, p.43; GOK, 2010, p, 40). These increases may be termed marginal, but, given the steady decline in paddy cultivation in Kerala through the 1990s and 2000s, a reversal of that trend, however small, is in itself a remarkable feat.

Figure2. 1 *Area under rice cultivation and annual production of rice, Kerala, 1955–56 to 2009–10* in '000 hectares and '000 tonnes



Sources: GOK (2008), GOK (2010), and data from Directorate of Economics and Statistics, Government of Kerala, reported in Krishnadas (2009).

2.6Area Production and Productivity in Kerala

Rice is the staple food of Kerala and forms an inevitable part of an average Keralites' diet.Unfortunately, the area under rice has been declining consistently since the last three decades.Today rice occupies only third position in area under cultivation way behind rubber and coconut and though last year the trend was reversed with a marginal increase in area and production, in2014-15, it again showed a declining trend. Moreover, the productivity of the crop is very low in the State (2837kg/ha), though it is higher than the national average (2424 kg/ha). There has only been a marginal increase in the productivity of rice in the past four decades. Details regarding area, production and productivity of rice in Kerala, meanwhile at the national level, there have been 2.7 per cent increase in area and 1.3 per cent increase in production of rice in 2013-14 over the previous year. Season wise production trends reveal that contrary to the previous year, the mundakan crop has shown decline in production while the viripppu and puncha crop showed increasing trend. Still the overall production failed to respond positively

2.7 District wise Productivity of Paddy cultivation of Kerala

Area under rice has fallen in all the districts of the State in the period 1996-97 to 2012-13. However, the decline has been sharpest for Ernakulam (93%) followed by Kollam (92%), Thiruvananthapuram, (86%) and Malappuram (78%). On the positive side, in Kottayam and Alappuzha, the major rice growing districts the decline has been much less (13 and 12 per cent respectively). In 2014-15, Kollam, Alappuzha and the northern districts of Kozhikode, Wayanad, Kannur and Kasaragod have shown decline in area as well as production in the State. In Kottayam, despite an increase in area of 9.8 per cent the production has not responded positively. (Directorate of Economics and Statistics, 2015)

The decline in area indicates that area under paddy has been increasingly converted into other crops as well as for non agricultural purposes. This is mainly due to low profitability as a result of increasing costs (caused by rising cost of human labour as well as seasonal shortage of labour) as well as relative price change in favour of competing crops. Inspite of focused intervention through state plan and Rashtriya Krishi Vikas Yojana (RKVY) along with enhancing per hectare assistance from `1500 to `4500 in 12th plan and introduction of procurement in all districts, rice production has not responded positively

2.8 CAUSES FOR THE DECLINING PADDY CULTIVATION IN KERALA

The following are the important causes of the declining trend of paddy cultivation in Kerala.

1. Seasonal shortage of labour supply

Compared to garden crops and plantation crops, paddy cultivation is more labour intensive. it is estimated that human labour costs amount to nearly 60 percent of the total costs involved in paddy farming . Present investigation shoes that household members of 60 percent of the sample farmers in the study area do not perform any sort of manual works in their fields. It is also found that 33 percent of the marginal farmers, 67 percent of the small farmers, 80 per cent of the medium farmers and 83 per cent of the local farmers are exclusively depending on hired human labour. According to vast majority of paddy farmers in this area the single biggest problem they are facing is the non-availability of sufficient farm labourers during the harvesting season.

2. Small size of holdings and decline in the number of full time farmers

It has been pointed out that an agricultural household with 5to6 member needs at least 10 acres of paddy fields for its sustenance in the absence of any other source of income. However, in kuttanad only 3 percent of the farmer households possess that much land 46. as per the provision of the land reforms act (1969) the maximum area of paddy fields that family can possess is restricted to ten acres. The excess land above the ceiling is declared as surplus and taken over by the government for redistribution. The redistribution of such surplus paddy lands taken over from large from largeenterprising farmers in Kuttanad led to the information of a new class of absentee land owners with less than one acre of paddy fields. Unable to conduct paddy farming successfully in their newly acquired fields, their lands to tenant farmers defeating the very purpose of land reforms.

3. Lack of proper marketing system

Wide temporal variations are observed in the price of paddy in kuttanad area. Compared to non – harvesting season farm price of paddy decreases considerably during the harvesting season. In order to clear their debts and due to the lack of storage facilities a vast majority of the paddy farmers in the study area sell their marketable surplus of the product immediately after harvest at the then prevailing low prices. Nearly 85 percent of the marginal and small farmers, 73 percent of medium farmer and 58 percent of large farmers in the study area have no granaries to store paddy.

4. Low level of profitability

There are three major factors that affect the profitability of rice cultivation in Kerala such as cost of cultivation, yields level and prices. Labour costs are relatively high. At this time the expenses involved in agriculture inputs are equally large burden of all farmers. The new economic policy helps to increase the price of pesticides and agricultural inputs, and the labour cost in Kerala is very high comparatively in other states in India. Insufficient labour make more demand for labour it may induce the rice in wage of the labour.

5. Growing aversion of new generation to paddy cultivation;

Some decades back in Kerala the upper class and middle class family is considered the ownership of paddy fields as a symbol of their social status, owners of the paddy fields as a symbol of their social status ,owners of the paddy fields commanded much social respect and acceptance. However, the present rice cultivation has lost its glamour, the new generation people from farmers households looking for the white collar job.

6. Pressure of population on land; there is a heavy pressure on land. In fact since the non-agricultural sectors of the economy have not been able expand at a sufficiently rapid pace of last five decades, this pressure has continuously increased. Increasing pressure of population on land is partly reasonable for the subdivision and fragmentation of small uneconomic holding is now low.

7. Inadequate irrigation facilities;

Productivity is bound to below in all those areas which lack irrigation facilities, and are totally dependent on rains.Palakkad is the example of this because in summer there was no irrigation facilities are available in agriculture.

2.9 POKKALI PADDY CULTIVATION

The Pokkali field is a unique eco-system prevailing in the coastal saline tract of central Kerala with rich bio diversity and amazing capacity to generate organic paddy and shrimp alternatively.

The raising of fish in paddy fields either together with rice or after the harvesting of paddy is an age-old system. The system of fish culture varies depending on the ecological settings of the rice fields. However it is carried out on a significant scale in the coastal wetlands than on the upland rice fields. While this farming has received some attention from agricultural and fisheries scientists, the socio-economic and institutional factors and process shaping rice- fish farming have hardly received analytical scrutiny from social scientists. Such an analysis, however, is significant since in recent decades, the wetlands under rice-fish farming has been facing severe threats owing to a variety of factors including the shift from ecologically sensitive rice- fish farming to semi intensive or intensive fish/prawn farming affecting adversely the environment and livelihood of the poor. This exclusive farming system of Kerala is known as Pokkali Krishi.

Pokkali fields are low lying and immersed in water. The tidal flows have to be regulated to do the farming activities. These fields are naturally connected to the Arabian Sea through backwaters and canals. The total Pokkali lands were originally estimated to be 25000 hectares1 . Large areas are converted for coconut cultivation and other purposes. The present area is estimated to be 9000 hectares. Year by year the area under Pokkali cultivation is declining. The present area under regular cultivation is 5000 htrs. In another 2000 hectares paddy cultivation is done occasionally i.e., only when the climatic conditions are favourable. The number of farmers involved in regular Pokkali cultivation are estimated to be 11605.

The preparation for Pokkali cultivation starts by around the month of May. The work starts by raising bunds. It is followed by taking mounts with one-meter base fifty cms height. The mounts are allowed to dry up by preventing entry of water to the field. With the onset of monsoon, salts and other toxic elements get washed out. When the topsoil is cleared of salt, germinated paddy seeds are sown on the mounts. The mounts act as a nursery. When the field becomes free of salt and toxic elements and the seedlings are 30 to 40 days old, transplanting is done which is known as nirathu. Water management for a few days areof utmost importance.

Water management is done by managing the sluices. Chemical fertilizers and pesticides are not used. Organic manure are being applied and the system f cultivation is of organic nature. The crop will be ready for harvest after four month months from sowing harvesting takes place in the month of October. Only the panicles are cut and the rest of the stalks are left to decay in water, which in time become feed for the prawns that start arriving in November-December. Modern farming technologies remain alien to the pokkali fields. The waterlogged, swampy fields have no use for otherwise labour-saving heavy equipment like tractors and harvesters.

Pokkali has been awarded the status of registered Geographical Indication (GI) by the Geographical Indications Registry Office, Chennai , and Tamil Nadu. The GI registration permits the exclusive global right on the concerned farmers to cultivate pokkali paddy and sell the finished product in the brand name of Pokkali the world over. The patent registration will deservingly enhance the market value of the pokkali rice and also fetch it higher prices in addition to enhancing its brand value. Geographical Indication is a mark that is used to recognize a manufactured product or a natural produce from a geographical region or locality within the region that has unique qualities and reputation linked to the place of its origin. The nature of labour involved in pokkali paddy cultivation along with corresponding mandays is shown below.

