Work Stress Mapping of Farmers in Jember Regency

Enggal Hadi Kurniyawan[1*], Nurfika Asmaningrum[2], Rondhianto[3], Erti Ikhtiarini Dewi[1], Alfid Tri Afandi[2]

[1] Department of Psychiatric and Community Nursing, Faculty of Nursing, Universitas Jember, Indonesia.
[2] Department of Fundamental Nursing, Faculty of Nursing, Universitas Jember, Indonesia.
[3] Department of Medical, Surgical and Emergency, Faculty of Nursing, Universitas Jember, Indonesia.

Abstract: Work stress among farmers remains an overlooked occupational health issue in Indonesia despite high vulnerability to economic and environmental pressures. This study aimed to map farmers' stress levels and identify demographic factors influencing stress. A quantitative descriptive design was used with 140 farmers selected through purposive sampling in Jember Regency. Stress was measured using the DASS-42 stress subscale, and data were analysed descriptively and through multiple linear regression. Results showed that 62.9% of farmers experienced mild stress, 30.7% moderate stress, and 6.4% severe stress. Regression analysis demonstrated that gender (p=0.012), educational attainment (p=0.005), family role (p=0.030), number of family members (p=0.025), land size (p=0.008), and monthly income (p=0.001) significantly influenced stress levels. Female farmers, individuals with low education, heads of households, farmers with more than four family members, land ≤ 0.65 ha, and income < Rp 1,916,983 had markedly higher stress scores. The study concludes that farmer stress is shaped by socioeconomic vulnerability and limited resources. These findings highlight the need for targeted interventions, including capacity-building programs, improved access to agricultural support, and policies that enhance economic stability to reduce work-related stress among Indonesian farmers

Keywords: Farmers; Socio-economic factors; Work stress

Introduction

Work stress is one of the significant challenges faced by farmers worldwide, including in Indonesia (Akbar et al., 2023; Harishoh et al., 2024). Various pressures arising from this occupation, ranging from uncertainty of harvests, dependence on weather conditions, fluctuations in commodity prices, to continuous physical and mental burdens, can lead to high levels of work stress (Kakpo et al., 2022; Kua et al., 2022; Yang et al., 2022). Stress among farmers poses a risk of reducing productivity, lowering quality of life, and affecting their families' well-being (Herrera Sabillón et al., 2022; Mohammadi-Mehr et al., 2025). In the context of Indonesian agriculture, this stress can be exacerbated by limited access to advanced agricultural technology,

minimal financial support, and policies that are less favorable to farmers (Rufaidah et al., 2023; Sulaiman et al., 2025). Therefore, mapping the level of work stress among farmers is crucial to understand the influencing factors and to design effective strategies for managing its impact.

Work stress among farmers has increasingly been recognized as a critical yet underexamined public health issue in Indonesia. Although agriculture remains one of the country's largest employment sectors, supporting the livelihoods of millions of rural households, systematic attention to farmers' mental well-being has been strikingly limited (Maharani et al., 2025; Rachmawati et al., 2025). National reports and various regional studies consistently indicate that work-related stress is prevalent among farmers, yet mental health has

rarely been incorporated into agricultural development agendas (Dedieu et al., 2022; Hammersley et al., 2023). This gap is concerning given that psychological distress can significantly affect farmers' decision-making capacity, productivity, family functioning, and overall quality of life. Despite the presence of several studies highlighting the economic and environmental difficulties faced by farmers, research specifically addressing the psychological dimensions of these challenges remains sparse (Bartkowski et al., 2022; Puspita et al., 2024). Moreover, very few studies have used standardized psychological measurement tools, resulting in limited empirical evidence that accurately reflects the mental health status of farming communities.

