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A mental model approach to farmer distress among small and marginal landholders of Kerala

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Abstract

The study was conducted in the districts of Idukki and Palakkad, Kerala in 2025 with the objective of identifying factors contributing to distress among small and marginal farmers. A qualitative research design was adopted, employing focus group discussions (FGDs) to extract farmer perceptions. Twenty key informants each were purposively selected from two panchayats in each district, and their responses were cross-validated with extension personnel for developing the model. The mental model approach, based on the information-decision framework, was used to organize farmer perceptions into six domains: stress factors, decision-making processes, constraints, outcomes, and adaptation and institutional interventions. The results showed that drought and wild animal conflict were perceived as the most critical stressors, while pest and disease incidence and low market prices further aggravated distress among farmers of the two districts. Farmers' decisions were found to be largely reactive, focusing on short-term coping strategies such as crop switching or input reduction, while long-term adaptive strategies were less common. Constraints such as limited financial literacy, dependence on informal credit, and inadequate awareness of schemes restricted informed decision-making. The outcomes of distress included both economic losses, such as indebtedness & reduced investment, and psychological consequences, including anxiety and loss of interest in farming. Adaptation strategies like crop diversification and community labour involvement were observed, but institutional support such as subsidies, crop insurance, and farmer producer organizations remained underutilized. The study concludes that farmer distress is multidimensional, requiring integrated interventions addressing environmental, economic, institutional, and psychosocial dimensions.

Keywords: Farmer distress, small and marginal farmers, mental model, focus group discussion, coping strategies

Introduction

Farmer distress refers to the combined economic, social, and political pressures experienced by farmers and rural households, arising from unstable yields, volatile market prices, rising input costs, indebtedness, and insufficient access to institutional credit, markets, and infrastructure. Distress is recognized as a pervasive part of human life, influencing individuals, families, and communities, and the present era has even been described as the "age of anxiety, distress and depression" because of the intensity of such pressures (Pestonjee, 1992; Horwitz, 2010) [11, 6]. Within agriculture, a fundamental dimension of distress is persistent income inequality. Small and marginal farmers, who form the backbone of Indian agriculture, are disproportionately disadvantaged in access to technology, credit, and remunerative markets, which results in lower incomes and productivity when compared with larger landholders and commercial agribusinesses.

Distress is multidimensional in nature, affecting cognitive, emotional, behavioural, and physical well-being. Economic factors include high indebtedness, crop failure, unviable landholdings, increasing costs of cultivation, and falling profits (Nair & Ramakumar, 2007) [10]. Social causes extend to stigma associated with debt, harassment from moneylenders, legal disputes, social obligations, and in some cases dependence on intoxicants (Talule, 2013; Shivaji *et al*., 2019) [17, 16]. Psychological stressors such as depression, strained family relationships, and disputes over property exacerbate the situation. Together, these factors erode household security and intensify agrarian vulnerability (Hoang *et al*., 2020) [5].

Kerala, despite its achievements in social development, is facing a severe agrarian crisis. Declines in crop prices, stagnating yields, diminishing soil fertility, scarcity of irrigation water, and recurrent pest and disease outbreaks have reduced the viability of farming. Climatic variability, particularly erratic rainfall and rising temperatures, has added to the risks (Bao *et al*., 2010; Sherin & Haseena, 2023) [1, 15]. These conditions have led to increasing indebtedness, financial insecurity, and a rise in farmer suicides. Previous studies in Kerala and elsewhere confirm that agrarian distress is not confined to fluctuations in crop output or prices, but is deeply embedded in structural weaknesses such as erosion of livelihood security, limited safety nets, and declining adaptive capacity (Nair & Menon, 2007; Reddy, 2021; Sherin & Haseena, 2023) [9, 13, 15].

A more comprehensive perspective is therefore required to examine the nature of farmer distress. Approaches that rely solely on economic indicators fail to capture the psychological and social dimensions of the problem. Qualitative frameworks that focus on farmer perceptions and lived experiences provide valuable insights into how different stressors interact and how farmers attempt to cope with them. Such perspectives enable the identification of critical challenges, coping mechanisms, and institutional supports that influence the capacity of farming households to manage adversity.

The present study was undertaken to examine the factors contributing to distress among small and marginal farmers in Kerala. By mapping their cognitive frameworks and perceptions of causes and coping strategies, the study seeks to provide insights into the multidimensional nature of distress. The justification for this approach lies in the recognition that policy interventions must be grounded in the lived experiences of farmers if they are to reduce vulnerability, enhance resilience, and strengthen the sustainability of Kerala's agrarian sector.

