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A SURVEY OF THE RISKS AND RISK MITIGATION STRATEGIES FOR PADDY CULTIVATORS OF THE KUTTANAD AREA IN THE ALAPPUZHA DISTRICT OF KERALA

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ABSTRACT

Uncertainty and risk are typical factors of Indian agriculture. To withstand the harsh risk, prior calculation, pre-framed policies and efficient implementation of these at the local as well as at the national level can help the farmers. It helps withstand huge burdens as a result of agricultural flaws due to natural calamities.

This paper discusses the main issues and driving forces of risk in paddy cultivation in the Kuttanad area of the Alappuzha district in Kerala. The assessment is done through a questionnaire survey to the farmers and provides a risk mitigation strategy for the discussed problem.

KEYWORDS: ***Questionnaire, agriculture, Kuttanad, policy, implementation, risk, FPO.***

1. INTRODUCTION

1.1. Paddy Farming in Kerala

The Indian economy largely depends on the agricultural sector. More than 50 per cent of the workforce are employed in agriculture-related activities. Rice continues to be the staple food of the people in Kerala, though the food habits of the people have remarkably changed over the past few decades. The state cultivates a wide variety of seasonal and perennial crops, due to the diverse topographic, climatic and soil conditions. The various crops raised within the state are broadly classified into food crops (which include paddy, tapioca, banana, cereals and millets, and pulses), garden crops (which include crops like coconut, areca nut, cashew and pepper) and plantation crops (tea, coffee, cardamom and rubber) (Thomas et al., 2002).

Palakkad and Alappuzha are the two districts in Kerala which produce rice in the state with a production share of 37.23% and 20.58% respectively. Palakkad district contributes more than one-third of rice to Kerala state. Both the districts together contribute 57.87% of the total paddy production in the state, hence the districts are known as the rice bowls of Kerala (Pramodh et al., 2018).

Paddy cultivation in Kerala has declined drastically over 20 years, from 5.88 lakh hectares in 1990 to 1.97 lakh hectares in 2013 with a production of 5.08 lakh tonnes in 2013. The small size of landholdings, high cost of inputs, pest and disease problems, unexpected floods, labour scarcity are some of the major reasons for the decline in area under paddy cultivation in the state (Reddy et al., 2001).

1.2. Farmer producer organizations (FPO)

A Farmer Producer Organization is defined as a rural organization whose members have organized themselves intending to enhance farm income through improved production, marketing, and local processing activities (Rondot et al., 2011). FPO's mainly deal with (i) policies on issues such as pricing, export and import of agricultural products, (ii) improvement of agricultural production practices, (iii) access to inputs and services, including agricultural credit, (iv) marketing of agricultural products and (v) local processing of agricultural production and its marketing, to generate higher productivity, reduce risk and improve market access. The association is a cooperative or federation that has been established to promote the interests of farmers (Bijman et al., 2008).

The Farmer Producer Company (FPC), registered under the Companies Act, is emerging as the most effective means of Farmer Producer Organization (FPO) to cater to the needs of farmers at the grass-root level. FPCs offer a wide range of benefits compared to other formats of aggregation of the farmers. Members of the FPC can leverage collective strength and bargaining power to access financial and non-financial inputs and services and appropriate technologies leading to a reduction in

costs of transactions. A producer company is a corporate body registered as a Producer Company under the Companies Act, 1956 (As amended in 2002). The same provisions have been retained for FPC after the amendment of the Companies Act in 2013. Its main activities consist of production, harvesting, processing, procurement, grading, pooling, handling, marketing, selling, export of primary produce of the Members or import of goods or services for their benefit. It provides for sharing of profits/benefits among the members. (National Institute of Agricultural Extension Management, 2018)

In India, 86.21 per cent of the total operational agricultural holdings are cultivated by small and marginal farmers (MoA & FW, 2019). In Kerala, about 99.09 per cent of the total agricultural land is cultivated by small and marginal farmers (MoA & FW, 2019). These farmers suffer from several issues such as exploitation from middlemen, Poor technology adoption, and modern methods of cultivation which can have several problems. Some of it includes the high influence on production and productivity, poor marketing facility, inability to access cheap credit, wide fluctuations in price, incapability to convert agricultural products into value-added products, etc. (Verma et al., 2019). This in turn led to the formation of Farmer collectives for providing economic and development support, financial scale from the activity and to increase the bargaining capacity of the small and marginal farmers (Balakrishnan et al., 2018).