Table 2.6 Pokkali paddy cultivation: nature of labor corresponding mandays

Sl. No	Details	Mandays	Mandays
		Men	Women
1	Bund raising and channelizing	10	0
2	Mount raising	5	5
3	Seed soaking	5	3
4	Payal removing	2	25
5	Weeding	2	25
6	Transplanting	2	25
7	Preparation of threshing ground and fabrication of shed	4	2
8	Harvesting	11	20
9	Post harvestlabour	10	15
10	Measuring and storing	3	3
	Total	54	123

Source: k.spurushan , "the operational economics and gender –wise manpower utilization for eco-friendlycultivaton of paddy shrimp in the pokkali fields at kochi,keraLA during 2002-2003

p.16 as presented in the international conference and exposition on marine living resources of india for food and medicine 27-29feb 2004 IMAGE,MRC NAGAR,CHENNAI"

The Pokkali fields are effectively used for fish/prawn farming after the harvest of the Pokkali crop. The seasonal rice and fish farming is effectively done over centuries. In this natural system the ecological balance is maintained and a reasonable profit is obtained by the farmer. When the monsoon subsides, the backwaters and canals becomes saline and juvenile prawns and fingerlings of other fishes come in large quantities in the outer canals. They are guided to the fields through trap sluices and the sluice gates 1 prevent them from going out. Thus they are allowed to grow in the field. The waste materials of Pokkali rice cultivation forms the natural food material and will meet all the food requirements of the fish crop.

CHAPTER - III

POKKALI PADDY CULTIVATION IN NAYARAMBALAM GRAMA PANCHAYATH

This chapter analyses area under Pokkali cultivation in Nayarambalam Gram panchayat in last four years, number of farmers engaged in this activity, their socio economic status and issues faced by them. Details of area and number of farmers were obtained from the Krishi Bhanvan while analysis of socio economic status and issues faced is based on primary data collected from the farmers using a structured schedule.

3.1 Pokkali Paddy cultivation in Nayarambalam Panchayat

There were 35 farmers engaged in Pokaali cultivation in Nayarambalam in 2011-12 which increased to 37 in 2012-13, declined to nil in 2013-14 and was 32 in 2014-15. (2013-14 was an exceptional year in that due to excessive rain the fields were flooded and hence only very few ventured to engage in it who later had to abandon the same due to crop destructions ictareundern). Area cultivated was 31.5 hehectares in 2011-12 which increased to 33 hectares in 2012-13 and decreased to 30 hectares in 2014-15. The area is currently spread over three Paadashekarams which include Nayarambalam Paddy field, Kaapu paddy field and Chakkarachaal paddy field. As compared to 2011-12, the area in 2014-15 was more or less same in Nayayarambalam paddy field but decreased in Chakkarachal paddy field (due to labour shortage).This decrease was compensated by an increase in kappu paddy field as as a result of which total area under pokkali cultivation in the entire panchayath remained constant.

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Table 3.1 Pokkali Paddy cultivation in Nayarambalam Panchayat

Paddy Field	2011-12		2012-13		2013-2014		2014-15	
	Hectare	Farmer	Hectare	Farmer	Hectare	farmer	Hectare	farmer
Nayarambalam paddy field	16.5	18	18	20	-	-	16.32	24
Kaappu paddy field	-	-	-	-	-	-	8.18	5
Chakkarachal paddy field	15	17	15	17	-	-	5.5	3
Total	31.5	35	33	37	-	-	30	32

Source: Krishi Bhavan,2015

PRIMARY SURVEY OF POKKALI FARMERS IN NAYARAMBALAM GRAMA PANCHAYATH

EDUCATIONAL QUALIFICATION

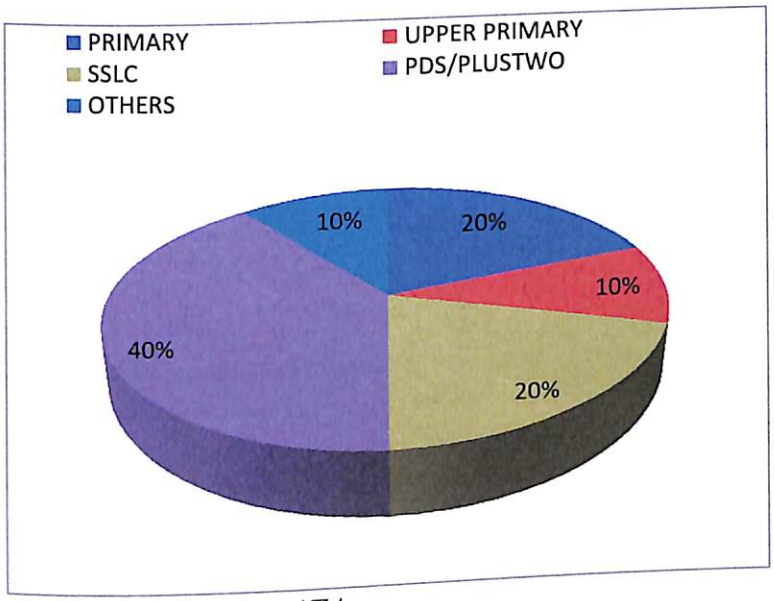
This table shows the qualification details of the respondents. About 20 percentage of the farmers have primary educational qualification. about 10 percentage of the population have upper primary educational qualification .20 percentage of population are SSLC qualified and 40percentage of population are PLUS TWO qualified and rest of the population are qualified with degree ie,10 percentage.

TABLE3.1-EDUCATIONAL QUALIFICATION

EDUCATIONAL QUALIFICATION	NUMBER OF RESPONENTS	PERCENTAGE (%)
PRIMARY	10	20
UPPER PRIMARY	5	10
SSLC	10	20
PLUSTWO	20	40
DEGREE	5	10
TOTAL	50	100

SOURCE – PRIMARY DATA

FIGURE3.1 QUALIFICATION



SOURCE – PRIMARY DATA

ANNUAL INCOME

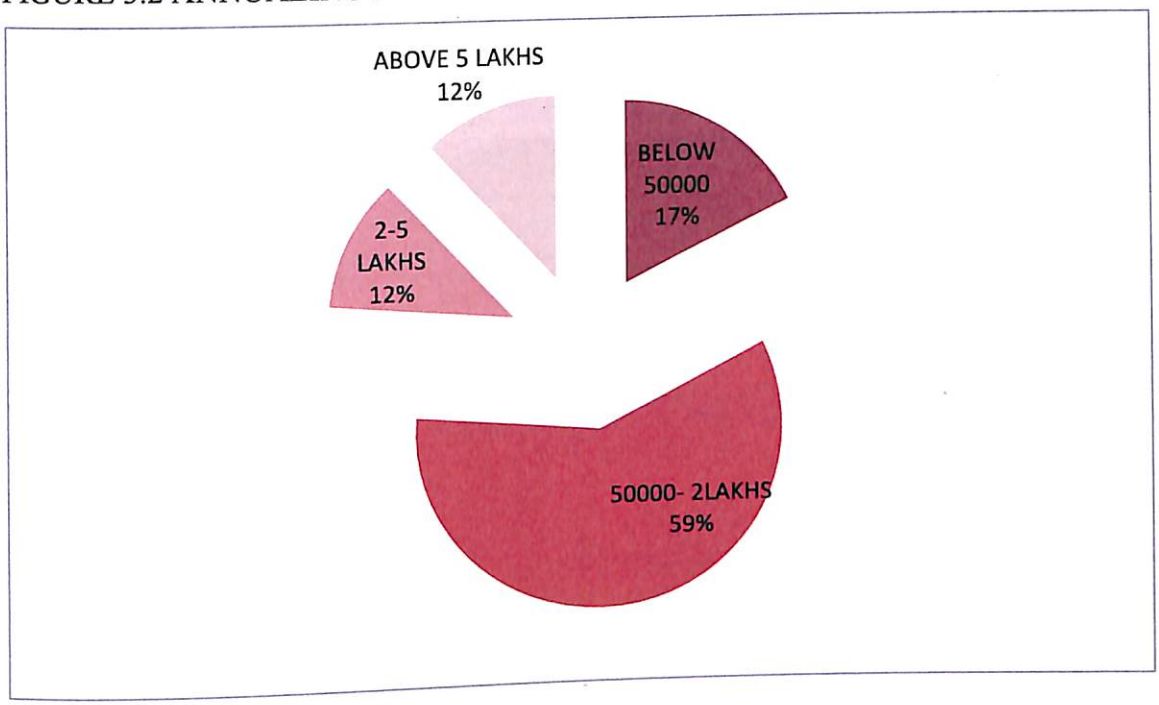
This table shows the annual income of the respondents. About 30 percentage of population have annual income below rupees50000. About 50 percentage of population have income rupees 50000- 2 lakhs. Abovt 10 percentage of the population have 2-5 lakh annual income and the rest of the population have above 5 lakhs annual income.