Existing literature indicates that farmers are subjected to a unique constellation of stressors compared to other occupational groups (O'Shaughnessy et al., 2022). Persistent uncertainties related to climate variability, fluctuating commodity prices, pest infestations, and seasonal income instability exert continuous mental pressure (Harun et al., 2023; Saccone & Vallino, 2025). In developing countries such as Indonesia, these pressures are often compounded by structural issues, including limited access to modern agricultural technologies, inadequate government support, and restricted financial resources. These systemic constraints intensify farmers' vulnerability to work stress and heighten their psychological burden (D'Orazio, 2025; Herawati et al., 2023). While prior studies have documented challenges such as crop risks and low income, there is insufficient quantitative evidence that maps how these occupational and socio-economic stressors translate into measurable psychological outcomes (Appiah, 2025; De Sario et al., 2023). This gap underscores the need for studies that examine mental health using validated psychological tools while simultaneously considering demographic determinants.

This study aims to fill this critical research gap by employing the Depression Anxiety Stress Scales (DASS-42), a widely validated instrument, to measure stress, depression, and anxiety among Indonesian farmers. The use of DASS-42 represents an important methodological advancement because it distinguishes stress from anxiety and depression, allowing for a more precise understanding of the psychological pressures experienced by farmers (Sulak & Koklu, 2024). Furthermore, this research integrates demographic variables including gender, educational attainment, family role, number of family members, land size, and monthly income to develop a comprehensive analytic model that captures the multifaceted nature of farmer stress. Such an approach is rarely found in previous Indonesian studies, which often rely solely on qualitative descriptions or focus narrowly on economic

indicators without assessing psychological dimensions (Cartwright & Igudia, 2024). Therefore, this study introduces a novel combination of standardized psychological assessment and demographic-based analysis, offering deeper insights into the mental well-being of farmers.

The importance of this research is reinforced by the fact that farmer stress is shaped not only by occupational factors but also by broader social and structural contexts. Previous findings highlight that heavy family responsibilities, particularly for farmers serving as heads of households, contribute significantly to psychological distress (Fajeriadi et al., 2025; Gunn & Hughes-Barton, 2022). Farmers with large families face increased financial demands, and when combined with unstable agricultural income, these pressures often manifest as chronic stress. Educational attainment also plays a crucial role in shaping farmers' coping mechanisms. Those with lower education levels frequently lack access to information, agricultural innovations, or institutional support that could help reduce crop-related risks (Kurniyawan et al., 2023; Slijper et al., 2022). As a result, they may perceive farming challenges as more overwhelming, which heightens stress levels.

Environmental unpredictability further complicates the psychological landscape for farmers. Dependence on weather conditions, frequent exposure to natural hazards, and climate-related crop failures create a persistent sense of uncertainty (Mishra et al., 2025; Teku, 2025). The inability to predict or control these environmental factors often produces feelings of powerlessness—an aspect strongly associated with chronic stress and mental exhaustion. In addition, fluctuating market prices and unstable buyer demand undermine farmers' financial security. When income does not meet household needs, stress levels rise sharply, particularly among farmers who rely solely on agriculture for their livelihoods (Khammissa et al., 2022; Schweitzer et al., 2023). These intertwined stressors illustrate that farmer stress is not an isolated psychological phenomenon but a manifestation of complex social, economic, and environmental dynamics.

Given these conditions, research that comprehensively maps farmer stress is urgent and highly relevant. The novelty of this study lies in its combination of validated psychological assessment tools and demographic analysis, which enables the identification of specific farmer groups most vulnerable to stress—a level of precision that previous research has not provided. By quantifying stress levels and analyzing associated demographic factors, this study contributes evidence that is not only academically valuable but also directly applicable to policymaking. The findings can guide the development of targeted mental-health

interventions, agricultural support programs, and community-based initiatives aimed at strengthening farmers' resilience.

Moreover, this research holds broader implications for agricultural sustainability. Farmers' mental well-being is closely linked to productivity, risk-management capacity, and long-term engagement in agriculture. High levels of stress can reduce motivation, impair decision-making, and increase the likelihood of abandoning farming activities (Pinzón et al., 2025; Purnomo, 2024). Therefore, addressing farmers' psychological health is essential not only for individual welfare but also for ensuring national food security. By producing robust data on stress levels and their determinants, this study provides an evidence base that enables stakeholders—including government agencies, agricultural institutions, and mental-health providers—to design more effective and holistic development strategies.

