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### Agrarian distress management among farmers of south Gujarat: Multidimensional assessment, district-level disparities and measurement reliability

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#### Abstract

Agrarian distress has emerged as a major challenge to the sustainability of farming systems in India, driven by climatic variability, economic instability and socio-psychological pressures. The present study was conducted in South Gujarat to assess the level of agrarian distress management among farmers using a structured and multidimensional approach. An ex-post facto research design was adopted and data were collected from 280 farmers selected through multistage random sampling across seven districts of South Gujarat. A well-structured and pre-tested interview schedule was used to measure ADM across six dimensions, namely preventive farm management, time management and organization, health and lifestyle coping, cognitive and emotional adjustment, social, communal and institutional support and diversion and spiritual coping. The findings revealed that a majority of farmers exhibited moderate to high levels of ADM, with stronger performance observed in time management and organization (88.50%) and health and lifestyle coping (85.31%). District-wise analysis indicated significant disparities, with Surat and Valsad districts showing higher ADM, while Narmada and Dangs recorded comparatively lower levels of ADM. The results highlight the influence of resource availability, institutional support and agro-ecological conditions on farmers' coping capacity. Reliability analysis indicated high internal consistency of the instrument, with a Cronbach's Alpha value of 0.901. Hotelling's  $T^2$  test confirmed the discriminating power of items, while the Intraclass Correlation Coefficient (ICC) demonstrated excellent reliability for the composite measure (0.901). The study concludes that farmers primarily rely on managerial and personal ADM strategies, with relatively lower dependence on institutional and social support systems. The findings emphasize the need for targeted, region-specific interventions, strengthened extension services and improved institutional mechanisms to enhance farmers' resilience and ensure sustainable agricultural livelihoods.

**Keywords:** Agrarian distress management, farmers, South Gujarat, reliability, Cronbach's alpha

#### Introduction

Agriculture remains a cornerstone of the Indian economy, with nearly 60 per cent of the population depending on it for their livelihood. However it is increasingly exposed to multiple challenges such as climate change, market volatility, resource constraints and declining farm profitability, which threaten livelihood security and sustainability (Raghavendra *et al.*, 2024; Gamit and Vinaya, 2024; Gamit and Vinaya, 2022) <sup>[14, 10, 9]</sup>. The inherent vulnerability of Indian agriculture to uncontrollable external forces renders it highly susceptible to production and income uncertainties (Kumar and Karthikeyan, 2017). Agrarian distress has emerged as a critical issue, driven by crop failures, natural calamities, income instability,

indebtedness and limited access to institutional support systems (Mishra, 2007; Deshpande and Prabhu, 2005) <sup>[12, 8]</sup>. The growing frequency and intensity of extreme weather events, as highlighted by the Intergovernmental Panel on Climate Change have further intensified risks in agriculture. Along with economic stress, farmers also experience psychological and social pressures, making agrarian distress a multidimensional phenomenon.

In this context, agrarian distress management has gained importance as it reflects farmers' ability to cope with and adapt to diverse stressors. The present study conceptualizes ADM as a multidimensional construct encompassing six key dimensions: preventive farm management, time management and organization, health and lifestyle coping,

cognitive and emotional adjustment, social, communal and institutional support and diversion and spiritual coping. These dimensions collectively represent behavioural, psychological, organizational and social strategies adopted by farmers to mitigate distress and sustain their livelihoods. Regionally, Gujarat is increasingly vulnerable to climate variability due to rising temperatures of the Arabian Sea, resulting in erratic rainfall and higher humidity in coastal areas. Environmental degradation, including declining forest cover reported by the Forest Survey of India (Anonymous, 2025b) <sup>[6]</sup>, has further intensified climatic instability. South Gujarat, in particular, faces multiple agro-ecological challenges such as cyclones, flooding, salinity and soil degradation, which adversely affect agricultural productivity (Patil *et al.*, 2023) <sup>[13]</sup>. Recurrent extreme events, including excess rainfall, unseasonal rains and Cyclone Biparjoy, have resulted in significant crop losses and economic damage (Anonymous, 2020; 2023a; 2023b) <sup>[1, 2, 3]</sup>. Recent prolonged rainfall leading to “leelo dukaal” (“green famine,” a condition of crop damage due to excess rainfall) conditions further reflects the persistent nature of agrarian distress in the region (Anonymous, 2024; 2025a) <sup>[4, 5]</sup>. In this context, there is an urgent need to understand how farmers manage agrarian distress at the field level, particularly under recurring climate-induced challenges in South Gujarat.