TABLE3.2-ANNUAL INCOME

ANNUAL INCOME	NUMBEROF RESPONDENTS	PERCENTAGE (%)
BELOW 50000	15	30
50000-2 LAKHS	25	50
2-5 LAKHS	5	10
ABOVE 5 LAKHS	5	10
TOTAL	50	100

SOURCE – PRIMARY DATA

FIGURE 3.2 ANNUALINCOME



SOURCE – PRIMARY DATA

OCCUPATIONAL STATUS

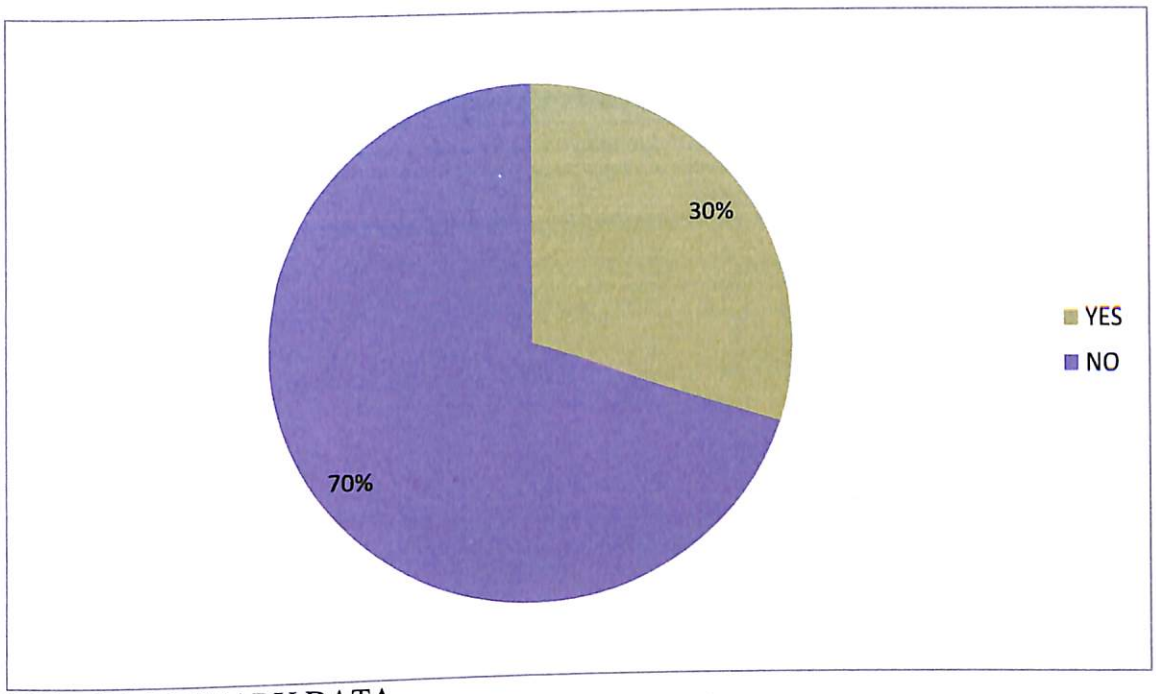
About 30% of owners are fully dependant on pokkali farming whereas 70% are not depended fully on pokkali farming.

TABLE 3.3-Dependence on agriculture

Dependant only on agriculture	NUMBEROF RESPONENTS	PERCENTAGE(%)
YES	15	30
NO	35	70
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.3- Dependence on Agriculture



SOURCE –PRIMARY DATA

OTHER OCCUPATIONS UNDERTAKEN

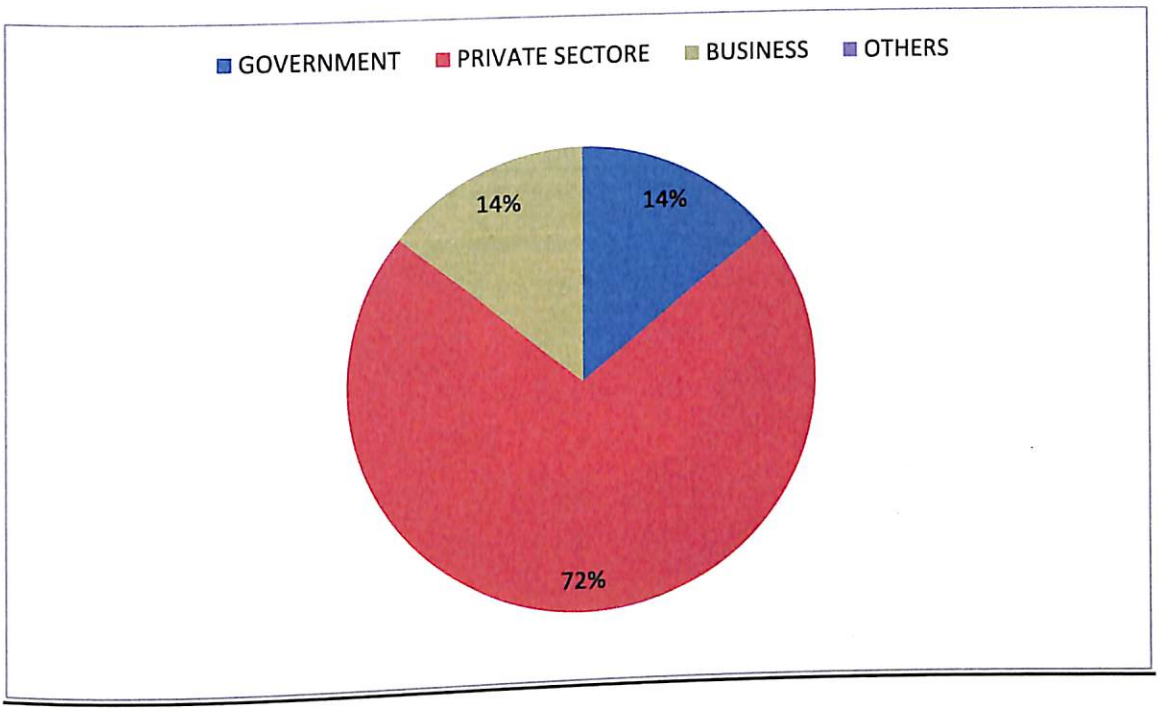
About 71.6 % are engaged in private sector jobs, 14.2% are engaged in government sector .14.2% are engaged in business in addition to cultivation of rice.

TABLE 3.4 -OTHER OCCUPATION UNDERTAKEN

OCCUPATION	NUMBER OF RESPONDENTS	PERCENTAGE (%)
GOVERNMENT	5	14.2
PRIVATE SECTOR EMPLOYMENT	25	71.6
BUSINESS	5	14.2
OTHERS	0	0
TOTAL	35	100

SOURCE-PRIMARY DATA

FIGURE3.4-OTHER OCCUPATIONS UNDERTAKEN



SOURCE – PRIMARY DATA

BANK ACCOUNT

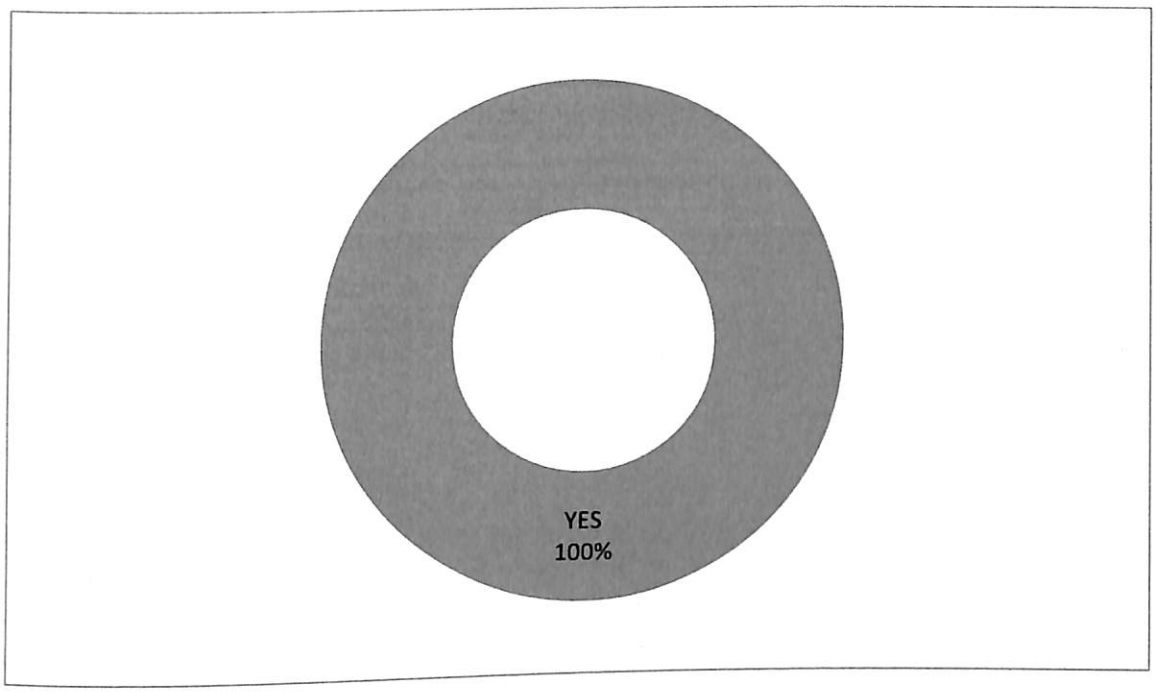
All the respondents have bank account indicating financial inclusion.

