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Beneficial Impact Of Agricultural Value Chainfinance Of Paddy Cultivation In Kerala

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ABSTRACT

There are several obstacles that prevent smallholder farmers in poor nations from realizing their full output potential. In order to help underprivileged communities, have access to value chain financing, researchers are studying Agricultural Value Chain Finance (AVCF). A great deal of research on AVCF has been carried out using different types of agricultural farming. Among these, cultivation of paddy was still limited. However, this topic has yet to receive considerable attention based on paddy cultivation and marketing which was limited to the Palakkad District. Thus, a study was done to analyze the effectiveness of AVCF in Paddy cultivation in the Palakkad district. By using the methodology of random sampling technique, the sample has been collected from 350 respondents in Palakkad. The result showed that the AVCF approach has a leverage chain relationship with more creditworthy chain members to attract direct and indirect finance of individuals and smallholder farmers in value chains. Further, the profitability of the farmers was highly influenced by the factor of flooding, which obtained the highest significance value.

Keywords: *Agricultural value chain finance (AVCF), Paddy cultivation, Small scale farmers, stakeholders, Kerala.*

1. INTRODUCTION

At the core of enhancing social well-being and a key driver of economic growth is the agriculture industry. Rice not only helps to alleviate poverty and also ensures food security in India, but it also boosts the country's export revenues.

When it came to paddy's output, India was rated second globally. Accordingly, agricultural production in India may contribute to the country's economic growth via market-based development, with repercussions seen along regional and national value chains. Even though they confront several obstacles on the road to commercialisation, small-scale farmers continue to dominate India's agricultural structure and employ more than half of the country's workforce. Agricultural funding prospects may be expanded through the value chain of finance, which also gives the chance to consolidate relationships between participants in the chain, enhance efficiency, and facilitate repayments of loans. Businesses, organisations, and other entities form a value chain

when they collaborate to meet product demand in the market. In figure 1 we can see a schematic of the agricultural value chain's working capital financing.

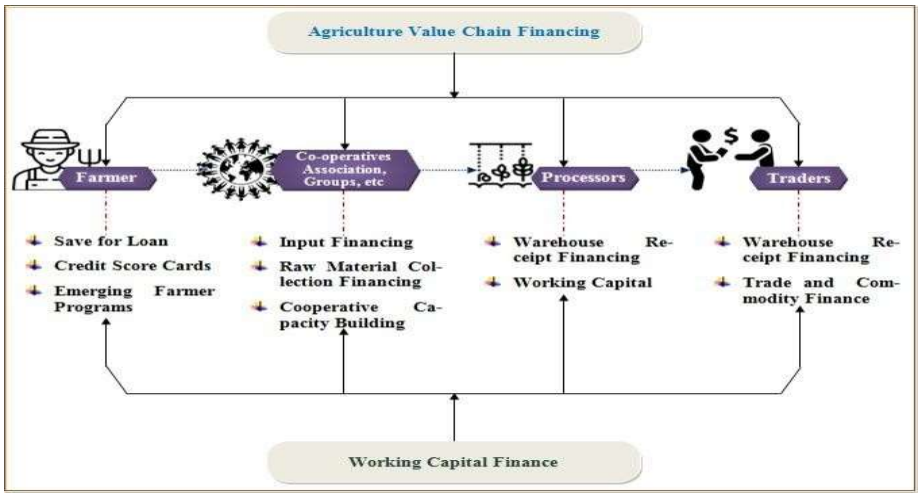


Figure 1: Working capital finance of agricultural value chain

A lack of capital is a major obstacle to smallholder farmers' efforts to modernise their practices. There was a severe lack of access to banking services for Indian farmers. In India, commercial banks and other lending institutions only account for 21% of the total loans. Governments and corporate organisations in developing nations are increasingly participating in agricultural value chains, offering inputs, funding, and other development-supporting services, in recognition of the importance of food security and poverty reduction. Programmes to assist agricultural finance alternatives to banks, like AVCF, have been running for a while now, with the help of a number of agencies and other development partners.