1.3. Agriculture in Kuttanad, Kerala

Kuttanad covers a total area of about 110,000 hectares, of which 31,000 hectares are dry lands, 66,000 hectares are wetlands and the remaining 13,000 hectares are water areas comprising rivers, lakes, waterways and channels (Thomas et al., 2002). Alappuzha holds the second position concerning the area (38,623 ha), production (1,28,560 tonnes) and productivity (3041.18 kg/ha) of rice next to Palakkad. Kuttanad is the only region in India that practices rice cultivation below sea level. The Kuttanad Below Sea-level Farming System (KBSFS) is unique as flat stretches of rice fields in delta swamps.

There are certain unique characteristics of paddy cultivation in the Kuttanad region, compared to other paddy growing areas in Kerala. Paddy lands in this region are divided into several blocks called *padasekharams*, bound by waterways, rivers and other natural partitions. Many of such *padasekharams* are man-made as they are recovered lands from the bed of backwaters (Thomas et al., 2002). The size of *padasekharams* ranges from less than one hectare to more than 1000 hectares. From the early days paddy cultivation in this region is called *puncha* cropping, as *puncha* crop (summer crop) is the traditional crop in Kuttanad during which 80 per cent of the paddy fields are sown. The season begins from October-November when the operation of bailing out water from *padasekharams* starts.

1.4. Risk in Agriculture

The agriculture sector is subject to many uncertainties. Multiple potential outcomes with unlikely expectations are associated with any farm production decision plan. Numerous events related to weather, market developments and other hazards cannot be directly controlled by the farmer but have a direct impact on the returns from farming(Jesús et al., 2008). Major risks in agriculture include climate and weather risks, natural catastrophes, pests and diseases, which cause highly variable production outcomes. Production risks are worsened by price risks, credit risks, technological risks and institutional risks. Risk management in agriculture ranges from informal mechanisms like avoidance of highly risky crops, diversification across crops and income sources to formal mechanisms like agriculture insurance, minimum support price system and future's markets (Risk Management in Agriculture, GoI, 2012).

2. LITERATURE REVIEW

Over the years, paddy production has drastically declined and numerous studies have taken place to analyse the root cause of the problem. The problems faced by the farmers such as availability of chemical fertilizer, the behavioural pattern of the fertilizer usage, financial situation and transport were evaluated. There was a lack of awareness about the optimum use of fertilizer to be applied for various crop types like Rabbi and Kharif crops, which was concluded from the study. Moreover, carelessness among the farmers, irregular guidance from the government and FPO's, lack of coordination among the farmers and agricultural staff, and illiteracy among farmers were discussed in the paper (Dhian et al., 1990). Many findings on the farmers' adoption of technology, adoption behaviour towards new rice production technologies and certain difficulties faced by the farming communities were studied. Past surveys have identified problems such as water scarcity in different areas, unavailability of manures, high cost of chemical fertilizers and labour costs(Nyein et al., 2000).

Researches in various parts of the country have been observed to narrow down the concerns of the farmers. A study in Mysore has concluded that major constraints included non-availability of agricultural inputs and high cost, disease problems with paddy, lack of technical knowledge, etc have been the

foremost difficulties faced by them (Lakshminarayan et al.,2011). In Tamil Nadu, an income and employment-related study was conducted which then concluded the lack of crop insurance schemes, low output prices, poor living standards and socio-economic status, high input prices and lack of agricultural engagement programs for farmers(Raja et al., 2011).

Studies on the economic analysis of rice productivity and major factors affecting rice yield in Himachal Pradesh concludes that the important constraints responsible for the yield gap are the low use of farm yield manure, small area of agricultural land, lack of new varieties for different agro-climatic regions and mechanisation difficulties (Sharma et al., 2013). Assessment of the level of technology adoption faced by the paddy farmers of Deoria District of Uttar Pradesh have been observed and the major constraints were the difficulties in measuring the adoption level of technology, deviations from recommended practices and measuring types. These difficulties faced by farmers were evaluated by ranking the problems in paddy cultivation. (Pushpa et al., 2014)

3. RESEARCH METHODOLOGY

There are numerous studies on the state-level analysis of paddy production, area analysis and current problems faced by the farmers. In this study, a questionnaire survey has been conducted and evaluated to over 500 farmers of Kuttanad in the Alappuzha region who are part of the Farmer Producer Organisation (FPO) – **'Farmertree'** which consists of more than 900 farmers. This research is a development-oriented study to analyse the pressing issues of the paddy farmers in Kuttanad and to provide the farmers and FPO's with feasible risk mitigation strategies.