TABLE 3.5-BANK ACCOUNT

YES/NO	NUMBER OF RESPONDENTS	PERCENTAGE (%)
YES	50	100
NO	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.5- BANK ACCOUNT



SOURCE – PRIMARY DATA

AREA OF CULTIVATION

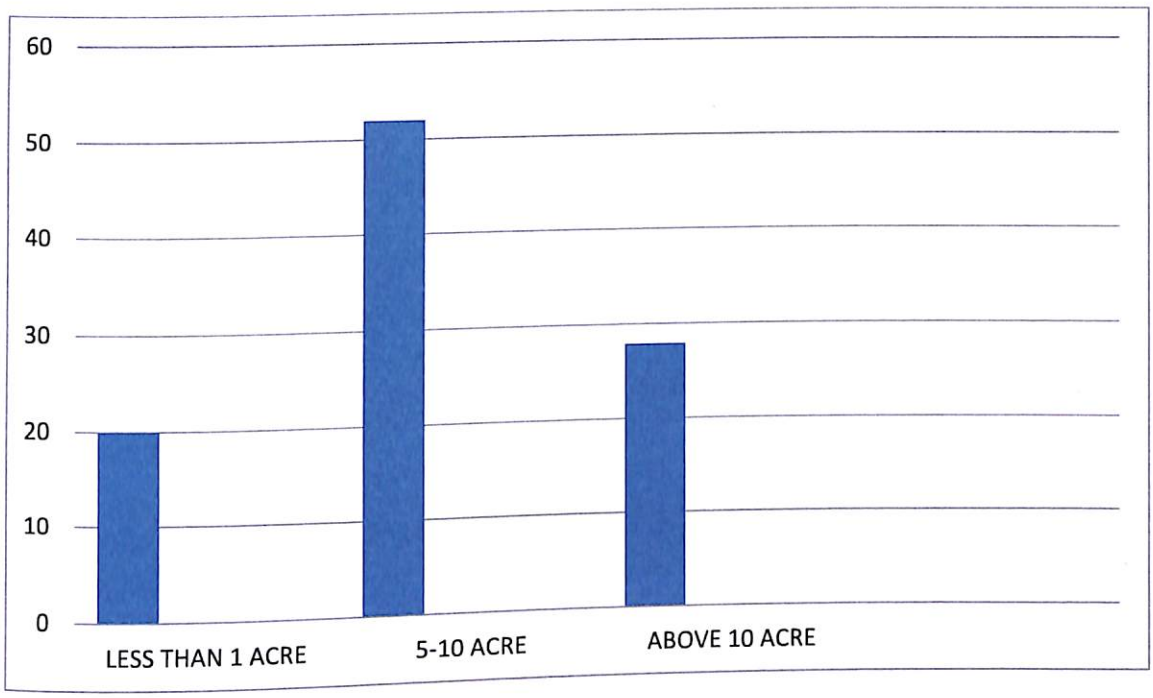
52% of cultivators have land between 5 to 10 acre .28% of them have land more than 10 acre.20% have less than 1 acres of land

TABLE3.6 –AREA OF CULTIVATION

AREA OF CULTIVATION	NUMBER OF RESPONDENTS	PERCENTAGE (%)
Less than 1 acre	10	20
5-10 acre	26	52
Above 10 acre	14	28
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.6 –AREA OF CULTIVATION



SOURCE- PRIMARY DATA

OWNERSHIP OF LAND

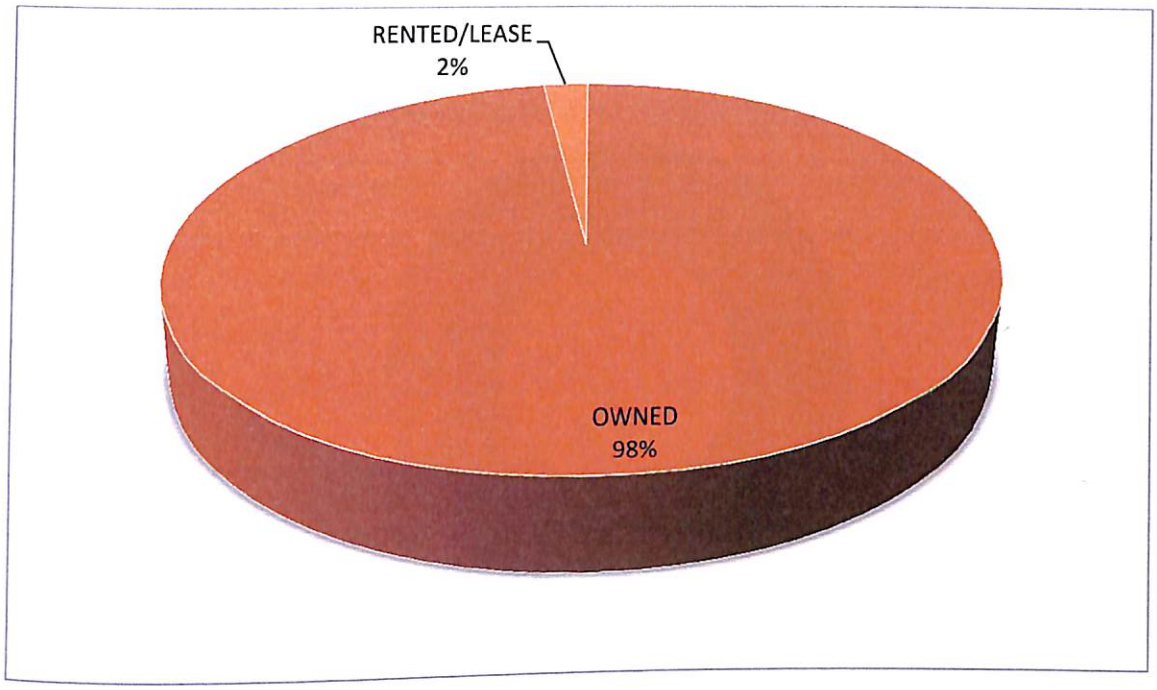
About 98% of respondents own the land whereas 2% of respondents rent their land.

TABLE3. 7 –OWNERSHIP OF LAND

OWNERSHIP OF LAND	NUMBER OF REPONDENTS	PERCENTAGE (%)
OWNED	49	98
RENTED/LEASE	1	2
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3. 7- OWNERSHIP OF LAND



PERIOD OF CLTIVATION

Period of cultivation is six months from June to October

KIND OF FARMING

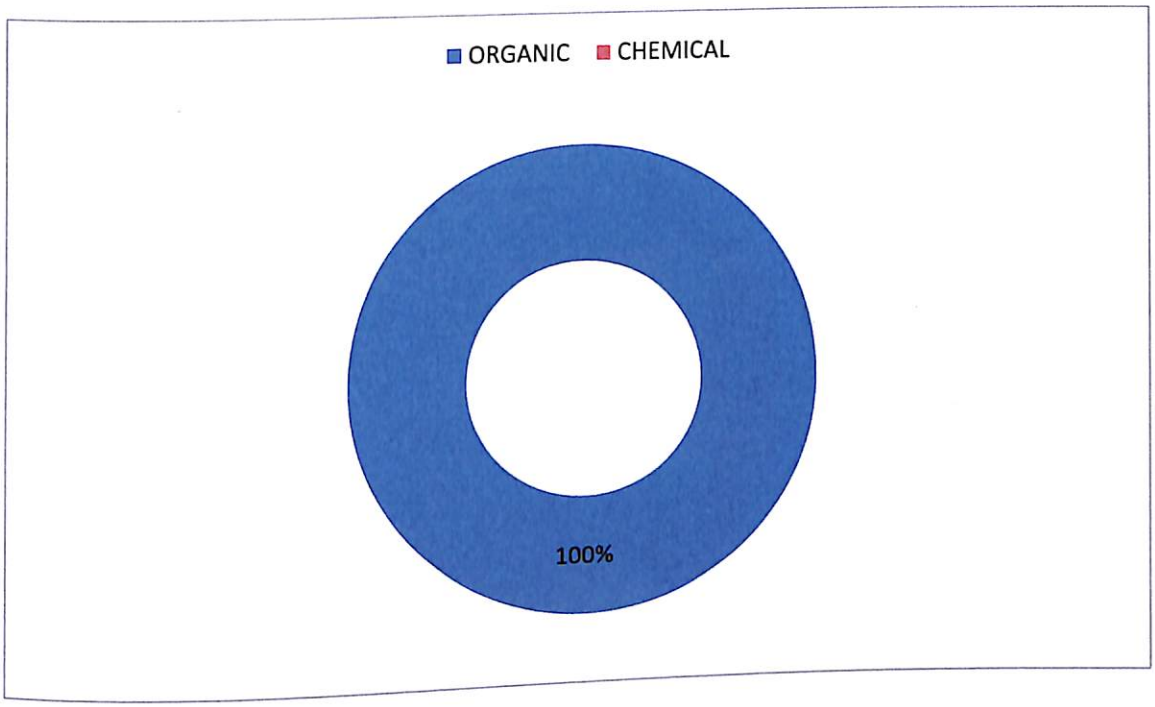
100% of pokkali cultivation is organic in nature.

