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Resilience of Crop Failure for Farmers in Dryland Area

Ariel Aoetpah[1], Rizky Pradita Manafe[2], Feronika Ratu[3]
[1-3]Psychology Department, University of Nusa Cendana
e-mail: [1]arilaoetpah69@gmail.com, [2]rizky.manafe@staf.unda.ac.id,
[3]feronikaratu84@gmail.com

Abstract. Indonesia, as an agrarian country, is highly dependent on the agricultural sector, including in East Nusa Tenggara Province, which is dominated by dryland areas and prone to crop failure. The impact is not only economic but also psychological, such as stress and depression. Nevertheless, some farmers remain able to survive, demonstrating resilience. This study aims to describe the resilience and adaptive strategies of farmers in dryland areas using a qualitative phenomenological approach through in-depth interviews. The results show that resilience is shaped by family responsibility, land ownership, positive mindset, spiritual beliefs, self-confidence, and dependence on farming. Resilient farmers can manage emotions, think optimistically, and develop adaptive strategies. These findings are expected to serve as a foundation for policies to support the resilience of farmers in drought-prone areas.

Keywords: *Resilience, Farmers, Dry Land, Crop Failure, Psychological Resilience.*

Abstrak. Indonesia sebagai negara agraris sangat bergantung pada sektor pertanian, termasuk di Provinsi Nusa Tenggara Timur yang didominasi lahan kering dan rawan gagal panen. Kondisi lingkungan seperti curah hujan rendah, suhu tinggi, dan kelembaban rendah menyulitkan budidaya pertanian dan meningkatkan risiko gagal panen. Dampaknya tidak hanya secara ekonomi, tetapi juga psikologis, seperti stres dan depresi. Meski demikian, sejumlah petani tetap mampu bertahan, menunjukkan adanya resiliensi. Penelitian ini bertujuan menggambarkan resiliensi dan strategi adaptasi petani di lahan kering, dengan pendekatan kualitatif fenomenologis melalui wawancara mendalam. Hasil menunjukkan bahwa resiliensi terbentuk dari tanggung jawab keluarga, kepemilikan lahan, pola pikir positif, keyakinan spiritual, kepercayaan diri, dan ketergantungan pada pertanian. Petani resilien mampu mengelola emosi, berpikir optimis, dan menyusun strategi adaptif. Temuan ini diharapkan menjadi dasar kebijakan untuk mendukung ketahanan petani di wilayah rawan kering.

Kata kunci: *resiliensi, petani, lahan kering, gagal panen, ketahanan psikologis.*

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Introduction

The province of East Nusa Tenggara (NTT) is one of the regions highly dependent on the agricultural sector in its economic structure (Zuhdi, 2021). However, the region's dominant geographic features and dry climate pose significant challenges for farmers during production, as approximately 76.64% of the total land area is dry land (BPS, 2024). Dry land is characterized by low rainfall, high temperatures, and low humidity, often leading to crop failure (Mulyadi Rochdiani and Hakim, n.d.).

Crop failure is a significant decline in agricultural yields caused by factors such as extreme weather, pest infestations, and poor soil quality (Lestari, 2022). In addition to economic losses, this condition also causes severe psychological impacts on farmers, such as anxiety, frustration, and even depression (Fitria & Riyadi, 2022; Septiani, Wuryaningsih and Kurniyawan, 2020). In such conditions, many farmers are afraid to plant again due to the trauma and financial pressure they have experienced (Ikhtiar, 2024).

Given the complexity of the challenges faced, this study aims to examine farmers' resilience in dryland areas following crop failure. The specific objectives of this study are to identify the forms of resilience among farmers, analyze the factors influencing resilience development, and assess the role of social environments, such as family and farmer groups, in supporting farmers' psychological resilience. This study also aims to provide empirical contributions to the development of agricultural policies that focus not only on technical aspects of production but also on the psychosocial aspects of farmers.