The questionnaire has examined several key aspects of the farmers' such as-

a) Difficulties in paddy cultivation over the past five years.
b) Major reasons for crop losses and constraints
c) Health aspects of the paddy growers
d) The economic viability of paddy cultivation in the region
e) Awareness of organic farming among the farmers
f) Response and awareness on new technology adoption
g) Government response and programs for farmers to address the constraints
h) Risks faced in each phase of the farming activity
i) Policy improvements
j) Impact of the flood, climate change and global warming.
k) Role of insurance companies

From the research it has been observed that the sources of uncertainty and risk in agriculture are diverse, (i) ranging from events related to harsh climatic and weather conditions to animal diseases; (ii) from changes in the price of agricultural produce to fertilizer and other input commodities; and (iii) from financial uncertainties to policy and regulatory risks.

From the questionnaire survey, major risks were classified and the farmers have rated them in Kuttanad based on the intensity with which each of it has impacted them.

There is a lot of natural uncertainty and risk which are uncontrollable, such as weather, plant disease, insect outbreak, etc which play a fundamental role in agricultural production. The top risk observed in Kuttanad is market uncertainty which has drastically impacted their profits and has widened their debts. Market uncertainty, especially in agricultural production, has to be determined in advance because of the inherent volatility of agricultural markets, as the market price is typically not known. A brief outline of the questionnaire with the general response from the farmers has been recorded for recommending risk mitigation strategies among the farmers as well as in FPO's.

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Fig: Paddy Farmers of Kuttanad (Picture Credits: Wikimedia)

Table1: Outline of the topics asked for a survey to the farmers of Kuttanad and their general response

Outline of the questions	**Major Response from farmers**
Major problems and risks faced	1. Delayed payment by Government supply department for paddy purchased; Delays in getting loans affects farming. 2. Unpredicted rain, flood disasters; flooding of paddy fields by saltwater due to improper management of *Thanneermukkam* bund. 3. Production – low production due to climate change, low-quality seeds supplied from NSDC/*Krishi Bhavan*.
Impact of COVID-19 in agriculture	1. Farmers were worried that an outbreak would force harvester machine operators, most of them from neighbouring States, to return to their native places. It would also result in labour shortage when the harvest reaches its peak. 2. But, everything was very smooth. There was no shortage of combine harvesters and labour. Paddy farming was not seriously affected in Kuttanad by the pandemic.
New technology adoption	1. Fear of risks – The farmers of *Kuttanad* are not ready to take risks; There are only two crop seasons in a year. Any loss or reduction in production while testing new technologies will significantly affect farmers' livelihood. 2. There should be some incentives given by the government to encourage the testing/piloting of new technologies by farmers. The guidance and technology transfer initiatives of government agencies are yet to reach farmers effectively.
Major crop loss in Kuttanad, Alleppey	The major crop loss in Kuttanad is due to flooding. This problem can be minimized up to an extent by constructing polder walls (bunds) around the *padashekarams*.
Government programs that address farm risk management	Insurance is the only government program for farm risk management. There needs to be an efficient response from the Government regarding risk mitigation strategies.

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Involvement of farmers	1. Farmers work together to solve problems. For instance, at the time of the flood, they collectively build bunds and at the time of delayed procurement, they conduct farmer strikes. 2. Educating the farmers can replace the conventional methods with mechanization. But risks like floods can be minimized by making crop insurance.
Farm Insurance	Insurance providers are also not much supporting farmers. The insurance claim is given only when a large group of farmers (covering a village) suffer crop loss. They are not providing claims when an individual farmer or a small group of farmers suffer crop loss.
Agriculture sector transformation	1. Agriculture and farming are now indeed becoming more difficult than in previous years. On the ground, we do not feel that there is any evidence that the agriculture sector is transforming towards a more resilient system. Crop insurance is the only solution to which we have got exposure, and this alone is not an effective solution for resilience/risk mitigation. 2. Every year many farmers in Kuttanad are withdrawing from this profession. The younger generation is not taking up farming as a profession. The risk associated with farming is increasing and a large number of farmers are going into more and more debts.