Methodology

The study was conducted among small and marginal farmers in two agrarian districts of Kerala, namely Idukki and Palakkad, which were purposively selected on the basis of their high concentration of cultivators dependent on agriculture (GOK, 2023) [4]. Within each district, one block was identified, Nedumkandam in Idukki and Mannarkkad in Palakkad, and from each block two panchayats were chosen based on the largest number of small and marginal farmers. A multi-stage random sampling method was employed for the selection of respondents. From these panchayats, twenty key informants were purposively selected as participants, ensuring that all respondents were primarily dependent on agriculture and had experienced distress during the previous two to three years. This process ensured that the respondents were sufficiently homogeneous to promote meaningful discussion, while also diverse enough to capture variation in perceptions. In addition to farmers, twenty extension personnel from each district were included to provide triangulation of perspectives and enhance the reliability of the findings. In addition, twenty extension functionaries from each district were randomly selected, thus constituting a supplementary sample of forty whose responses were used for validation and cross-checking.

The mental model approach (fig. 1) was used to capture and represent the cognitive frameworks farmers employed in understanding the causes of distress and coping mechanisms. A structured instrument was developed based on the information-decision framework (Richardson *et al*., 1994; Reddy *et al*., 2021) [14, 13], which consisted of six domains: stress factors, decision-making processes, constraints in decision-making, outcomes of distress, and adaptation strategies & institutional interventions. Farmers were encouraged to describe how these domains interacted, linking stressors with decisions, constraints, and resulting outcomes. The narratives were coded and analysed through qualitative content analysis, which facilitated the construction of cognitive maps representing farmers' mental models. Cross-validation was achieved by comparing farmer responses with the perspectives of extension personnel, thereby reducing subjectivity and enhancing validity.

The induction of mental models was conducted through focus group discussions (FGDs), a widely applied technique for exploring shared perspectives in a participatory environment (Morgan, 1996; Krueger & Casey, 2000) [8, 7]. Separate FGDs were organized in each panchayat, each comprising twenty farmer participants. The discussions were held in familiar community settings, which helped create a relaxed atmosphere conducive to open sharing. A flexible interview guide was used to facilitate dialogue across the six domains of the mental model. As recommended in FGD literature, questions were posed in an open and flexible manner to stimulate interaction, encourage participants to share experiences, and allow common as well as divergent perspectives to emerge (Onwuegbuzie *et al*., 2009; Tümen-Akyıldız & Ahmed, 2021) [20, 18]. Each discussion lasted approximately one and a half hours, and detailed field notes were recorded contemporaneously. The responses obtained during FGDs were documented through detailed field notes and subsequently analysed using qualitative content analysis (Powell & Single, 1996; Cameron, 2010; Focus Groups, 2017) [12, 2, 3], enabling the identification of recurring patterns in stress factors, coping strategies, and institutional supports. These themes were synthesized into cognitive maps that represented the farmers' mental models of distress and resilience. The findings from FGDs were cross-checked with the survey results and triangulated with the views of extension personnel to strengthen credibility and trustworthiness. Ethical safeguards were followed, informed consent was obtained, confidentiality of responses was assured, and farmers exhibiting acute psychological stress were sensitively referred to local extension and welfare officers for further support. This methodological approach generated rich qualitative data and enabled the reconstruction of the shared mental models of distress and coping strategies among small and marginal farmers in Kerala.

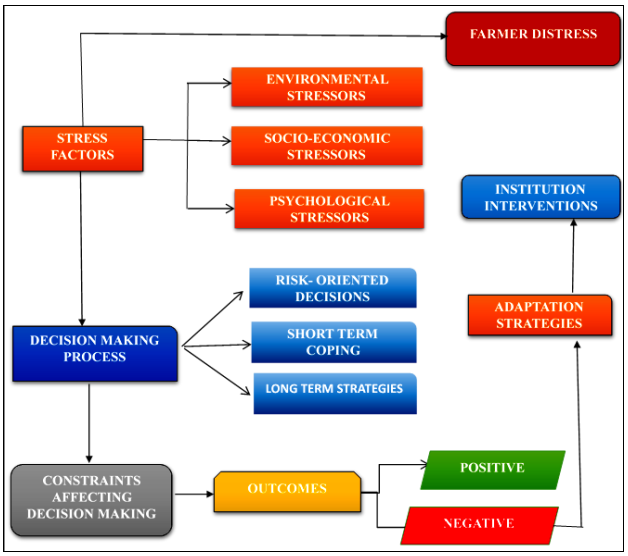

Fig 1: Mental model of farmer distress operationalized through six thematic domains