TABLE3. 8 –KIND OF FARMING

KIND OF FARMING	NUMBER	PERCENTAGE
ORGANIC	50	100
CHEMICAL	0	0
BOTH	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.8 -KIND OF FARMING



FAMILY MEMBERS ENGAGED IN FARMING

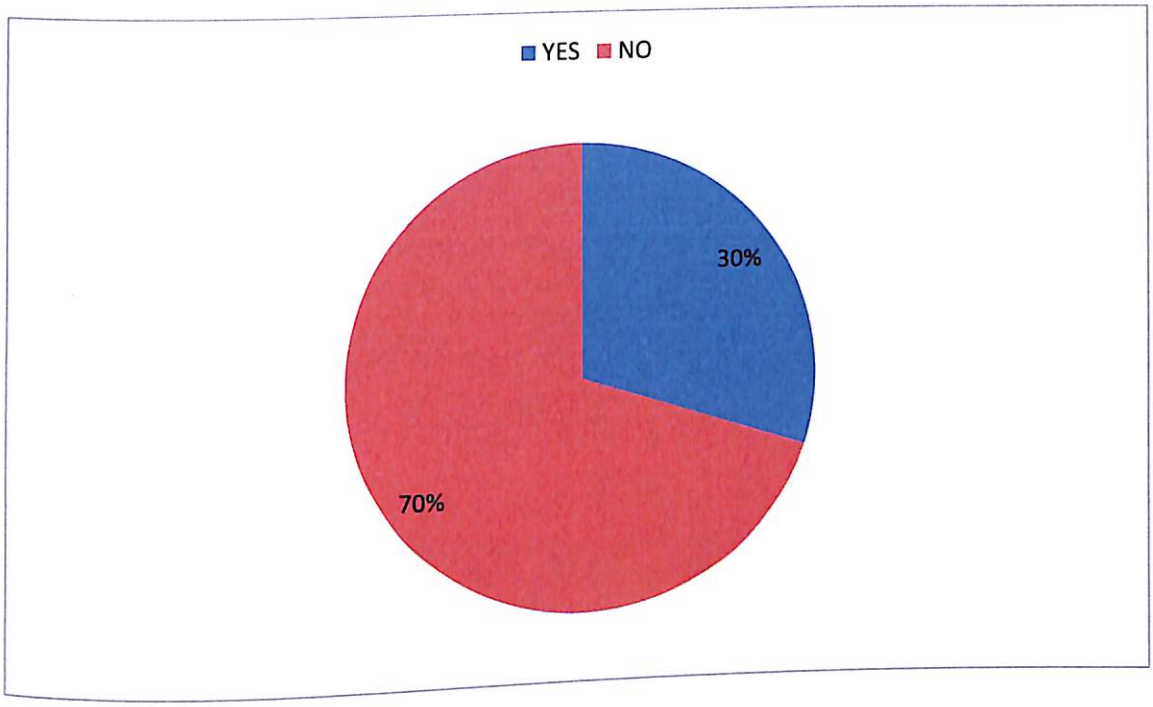
Only 30% of family members are engaged in pokkali cultivation along with the owners

TABLE3. 9-FAMILY MEMBER ENGAGED IN FARMING

YES/NO	NUMBER OF RESPONDENTS	PERCENTAGE (%)
YES	15	30
NO	35	70
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.9- FAMILY MEMBER ENGAGED IN FARMING



SOURCE-PRIMARY DATA

AVAILABILITY OF INPUTS

According to the respondents land is easily available for cultivation.

TABLE 3.10.1 LAND

AVAILABILITY	NUMBER OF RESPONDENTS	PERCENTAGE (%)
EASILY AVAILABLE	50	100
SCARCE	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

TABLE 3.10 2 LABOUR

According to the 96% labor is the scarce input

AVAILABILITY	NUMBER OF RESPONDENTS	PERCENTAGE (%)
EASILY AVAILABLE	2	4
SCARCE	48	96
TOTAL	50	100

SOURCE-PRIMARY DATA

TABLE 3.10.3 CAPITAL

100% of the respondents stated that capital is easily available for cultivation

AVAILABILITY	NUMBER OF RESPONDENTS	PERCENTAGE (%)
EASILY AVAILABLE	50	100
SCARCE	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

TABLE 3.10.4 WATER

100% of the respondents stated that water is easily available for cultivation

AVAILABILITY	NUMBER OF RESPONDENTS	PERCENTAGE (%)
EASILY AVAILABLE	50	100
SCARCE	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

SOURCE OF WATER

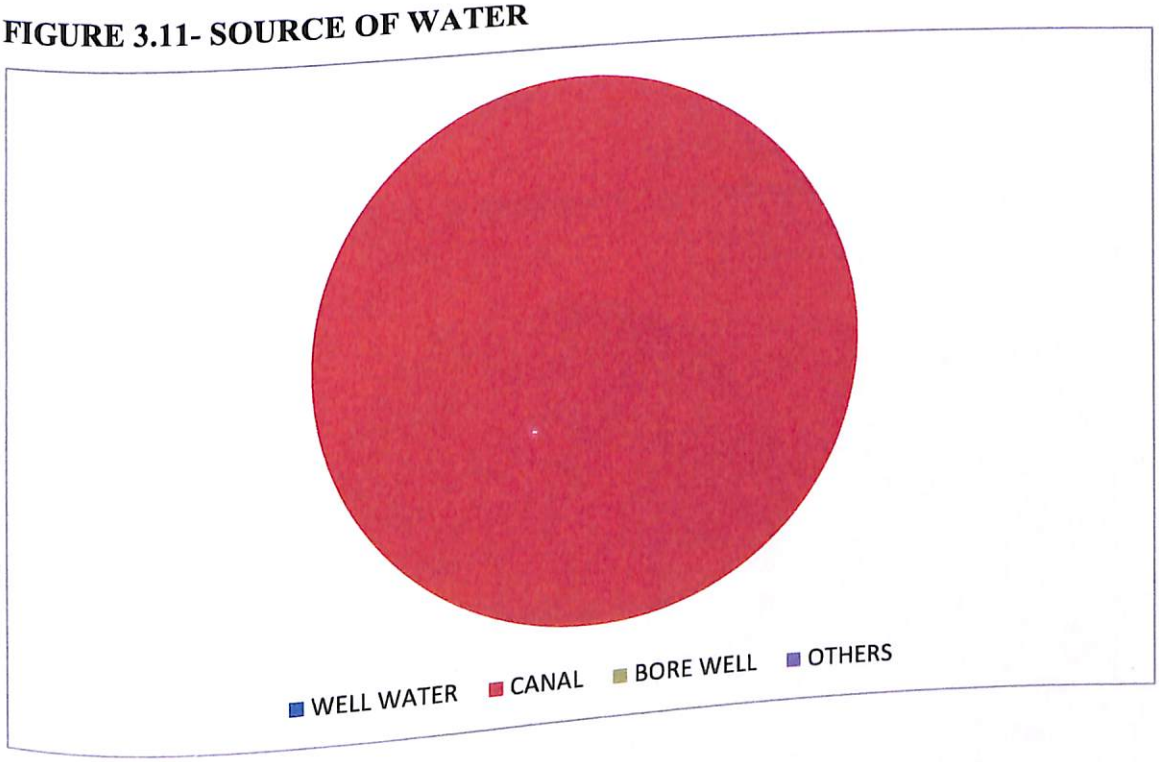
100% of respondents use water from canal for cultivation.