In summary, this research offers a timely and important contribution to the literature by highlighting the psychological dimensions of agricultural work in Indonesia. With its integration of validated psychological tools and demographic analysis, the study fills a significant gap in current knowledge, introduces methodological novelty, and provides strong justification for the need to address farmers' mental well-being as part of national agricultural policy.

Method

Population and Sample

The population of this study consisted of farmers in Jember Regency, who are characterized by high-intensity agricultural work and strong dependence on harvest outcomes. The sample included 140 farmers selected using a purposive sampling technique, with the main criteria being farmers whose primary source of household income relies on agriculture, adjusted to the demographic characteristics of the farmers' place of residence. This technique was chosen to ensure that the sample met the required characteristics for evaluating work stress in the agricultural environment.

Time and Location of the Study

This study was conducted in Jember Regency, East Java, Indonesia, an agricultural region characterized by high-intensity farming activities and strong dependence on seasonal harvest outcomes. The field survey and data collection were carried out within the designated study period of July-August 2024.

Type of Study

This study employed a quantitative descriptive design to map the level of work stress among farmers in the research area. A descriptive approach was chosen because it allows the researchers to describe the characteristics of the respondents and identify factors associated with the level of stress experienced by farmers. A quantitative approach was applied to obtain objective data regarding the relationship between demographic factors and stress levels, so that the results could be statistically interpreted.

Research Methode and Stages

The instrument used in this study was the Depression Anxiety Stress Scales (DASS-42), which has been proven valid and reliable in measuring levels of stress, depression, and anxiety (SHAYAN et al., 2021). DASS-42 consists of 42 items divided into three subscales: depression, anxiety, and stress. Each item is rated on a four-point Likert scale, ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). In this study, the main focus was on the stress subscale, which provides an overview of the level of psychological pressure experienced by farmers. DASS-42 was chosen because it distinguishes stress symptoms from other psychological components, providing more accurate data on work stress intensity.

The independent variables in this study included demographic factors assumed to influence farmers' stress levels: gender, educational attainment, family role, number of family members, land size, and monthly income. The dependent variable was the stress level, measured through the stress subscale score of the DASS-42.

Data Analysis

Data collection was conducted through a field survey. The research team distributed the DASS-42 questionnaire to 140 farmer respondents in the designated locations. Each respondent was provided with an explanation of the study's objectives, and participation was voluntary. The questionnaire was completed with researcher guidance to ensure respondents understood the instructions and answered accurately. Respondents were given a specific timeframe to complete the questionnaire and were allowed to ask questions if any items were unclear.

The data obtained were analyzed descriptively to describe respondents' characteristics and overall stress levels. A multiple linear regression test was used to examine the simultaneous effects of all independent variables on stress levels.

This study followed research ethics procedures, where all respondents were informed about the objectives and benefits of the study, and their personal data confidentiality was guaranteed. Each respondent signed an informed consent form before participation, and all collected data were used solely for research

purposes. Respondents were also assured that they could withdraw from the study at any time without consequence. The study was ethically reviewed by the Faculty of Dentistry, University of Jember, and was declared ethically feasible under approval number No. 2563/UN25.8/KEPK/DL/2024. The following is a flowchart of the research steps.
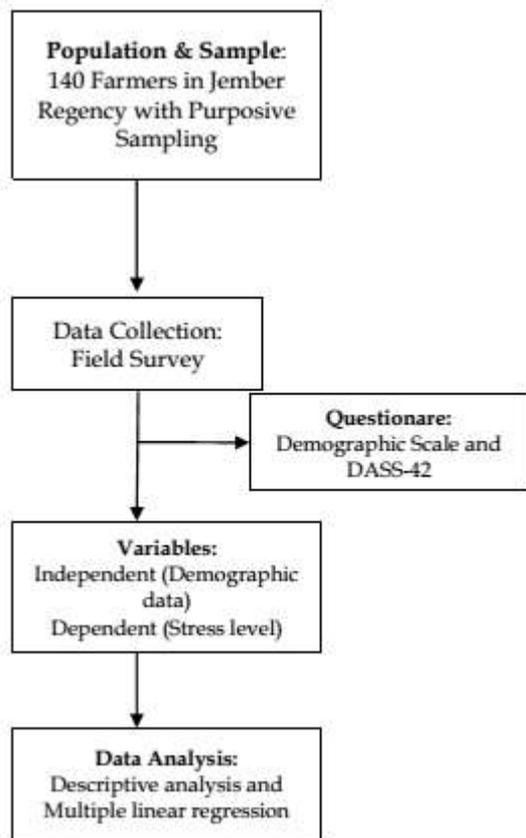