Despite extensive research on agrarian distress in India, the majority of studies have primarily focused on its causes, including climatic variability, economic instability and farmer suicides, with comparatively limited attention to farmers’ management strategies at the field level. Existing literature predominantly emphasizes macro-level analyses and policy perspectives, often overlooking micro-level behavioural responses and multidimensional ADM mechanisms adopted by farmers. Although a few studies have addressed psychological stress and adaptation, there remains a lack of comprehensive frameworks integrating farm management, organizational, psychological, social and spiritual dimensions of distress management. In addition, region-specific empirical evidence from South Gujarat is limited, particularly in the context of recurring climate-induced shocks and agro-ecological vulnerabilities. The present study attempts to fill this gap by developing and applying a structured, multidimensional framework to assess agrarian distress management among farmers in South Gujarat.

The findings of the study will be useful for policymakers, agricultural extension agencies and development practitioners in designing farmer-centric interventions. The study also holds significance for agricultural extension by providing insights into farmers’ ADM behaviour, which can guide the development of targeted advisory and support systems. Further, the use of a standardized and reliable measurement tool enhances the scientific rigor of the study and provides a foundation for future research in ADM.

## Objectives

1. To quantify the level of agrarian distress management among farmers in South Gujarat
2. To examine dimension-wise patterns and district-level disparities in agrarian distress management among farmers of South Gujarat
3. To assess the reliability of the ADM measurement

schedule using Cronbach's Alpha, Hotelling's  $T^2$  test and Intraclass Correlation Coefficient

## Methodology

The present investigation was conducted in the South Gujarat region of Gujarat under the jurisdiction of Navsari Agricultural University. An *ex-post facto* research design was adopted, as the variables under study had already occurred and were beyond the control of the researcher. The study covered seven districts, namely Bharuch, Surat, Narmada, Tapi, Navsari, Valsad and The Dangs. A multistage random sampling technique was employed. In the first stage, two talukas from each district were selected randomly, followed by the selection of two villages from each taluka in the second stage through simple random sampling. In the final stage, ten farmers from each village were selected through simple random sampling, resulting in a total sample size of 280 respondents. Primary data were collected through personal interviews using a well-structured and pre-tested interview schedule designed to measure ADM across multiple dimensions. Secondary data were obtained from annual reports, research publications, bulletins, books and official records. Data collection was carried out during November 2025 to January 2026 through farm and household visits. The collected data were coded, tabulated and analysed using MS Excel, R software (version 4.6.0) and Python (version 3.14). ADM was assessed dimension-wise by computing scores for each dimension. Descriptive statistical tools such as mean, frequency, percentage and standard deviation were used for analysis. A radar mapping technique was employed to visually represent the comparative performance of different dimensions. The reliability of the structured schedule was assessed using Cronbach's Alpha, while content validity was ensured through expert consultation and pilot testing prior to the main survey. The ADM index was computed using min-max normalization, and the scores were standardized on a 0–100 scale using the following formula:

$$\text{Index Value} = \frac{\text{Obtained Score} - \text{Minimum Possible Score}}{\text{Maximum Possible Score} - \text{Minimum Possible Score}} \times 100$$

The minimum and maximum possible scores were derived based on the number of respondents, number of items and the 5-point continuum scale. Dimension-wise analysis was carried out by aggregating the scores of respective items and expressing them as percentage indices. Equal weightage was assigned to all dimensions to maintain comparability. The dimensions were ranked in descending order, where higher index values indicated stronger coping capacity. Similarly, the district-wise ADM index was computed by aggregating the total scores of respondents across all dimensions within each district and expressing them as percentage values. Districts were ranked accordingly based on the obtained index values. Further, Hotelling's  $T^2$  test was employed to determine whether significant differences existed among the mean scores of items, thereby assessing their discriminating ability. The Intraclass Correlation Coefficient (ICC) was computed to evaluate the consistency and reliability of measurements across items, providing estimates for both single and average measures, using a two-way mixed effects model based on absolute agreement for average measures, following the guidelines of Koo and Mae.