TABLE 11- SOURCE OF WATER

SOURCE OF WATER	NUMBER OF RESPONDENTS	PERCENTAGE (%)
WELL WATER	0	0
CANAL	50	100
BORE WELL	0	0
OTHERS	0	0
TOTAL	50	100

SOURCE- PRIMARY DATA

FIGURE 3.11- SOURCE OF WATER



SOURCE- PRIMARY DATA

COST OF CULTIVATION

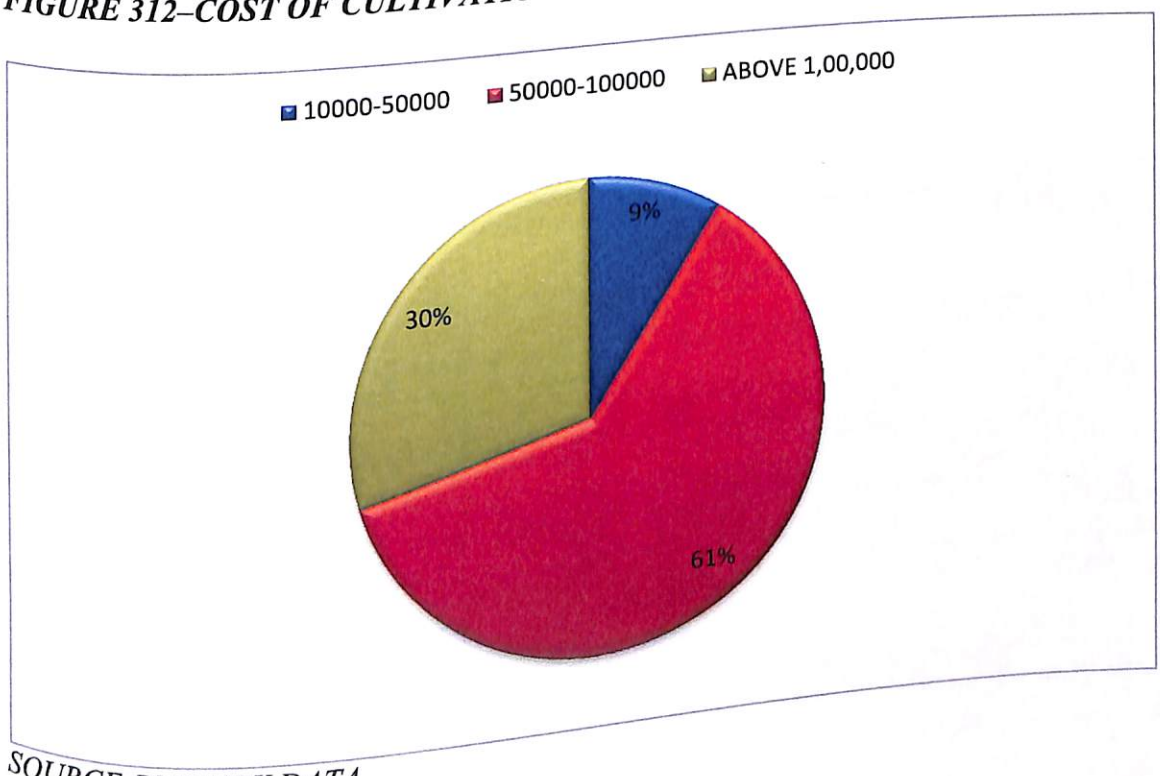
54% of the respondents stated that their cost of cultivation fall between Rs 50,000 to 1,00,00 lakh rupees

TABLE 3.12-.COST OF CULTIVATION

TOTAL COST	NUMBER OF RESPONDENTS	PERCENTAGE (%)
10000-50000	10	20
50000-100000	27	54
ABOVE 1,00,000	13	26
TOTAL	50	100

SOURCE- PRIMARY DATA

FIGURE 312–COST OF CULTIVATION



SOURCE-PRIMARY DATA

BORROWING FOR CUTIVATION

About 52% of the respondents take loan for the purpose of cultivation

TABLE3.13 BORROWING FOR CULTIVATION

BORROWING FOR CUTIVATION	NUMBER OF RESPONDENTS	PERCENTAGE (%)
YES	26	52
NO	24	48
TOTAL	50	100

SOURCE-PRIMARY DATA

SOURCE OF BORROWING

57.6% of the respondents borrow from bank.

TABLE 3.14 -SOURCE OF BORROWING

SOURCE OF BORROWING	NUMBER OF RESPONDENTS	PERCENTAGE (%)
KRISHIBHAVAN	0	0
BANK	15	57.6
COOPERATIVE SOCIETIES	0	0
MONEYLENDERS	5	19.4
OTHERS(FRIENDS AND RELATIVES)	6	23
TOTAL	26	100

SOURCE-PRIMARY DATA

PERIOD OF BORROWING

The respondents borrow mainly for short periods of maximum 1 year

TABLE 3.15-PERIOD OF BORROWING

PERIOD OF BORROWING	NUMBER OF RESPONDENTS	PERCENTAGE (%)
SHORT TERM	26	100
MEDIUM TERM	0	0
LONG TERM	0	0
TOTAL	26	100

SOURCE – PRIMARY DATA

AWARENESS ABOUT VARIOUS SCHEMES

30% of the respondents are aware about various schemes provided for pokkali cultivation

TABLE 3.16-AWARE

AWARENESS REGARDING VARIOUS SCHEME	NUMBER OF RESPONDENTS	PERCENTAGE (%)
YES	15	30
NO	35	70
TOTAL	50	10

SOURCE-PRIMARY DATA

SCHEME NAME

66.7% of them are aware of Nayarambalam Gramapanchayat schemes 13.3% of them are aware of combined pokkali and shrimp cultivation

TABLE 3.15.1 SCHEME NAME

AWARE OF SCHEME	NUMBER	PERCENTAGE
COMBINED POKKALI AND SHRIMP CULTIVATION SCHEME	2	13.3
RASTHRIYA KRISHI VIKAS YOJANA(RKVY)	1	6.7
NAYARAMBALAM GRAMA PANCHYAT SCHEMES	10	66.7
BLOCK PANCHAYAT SCHEMES	2	13.3
TOTAL	15	100

SOURCE-PRIMARY DATA

BENEFICIAL

30 % of the respondents have benefitted from the above schemes provided by various institutions . Most have benefitted from the scheme of the Panchayat.

TABLE 3.15.2 BENEFICIAL

BENEFITTED	NUMBER	PERCENTAGE
YES	15	30
NO	35	70
TOTAL	50	100

SOURCE-PRIMARY DATA

LEVEL OF SATISIFICATION FROM VARIOUS SCHEMES

86.7% of the respondents are less satisfied by the schemes provided by the government.13.3 % of the respondents are not satisfied by the schemes provided by the government. None reported that they were very satisfied.

TABLE 3.16-LEVEL OF SATISFICATION

LEVEL OF SATISFICATION	NUMBER	PERCENTAGE
VERY MUCH SATISFIED	0	0
LESS SATISFIED	13	86.7
NOT SATISIFIED	2	13.3
CANNOT SAY	0	0
TOTAL	15	100

SOURCE-PRIMARY DATA

FIGURE 3.16 LEVEL OF SATISFICATION

SOURCE-PRIMARY DATA

Q24. MIXED CULTIVATION

Only 30% of the respondents are engaged in mixed farming where they combine paddy cultivation with prawn/ fish cultivation which is the true essence of Pokkali farming technique.

TABLE 3.17 MIXED CULTIVATION

MIXED CULTIVATION	NUMBER	PERCENTAGE
YES	50	30
NO	35	70
TOTAL	50	100

SOURCE-PRIMARY DATA

TYPE OF MIXED CULTIVATION

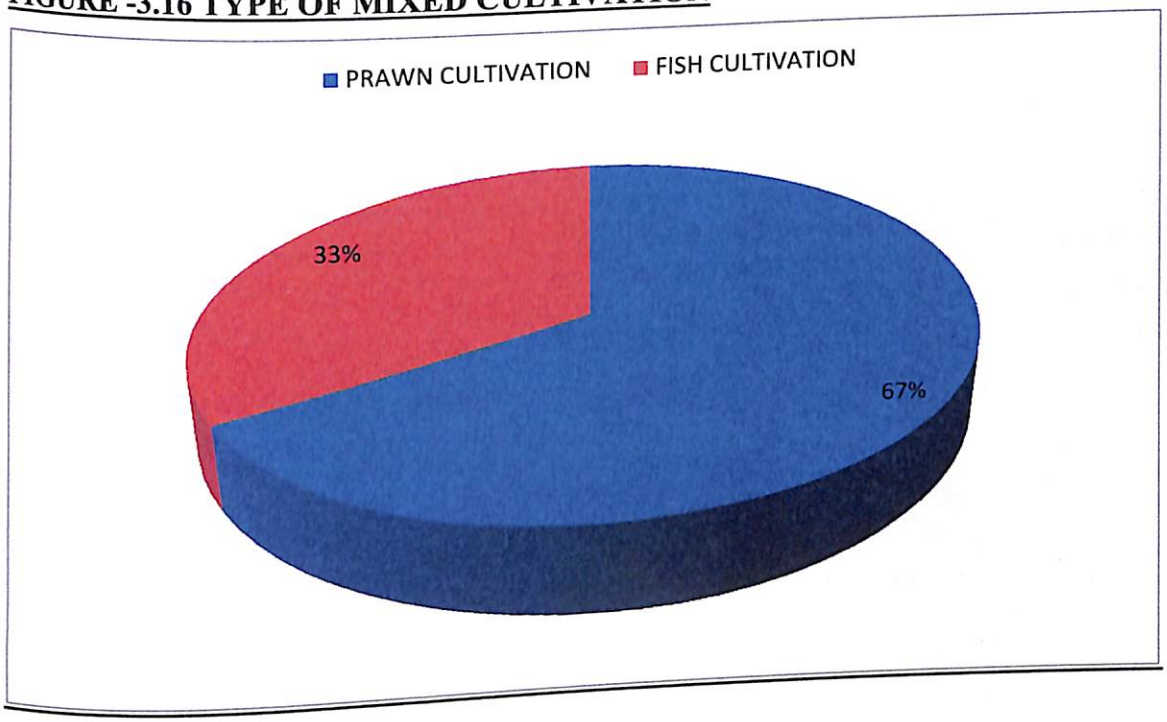
TABLE 3.18-TYPE OF MIXED CULTIVATION

Among the 15 people who reported following the practice mixed farming, 66,7% are engaged in prawn cultivation while the remaining 33.3% are engaged in fish cultivation along with paddy cultivation.

