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Farmers' Coping Strategies in Facing Flood Disasters

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Abstract:
Flood disasters in agricultural areas have the potential to inflict devastating losses, mainly through crop failures. These failures can severely undermine farmers' economic conditions and dramatically decrease productivity levels within the agricultural sector. Consequently, farmers face significant challenges in managing the aftermath of such disasters. This research is dedicated to exploring and elucidating the coping strategies employed by farmers in Wonoasri Village, Tempurejo District, Jember Regency. A quantitative descriptive study involved 290 participants selected through a simple random sampling technique. Data collection was facilitated using a characteristics sheet specific to farmers alongside the Brief Cope Questionnaire. The findings reveal that farmers primarily utilize adaptive coping strategies, achieving an impressive median score of 83.00. Notably, the most prevalent strategies include religious coping, behavioral disengagement, and substance use. These insights underscore the resilience and resourcefulness of farmers as they navigate the challenges posed by flood disasters.

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INTRODUCTION

Indonesia is highly prone to natural disasters, including earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides (Basri et al., 2022). Since a significant portion of the population relies on agriculture for livelihood, these disasters disproportionately impact farming communities (McGreevy & Adrien, 2023). In East Java, erratic rainfall patterns exacerbate agricultural challenges, particularly in regions like Wonoasri Village, where geographical conditions intensify flood risks. The interplay of environmental and human factors in this area underscores farmers' vulnerability to climate-related stresses (Das et al., 2024).

Wonoasri Village in Tempurejo District, Jember Regency, faces recurring floods due to its low-lying, concave terrain, which traps water during heavy rainfall (Zhang et al., 2022). The Sanenrejo River, a critical water source, often overflows during peak discharge periods, overwhelming the village's drainage capacity. Compounding these issues are sedimentation and blockages in river basins caused by upstream villages like Curahnongko and Mayang (Acheampong et al., 2023). These geographical and hydrological factors make Wonoasri particularly susceptible to annual flooding, disrupting agricultural activities and livelihoods.

Unpredictable weather patterns in the region have severe implications for farmers (Yang et al., 2021). Delays in planting or harvesting due to erratic rainfall or floods create uncertainty, reducing agricultural productivity and increasing the risk of crop failure (Jaber et al., 2022). Such conditions heighten stress among farmers, with 59% reporting moderate to high-stress levels linked to weather

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variability, while 41% experience low stress (Yeleliere et al., 2023). The psychological burden of these challenges is compounded by economic instability, as many farmers earn incomes below the minimum wage (Ullah et al., 2024).

To manage stress, farmers in Wonoasri employ coping strategies tailored to the nature of the stressor (Proctor & Hopkins, 2023; Kurniyawan et al., 2024). Problem-focused approaches, such as modifying farming practices or collaborating with local authorities to improve infrastructure, are common responses to external challenges like floods (Ahmad et al., 2025). Conversely, emotion-focused strategies—such as patience, acceptance, and reliance on spiritual beliefs—manage internal anxieties (Ahmad & Jafree, 2023). These adaptive mechanisms reflect farmers' resilience and highlight systemic institutional support gaps (Nicholas-Davies et al., 2021; Suraying et al., 2024).

Family support is critical in mitigating stress for farmers (Deegan & Dunne, 2022; Harishoh et al., 2024). Emotional encouragement and shared responsibilities within households help buffer against the psychological impacts of crop failures or income losses (Lindsay et al., 2025). Additionally, community networks facilitate knowledge exchange on adaptive farming techniques, such as drought-resistant crops or water management practices (Aliyar et al., 2025). However, these informal systems often do not address more significant structural issues, emphasizing the need for targeted interventions (Chao, 2024).

Further research is essential to understand the coping strategies of rice farmers in Wonoasri Village, particularly about flood management and climate adaptation (Ali et al., 2021). Studies should explore how gender, education levels, and income disparities influence vulnerability and resilience (Sule et al., 2022). Policymakers must prioritize infrastructure improvements, such as river dredging and flood barriers, alongside social protections like subsidized insurance to safeguard farmers' well-being (Hovis et al., 2020).

Addressing farmers' challenges in Wonoasri requires a holistic approach that combines environmental management, economic support, and mental health resources (Fahad et al., 2023). Strengthening early warning systems, promoting climate-smart agriculture, and enhancing access to education can empower farmers to adapt to changing conditions (Ahmed et al., 2024). By integrating local knowledge with scientific research and policy action, Indonesia can build resilient agricultural systems capable of withstanding the growing threats of climate change and natural disasters (Herningtyas et al., 2023).

METHOD

The research design used in this study is descriptive quantitative. This study aims to describe a phenomenon or describe the data that has been collected. The analysis of this study is in the form of data with descriptive form using one variable. Researchers identify coping strategies for farmers in the flood disaster area of Tempurejo District, Jember Regency. The population in this study consisted of all farmers in Wonoasri Village, Tempurejo District, totaling 1,053 individuals. This study's sample comprised nine farmer groups, totaling 290 respondents. This number was determined using the Slovin formula to calculate the sample size.