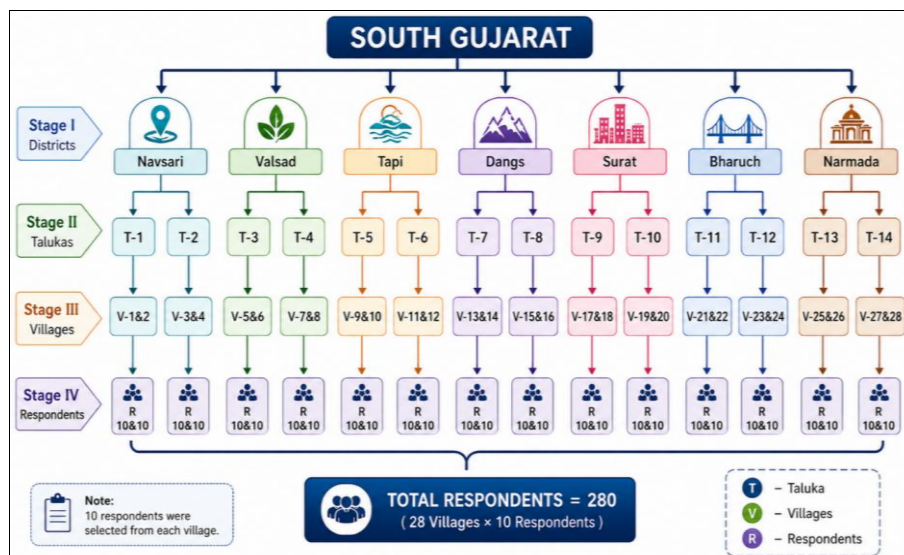


**Fig 1:** Sampling Framework for Agrarian Distress Management Study in South Gujarat

## Results and Discussion

### Agrarian Distress Management among Farmers of South Gujarat

The findings indicate that a considerable proportion of farmers exhibited high to very high levels of ADM across different dimensions, reflecting their adaptive capacity in managing farming-related challenges. Higher levels were particularly observed in Health and Lifestyle Coping (51.42%), followed by Time Management and Organization (51.07%) and Preventive Farm Management (46.79%), indicating better adoption of planning, precautionary measures and health-related coping strategies among

farmers. Diversion and Spiritual Coping (42.14%) and Cognitive and Emotional Adjustment (40.71%) also reflected moderate engagement in psychological and behavioural coping mechanisms. Comparatively, Social, Communal and Institutional Support recorded relatively lower high-level responses (39.29%), suggesting comparatively limited dependence on institutional and collective support systems. Overall, the results indicate that farmers relied more on personal and managerial ADM mechanisms than external support-based strategies for managing agrarian distress.

**Table 1:** Dimension wise ADM among the farmers (n=280)

| Sr. No. | Agrarian distress Management Dimensions    | Categories | Range    | Frequency (f) | Percentage (%) |
|---------|--------------------------------------------|------------|----------|---------------|----------------|
| 1)      | Preventive Farm Management                 | Very Low   | 10 to 18 | 42            | 15.00          |
|         |                                            | Low        | 19 to 26 | 36            | 12.85          |
|         |                                            | Medium     | 27 to 34 | 71            | 25.36          |
|         |                                            | High       | 35 to 42 | 67            | 23.93          |
|         |                                            | Very High  | 43 to 50 | 64            | 22.86          |
| 2)      | Time Management and Organization           | Very Low   | 04 to 07 | 20            | 07.14          |
|         |                                            | Low        | 08 to 10 | 44            | 15.72          |
|         |                                            | Medium     | 11 to 14 | 73            | 26.07          |
|         |                                            | High       | 15 to 17 | 70            | 25.00          |
|         |                                            | Very High  | 18 to 20 | 73            | 26.07          |
| 3)      | Health and Lifestyle Coping                | Very Low   | 06 to 11 | 38            | 13.57          |
|         |                                            | Low        | 12 to 16 | 58            | 20.72          |
|         |                                            | Medium     | 17 to 20 | 40            | 14.29          |
|         |                                            | High       | 21 to 25 | 51            | 18.21          |
|         |                                            | Very High  | 26 to 30 | 93            | 33.21          |
| 4)      | Cognitive and Emotional Adjustment         | Very Low   | 07 to 13 | 43            | 15.36          |
|         |                                            | Low        | 14 to 18 | 43            | 15.36          |
|         |                                            | Medium     | 19 to 24 | 80            | 28.57          |
|         |                                            | High       | 25 to 29 | 61            | 21.79          |
|         |                                            | Very High  | 30 to 35 | 53            | 18.92          |
| 5)      | Social, Communal and Institutional Support | Very Low   | 7 to 13  | 48            | 17.14          |
|         |                                            | Low        | 14 to 18 | 49            | 17.50          |
|         |                                            | Medium     | 19 to 24 | 73            | 26.07          |
|         |                                            | High       | 25 to 29 | 54            | 19.29          |
|         |                                            | Very High  | 30 to 35 | 56            | 20.00          |
| 6)      | Diversion and Spiritual Coping             | Very Low   | 6 to 11  | 52            | 18.57          |
|         |                                            | Low        | 12 to 16 | 62            | 22.14          |
|         |                                            | Medium     | 17 to 20 | 48            | 17.15          |
|         |                                            | High       | 21 to 25 | 65            | 23.21          |
|         |                                            | Very High  | 26 to 30 | 53            | 18.93          |