TYPE OF MIXED CULTIVATION	NUMBER	PERCENTAGE
PRAWN CUTIVATION	10	66.7
FISH CULTIVATION	5	33.3
TOTAL	15	100

SOURCE-PRIMARY DATA

FIGURE -3.16 TYPE OF MIXED CULTIVATION



SOURCE-PRIMARY DATA

YEARS OF CULTIVATION

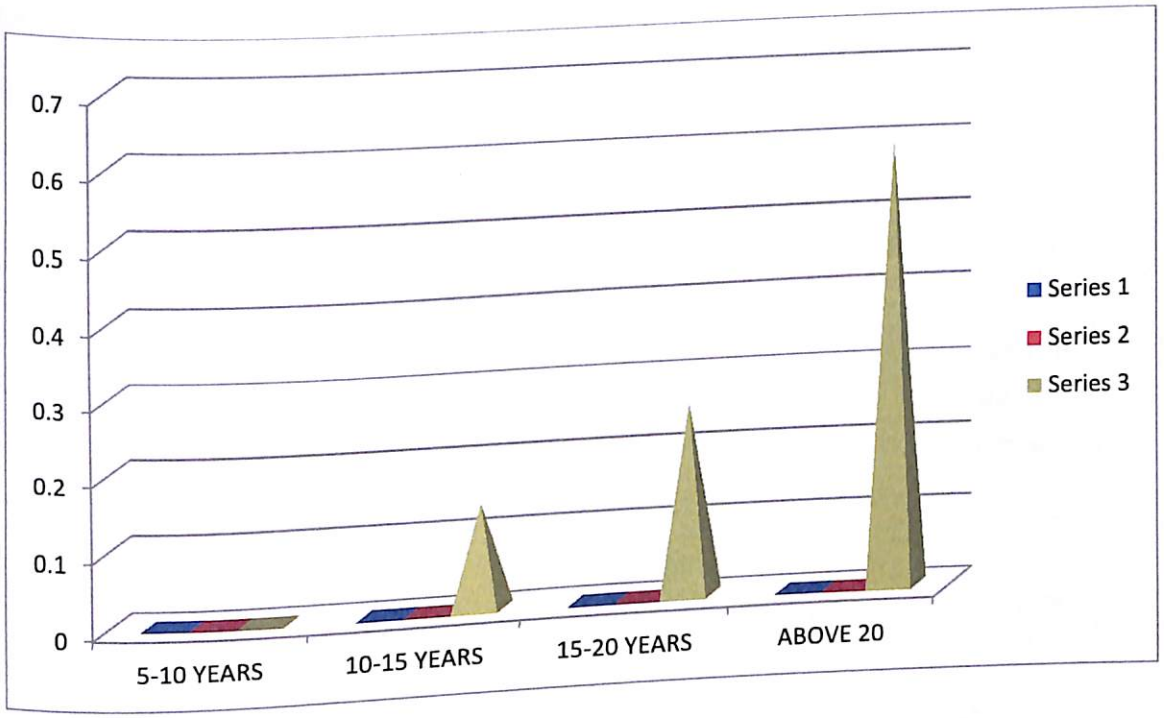
60% of the respondents have been engaged in cultivation for more than 20 years.26% has been engaged for 15 to 20 years.14% have been engaged for 10 to 15 years indicating a long history and experience in this field.

TABLE 3.19 YEARS OF CULTIVATION

YEARS OF CULTIVATION	NUMBER	PERCENTAGE
5-10	0	0
10-15	7	14
15-20	13	26
ABOVE 20	30	60
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.17 YEARS OF CULTIVATION



SOURCE-PRIMARY DATA

SATISFICATION WITH THE REVENUE EARNED FROM POKKALI CUTIVATION

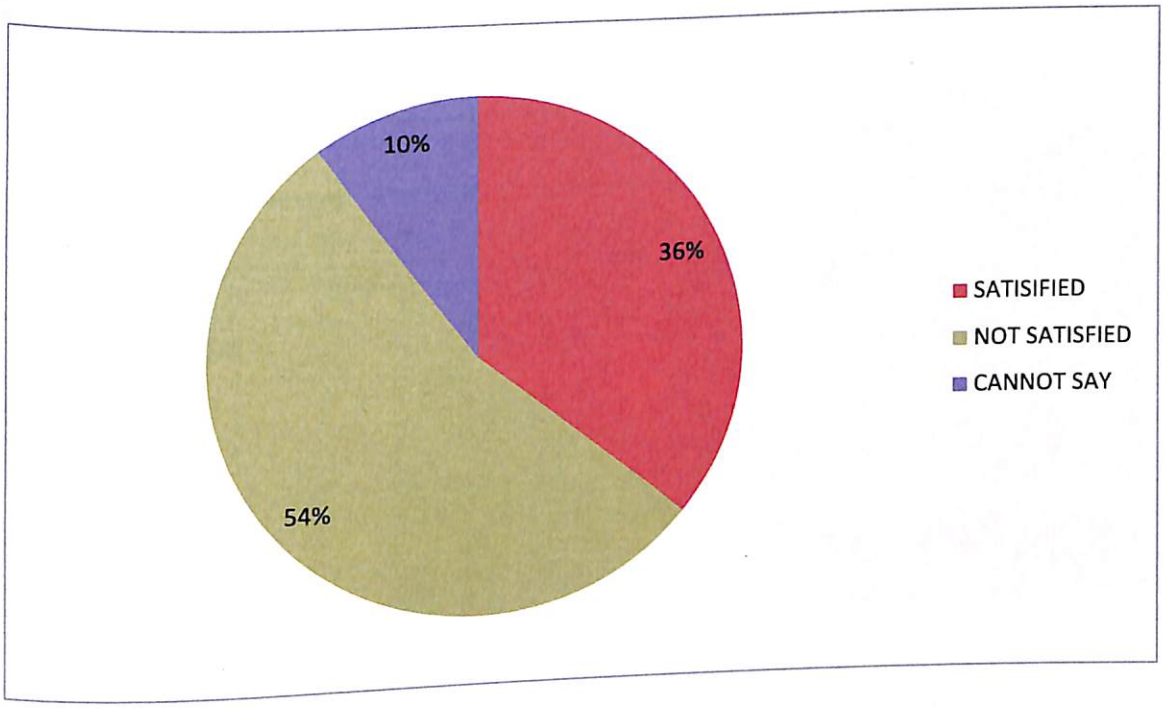
TABLE 3.20 - SATISFICATION WITH THE REVENUE EARNED FROM POKKALI CUTIVATION

36% Of the respondents are satisfied with the revenue earned by pokkali cultivation.54% of them are not satisfied with the revenue earned from cultivation

LEVEL OF SATISFICATION	NUMBER	PERCENTAGE
VERY MUCH SATISFIED	0	0
SATISIFIED	18	36
NOT SATISFIED	27	54
CANNOT SAY	5	10
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE3. 18-SATISFICATION WITH THE REVENUE EARNED FROM POKKALI CUTIVATION



SOURCE-PRIMARY DATA

PROBLEMS FACED BY POKKALI CUTIVATION

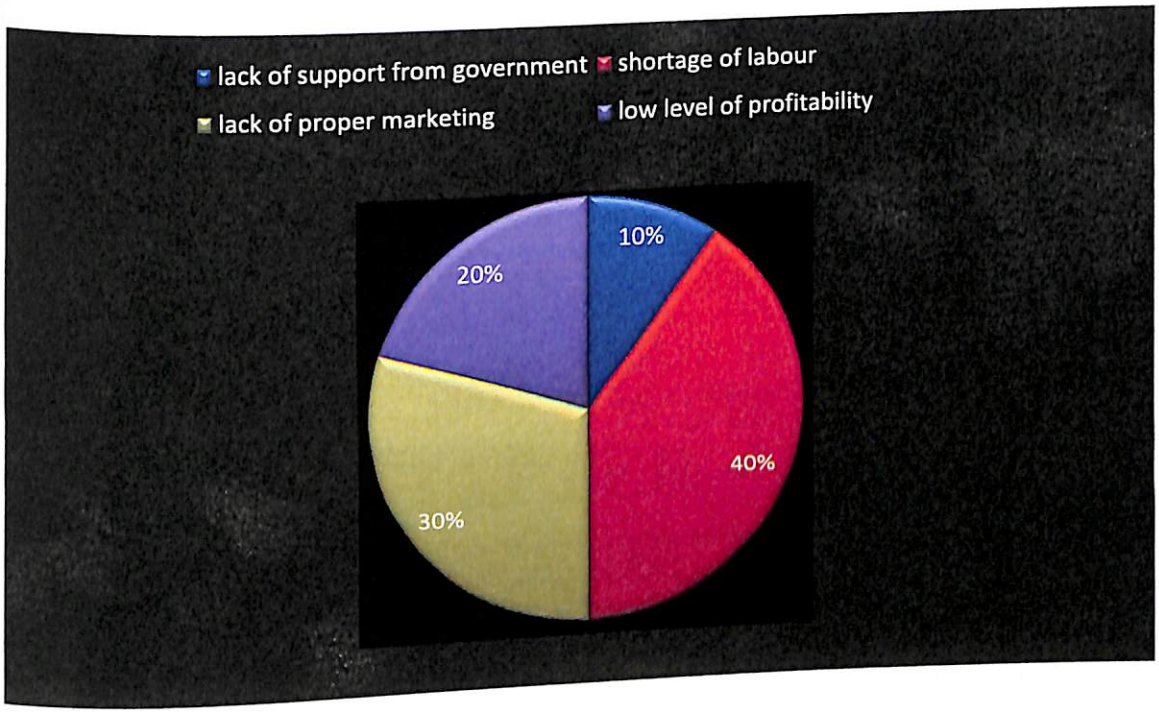
70% of the respondents face labour shortage.20% of them face low profit from cultivation.5% of them face lack of support from government.