The technique used in this study involved probability sampling, which provides equal opportunities for all members of the population to be selected as participants. Specifically, a simple random sampling method was employed. This research was conducted in Winoasri Village, Tempurejo District, Jember. There are nine farmer groups in Wonoasri Village. The researcher created small pieces of paper with the names of each farmer group's members to select participants. These papers were shuffled, and each time a name was drawn, that individual was selected as a participant in the study. The paper was then returned to the pool, and the process continued until

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290 participants were selected. If a name was drawn again, it was considered invalid and returned to the pool for further randomization. To find the participants' homes, the researcher consulted with the heads of the farmer groups to obtain the necessary addresses.

The questionnaire used is the Brief Coping Questionnaire. It consists of 28 questions that measure three aspects of coping: problem-focused, emotion-focused, and dysfunctional. The first aspect, emotion-focused coping, involves individual actions to reduce adverse emotional reactions and alleviate emotional distress caused by stressors. This may include strategies such as avoidance, emotional release, relaxation techniques, and self-blame. The second aspect, problem-focused coping, encompasses strategies employed to find solutions to specific problems. The questionnaire comprises 28 items, and a Likert scale is used for responses.

The completed data is then processed by analyzing it to determine its meaning. Data on participant characteristics is presented in terms of frequency and percentage. Values are the mean and standard deviation for normally distributed numeric data. However, if the data is not normally distributed, it is represented using the median, minimum, and maximum values. In this study, the normality of the data is assessed using skewness and kurtosis, with standard data defined as having a value between -2 and 2. The results indicate that this study's data distribution is not normal.

This research applies the ethical principle of respecting human rights by allowing potential respondents to determine whether they are willing to participate in this research. The principle of benefit is provided by a guarantee of being free from risk and not endangering respondents, as well as justice to maintain the confidentiality of profiles and results. The ethical feasibility test in this study was conducted at the Faculty of Dentistry, University of Jember.

RESULT

The study's results explain the coping strategies for farmers in the flood disaster area of Wonoasri Village, Tempurejo Sub-District, Jember. The total number of participants in this study was 290 farmers.

Farmer's Characteristic

The characteristics of the participants in this study include age, gender, last education, occupation, income, other agricultural products, land area, and working time. The distribution of participants can be seen based on the characteristics of the participants in the table.

Table 1. Characteristics of Participants in the Flood Disaster Area of Wonoasri Village (n=290)

Characteristics	Frequency	Percentage
Age		
Adult	189	67.6
Elder	91	32.4
Formal Education		
Elementary	156	53.8
High school	131	45.2
Graduate	3	1.0
Gender		
Male	268	92.4
Female	22	7.6
Occupation		
Officer	51	17.5
Entrepreneur	45	15.5
Other	5	1.7
Total	1000	100.00

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The participant data characteristics reveal that most participants are aged between 46 and 55, accounting for 36.9% or 107 individuals. In contrast, only 3.1% or 9 participants are between 26 and 35 years old. The gender distribution shows significantly more males, with 268 individuals or 92.4%, compared to 22 females, comprising 7.6%.

In terms of education, most participants have either elementary school education or no formal schooling, totaling 53.8%. Those with a college education represent only 1.0% or three individuals.

Regarding employment characteristics, 188 participants, or 64.8%, are farmers who also engage in livestock rearing. Additionally, there is one farmer whose primary occupation is as a civil servant, representing 0.3% of the participants.

Farmer's Coping

Table 2. Farmer's Coping in the Flood Disaster Area of Wonoasri Village (n=290)

Indicators	Median	Min-max
Coping Strategy	83	62-97

According to Table 3, The median of Farmer's Coping in the Flood Disaster Area of Wonoasri Village is 83.

Table 3. Indicators Farmer's Coping in the Flood Disaster Area of Wonoasri Village (n=290)

Indicators	Median	Min- Max
Active coping	8.00	2-8
Use of instrumental support	6.00	2-8
Planning	5.00	2-8
Acceptance	6.00	2-8
Positive reframing	6.00	2-7
Religion	8.00	3-8
Denial	7.00	2-8
Use of emotional support	4.00	2-8
Humor	4.00	2-8
Self-distraction	4.00	2-8
Venting	6.00	2-8
Behavioural Disengagement	8.00	2-8
Self-blame	6.00	2-8
Substance use	8.00	4-8

According to Table 3, the highest values for coping strategies are active coping, religion, behavioral disengagement, and substance use. The coping strategies with the lowest values are emotional support, humor, and self-distraction.