The comparatively higher levels observed in Health and Lifestyle Coping, Time Management and Organization and Preventive Farm Management may be attributed to farmers' practical experience in managing agricultural uncertainties, regular engagement in farm planning activities and increased awareness regarding health and precautionary measures. The moderate levels observed in Cognitive and Emotional Adjustment and Diversion and Spiritual Coping

indicate that farmers also relied on psychological resilience, social interaction and spiritual practices to cope with agrarian distress. The relatively lower level of Social, Communal and Institutional Support suggests limited access to institutional assistance and comparatively lower dependence on external support systems for distress management.

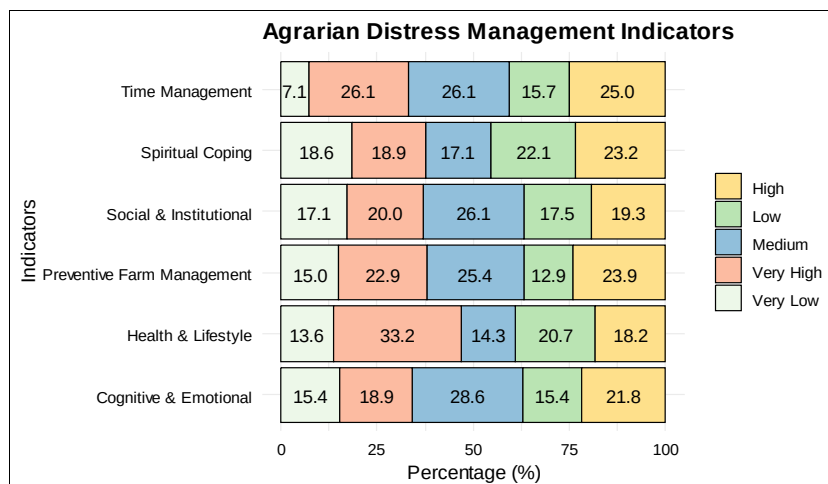


**Fig 2:** Distribution of Farmers According to Agrarian Distress Management Across Different Dimensions

**Table 2:** Distribution of the farmers according to overall their ADM (n=280)

| Sr. No. | Categories    | Range      | Frequency (f) | Percentage (%) |
|---------|---------------|------------|---------------|----------------|
| 1.      | Very low ADM  | 40 to 72   | 12            | 04.29          |
| 2.      | Low ADM       | 73 to 104  | 40            | 14.29          |
| 3.      | Moderate ADM  | 105 to 136 | 110           | 39.29          |
| 4.      | High ADM      | 137 to 168 | 95            | 33.92          |
| 5.      | Very high ADM | 169 to 200 | 23            | 08.21          |

The analysis reveals that a considerable proportion of farmers fell under moderate to high ADM (73.22%), indicating that a majority of respondents were able to adopt various coping and adaptive strategies to manage agrarian distress. This pattern may be attributed to accumulated farming experience, informal support networks and exposure to extension services, which collectively enhance farmers' coping capacity. However, the presence of farmers

in lower categories indicates structural and resource constraints, suggesting the need for targeted institutional interventions and capacity building programmes. These findings are in line with the studies of Tandekar (2014)<sup>[15]</sup>, Kerketta (2022)<sup>[11]</sup> and Belokar (2022)<sup>[7]</sup>, who reported that farmers predominantly fell under moderate ADM categories due to partial access to institutional and social support systems.