TABLE 3.21-PROBLEMS FACED BY POKKALI CULTIVATION

PROBLEMS	NUMBER	PERCENTAGE
LACK OF SUPPORT FROM GOVERNMENT	5	10
SHORTAGE OF LABOURS	20	40
LACK OF PROPER MARKETING SYSTEMS	15	30
LOW LEVEL OF PROFITABILITY	10	20
CLIMATIC PROBLEMS	0	0
TOTAL	50	100

SOURCE-PRIMARY DATA

FIGURE 3.19-PROBLEMS FACED BY POKKALI CULTIVATION



SOURCE – PRIMARY DATA

CHAPTER – IV

FINDINGS AND CONCLUSION

FINDINGS AND CONCLUSION

The study analyses pokkali paddy cultivation in Nayarambalam Grama Panchayat in Kerala. There were thirty five farmers engaged in Pokaali cultivation in Nayarambalam in 2011-12 which increased to thirty seven in 2012-13, declined to nil in 2013-14 and was thirty two in 2014-15. .Area cultivated was 31.5 hectares in 2011-12 which increased to thirty three hectares in 2012-13 and decreased to thirty hectares in 2014-15. The area is currently spread over three Paadashekarams which include Nayarambalam paadashekaram, Kaapu paadashekaram and Chakkarachaal paadashekaram. As compared to 2011-12, the area in 2014-15 was more or less same in Nayayarambalam paadashekaram but decreased in Chakkarachal padasheharam (due to labour shortage).This decrease was compensated by an increase in kappu padasheharam as a result of which total area under pokkali cultivation in the entire Panchayath remained constant.

The study reveals that About twenty percentage of the farmers have primary educational qualification, about ten percentage have upper primary educational qualification,twenty percentage are SSLC qualified and forty percentage are PLUS TWO qualified and rest of the population are qualified with degree ie,ten percentage.

About thirty percentage of population have annual income below rupees 50000. About fifty percentage of population have income rupees fifty thousand- two lakhs. About ten percentage of the population have 2-5 lakh annual income and the rest of the population have above five lakhs annual income.

The study revealed that there has been an increase in interest in cultivation recently with more people from younger generation joining in. The reason behind this is people's preference for organic food particularly the present generation. It was found that the most of the cultivators cultivate in their own land. Only one respondent was cultivating on leased land. Cultivators follow the traditional pattern of cultivation all cultivation is done organically, no chemicals are used. The Period of cultivation is six months from June to October. About thirty percentage of the respondents only are aware about various schemes provided for pokkali cultivation eighty six percentage are less satisfied by the schemes provided by the government and thirteen of the respondents are not satisfied by the schemes provided by the government.

Only thirty perentageof the respondents are engaged in mixed farming where they combine paddy cultivation with prawn/ fish cultivation which is the true spirit of Pokkali cultivation. Among this small group sixty six percentage are engaged in prawn cultivation and remaining thirty three percentage in fish cultivation . The main reason pointed out for not following such mixed cropping was scarcity of labour and high labour cost.

Sixty percentage of the respondents have been engaged in cultivation for more than 20 years, twenty six percentage have been engaged for 15 to 20 years and fourteen percentage have been engaged for 10 to 15 years indicating a long history and experience in this field.

Thirty six percentage Of the respondents are satisfied with the revenue earned by pokkali cultivation but majority, fifty four percentage are not satisfied with the returns. More than half of the sample surveyed, that is, seventy per cent of them do not depend only on agriculture for their livelihood. The study showcased that most of the respondents are engaged in private sector and small proportion in business and government sector. The study also revealed that all the respondents have their own bank accounts indicating financial inclusion in the literal sense of the term so that had access to necessary funds from legal sources. The main problems pointed out by farmers were lack of labor supply and lack of marketing. Other inputs are sufficiently available, say, for example, capital, land etc is. The profits earned out of Pokkali cultivation as such is very low. So they also engage in marine farming – including shrimps and other fishes. This helps the farmers to reap higher profits. After six months of pokkali cultivation, this is done on a rotational basis.

RECOMMENDATIONS

On the basis of the study we make the following recommendations

1) While many schemes are in existence for supporting Pokkali cultivation, very few farmers are aware of it and even if aware the cumbersome procedure for obtaining the benefits deter many from availing the benefits. Hence Government has to ensure that schemes reach the intended beneficiary and serve the purpose for which they are designed.
2) Since labour shortage was one of the main difficulties pointed out, the panchayat needs to explore the possibility of utilizing facilities of MGNREGS for promoting Pokkali cultivation. This will also encourage mixed cropping of fish cultivation along with farming which is the true essence of Pokkali farming.
3) Greater support needs to be extended in marketing the output and ensuring that farmers get a fair return so that they sustain their interest in this eco friendly method of cultivation

CONCLUSION

Pokkalikrishi is an indigenous method of agriculture in wetlands and seasonal cropping or both rice and shrimp is an eco-friendly, and sustainable method of agriculture. Though the area under cultivation is considerably reduced in Kerala as a whole, it was observed to be stable in Nayarambalam and the number of farmers had increased overtime. A positive noteworthy development is the influx of younger generation into this method of cultivation. All measures need to be taken to support them and sustain this traditionally eco-friendly cultivation technique which holds great relevance in the context of global warming.

APPENDIX

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INTERVIEW SCHEDULE

1. Name
2. Gender

   Male Female
3. Qualification

   (a) Primary (b) upper primary

   (c) SSLC (d) plus two

   (e) other
4. Details of family members

Name	Age	Occupation	Monthly salary/wages

5.Annual income

(a)below 50000 (b) 50000-2 lakhs

(c) 2-5 lakhs (d) above 5 lakhs

6. is agriculture your main occupation?

(a) yes (b) no (c) can't say

7. A part from agriculture do you do some other work for earning?

(a) yes (b) no

8. if any specify.....

9. Do you have a bank account?

(a) yes (b) no

10. Area of land under cultivation

.....

11. Ownership of land under cultivation

(a) owned land (b) rented/ leased land

12. Period of cultivation

.....

13. What kind of farming do you prefer most?

(a) organic (b) chemical (c) both

14. If chemical, what is the main reason for using it?

(a) good production (b) low cost

(c) lack availability of organic fertilizers (d)subsidy

(e) cannot say

15. Are you the only member of your family engaged in farming?

(a) yes (b) no

16. If no, then part from you how many members are involved in farming

Persons	No of hours

17.Availability of inputs

Inputs	Easily available	Scarce
Land		
Labour		
Capital		
Water		
Fertilizer		
Others (pls specify)		

18.source of water for cultivation

(a) well water (b) canal

(c) borewell (d) others

19.cost of cultivation

Item	Amoount
Labour;	
Planting	
Watering	
maintenance	
Harvesting	
Others	

20. Do you have any debit?

(a)yes (b) no

21. If yes, specify the source of debt

(a) bank (b) money lenders (c) cooperative society (d) others

22. Nature of debt

Source	period	Rate of interest
Bank		
Money lenders		
Cooperative society		
Others		

23. Awareness and benefits from schemes schemes provided by the government

Schemes	Aware		Benefitted		Level of satisfaction			
	yes	no	yes	no	Very much satisfied	Less satisfied	Not satisfied	Cannot say
Combined pokkali and shrimp cultivation scheme								

Rastriya krishi vikas yojana (RKVY)								
Nayarambalam grama panchayat schemes								
Block panchayat schemes								

.

24. Do you have mixed cultivation?

(a) yes (b) no

25. If yes specify .....

26. How many years have you been cultivating pokkali?

.....

27. Are you satisfied with your revenue

(a) very much satisfied (b) satisfied

(c) not satisfied (d) cannot say

28. any suggestion to the government for the promotion of cultivation

.....