4. RESULTS AND DISCUSSIONS

Kuttanad in Alleppey, popularly known as the 'rice bowl' of the state involves various activities in the agricultural farms. Kuttanad has been declared as one of the Ramsar (international treaty for the conservation and sustainable utilization of wetlands) sites on the southwestern coast of India as per the guidelines of the Ramsar Convention of 1971. Kuttanad is a potential site designated by the Globally Important Agricultural Heritage systems (GIAHS) to assist national and local stakeholders in the dynamic conservation of their agricultural heritage systems.

It has been observed that agricultural production has drastically reduced over the years while compared with the population growth based on various reasons. Therefore, discovering the root cause in agricultural production helps to sustain the farmers for a long time. This paper, as per the survey conducted to the farmers, provides a wider outlook on the real-life problems in paddy cultivation. The output obtained from the farmers have helped to narrow down the key factors causing the reduction of paddy cultivation in Kuttanad and the risks associated with farming. The survey also provides insights on improvements and recommendations from the farmers, as most of the time their problems are not being heard and addressed. A total of ten problems have been identified and a weighted average score analysis has been performed to prioritize the problems faced by the respondents in the paddy cultivation. The ranking has been given for the average score calculated based on the farmers rating which has been given for a particular factor causing the risk nominated from the highest to lowest score.

Table 2: Problems faced by farmers in paddy cultivation in Kuttanad and the relative risk ranking

Problems in Paddy Cultivation	Avg. Score	Rank	Major Reasons
Low quality of seeds	4.57	2	Low-quality seeds are supplied for free by the government. Farmers were forced to purchase additional seeds.
Labour shortage	4.05	4	High labour charges. Need farm mechanisation. Youth not interested in farming
Inadequate equipment	4.01	5	Lack of equipment suppliers in Kuttanad. Dependent on equipment suppliers from other districts and states.
Fertilizer problem	2.99	8	Health issues among farmers- reasons for Cancerous diseases
Weeds problem	3.60	6	Due to climatic changes
Water scarcity	1.47	10	Saltwater intrusion during the opening of 'Thanneermukkom bund'.

Flood problem	4.50	3	Frequently leads to crop loss in the second season
Low price for paddy	3.26	7	Rice mill agents appointed by Government supply department to procure paddy charge high commissions from farmers.
Inadequate support price	2.38	9	Lack of profitability due to high farming expenses.
Marketability problems	4.66	1	Delayed payment by Government supply department (SupplyCo) for paddy purchased No alternative buyers

The table depicts the average score analysis of the major problems in paddy cultivation, which has been determined based on farmer impact rating in Kuttanad (No of ratings/ total no. of farmers). The priority of problems faced in the Kuttanad region is as follows; Marketability problems (4.66), Low quality of seeds (4.57), Flood (4.5), labour shortage (4.05), Inadequate equipment for cultivation (4.01), weeds problem(3.6), low price for paddy- output (3.26), fertilizer problem (2.99), inadequate support price (2.38), and water scarcity (1.47). The finding states that Marketability problems (avg. score = 4.66) are considered as the major problem among the list of problems considered for evaluation.

The evaluation has also provided insights into the current methodologies and risk management policies or procedures. It was also observed that the Farmer Producer Organisations (FPO's) do not have any risk mitigation strategies currently in place and there hasn't been sufficient assistance from the agricultural authorities or the government in this regard. There has been a wide agreement on the seasonal shortage of agricultural labour being a major challenge. Along with labour shortages, many other factors have accounted for the problem over the years in Kuttanad today. Due to the vast expansion of education, technology and resources, the growing occupational diversification and movement of the workforce from agriculture to a diverse set of non-agricultural occupations have been occurring at a much faster rate in Kerala than in the rest of India. Many farmers have observed that it is often difficult to find workers at the time of transplanting and harvesting operations for which timely availability of labour is crucial.

All the factors and problems of the farmers have been identified and a mitigation strategy has been developed for the Farmer Producer Organizations (FPO's) to inculcate in their policies and to adopt the methodologies to step up the paddy cultivation in Kuttanad in the coming years. The risk matrix quoting key risks with the mitigation strategy has been charted in Table 3.