STATEMENT OF PROBLEM

One certain way to boost efficiency for both parties involved in the agricultural financing process is to familiarize oneself with value chain finance. Finding out what money is needed to boost the value chain finance may also improve the efficiency and quality of financing agricultural networks.

There is a great demand for agricultural finance because farmers, suppliers, processors and buyers need access to finance to function and improve their businesses. However, on the supply side, bankers often struggle to cover their risks and expenditures in supporting agriculture which effects a large gap in sufficient financing.

2. SCOPE OF THE STUDY

A district in Kerala was the only subject of this study, which zeroed on rice agriculture in particular. Extending the study to include more people from other regions and analysing the effective practices of players might boost rice crop yield across the board are also possible directions for future research. Agricultural finance and investment might be accelerated with the aid of this study's findings on how to scale up VCF, which could lower loan risks.

3. JUSTIFICATION OF THE STUDY

4. Financial support for agricultural supply chains may be enhanced through AVCF's

- Minimising the expense of financial transactions while utilising the information and connections inside the value chain to lessen the impact of potential hazards.
- Identifying the financing needed to strengthen the chain.

In addition to encouraging specialisation and improving productivity by technological means, it backs the growing commercialisation and transformation of agriculture, which is essential to the sector's long-term viability. Therefore, the efficacy of paddy farming in Kerala's agricultural value chain financing is examined in the proposed study approach.

5. REVIEW OF LITERATURE

The purpose of the study by Lam et al. (2022) was to examine the efficiency of both internal and external funding sources. We have gathered data from 45 other stakeholders and 160 representative producers. We analysed the findings using qualitative analysis. A well-functioning financial ecosystem is the end consequence of the chain's internal and external financing. The 3Ps—people, planet, and profit—are all helped along the way by AVCF funding. Still, the biggest problem for agriculture in general and TienPhong Cooperative (T.P.C.) in particular was the lack of easy access to financing.

(Middelberg, 2017) examined the agricultural finance for smallholder farmers in Zambia. In this study, a framework of Value Chain Financing (VCF) has been employed for the increase in access to agricultural finance. A study sample has been gathered from 14 respondents. Using a qualitative technique, the data has been collected and analyzed. Finally, the result indicated that the role players in Zambia's agricultural sector coordinated the actions of various chain actors, and allows smallholders access to finance within the context. However, limited samples have been collected in this study, and the findings could not be necessarily generalized to other countries.

A study by Abdul-Rahaman and Abdulai (2018) looked into how farmer groups may boost productivity and efficiency. Four hundred twelve small-scale rice growers from the northern region of Ghana were surveyed. The outcome was examined using Stochastic Production Frontier (SPF) and Propensity Score

Matching (PSM). Farmers who are part of farmer organizations are more likely to work in close proximity to their own production frontier than those who sell and grow paddy independently, according to the results. The inability to account for farmers' unobserved characteristics led to a PSM.

Researchers in one region looked at the characteristics of the people involved in the rice value chain and how small-scale rice farming businesses used value chain finance (B Okpukpara et al., 2021). One hundred forty people in Nigeria's Enugu state were surveyed for a research project. A basic random sample approach was used to analyses the results. The survey found that 27.9% of the respondents had easily available with credit, whereas 8.6% had inaccessible credit. It also revealed that short-term working capital was chosen by 10.7% of producers, while 22.1% preferred mid-term finance. The possibility that other locations or nations could have different outcomes is a drawback of this study.

The purpose of the study by Linn and Maenhout (2015) was to investigate the operational limitations faced by various participants in Myanmar's rice value chain. Samples were gathered in Myanmar's Ayeyarwaddy area utilising both primary and secondary sources of information. Stratified and purposive sampling methods were used to examine the gathered samples. Lastly, the study's findings demonstrated that the value chain in the chosen region was inadequate, with a high number of players confronting many restrictions. Uncertainties, which can undermine the impact of public and private initiatives, have a significant impact on agricultural value chain product quality and production.