Figure 1. Research Mechanism

Results and Discussion

This section presents the demographic and socioeconomic characteristics of the respondents involved in the study. Understanding these baseline characteristics is essential because they provide context for interpreting the findings and assessing the representativeness of the study population. The variables described include gender, educational attainment, family roles, number of family members, agricultural land ownership, and monthly income. These characteristics offer an overview of the respondents' backgrounds, enabling a clearer understanding of the social and economic conditions that may influence their behaviors, perceptions, and decision-making patterns. Detailed distributions for each characteristic are presented in Table 1.

This study involved 140 farmers as respondents, with demographic characteristics reflecting their social

and economic backgrounds. Of the total respondents, 60% were male and 40% were female, indicating the dominance of male farmers in this sector. Most respondents had low levels of education, with 61% having completed only elementary school or less, which may limit their access to information and better agricultural techniques. In terms of family roles, the majority of farmers functioned as heads of households (72 people), followed by wives (44 people), and had relatively large average family members; 55% of respondents had more than four family members. This can add to the burden of economic responsibilities and stress.

Table 1. Respondent Characteristics

Respondent Characteristics Data	Number (n)
Gender:	
Man	84
Woman	56
Last education:	
Not in School/Did Not Graduate from Elementary School	27
Elementary School	58
Junior High School/Islamic Junior High School	34
Senior High School/Islamic Senior High School	21
College	-
Roles in the Family:	
Head of family	72
Wife	44
Child	14
Son-in-law	3
Parent	3
Mother-in-law	-
Other Brothers	4
Number of Family Members:	
≤4 People	63
>4 People	77
Agricultural Land Area:	
≤0.65 hectares	129
>0.65 Hectares	11
Monthly Income:	
< Rp. 1,916,983	125
≥ Rp. 1,916,983	15

Most respondents had limited agricultural land, with 92% owning land < 0.65 hectares, potentially limiting their production capacity and income. Furthermore, 89% of respondents earned less than IDR 1,916,983 per month, representing significant financial challenges. Given these characteristics, farmers often face high levels of stress, both from family responsibilities and economic constraints, which contributing to high levels of stress among them. These findings highlight the importance of targeted support to improve farmers' well-being and reduce their mental stress.

Table 2. Data on Farmer Stress Levels

Stress Level	Respondents (n)	TP*	K*	LS*	SS*	Score DASS-42	Percentage (%)
Light	88	35	30	18	5	15-18	62.9
Currently	43	0	15	20	8	19-25	30.7
Heavy	9	0	0	2	7	>25	6.4
Total	140	35	45	40	20	-	100

Table 3. Multiple Linear Regression Analysis Data

Variables	Coefficient	p value	Effect on Stress Levels
Gender	0.345	0.012	Significant
Last education	-0.412	0.005	Significant
Roles in the Family	0.298	0.030	Significant
Number of Family Members	0.267	0.025	Significant
Agricultural Land Area	-0.394	0.008	Significant
Monthly Income	-0.512	0.001	Significant

*Information: Multiple linear regression analysis was conducted to evaluate the influence of characteristic variables (gender, last education, role in the family, number of family members, agricultural land area, and monthly income) on the level of work stress measured using the stress subscale on the DASS-42.