This study is important because it offers benefits in three areas: theoretical, practical, and social. Theoretically, this study enriches the literature on farmer resilience in the context of climate change and uncertainty in dryland-based agriculture. This study also comprehensively applies the resilience theory developed by Reivich and Shatte, which includes seven main aspects: emotional regulation,

impulse control, optimism, causal analysis, empathy, self-efficacy, and ability to seek help (Reivich & Shatte in Mbeo, 2023). Practically, the results of this study can serve as a reference for policymakers in designing psychosocial interventions to enhance farmers' resilience to climate change. From a social perspective, this study reinforces the understanding of the importance of family and community support in shaping farmers' resilience.

In theoretical studies, resilience is defined as an individual's ability to recover from difficulties and continue to function positively when facing challenges (Desmita in Firdaus et al., 2024). Resilience is important in agriculture, where farmers face high external risks and weather uncertainty. Previous research has shown that farmers on dry land tend to have a higher risk of crop failure compared to farmers on rain-fed paddy fields (Aini et al., 2015). Additionally, the psychological impact of crop failure has been studied among tobacco and melon farmers, with results indicating high emotional stress (Fitria & Riyadi, 2022). However, few studies explicitly integrate psychological and social aspects to examine how farmers recover after failure through resilience mechanisms.

This highlights a research gap: the lack of studies on the forms of farmer resilience after crop failure and the holistic factors that influence it. Most studies have focused more on economic risks and losses rather than on how farmers survive and recover from adversity (Hidayati & Suryanto, 2015; Aini et al., 2015). Therefore, this study aims to fill this gap by combining psychological, social, and agricultural aspects.

The researchers' main argument is that a strength-based approach, such as resilience, is more appropriate for analyzing farmers' responses to crop failure. This approach provides space to understand farmers' success in surviving pressure and uncertainty, rather than describing their vulnerability. Based on interviews with farmers in Bena Village, some demonstrated strong adaptive abilities after crop failure, thanks to the support of their families, farming communities, and the wise

management of crop yields (Interview with S.O., March 1, 2025; Interview with B.S., March 2, 2025).

The hypotheses of this study are: (1) Dryland farmers with high levels of resilience will demonstrate better adaptive capacity after crop failure. (2) Internal factors such as self-efficacy and motivation, as well as external factors such as family and farmer group support, have a significant influence on farmers' resilience levels. (3) There are significant differences in resilience between farmers who own their own land and those who do not.

Method

This study employed a qualitative phenomenological approach to explore the resilience of dryland farmers after experiencing crop failure. The research was conducted in Bena Village, East Nusa Tenggara Province, an area dominated by dryland farming and frequently affected by crop failure. Data collection was conducted over three months (March–May 2025) to capture farmers' experiences during both the planting and harvesting seasons.

The study population consisted of all dryland farmers in Bena Village. From this population, five farmers were selected as participants using purposive sampling. This technique was chosen because the study required participants with specific experiences: having experienced crop failure and possessing coping or adaptation strategies. Thus, the data obtained were in-depth, relevant, and aligned with the research objectives. The inclusion criteria were: (1) being the head of a household with farming as the main livelihood; (2) having experienced at least one crop failure in the past two years; and (3) willingness to participate in in-depth interviews.

Data were collected through semi-structured interviews and field observations. Each interview lasted 45–90 minutes, was conducted in the local language, and was then transcribed and translated into Indonesian. To ensure data

validity, a member check was conducted by returning the interview summaries to the five participants for confirmation. All participants stated that the transcripts accurately reflected their experiences, with only minor corrections to local terminology.

Data analysis employed Descriptive Phenomenological Analysis (DPA). This method was chosen because it is suitable for providing a detailed description of participants' lived experiences as they are, without excessive interpretation by the researcher. Through DPA, the researcher sought to extract meaning from farmers' original statements and present them in descriptions that reflect their experiences of resilience after crop failure. Ethical considerations were observed by obtaining informed consent from all participants, ensuring anonymity, and allowing participants the right to withdraw from the study at any time.