The involvement of non-farmer players in the development of AVCF was investigated by Villalba et al. (2023) in relation to banks and agribusinesses. Thorough interviews with the relevant specialists were conducted to get the necessary data. In order to analyse important solutions, this study used an ecosystem approach. Researchers found that by leveraging social and trade capital, the AVCF might lower the transaction costs and lessen the impact of market, price, and quality-related concerns. Having said that, this study's samples were somewhat small.

The study of the agricultural value chain in Northern Uganda was conducted by Dalipagic and Gabriel (2014). Both primary and secondary data were collected from the Acholisub region and the Langosub region. A

purposive sample strategy was used to analyse the outcome. The research found that rice may be a lucrative cash crop in the highland and lowland regions surveyed. It quickly proved difficult for the small staff to analyse so many value chains

6. RESEARCH GAP

The study ascertains the relationship of the various interferences in relation with value chain finance and the effectiveness of the value chain. Other researcher will have advantage from this study to use itas a reference to take on related studies and will attend as filling some of the gaps that have been perceived in previously related researches.

7. RESEARCH METHODOLOGY

The present research study is conducted to analyze the efficacy of the agricultural value chain in paddy cultivation. Further, this study analyzes the impact of financial services in value chain of paddy cultivation, processing, and marketing. In this study, the methodology adopted is a random sampling technique based on a well-structured questionnaire and quantitative research. Farmers, input providers, purchasers, government and cooperative organisations, and other value chain players were surveyed using a questionnaire. In the Palakkad District of Kerala, 350 people were surveyed for this study. Forty percent of Kerala's total paddy acreage is located in the Palakkad, making it the state's rice granary. We have gathered information from both primary and secondary sources. Consequently, this study chose 123 farmers, 67 input providers, 75 governments and cooperative organisations, 59 purchasers, and 26 stakeholders in the value chain. A descriptive statistical analysis was employed to determine the distribution of respondents' replies from the study questionnaire and to provide a detailed description of the variables that were researched. A few basic statistical procedures were utilised to examine the data interpretation, including percentage analysis, mean, and standard deviations.

Even when working with a population that is unknown, researchers can still achieve decent results using random sampling approaches. The key points that back up its assertions are highlighted in this synopsis. Because of random selection, every individual in the population has an equal opportunity to be included. This avoids the researcher's potential for bias caused by picking participants at random out of convenience or preconceived notions. The random sample is a little representation of the whole population. By looking at the sample, the researcher may make better informed judgements about the larger group.
Making an extensive list (frame) that as nearly as possible represents the entire population is crucial in this situation. This frame could be a phone book, membership list, internet database, or even actual places where people congregate.

8. OBJECTIVES OF THE STUDY

- To analysis of the efficacy of AVCF.
- To identify the Influencing factors for profitability of farmers.
- To examine the impact of financial services on the value chain of paddy and its marketing benefits.

9. HYPOTHESIS

Hypothesis 1: AVCF has positive impact on productivity of paddy cultivation

Hypothesis 2: Farmers ability to manage risk have significant impact on their profitability

Hypothesis 3: Agricultural productivity significantly affects the profitability of farmers with high productivity leads to increase profitability

Hypothesis 4: The availability of financial services positively impacts the value chain of paddy.

Hypothesis 5: Adoption of financial services in paddy value chain leads to enhance market access, facilitating better marketing opportunities and higher market price.