The analysis reveals several key socioeconomic factors that influence farmers' stress levels. Gender plays a significant role, with women exhibiting higher stress scores than men, suggesting that female farmers may be more vulnerable to stress due to the combined demands of agricultural work and household responsibilities. Education also shows a strong association with stress, as farmers with lower educational attainment tend to report higher stress levels, likely because limited education reduces access to agricultural knowledge and modern farming techniques that could improve productivity and ease work burdens.

Family roles further contribute to stress variations; heads of households experience greater stress than other family members because they bear primary responsibility for financial stability and the overall well-being of the family. In addition, family size is an important determinant, as respondents from larger families—those with more than four members—report higher stress levels, reflecting the heavier financial demands placed on households with more dependents. Agricultural land size also emerges as a significant factor, with farmers managing smaller plots (≤0.65 hectares) experiencing higher stress due to limited production capacity and reduced income potential, making them more vulnerable to the uncertainties of agricultural yields. Finally, monthly income demonstrates a clear relationship with stress levels, as farmers earning below Rp 1,916,983 per month show higher stress scores, indicating that financial strain and difficulty meeting basic household needs serve as substantial sources of psychological pressure.

Discussion

The results of this study indicate that the level of work stress among farmers is influenced by several demographic factors, namely gender, educational attainment, family role, number of family members, agricultural land area, and monthly income. Multiple linear regression analysis revealed that these six variables collectively have a significant effect on stress levels. Specifically, women reported higher stress scores than men. Farmers with lower levels of education also tended to experience greater stress, as did those serving as heads of households (Ackerl et al., 2023). In addition, farmers with more than four family members, land areas of ≤ 0.65 hectares, and monthly incomes below Rp 1,916,983 experienced significantly higher stress than other groups. These findings highlight the vulnerability of certain segments of the farming population to work-related and socio-economic stress.

This result is consistent with theories of work stress, particularly the Job Demands-Resources (JD-R) Model, which posits that stress levels are influenced by the imbalance between job demands and the resources available to individuals (Abdou et al., 2024). Female farmers, for example, may experience greater stress due to the dual burden of agricultural work and household responsibilities, whereas male farmers are more likely to focus solely on occupational tasks (Proctor et al., 2024; Wheeler & Lobley, 2023). Regarding education, farmers with limited schooling often lack access to modern agricultural technologies and information, increasing the risk of crop failure and exacerbating psychological stress.

The Role Strain Theory is also relevant for explaining these findings, particularly in relation to family roles. Heads of households, often viewed as primary breadwinners, bear heavy responsibilities for meeting family needs (Qothrunnada et al., 2024). When harvests are insufficient, financial pressures can trigger higher stress levels. This pressure intensifies in larger households, as evidenced by the correlation between family size and stress levels. In terms of land area and

income, Behavioral Economics Theory suggests that limited resources heighten vulnerability to stress. Farmers with smaller plots of land have lower production capacity and are thus heavily dependent on crop yields (Giller et al., 2021). When crops fail, they lose their primary source of income, which worsens stress. Furthermore, low income restricts their ability to invest in productivity improvements or obtain financial support, ultimately increasing psychological distress.

In addition to the JD-R and Role Strain perspectives, the Conservation of Resources (COR) Theory is highly relevant for understanding farmer stress (Merino et al., 2021). COR theory posits that individuals experience stress when they lose, are threatened with losing, or lack sufficient resources to meet demands. In this context, resources such as education, land area, and income are crucial for managing agricultural pressures (Yu et al., 2024). Limited resources undermine farmers' ability to cope with work demands, resulting in elevated stress. For instance, farmers with low education face difficulties not only in adopting new agricultural technologies but also in accessing financial support or government aid, leaving them more vulnerable to the effects of crop failures and fluctuating commodity prices.

The Social Cognitive Theory (SCT) also provides valuable insights into farmers' work stress, particularly through the concept of self-efficacy, or confidence in managing challenges (Pakmehr et al., 2021; Yazdanpanah et al., 2021). Farmers with low education or limited farming experience often have low self-efficacy, making them less confident in handling risks such as weather variability or market fluctuations (Riviwanto et al., 2024). This lack of confidence can exacerbate stress, as they feel little control over outcomes. Moreover, cultural norms that emphasize the family's economic success as the responsibility of the household head may intensify stress, especially for men in the breadwinner role.