DISCUSSION

Farmer age is a critical factor influencing agricultural productivity, technology adoption, and overall sustainability within the agricultural sector. Farmers are generally aging in many countries, affecting efficiency and innovation in farming practices. Research indicates a close relationship between age and farmer productivity; younger farmers usually possess greater physical strength and adaptability when facing agricultural challenges than their older counterparts. Several studies have demonstrated that older farmers often experience a decline in physical abilities, which can hinder their work effectiveness on farms (Caffaro et al., 2022).

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Younger farmers are more inclined to accept and implement agricultural innovations, such as using modern tools, digital technology, and sustainable farming methods. Conversely, older farmers may find it more challenging to adapt to changes due to limited access to information or a lack of digital skills (Rakhmawati et al., 2021). Furthermore, the younger generation is more interested in agriculture when the sector offers modern technology and attractive economic opportunities (Borda et al., 2023). Therefore, promoting methods that reflect the latest advancements can lead to more productive-age farmers.

The low number of female farmers can be attributed to traditional roles wherein women are primarily responsible for food availability, leading them to spend more time on household activities. In many cases, men perform heavier tasks, while cultural norms in Indonesia tend to assign women domestic responsibilities, creating a long-standing habit (Annes et al., 2020). Women play a dual role as housewives and contributors to agricultural activities, even though their work is often not as physically demanding as men. Their contributions may involve completing household chores or seeking additional income for their families (Balayar & Mazur, 2022). Many female farmers treat farming as a secondary job to support their husbands or as the primary breadwinners. In contrast, male farmers tend to have more substantial physical energy for demanding tasks (Southard, 2025). This study's respondents show a higher number of male farmers than female farmers, reflecting the gender-based division of labor.

The study's results revealed that most farmers had an educational background of either having attended Elementary School or not having attended school at all, accounting for 156 participants or 53.8%. The level of education impacts farming practices because it is closely linked to innovation and adaptability (Rizzo et al., 2024). A higher education often accelerates an individual's ability to learn and manage agricultural practices effectively (Rust et al., 2022). In Wonoasri Village, most farmers have only reached Elementary School or have not received formal education, primarily due to financial constraints. Farmers typically acquire agricultural knowledge through generations, and developing new skills in this sector requires a willingness to learn and adapt. Unfortunately, awareness of the need for formal education is often low in rural communities, leading to a belief that an education level up to Elementary School is sufficient.

The study also found that farming with livestock constitutes the main occupation for many participants, with 188 respondents, or 64.8%, reporting this as their primary job. People often engage in livestock farming alongside crop production, utilizing fertilizers their animals produce. The work involved in farming usually requires additional time and effort beyond crop cultivation (Lemaire et al., 2023). Villagers often pursue additional income through other jobs, as most households require supplementary sources of revenue. After completing their agricultural tasks, many farmers seek out grass for animal feed, raise livestock for themselves or others, or provide care for livestock owned by others for additional wages. Livestock raised by farmers can be sold to increase family income.

The results indicated that farmers' coping strategies in the flood-plagued area of Wonoasri Village, Tempurejo District, Jember Regency, were classified as effective, achieving a median score of 83.00. The standard score for coping strategies ranges from a minimum of 28 to a maximum of 112, highlighting a good level of coping among the farming community. A higher coping score reflects more decisive and adaptive coping mechanisms, crucial when facing natural disasters like floods. Psychological factors play a significant role in shaping these coping strategies, as individual intelligence, past experiences, and self-concept have been identified as key contributors to how individuals respond to challenges (Miao et al., 2024; Maharani et al., 2024). These findings demonstrate not only the resilience of the farmers but also their ability to adapt and utilize available resources effectively in demanding situations.

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The insights gained from this study underscore the resourcefulness and determination of farmers as they navigate the hardships brought by flood disasters. By employing diverse coping strategies, these individuals showcase their capacity to manage stress and recover from adversity, ensuring their survival and the sustainability of their livelihoods. Such resilience is critical in regions prone to recurring natural disasters, where external support may be limited or delayed (Kurniyawan et al., 2022; Intiyaskanti et al., 2021). Understanding the psychological and environmental factors that influence coping mechanisms can further aid in designing targeted interventions and policies to support affected communities. This highlights the importance of integrating local knowledge and practices into broader disaster management frameworks, ultimately enhancing community preparedness and response capabilities.

CONCLUSION

Most farmers are of productive age, with the majority being male. Most have either completed elementary school or have not attended school, and most farmers earn a monthly income below the minimum wage. The findings reveal that farmers primarily utilize adaptive coping strategies, achieving an impressive median score. Notably, the most prevalent strategies include religious coping, behavioral disengagement, and substance use. These insights underscore the resilience and resourcefulness of farmers as they navigate the challenges posed by flood disasters. Nurses need to study coping strategies for farmers in disaster areas to improve promotive and preventive efforts in farmers to improve holistic nursing care for the community in flood disaster areas.

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