Results

Stress factors in (fig. 2 & fig.3) showed clear patterns across Idukki and Palakkad. Drought and wild animal conflict were

reported by 100% of farmers and extension personnel in both districts, making them the most severe environmental triggers. Pest and disease attacks affected 85% of farmers in Idukki and 70% in Palakkad, while 70-85% of respondents across groups identified low crop prices and poor market prices as persistent economic stressors. High input costs were reported by 80-85% of farmers and validated by 85% of extension personnel across districts. Psychological stress indicators such as moodiness, tension, and headaches were recorded among 60-80% of respondents, while depression was noted by 60% of farmers in Palakkad.

The decision-making processes of farmers were shaped by these stress factors and were strongly risk-oriented. Farmers' decision pathways (fig. 4 & fig. 5) were predominantly short-term and risk-oriented. Constant weighing of risks was reported by 60-65% of farmers in Idukki and only 40% in Palakkad, while 65% of extension personnel in Idukki and 40% in Palakkad confirmed this trend. Borrowing from moneylenders was common in both districts, reported by 95% of farmers in Idukki and 85% in Palakkad, with 80-95% of extension personnel concurring. Crop switching was practiced by 95% of farmers in Idukki and Palakkad, and confirmed by 95-100% of extension personnel. Changing crop patterns due to stress was universally acknowledged, with 100% of all respondent reporting this behaviour.

Constraints in decision-making were widely acknowledged. Farmers frequently (fig. 6& fig. 7) cited limited financial literacy and inadequate access to timely inputs. Limited financial literacy was reported by 100% of farmers in Idukki, 95% of extension personnel, and 90-100% of respondents in Palakkad. Inadequate access to inputs was highlighted by 100% of farmers in Idukki, 100% of farmers in Palakkad, and 80-95% of extension personnel across districts. Poor awareness of schemes affected 60-75% of farmers, while knowledge gaps in modern technologies were reported by 100% of farmers in both districts. Rising indebtedness or financial barriers were cited by 85-90% of farmers and 80-85% of extension personnel.

The outcomes of distress were described (fig. 8 & fig. 9) in both negative and positive terms. Among the positive outcomes, crop diversification and community labour support were reported by 100% of farmers in both districts, and by 100% of extension personnel in Idukki. Improved irrigation and water use efficiency was adopted by 95% of farmers in Idukki, but only 65% in Palakkad. Better utilization of government schemes was observed among 70-75% of farmers. Negative outcomes were more pronounced. Indebtedness was experienced by 70-90% of farmers, with 100% of extension personnel in Palakkad confirming the trend. Reduced farm investment was reported by 95% of farmers in Idukki, and 85% in Palakkad. Crop failure was experienced by 90-100% of farmers, while stress, anxiety, and emotional strain were noted by 75-100% across districts.

Adaptation strategies were observed (Fig.10& fig. 11).as weak yet essential responses that farmers adopted to cope with distress. Borrowing from moneylenders or financial institutions was reported by 95% of farmers and extension personnel in Idukki, and by 75% of respondents in Palakkad. Selling assets was practiced by 80% of farmers in Idukki, and 75-80% in Palakkad. Switching to low-water-demanding crops and following indigenous agricultural practices were universally adopted, with 100% of farmers in both districts and 90-100% of extension personnel reporting these strategies. Working in MGNREGP was reported by 95% of farmers in both districts, and by 90-95% of extension personnel. Non-farm employment was adopted by 90% of farmers in Idukki, and 90% of extension personnel, while 75% of farmers in Palakkad reported the same.