Verification: Using the research methods described in the article, each hypothesis was tested as follows:

1. Hypothesis 1: Information on the productivity of paddy agriculture was gathered from respondents who were involved in the agricultural value chain. In order to confirm this hypothesis, measures like yield per hectare or output per unit of input may have been included in this data. The researcher then used statistical techniques like regression analysis and correlation analysis to examine the association between paddy yield and the availability and use of Agricultural Value Chain Finance (AVCF). The hypothesis would be supported by a substantial regression coefficient or a positive correlation.
2. Hypothesis 2: The researcher may have gathered information on different risk management techniques used by farmers, such as crop insurance, crop diversification, or application of hedging techniques. In order to evaluate this hypothesis, it would have been possible to evaluate farmers' profitability using financial performance metrics like net income or return on investment. The association between risk management strategies and profitability may have been investigated using statistical analysis techniques like regression analysis or t-tests. A strong correlation would lend credence to the theory.

Hypothesis 3: The researcher most likely gathered information from the respondents on profitability metrics like net income as well as agricultural productivity metrics like yield per hectare. A statistical analysis, like regression or correlation analysis, would have been performed to look at the connection between profitability and agricultural productivity. The hypothesis would be supported by a substantial regression coefficient or a positive correlation.

Hypothesis 4: The researcher may have gathered information on the availability and use of financial services, such as credit, insurance, and investment opportunities, along the paddy value chain. In order

to test this hypothesis, use statistical analysis techniques, the effect of financial services on different value chain segments, like production, processing, and marketing, might have been evaluated. The hypothesis would be supported if there was a positive correlation between value chain performance and financial services availability.

Hypothesis 5: It is probable that the researcher gathered information from the participants in the paddy value chain regarding market accessibility, marketing prospects, and market rates. It would have been possible to investigate the association between the uptake of financial services and various market- related characteristics using statistical analysis techniques like regression analysis or t-tests. The hypothesis would be supported by a significant link showing better market access, opportunities, or prices related to the uptake of financial services. With the use of pertinent data collection and suitable statistical analysis tools, the researcher was able to test each hypothesis and make inferences based on the study's findings.ANALYSIS

1. The demographic characteristics of the respondents was shown in table 1,

Table 1: Demographic analysis

Items	Unit	Parameters	Farmer	Input suppliers	Government and cooperative agencies	Buyers	Stakeholders
Age	Years	Numbers	52.3	48.4	49.7	40.3	39.8
Gender	Number	Male	97	51	54	49	24
		Female	26	16	21	10	2

Educatio n	Schoolin g years	Numbers	5.4	9.1	6.2	5.8	6.3
Work experien ce		Numbers	29.1	14.7	16.5	17.6	17.9
Farm size	ha	Numbers	3.8	-	-	-	-
nall farm size	≤ 2.02 ha	Numbers	47	-	-	-	-
lium farm size	> 2.02 ha and ≤ 4.05 ha	Numbers	49	-	-	-	-
Large farm size	> 4.05 ha	Numbers	38	-	-	-	-
Yield of paddy	kg/ha	Numbers	4125.1 4	-	-	-	-

Table 1 shows the demographic information of the respondents, including their age, gender, education level, years of work experience, farm size, and paddy output. In this case, we figured out the responder demographic's mean, minimum, and maximum values. In an age category, the farmers achieved the highest mean value i.e. 52.3. Comparing the gender, the males were high in all categories compared to females. Further, in the analysis of the education of respondents, the input suppliers achieved the highest mean value which is 9.1; whereas, the farmers achieved the lowest mean value i.e. 5.4. However, the farmer achieved the highest mean value in working experiences among the other categories of respondents. Here, the majority of the farmers had a medium size farm and the achieved yield of paddy was 4125.14 and the minimum and maximum values are 613.24 and 5739.10 respectively.