From a sociological perspective, Pearlin's Stress Process Model highlights that stress arises not only from job demands but also from limited social resources and weak social support. In this study, family and community roles significantly affected stress levels. Farmers with larger families faced greater economic demands, increasing stress, while inadequate social support from family or community reduced their ability to cope (Alharbi, 2024; Chai et al., 2025). Thus, work stress is shaped not only by individual and economic factors but also by broader social dynamics. Strong social support can buffer stress, whereas its absence can amplify the effects of work pressures.

Together, these theories provide a comprehensive framework for interpreting the findings. COR, SCT, and the Stress Process Model demonstrate that work stress among farmers is not solely an economic or occupational issue but also involves intertwined psychological, social, and cultural dynamics. A lack of resources, low self-efficacy, and limited social support combine to increase vulnerability to high stress (Aune et al., 2021; Berdida et al., 2023). This theoretical approach underscores the need for interventions that strengthen resources, empower communities, and build farmers' confidence.

Based on the evidence and theoretical interpretations, this study emphasizes that farmer stress is shaped not only by individual factors but also by broader structural conditions. One strategic measure is to improve farmers' access to modern agricultural technologies and information. Governmental and non-governmental organizations (NGOs) can play a critical role by providing training and mentoring programs, especially for farmers with lower education, to enhance yields and reduce risks of crop failure (Mapiye et al., 2023; Zheng et al., 2022) . Additionally, targeted support for women farmers—who are especially vulnerable to stress—is essential. Social and community-based support systems can help women farmers manage their dual burdens, while empowerment programs in agriculture can enhance their skills and confidence.

In the long term, policies that ensure access to larger land areas and stabilize crop prices are also necessary to mitigate farmer stress. Agricultural subsidies, low-interest credit, and crop insurance programs represent concrete strategies to enhance farmers' productivity and reduce the uncertainty of agricultural yields (Marengo et al., 2022; Şengül, 2025). Overall, farmer stress is a complex and multidimensional phenomenon. A comprehensive approach involving individual, community, and structural interventions is required to reduce the psychological burden. This study also opens pathways for future research to further explore the mechanisms underlying each factor contributing to stress and to evaluate the effectiveness of different interventions. Ultimately, the findings underscore the importance of addressing farmers' mental well-being as a cornerstone of agricultural sustainability in Indonesia.

Conclusion

This study concludes that farmers' work stress is significantly shaped by key demographic and socioeconomic factors, including gender, educational level, family role, family size, agricultural land area, and monthly income. Overall, individuals with limited resources—such as women, farmers with lower educational attainment, larger family responsibilities, smaller land ownership, and lower income—were more vulnerable to elevated stress levels. These results align with major theoretical frameworks such as the Job Demands–Resources (JD-R) Model, Role Strain Theory, Conservation of Resources (COR) Theory, and the Stress

Process Model, all of which highlight how heightened demands and insufficient resources contribute to psychological strain. Generalizing from these findings, work stress among farmers can be understood as a structural issue influenced by resource scarcity and economic instability, suggesting that similar patterns may occur in rural agricultural populations with comparable socioeconomic conditions. Practically, the results underscore the need for targeted interventions that strengthen farmers' personal and structural resources, including improving access to agricultural training, enhancing economic support programs, expanding land-use optimization initiatives, and fostering stronger community-based support systems. These strategies are essential to reduce work stress and promote better mental well-being among farming communities.

Author Contributions
Conceptualization, validation, review: E.H.K; methodology and validation: A.T.A; Formal Analysis: E.I.D; investigation and resources: N.A.; R. All authors have read and approved the final version of the manuscript.

Conflicts of Interest
The authors declare no conflicts of interest regarding the conduct of this research, the preparation of the manuscript, or its publication. The funding provided by LP2M Universitas Jember through the Beginner Lecturer Research Grant did not influence the study design, data collection, analysis, or interpretation of the results.

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