Institutional support utilization (fig. 12 & fig. 13) remained low. Subsidies and financial assistance reached 65% of farmers in Idukki and 75% in Palakkad, while crop insurance schemes were accessed by only 25-50% across groups. Minimum support price (MSP) and procurement benefits were reported by 90-100% of extension personnel, but only 65-90% of farmers. Awareness and capacity-building schemes were used by 60% of farmers in Idukki and 95% in Palakkad. Participation in community-based organizations such as FPOs and Kudumbashree JLGs was minimal, with only 60-65% of farmers in Idukki and 100% in Palakkad reporting involvement. Extension and support services were accessed by 60-95% of respondents, but consistent usage remained low

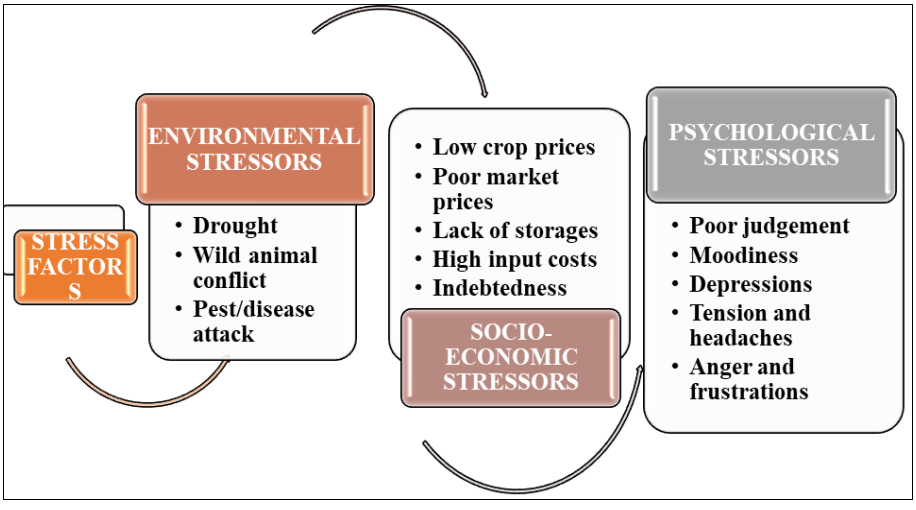

Fig 2: Categorization of stress factors leading to farmer distress

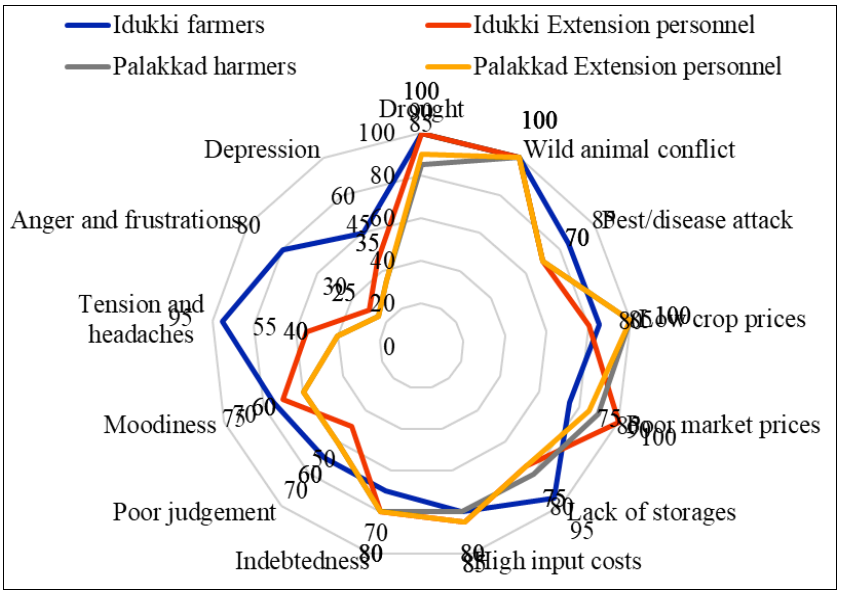

Fig 3: Distribution of stress factors severity identified in the farmer distress mental model

RISK-ORENTED DECISIONS	SHORT TERM DECISIONS	LONG TERM DECISIONDS
• Constant weighing of risks • Investing in inputs • Borrowing money from moneylenders/financial institutions • Switching crops • Pest/disease management	• Changing crop patterns • Reduction in cropped area • Switching to low water demand crops • Animal deterrents (not effective) • Discontinuance of cultivation in wild animal conflict areas • Adoption of ITKs • Use of emergency pesticide sprays/field sanitations • Borrowing money from formal/informal sources • Shift to short duration or high value crops	• Crop diversification • Adoption of climate resilient crops • Shifting to long duration perennial crops • Strengthening FPOs • Adoption of drought resistant varieties • Integrated pest management • Farmer cooperative storage units • Formation of farmer self-help or peer groups • Value addition and branding

Fig 4: Farmers'decision pathways under stressful situation.