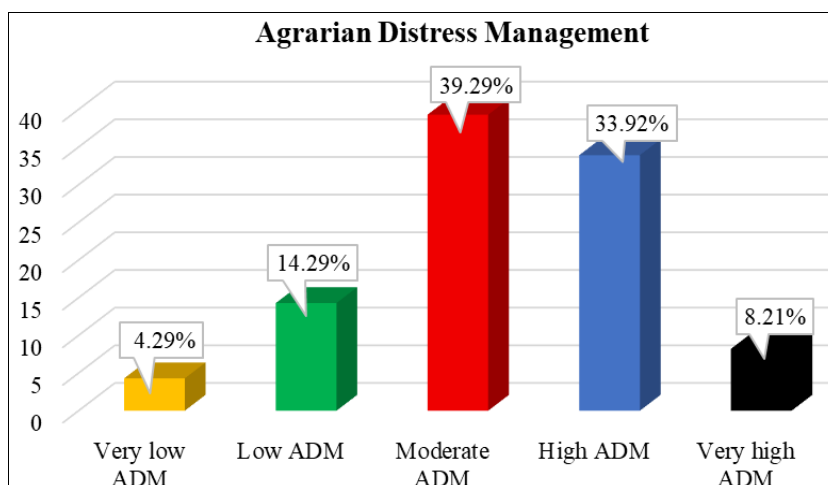


**Fig 3:** Distribution of farmers according to their ADM categories

### District Wise Overall Agrarian Distress Management

District-wise agrarian distress was assessed by computing the mean index values of all dimensions, ensuring equal weightage to each dimension and preserving the multidimensional structure of distress and the district wise analysis of ADM revealed clear variation among the selected districts. Surat district recorded the highest ADM index value of 82.10 per cent and secured the first rank indicating comparatively stronger adoption of ADM strategies and better preparedness in managing agrarian distress situations.

Valsad district ranked second with an index value of 81.69 per cent followed by Bharuch district with 80.51 per cent reflecting relatively high levels of distress management practices among farmers. Navsari and Tapi districts occupied the fourth and fifth positions respectively indicating moderate levels of ADM. Dangs district recorded a lower index value of 76.53 per cent suggesting comparatively limited ADM. Narmada district registered the lowest index value of 67.89 per cent which indicates weaker adoption of ADM strategies among farmers.

**Table 3:** District-wise Overall ADM Index and Ranking

| Sr. No. | District | Score Obtained | Index Value (%) | Rank |
|---------|----------|----------------|-----------------|------|
| 1)      | Surat    | 4466           | 82.10           | I    |
| 2)      | Valsad   | 4444           | 81.69           | II   |
| 3)      | Bharuch  | 4380           | 80.51           | III  |
| 4)      | Navsari  | 4361           | 80.17           | IV   |
| 5)      | Tapi     | 4327           | 79.54           | V    |
| 6)      | Dangs    | 4163           | 76.53           | VI   |
| 7)      | Narmada  | 3693           | 67.89           | VII  |

Overall, the findings highlight noticeable inter-district disparities in ADM, with agriculturally progressive districts demonstrating comparatively stronger ADM than resource-constrained districts. These disparities emphasize the need for location-specific interventions, improved extension support and capacity-building programmes to strengthen farmers' resilience in lower-performing districts. The higher

index values observed in Surat and Valsad districts may be attributed to better irrigation facilities, market access and extension services, which enhance farmers' capacity to adopt effective ADM strategies. In contrast, lower performance in Narmada and Dangs districts reflects resource constraints, geographical limitations and comparatively weaker institutional support.

**Table 4:** Dimension-wise ADM Index Values and Ranking

| Sr. No. | Dimensions of ADM                        | Score | ADM index (%) | Rank |
|---------|------------------------------------------|-------|---------------|------|
| 1)      | Preventive Farm Management               | 9158  | 81.77         | III  |
| 2)      | Time Management & Organization           | 3965  | 88.50         | I    |
| 3)      | Health & Lifestyle Coping                | 5733  | 85.31         | II   |
| 4)      | Cognitive & Emotional Adjustment         | 6235  | 79.53         | IV   |
| 5)      | Social, Communal & Institutional Support | 6139  | 78.30         | V    |
| 6)      | Diversion & Spiritual Coping             | 5208  | 77.50         | VI   |

While the frequency-based analysis (Table 1) indicated a marginally higher proportion of farmers in the high and very high categories for Health and Lifestyle Coping (51.42%) compared to Time Management and Organization (51.07%), the index-based ranking (Table 4) positioned Time Management and Organization first (88.50%) and Health and Lifestyle Coping second (85.31%), as the index accounts for the full score distribution across all response categories rather than only the top two. The dimension wise analysis of ADM revealed noticeable variation across different dimensions. Among the six dimensions, Time Management and Organization recorded the highest ADM Index value of 88.50 per cent and secured the first rank, indicating that farmers largely relied on effective planning, scheduling of farm operations and efficient utilization of available resources to manage distress situations. Health and Lifestyle Coping ranked second with an index value of 85.31 per cent, suggesting that maintenance of physical well-being, adoption of healthy routines and stress

management practices played an important role in enhancing farmers' resilience.