Fig 2: Flood affected Kuttanad- 2018 Kerala floods (Picture credits: Manorama online)

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Table 3: RISK MATRIX

Risk head	Risk description	Risk trigger	Proposed risk mitigation mechanism
Natural conditions	Agriculture is affected by many uncontrollable factors that are often related to the weather, such as excessive or insufficient rainfall, extreme temperatures, insects, and several diseases. Agricultural impacts from natural events and disasters mostly include: 1. Contamination of water bodies, 2. Loss of harvest and livestock, 3. Increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure.	Natural conditions; biological and environmental hazards; technological level; natural disaster; demand; policy decisions	1. Using a weather data time series to examine (often with a crop model) how weather variability affects farm production and then conduct a sensitivity analysis of the subsequent farm income to changes in prices or to use simulation models for scenarios related to risk types.
Environmental hazards	1. Flood, erosion, wind storm, etc are the most significant and negatively related to agricultural production. 2. Pests, diseases and yield losses are other major influencing factors.		1.Following recommended production practices by FPO's and agencies. 2. Diversify farming by growing different varieties of crops and completely new crops. 3. Expand production through more intensive growing practices or by planting more acreage. 4. Purchase federal crop insurance coverage to stabilize income during times of loss and purchase coverage for non-insured crops. 5. Adopt risk-mitigating practices such as drip irrigation, tile drainage, trap crops or resistant varieties. 6. Consider site selection - use fields less susceptible to frost or pests and rotate crops. 7. Maintain equipment and keep facilities in good working condition.
Input Risk	1. Access to quality inputs remains an important constraint in Kuttanad. The agricultural sectors often supply substandard and/or counterfeit seeds to the farmers which can impact their farming. 2. The formal system consists of manufacturers, agricultural dealers, government entities and Non-Governmental Organizations (NGOs) that distribute seeds.	Farming and Agri inputs Storage, Packaging, Distribution Production and Harvest, Processing	The farmers can adopt the informal system of retaining good quality seeds: a. Farmers saving seed for own use, where no trade is involved; b. Farmers exchanging seed with other farmers in the Kuttanad region; c. Farmers and FPO's growing seeds in local markets, NGOs, seed fairs, and development projects.
Technological aspects	Technology plays an important role in the production risk in farming. Rapid introduction of new varieties of crop and production techniques offers a potential for improved efficiency, but may at times yield poor results in the short term.	Inadequate farming equipment	1. Nanotechnology for plant protection and nutrition, in the form of nano pesticides or nano fertilizers. 2. Genetically altered seeds and precision farming are two examples of evaluating new technologies in agriculture production. Some seeds are genetically modified to provide resistance to specific herbicides, thereby facilitating improved weed control. Other seeds are genetically modified to provide resistance to diseases or insects.
Demand	Uncertain & unanticipated demand Inadequate information on demand Changes in food safety requirements Transportation issues	Storage, Distribution, Processing and Packaging Production and Harvest, Storage, Distribution and Retail	1. Farmers regard price risk as to the most significant risk factor and diversification as the most important management strategy. By producing more than one crop or livestock product, farmers can reduce the risk of a total production loss. For example, a producer who operates a dairy and raises corn is not completely dependent on one product. Another example is Panchakrishi which is being practised at Attappady, Kerala.

			2. The most significant positive correlations were found between the size of land in hectares and the assessment of the importance of the price risk which is also confirmed by numerous foreign researches, according to which the small companies are more affected by the price risk, not being able to reach the profit nor the standards of big companies.
Logistics and infrastructural	Inadequate road infrastructure Increase in fuel costs Lack transportation infrastructure Conflicts, labour disputes, labour shortages Lack of infrastructure, service units and warehouses	Processing, Production, and Harvest Storage, Processing	1. Know the supply chain partners. 2.Close collaboration with the suppliers, distributors, and retailers helps to ensure that the goods are quickly and properly handled at every step of the shipping process, maximizing efficiency, and minimizing mistakes. 3. Make sure contacts are clear and robust. 4. Adequate insurance coverage.
Market dynamics	1. Uncertainty with prices, costs, and market access. 2. Sources of volatility in agricultural commodity prices include weather shocks and their effects on yields, energy price shocks and asymmetric access to information are additional sources of market risk.	High output prices	1. Develop a marketing plan – area wise with proper realistic sales forecasts and target prices. 2. Formation of a marketing cooperative to enhance prices and guarantee a market. 3. Increase direct marketing efforts to capture a higher price. 4. Market via multiple channels or outlets to reduce reliance on a single market. 5. Making Sales or price contracts with buyers. 6. Spread harvest and sales over the season by scheduling planting and considering storage. 7. Conduct market research - understand your customers' needs and preferences.
Environmental risk	Extreme weather conditions lead to an uncertain working environment for contractors and employees and consequent delays in project completion.	Farming and Agri inputs, Production and Harvest, Storage, Processing, Packaging, Distribution, and Retail	1. Review business insurance policies and carry sufficient liability coverage. 2. Choose a different business legal structure – as an example, a sole proprietorship is not always best. 3. Understand business contracts and agreements - ask questions if you are unsure. 4. Develop good relationships with neighbours and address their concerns. 5. Use good agricultural practices to limit environmental risk. 6. Know and follow state and federal regulations related to your farming operation.
Income risk	The income risk is measured by the variability of the incomes and it varies according to the single crops, depending on the climate, land and production method.		1. Implementation of a strategic business plan. 2. Monitor financial ratios and enterprise benchmarks. 3. Control key farm expenses - consider other suppliers and alternative inputs. 4. Conduct a trend analysis to assess change in farm profits and owner's equity over time. 5.Purchasing Whole-Farm Revenue Protection to provide a safety net in poor earning years. 6. Communicate and renegotiate agreements with suppliers and loan terms with lenders. 7. Consider leasing and rental options rather than purchasing machinery, equipment or land. 8. Evaluate the possibility of expanding or contracting different enterprises.