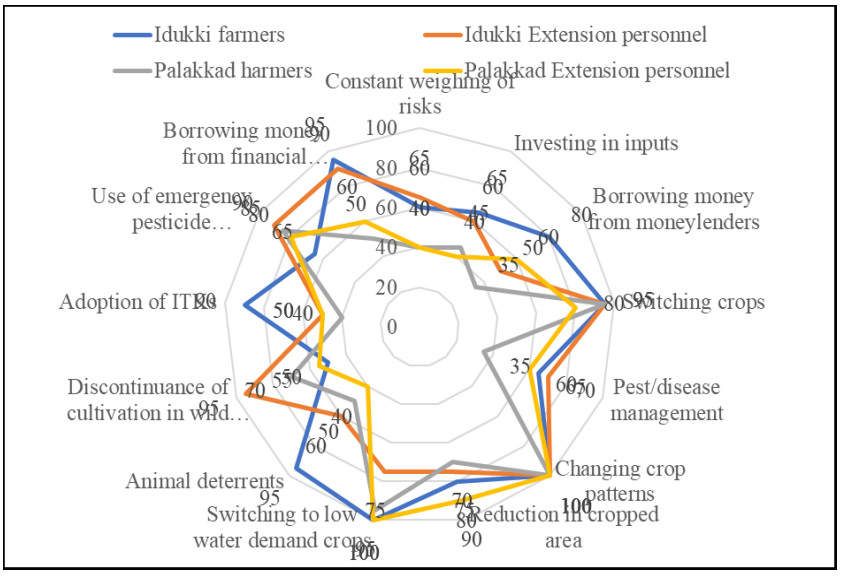

Fig 5: Comparison of farmer and extension personnel agreement levels on decision making process of farmers under stressful situations.