Preventive Farm Management obtained an index value of 81.77 per cent and ranked third reflecting considerable adoption of preventive agricultural practices such as risk reduction measures crop planning and precautionary farm management strategies. Cognitive and Emotional Adjustment ranked fourth with an index value of 79.53 per cent indicating moderate psychological adaptation and emotional regulation among farmers while facing agrarian uncertainties. Social, Communal and Institutional Support secured the fifth position with an index value of 78.30 per cent, suggesting comparatively lower dependence on collective support systems, extension agencies and institutional mechanisms. Diversion and Spiritual Coping recorded the lowest index value of 77.50 per cent and ranked sixth implying that recreational and spiritual coping mechanisms were relatively less highlighted by farmers ADM.

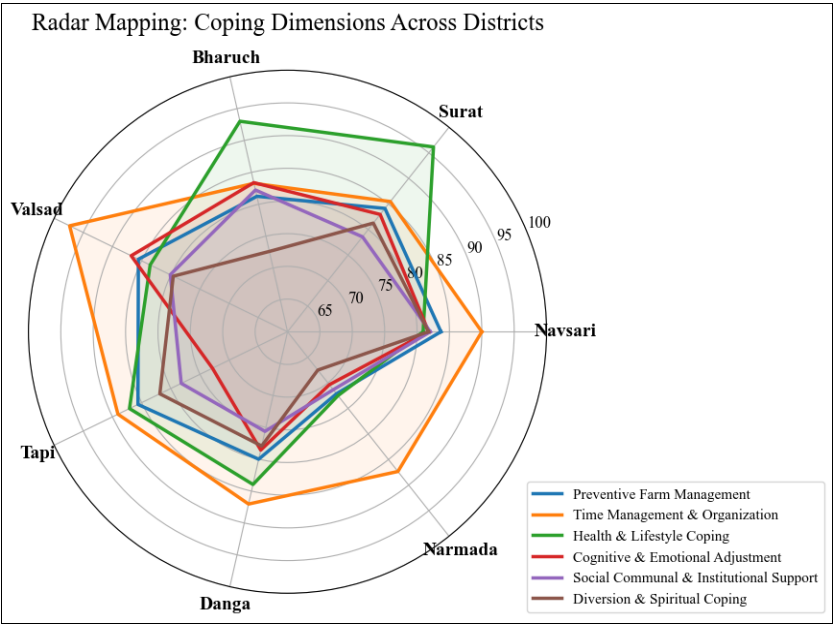


Fig 4: Radar mapping of district wise Agrarian Distress Management

Overall, the findings indicate that farmers predominantly depended on managerial efficiency and personal health related coping strategies rather than external institutional or diversion based mechanisms highlighting the importance of strengthening community support systems for comprehensive ADM. The district wise comparison of ADM across different ADM

dimensions revealed variations in ADM among farmers. With respect to Preventive Farm Management Valsad and Tapi districts recorded comparatively higher index values indicating better adoption of preventive agricultural practices while Narmada district registered the lowest value suggesting limited preventive preparedness.