2. Efficacy of AVCF

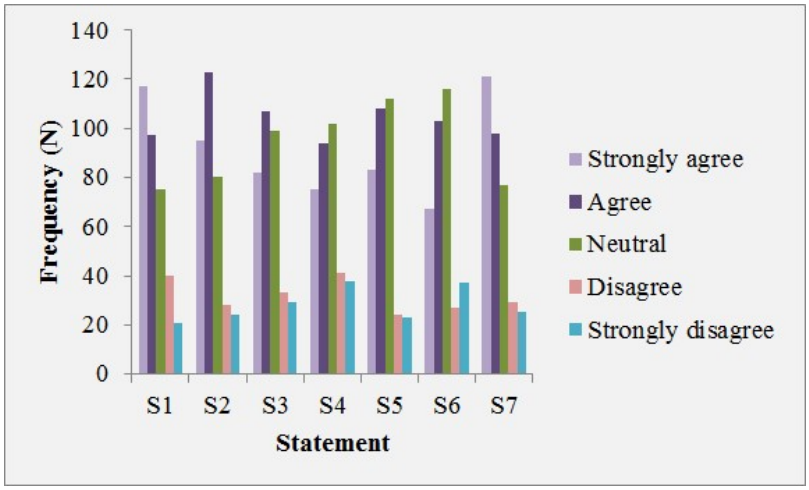
Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
S1-Growth prospects of Value Chain	117	97	75	40	21
S2-Improve agricultural productivity	95	123	80	28	24
S3-Improve agricultural assets	82	107	99	33	29
S4-Enhance or create capabilities and skills	75	94	102	41	38

S5-Increase trad ed volume of goods	83	108	112	24	23
S6-Potential for impact on vulnerable groups	67	103	116	27	37
S7-Lower agricultur al costs and financing risks	121	98	77	29	25

Table 2: Analysis of the efficacy of AVCF

Using a 5-point Likert scale ranging from "Strongly agree to strongly disagree" (Wiesner, 2019), Table 2 displays the results of the AVCF effectiveness studies. The statement "Lower agricultural costs and financing risks" was acquired with a score of 121, as most respondents strongly agreed with it. The phrase "Improve Agricultural Productivity" was also agreed upon by the majority of responders (123). After that, when asked about the "Potential for impact on vulnerable groups," 116 people said that they did not care either way. Out of all the statements, "Enhance or create capabilities and skills" had the largest number of respondents who disagreed with it (41) and those who strongly disagreed with it (38). The effectiveness of AVCF was illustrated graphically in figure 2.

Figure 2: Graphical representation of the effectiveness of AVCF



3. Influencing factors of profitability of farmers

Table 3: Analysis of Factors Influencing of Profits of Farmers

Variables	Coef.	t-value	Sig.
Constant	78.12	1.44	0.213ns

Difficult transportation (1 = yes, 0 = no)	-1.87	-0.082	0.955ns
Flooding (1 = yes, 0 = no)	-97.13	-5.123	0.000***
Poor extension services (1 = yes, 0 = no)	-9.78	-0.458	0.675ns
Pests and diseases infestation (1 = yes, 0 = no)	-49.31	-2.170	0.038**
Uneven rain during production period (1 = yes, 0 = no)	-42.09	-2.134	0.041**
	R^2	0.524	0.000***
	Adj.R^2	0.482	
	F-value	13.97	

ns= not significant, **= 5% significant, ***=1% significant.

The analysed influencing factors of the profitability of the farmer were presented in Table 3. This section measures the coefficient, t-value, and significant value of the specified variables. In comparison to all other variables, inundation exhibited the highest level of significance, with coefficient and t-values of -97.13 and -5.123, respectively. The second highest level of significance was attained by Uneven rain during the production period, with a value of 0.041**, followed by Pests and diseases infestation (0.038**). Additionally, the adjusted R2, F-value, and R2 values for the specified variables are 13.97, 0.482, and 0.524, respectively.

4. Impact of financial services on the value chain

In this section, the impact of financial services in the VCF with the p-value of the chi-square test, and AVCF and its marketing benefits of farmers, suppliers, government and cooperative agencies, buyers, and stakeholders have been analyzed and discussed.