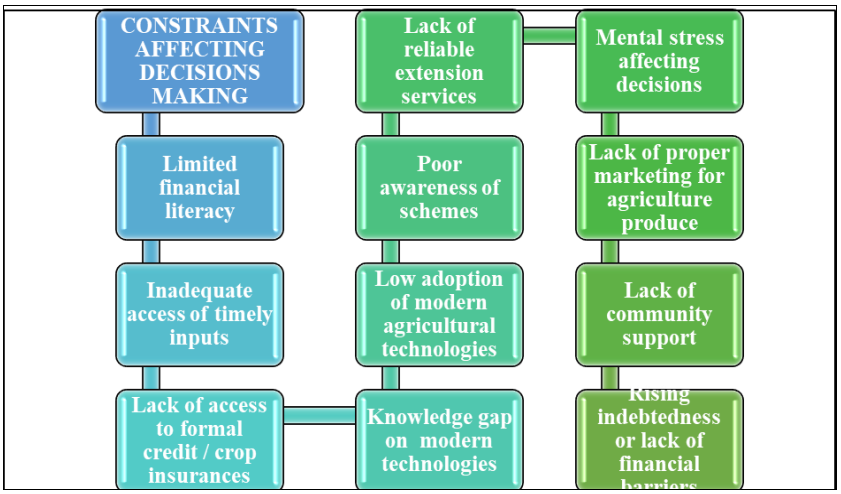

Fig 6: Major constraints affecting farmers' decision-making process

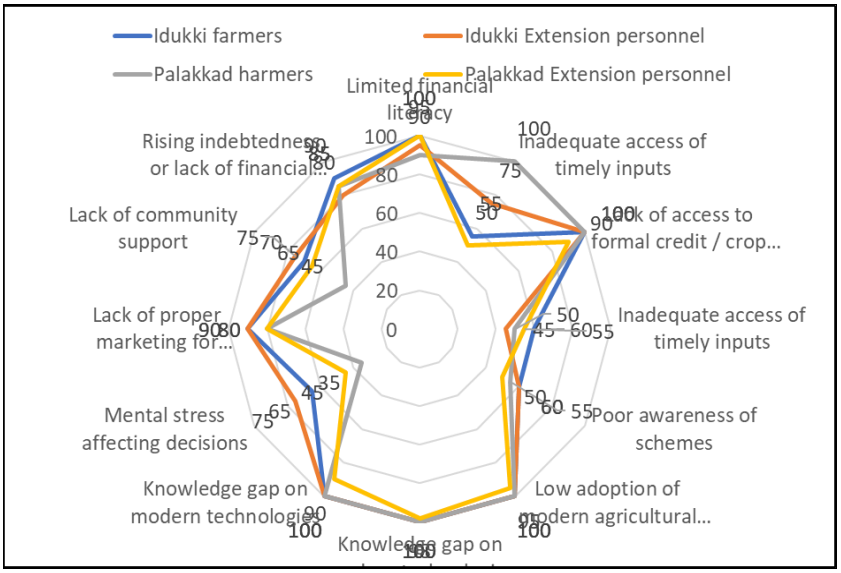

Fig 7: Quantitative validation of major constraints affecting decision-making through percentage responses from farmers and extension personnel.

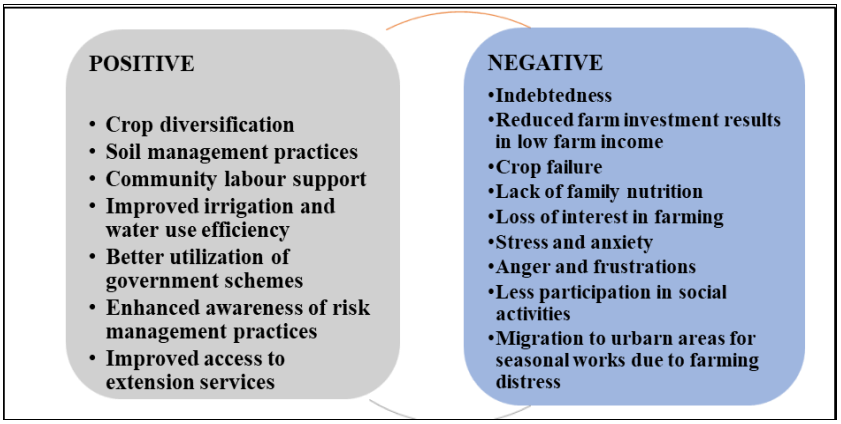

Fig 8: Positive and negative outcomes of farmer distress.

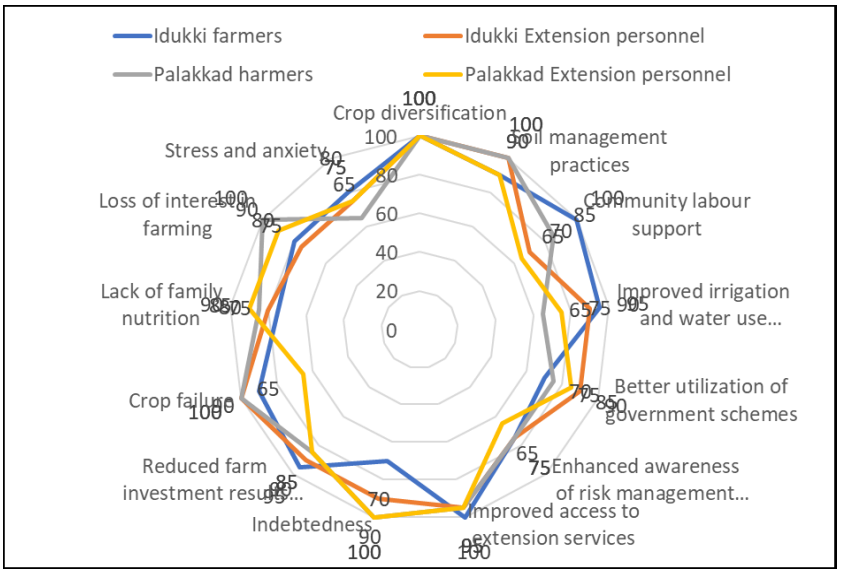

Fig 9: Distribution of positive and negative outcomes of farmer distress, validated by extension personnel.