5. CONCLUSIONS AND RECOMMENDATIONS

The agricultural sector has a vital role in the Indian economy. This research of paddy cultivation in the Kuttanad region has provided insights on a lot of aspects that have been neglected for a long time. Important problems of rice cultivation were identified and most viable strategies have been suggested. Some of the risks such as a) the decline in the

number of full time dedicated farmers, b) profitability issues, c) the disinclination of younger generation towards cultivation and farming, d) labour shortages, lower wages and economic status of farmers, e) unacceptable increase in input costs, f) indebtedness to non-institutional credit and poor marketing system, g) inadequate and improper guidance from research institutes, h) inadequate infrastructure development etc. All these should be taken care of for the smooth sailing of the agricultural sector.

Several suggestions were obtained from the farmers to continue the job and to encourage the younger generation to incline towards agriculture and farming. Some of the suggestions include-

1. Support should be given to farmers in implementing new technologies.
2. Scientific Management of saltwater entry shutters and flood water drainage gates.
3. Timely procurement and instant payment method should be implemented at the earliest.
4. Reduce wastage of produce through proper storage and on-time procurement.
5. Farmer producer organisations should get support in developing and implementing risk management policies that can eventually support the farmers on an urgent need basis.

Governments at the central and state level need to introduce efficient schemes for the existing FPOs to extend their services. Farmers, as well as FPO's, are not updated on the recent schemes that assist the farmers financially and non-financially. It has to be made sure that stakeholders and other departments which are linked to the agriculture sector must provide awareness and timely assistance to the farmers about the schemes. The state government as well as the central government must initiate proper budget assistance for the smooth functioning of the agricultural department which constitutes the major sector of the economy.

6. REFERENCE

1. *Anton, J. (2007), "Agricultural Support in the WTO Green Box: An analysis of EU, US and Japanese spending", Working paper for the International Centre for Trade and Sustainable Development (TCTSD). Geneva.*
2. *Government of India (2010), Agricultural Statistics at a Glance 2010, directorate of economics and statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, available at http://dacnet.nic.in/eands/, viewed on June 21, 2011.*
3. *Hamal, K.B. and Anderson, J.R. 1982, 'A note on decreasing absolute risk aversion among farmers in Nepal' Australian Journal of Agricultural Economics 26(3), 220-5.*
4. *Hao Aimin, (2010) "Uncertainty, Risk Aversion and Risk Management in Agriculture"*
5. *Jayan Jose Thomas, " Paddy Cultivation in Kerala"*
6. *R Ravikumar & Sudheesh B "ECONOMIES OF PADDY CULTIVATION IN PALAKKAD DISTRICT OF KERALA"*
7. *Shine Raju Kappil and Ajeet Kumar Sahoo, "Potential Appraisal of Farmer Producer Companies in Kerala"*
8. *Soni Solaman & G Veerakumaran, (2020), "Problems and Constraints Faced by Farmer Producer Company in India with Special Reference to Poultry Sector of Kerala"*
9. *Thomas PM. Problems and prospects of Paddy cultivation in Kuttanad region – A case study of Ramankari village in Kuttanad Taluk. Project report of Kerala Research Programme on Local Level Development (KRPLLD), Thiruvananthapuram. 2002.*
10. *Thomas, J.J. (2011). Paddy cultivation in Kerala. Rev. Agrarian Studies 1(2): 215-226. Available: http:// ras.org.in /paddy_cu1tivation_in_kerala [17.02.2020].*