Table 4: Analysis of the impact of financial services in the value chain

	Dependent variables	p-value of Chi-square test		
		Category		
		Asset based	Group Collateral	Grants / Subsidies
Impact of financial services in the value chain	Next stage processing or retail	0.64	0.164	0.059
	Stage of Intervention	0.21	0.613	0.003
	Ease of Doing business	0.12	0.35	0.275
	Source of Funds	0.13	0.223	0.004
	Global Competitiveness Index	0.68	0.152	0.554
	Product Group	0.87	0.093	0.095

	End Market	0.5	0.678	0.083
	Perishable/durable goods	0.26	0.024	0.751

Table 4 displays the impact of financial services in the value chain by analyzing the p-value of the Chi-square test. Here, the variables of next stage processing or retail, stage of intervention, ease of doing business, source of funds, global competitiveness index, product group, end market, and perishable/durable goods were taken for the analysis. Then, the asset- based, group collateral, and grants/subsidies were calculated for the selected variables. In an asset-based, the variables of the product group obtained the highest value (0.869). Furthermore, in the group collateral, and grants/subsidies, the variables of end market and perishable/durable goods achieved the highest values i.e. 0.678, and 0.751 respectively, whereas the stage of intervention obtained the lowest value of 0.003.

5. AVCF and its marketing benefits

Table 5: Analysis of marketing benefits of AVCF

	Cost (MMK/kg)	Revenue (MMK/kg)	Profit (MMK/kg)	Margin (MMK/kg)

Actor	Unit Total Cost	Unit Added Cost	Unit Price	Unit Marketing Profit	% Total Marketing Profit	Unit Marketing Margin	% Total Marketing Margin
Farmers	217	217	243	28	9.3	243	45.3
suppliers	243	3	247	7	1.9	7	1.5
Government and cooperative agencies	260	45	416	149	51.4	169	31.4
Buyers	418	18	456	40	12.8	58	9.2
Stakeholders	467	18	543	85	24.6	91	12.6

USD 1 = MMK 1,350

Table 5 represents the analysis of the marketing benefits of AVCF with the actors like farmers, suppliers, government and cooperative agencies, buyers, and stakeholders. Here, the profits and margins of paddy cultivation and marketing were calculated for domestic consumption. Further, the total marketing profit was calculated by the marketing profit per unit of each actor by the total marketing profit per unit of all actors with 100%. Here, government and cooperative agencies obtained the highest percentage i.e. 51.4. Thereafter, in the margin marketing, the total marketing margin farmers obtained the highest percentage, which are 45.3.

10. FINDING

This present study was conducted to analyze the beneficial impact of AVCF on paddy cultivation in the Palakkad District of Kerala.

This study concluded that most people strongly agreed with the efficacy of AVCF of lower agricultural costs and financing risks (121).

Further, by analyzing the influencing factor of profitability of farmers, the variable flooding achieved the highest significance level (0.000***) and its t-statistics is -5.123. It also revealed that in the impact of financial services, the variable of product group obtained the highest asset based value i.e. 0.869. whereas the stage of intervention obtained the lowest value of 0.003.

Gross marketing margin across the global value chain is very wide and is not equally distributed among the different actors.

In the total marketing margin, farmers obtained the highest percentage, which is 45.3

11. SUGGESTIONS

1. There are notable differences in respondents' demographics, with input providers having the highest mean education level (9.1 years) and farmers having the highest mean age (52.3 years) according to the study. The majority of farmers operate medium-sized farms, producing 4125.14 kg/ha on average. To enable customized outreach and support initiatives, look into more about how demographic variables affect and how various stakeholder groups perceive and use agricultural value chain finance (AVCF). Programs for the AVCF that are specifically designed to meet the needs of a given population can be implemented in a more efficient and inclusive manner, which would promote sustainable agricultural growth in Kerala.