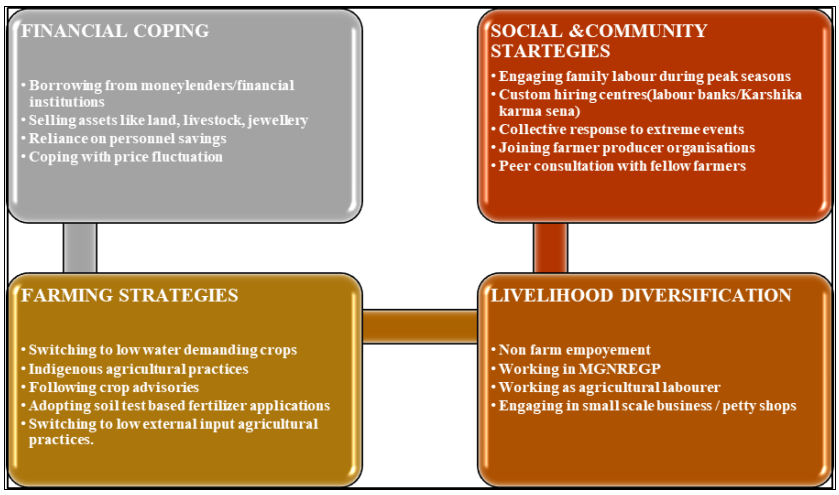

Fig 10: Adaptation strategies adopted by farmers' under distress conditions.

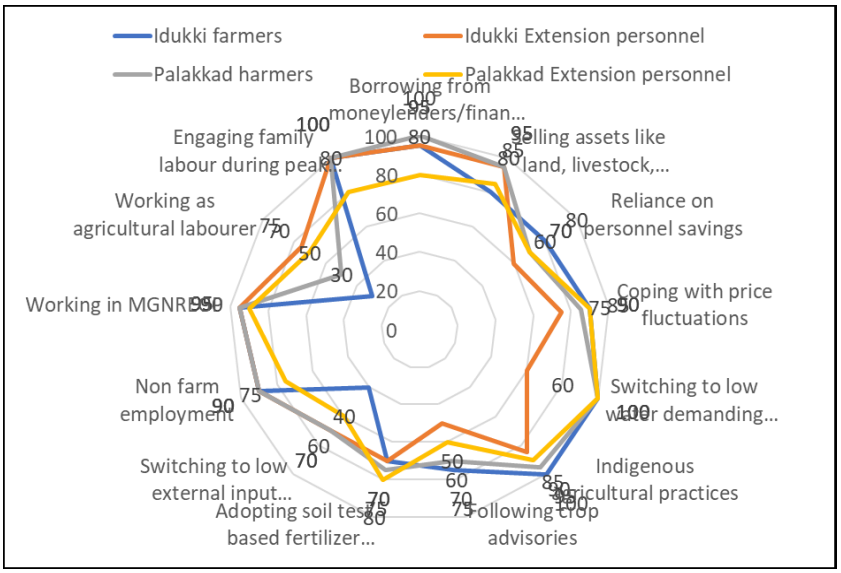

Fig 11: Quantitative validation of farmers' adaptation strategies of farmers under distress conditions, validated by extension personnel.

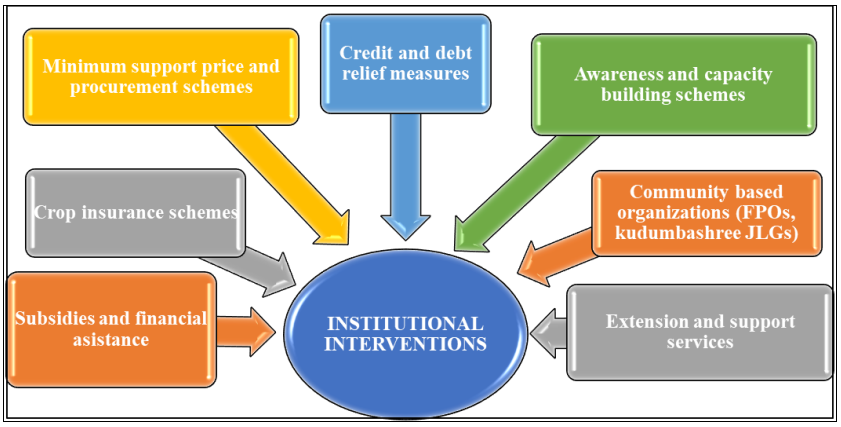

Fig 12: Institutional Interventions Supporting Farmers under Distress Condition.