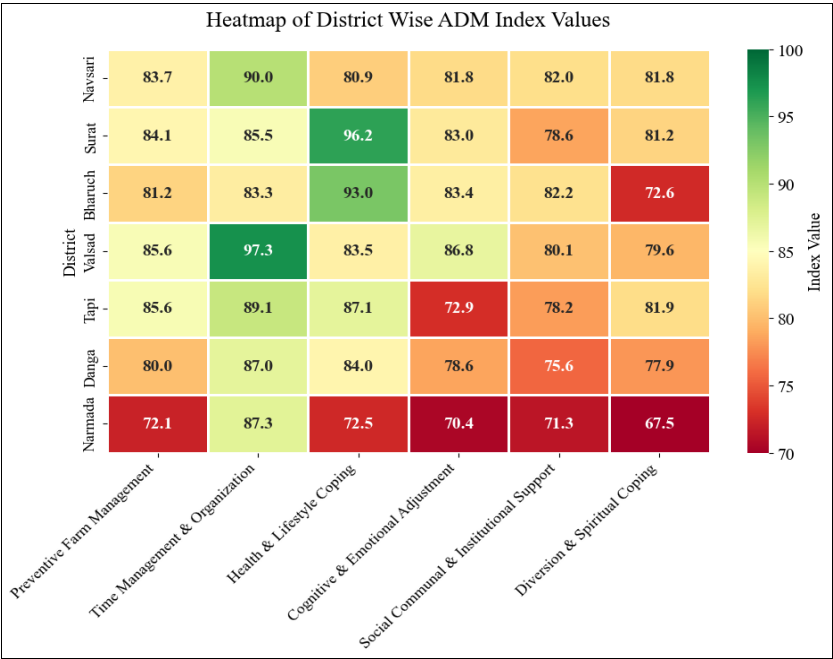


Fig 5: Heatmap of district wise ADM value index

In the dimension of Time Management and Organization Valsad district achieved the highest index value followed by Navsari and Tapi reflecting efficient planning and organization of farm activities among farmers in these districts. Health and Lifestyle Coping was found to be strongest in Surat district which recorded the highest index value indicating greater emphasis on maintaining physical and psychological well-being during distress conditions

whereas Narmada showed relatively lower performance. Regarding Cognitive and Emotional Adjustment Valsad district ranked higher suggesting stronger psychological adaptation and emotional resilience among farmers while Narmada recorded the lowest value indicating weaker ADM. In Social Communal and Institutional Support Bharuch and Navsari districts demonstrated comparatively better utilization of social networks and institutional

assistance whereas Dangs and Narmada districts exhibited lower reliance on such support systems.

In the Diversion and Spiritual Coping dimension Tapi district obtained the highest index value reflecting greater engagement in relaxation and spiritual practices as coping mechanisms while Narmada district recorded the lowest value. Overall, the results indicate that although most districts demonstrated moderate to high levels of ADM noticeable disparities exist particularly in interior and resource constrained districts highlighting the need for targeted extension support institutional strengthening and psychological resilience programmes to ensure balanced ADM across districts.

### Reliability of the Adm Measurement Schedule

**Table 5:** Item–Total Statistics for Reliability Analysis

| Item                                     | Corrected Item–Total Correlation | Cronbach's Alpha if Item Deleted |
|------------------------------------------|----------------------------------|----------------------------------|
| S-1                                      | 0.443                            | 0.898                            |
| S-2                                      | 0.422                            | 0.898                            |
| S-3                                      | 0.457                            | 0.898                            |
| S-4                                      | 0.453                            | 0.898                            |
| S-5                                      | 0.496                            | 0.897                            |
| S-6                                      | 0.454                            | 0.898                            |
| S-7                                      | 0.478                            | 0.898                            |
| S-8                                      | 0.487                            | 0.898                            |
| S-9                                      | 0.467                            | 0.898                            |
| S-10                                     | 0.406                            | 0.899                            |
| S-11                                     | 0.235                            | 0.901                            |
| S-12                                     | 0.268                            | 0.901                            |
| S-13                                     | 0.317                            | 0.900                            |
| S-14                                     | 0.316                            | 0.900                            |
| S-15                                     | 0.451                            | 0.898                            |
| S-16                                     | 0.476                            | 0.898                            |
| S-17                                     | 0.349                            | 0.899                            |
| S-18                                     | 0.507                            | 0.897                            |
| S-19                                     | 0.511                            | 0.897                            |
| S-20                                     | 0.468                            | 0.898                            |
| S-21                                     | 0.407                            | 0.899                            |
| S-22                                     | 0.412                            | 0.899                            |
| S-23                                     | 0.351                            | 0.900                            |
| S-24                                     | 0.402                            | 0.899                            |
| S-25                                     | 0.364                            | 0.899                            |
| S-26                                     | 0.335                            | 0.900                            |
| S-27                                     | 0.331                            | 0.900                            |
| S-28                                     | 0.322                            | 0.900                            |
| S-29                                     | 0.471                            | 0.898                            |
| S-30                                     | 0.488                            | 0.898                            |
| S-31                                     | 0.483                            | 0.898                            |
| S-32                                     | 0.398                            | 0.899                            |
| S-33                                     | 0.293                            | 0.900                            |
| S-34                                     | 0.302                            | 0.900                            |
| S-35                                     | 0.336                            | 0.900                            |
| S-36                                     | 0.439                            | 0.898                            |
| S-37                                     | 0.355                            | 0.900                            |
| S-38                                     | 0.516                            | 0.897                            |
| S-39                                     | 0.498                            | 0.897                            |
| S-40                                     | 0.352                            | 0.899                            |
| Total Cronbach Alpha of the ADM schedule |                                  | 0.901                            |

The item–total statistics revealed that the Corrected Item–Total Correlation (CITC) values for most items exceeded

the recommended threshold of 0.30, indicating satisfactory internal consistency of the scale. A few items (S-11, S-12 and S-33) show relatively lower correlations, yet they remain within a tolerable range and do not adversely affect the overall reliability. Further, the Cronbach's Alpha if Item Deleted values range between 0.897 and 0.901, which are very close to the overall Cronbach's Alpha value (0.901), suggesting that the removal of any item would not significantly improve the scale reliability. The overall Cronbach's Alpha coefficient of 0.901 indicates a high level of internal consistency, confirming that the ADM schedule is a reliable instrument for assessing ADM among farmers.