2. The majority of respondents (121) strongly believe that AVCF is effective in reducing finance risks and agricultural expenses; however, responses on factors pertaining to improve capacities and skills are not as consistent. Undertake qualitative investigations to investigate subtle causes of varying opinions regarding the effectiveness of AVCF, supporting the creation of focused training and capacity-building programs. Specific capacity-building initiatives that cater to the various requirements and concerns of stakeholders augment the efficiency and uptake of AVCF techniques in paddy farming.
3. The most important factor affecting farmers' profitability is flood (p-value = 0.000***), which is followed by insect and disease infestation and uneven rain during the production season. Implement resilience-building techniques to lessen the negative impact of environmental conditions on farmers' profitability, such as enhanced irrigation systems and pest management plans. In paddy farming communities, more stable and sustainable livelihoods are ensured by strengthening farmers' resistance to environmental problems through tailored interventions.
4. The impact of financial services differs depending on where in the value chain the stage of intervention is located (0.003), and the product group receives the highest asset-based value (0.869). In order to encourage more effective resource allocation and value creation, financial interventions should be specifically designed to address demands and constraints at various levels of the agricultural value chain. Financial interventions that are specifically designed to address each stage of the value chain maximize resource usage and promote increased productivity and profitability in paddy farming.
5. Farmers receive the largest portion of the marketing margin overall (45.3%), illustrating differences in how profits are distributed among value chain participants. In order to empower small-scale farmers and guarantee fair and inclusive involvement in the value chain, implement equitable profit-sharing arrangements and capacity-building activities. Fair profit-sharing arrangements promote social justice and economic viability, resulting in a more robust and inclusive agricultural value chain in Kerala.

12. FUTURE RESEARCH SCOPE

Research Opportunities on "Beneficial Impact of Agricultural Value Chain Finance of Paddy Cultivation in Kerala".

1. A longitudinal investigation to evaluate sustainability to determine if the advantages of Agricultural Value Chain Finance (AVCF) interventions on paddy farming can be sustained over the long run and with resilience, conduct a longitudinal study. Examine how the effectiveness of AVCF efforts is affected over time by external factors such market dynamics, governmental changes, and climate change

2. Analyzing Stakeholder Viewpoints Qualitatively Examine stakeholders' opinions on the effectiveness and impact of AVCF in further detail by using qualitative research techniques such focus groups, interviews, and case studies. Gain a deeper understanding of the experiences, difficulties, and suggestions made by stakeholders for improving AVCF interventions in the Kerala's paddy environment.Comparative Analysis across Regions: To determine variations in the influence of AVCF on paddy farming, conduct comparative research across Kerala's or other states' various regions. Determine the region-specific elements that affect the efficacy of AVCF interventions, then adjust tactics to maximize results.
3. Policy Evaluation and Recommendations: To find possibilities and gaps for improving the impact of AVCF, evaluate current agricultural policies and financial support systems connected to Kerala's paddy farming. Offer policymakers evidence-based suggestions with the goal of encouraging equitable and sustainable agricultural growth through focused AVCF initiatives.
4. Gender Dynamics in AVCF Impact: Examine how AVCF affects rice farming from a gender perspective, taking into account the differences in results, access, and involvement that male and female farmers encounter. Examine how AVCF programs might incorporate gender-sensitive strategies to empower women farmers in Kerala and advance gender parity.

Through pursuing these research routes, academics and industry professionals can enhance their comprehension of the advantageous effects of AVCF on Keralan paddy production and aid in the creation of evidence-based plans for the region's sustainable agricultural growth and poverty alleviation.

13. CONCLUSIONS

The research findings demonstrate that agricultural value chain finance has had a beneficial impact on paddy cultivation in Kerala. It has improved access to finance, enhanced productivity, reduced dependency on informal credit, strengthened market linkages, mitigated risks, and uplifted farmers' livelihoods. These positive outcomes highlight the importance of continued support and investment in value chain finance initiatives to sustain and further enhance the agricultural sector in Kerala. Policymakers, financial institutions, and other stakeholders should collaborate to ensure the availability of affordable and accessible finance throughout the paddy value chain, fostering sustainable agricultural development in the region.

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