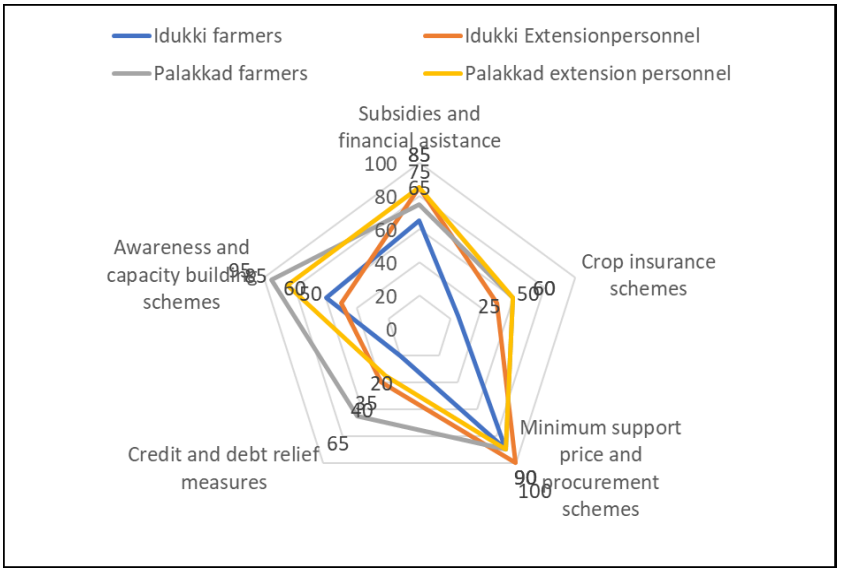

Fig 13: Comparative percentage responses of farmers and extension personnel on institutional interventions supporting farmers under distress conditions

Discussion

The findings of this study highlight that farmer distress in Kerala is a multidimensional phenomenon shaped by environmental, socio-economic, psychological, and institutional factors. The consistent identification of drought and wild animal conflict as severe stressors confirms earlier observations that climatic variability and ecological challenges remain among the most pressing risks for smallholders. Unlike flood-related damage, which farmers perceived as occasional, prolonged drought and recurring animal incursions directly threaten farm livelihoods and exacerbate insecurity.

The predominance of reactive decision-making in response to these pressures reflects broader patterns noted in farmer behaviour under uncertainty. Farmers prioritized immediate survival over long-term strategies, which explains their reliance on short-term coping mechanisms such as reducing input use or shifting to short-duration crops. This aligns with prior studies indicating that the absence of reliable institutional support discourages risk-taking and limits innovation.

Constraints identified in the discussions reveal structural weaknesses in the farming support system. Limited awareness of schemes, dependence on informal credit, and inadequate access to information reproduce a cycle of vulnerability. These findings are consistent with national-level research which emphasizes that lack of financial literacy and weak extension linkages hinder smallholder participation in formal institutions. Importantly, both farmers and extension personnel agreed that systemic delays and inefficiencies perpetuate low uptake of beneficial programs, reinforcing distress.

The outcomes of distress demonstrate the interconnection of economic and psychological dimensions. While indebtedness, reduced investment, and food insecurity represent economic consequences, the loss of interest in farming, stress, and anxiety highlight the psychosocial burden. This combination of economic and emotional strain supports the argument that farmer distress cannot be understood solely in financial terms but requires an integrated socio-psychological perspective.

Although some resilience strategies were evident, their effectiveness was limited. Diversification, community labour, and low-cost soil fertility practices provided partial relief, yet these were adopted unevenly and often without institutional reinforcement. The limited reach of subsidies, crop insurance, and price support policies underscores the gap between policy intent and ground realities. The partial

adoption of farmer producer organizations also reflects a missed opportunity to strengthen collective bargaining and reduce market-related vulnerabilities.

Overall, the evidence suggests that distress among small and marginal farmers in Kerala persists due to the interplay of high environmental and market risks, reactive decision-making, systemic constraints, and weak institutional interventions. These findings emphasize the need to reframe support systems so that they address not only economic risks but also psychological and social dimensions of vulnerability.

Conclusion

This study establishes that distress among small and marginal farmers in Kerala is driven by a combination of environmental stressors, socio-economic constraints, and weak institutional support. Drought, wild animal conflict, and low crop prices were identified as the most critical triggers, leading farmers to adopt largely reactive coping strategies. Constraints such as limited financial literacy, dependence on informal credit, and poor access to schemes restricted informed decision-making. The outcomes were reflected in both economic and psychological dimensions, including indebtedness, food insecurity, stress, and loss of interest in farming. Resilience was observed only where farmers pursued diversification, community cooperation, or low-cost practices, though such strategies remained partial and weakly supported. These findings underscore the urgent need for integrated interventions that combine climate adaptation, financial literacy, institutional efficiency, and psychosocial support to reduce distress and strengthen the resilience of vulnerable farming households.

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