**Table 6:** Hotelling's T-Squared Test

| Test Statistic | Hotelling's T-Squared | F-value | df1 | df2 | Sig.  |
|----------------|-----------------------|---------|-----|-----|-------|
| Value          | 378.545               | 8.384   | 39  | 241 | 0.000 |

The results of Hotelling's  $T^2$  test indicated a statistically significant difference among the mean scores of the items ( $T^2 = 378.545$ ;  $F = 8.384$ ;  $p < 0.01$ ). This finding suggests that the items do not have equal mean values and vary significantly in their responses and confirming the heterogeneity and discriminating ability of the scale items. Such significant differences in item means confirm that each item captures a distinct aspect of ADM, thereby demonstrating adequate discriminating ability. It may be noted that redundancy of items is assessed through inter-item correlations and not through mean differences; Hotelling's  $T^2$  thus confirms discriminating power rather than uniqueness of content.

**Table 7:** Intraclass Correlation Coefficient (ICC)

| Type of Measure  | ICC Value | 95% Confidence Interval | F-value | df1 | df2   | Sig.  |
|------------------|-----------|-------------------------|---------|-----|-------|-------|
| Single Measures  | 0.185     | 0.160 – 0.216           | 10.099  | 279 | 10881 | 0.000 |
| Average Measures | 0.901     | 0.884 – 0.917           | 10.099  | 279 | 10881 | 0.000 |

The Intraclass Correlation Coefficient (ICC) analysis revealed a low reliability for single measures ( $ICC = 0.185$ ), indicating limited consistency when individual items are considered independently. However, the average measures ICC (0.901) was found to be very high, with a narrow confidence interval (0.884–0.917), demonstrating excellent reliability of the composite scale. The statistically significant F-value ( $p < 0.01$ ) further confirms the consistency of the measurements. These results indicate that although individual items may show variability, the aggregated scale provides a highly stable and reliable measure of ADM.

Overall, the findings indicate that farmers in South Gujarat exhibit moderate to high levels of ADM, primarily driven by managerial efficiency and personal ADM strategies. The reliability analysis further confirms that the ADM scale is a robust and consistent instrument for assessing ADM behaviour. However, the observed inter-district disparities and relatively lower performance in certain dimensions highlight the need for targeted interventions, strengthened extension support and improved institutional mechanisms to enhance farmers' resilience against agrarian distress.

## Conclusion and Suggestions

The present study assessed the level of agrarian distress management among farmers in South Gujarat using a structured and statistically validated ADM scale. The findings reveal that farmers exhibit moderate to high levels of distress management, with relatively stronger performance in dimensions related to managerial efficiency, health and lifestyle coping and cognitive-emotional adjustment. This indicates that farmers are actively engaging in adaptive strategies to mitigate the effects of agrarian distress. District-wise analysis highlighted significant variations, with districts such as Surat and Valsad demonstrating higher levels of ADM, while comparatively lower performance was observed in Narmada and Dangs. These differences underline the influence of factors such as irrigation access, market connectivity, resource availability and institutional support in shaping farmers' ADM. The results emphasize that agrarian distress is not uniform and requires region-specific approaches for effective management. The reliability and validity assessments, including Cronbach's alpha, Hotelling's T-squared test and Intraclass Correlation Coefficient, confirmed that the ADM scale is a robust, consistent and reliable instrument for measuring farmers' ADM. The high reliability further strengthens the credibility of the findings and supports the applicability of the scale in similar contexts. Despite the overall positive ADM levels, certain dimensions such as institutional support and social mechanisms require further strengthening. The study highlights the need for targeted interventions, particularly in resource-constrained districts, through improved extension services, enhanced access to institutional support and promotion of community-based ADM strategies. In conclusion, strengthening ADM requires an integrated approach combining technical, institutional and socio-psychological support systems. The findings of the study provide valuable insights for policymakers, extension agencies and development practitioners to design effective, location-specific strategies aimed at enhancing farmers' resilience and ensuring sustainable agricultural livelihoods.

## Conflict of Interest

There is no conflict of interest among any authors regarding publication of the research paper in the journal as well as in the content.

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