Result

Forms of Failure

a. Natural Conditions

Dryland farmers face various natural challenges, including water shortages, unpredictable rainfall, and pest infestations. All participants (P1–P5) stated that water dependence was a key factor in successful planting. Excessive rainfall leads to high humidity and grain damage, while salty soil exacerbates the problem. Additionally, pests such as grasshoppers, locusts, and caterpillars continue to attack even when water is available, resulting in plant death. This indicates that farming success is highly dependent on external factors that are difficult to control.

b. Social Conditions

In addition to natural factors, crop failure is also triggered by an uncoordinated irrigation system. Farmers (P1, P2, P4, P5) complain about unequal water distribution, conflicts between farmers in irrigation management, and delays in opening channels by officials. Some farmers also face physical obstacles such as

declining health conditions. These social factors exacerbate the risk of crop failure and highlight the need for a fair and collaborative water management system.

Psychological Response

a. Blaming the Situation

Most farmers blame external factors—such as weather, irrigation, fertilizers, and pests—for crop failure. This is a self-defense mechanism that helps alleviate stress and maintain resilience. "*We tried our best, but the water wasn't turned on… in the end, I just accepted it*." (P1)

b. Emotional Experience

Crop failure triggers negative emotions such as anger, disappointment, stress, and mental fatigue. Despite this, farmers continue to strive to recover, hoping that the next season will be better. "I can't sleep peacefully… the stress is so overwhelming." (P5)

Reasons for Persevering

a. Family Responsibilities

The main motivation for farmers to persevere is their responsibility toward their wives, children, and extended families. "I have a family, so there are responsibilities… what will my wife and children eat if I don't work?" (P2)

b. Land Ownership

Owning their own land makes farmers feel responsible for continuing to manage it, even when it is unprofitable. "If we sell the land, where will we get it from? So even if we fail, we try again." (P1)

c. Positive Thinking and Spirituality

The belief that farming outcomes are God's will provides mental strength for farmers. Prayer and tithing are an important part of their practices. "Before entering the fields, we must pray first… all results come from God." (P1)

d. Self-Confidence

Farmers believed that sincere efforts would not be in vain. "What we do will definitely yield results… we must be confident." (P3)

e. Dependence on Agriculture

Farming is their only source of livelihood, keeping them going despite facing significant risks. “I compared being a laborer to farming, and the results in agriculture are better.” (P5)

Survival Efforts

a. Acceptance of the Situation

Farmers demonstrate mental resilience by accepting crop failure as part of the process. They do not dwell on stress but use failure as a lesson to rise again. “Even if tears fall, we must replant.” (P1)

b. Adaptation Strategies

Various adaptive strategies are employed to address drought and waterlogging, such as using pumps, adjusting planting times, and drying fields to combat algae (P1, P2, P5). To manage pests and problematic soil, farmers use organic fertilizers, natural pesticides, and traditional methods like ash and lime. “*Just give it less water… then sprinkle lime*.” (P5) “*I draw the water myself because they don’t have the equipment.*” (P1) These adaptations reflect the resilience, creativity, and survival spirit of dryland farmers amid complex environmental and social challenges.

Discussion

Data analysis in this study used Descriptive Phenomenological Analysis (DPA). This approach aims to provide a detailed description of participants’ experiences as they are, while minimizing the researcher's subjective interpretation. This study shows that the resilience of dryland farmers in Bena Village is a multidimensional process shaped by personal, social, and environmental factors. Farmers' persistence after crop failure is strongly influenced by family responsibility, land ownership, spiritual beliefs, and self-confidence. One informant stated, "If I stop farming, what will my family eat? Even after crop failure, I plant again” (Interview, Farmer 1). This illustrates that family responsibility is a primary driving force for farmers to continue.

The challenges faced by Bena farmers—drought, pest attacks, and soil degradation—are consistent with national studies highlighting the vulnerability of dryland agriculture to climate variability. One farmer explained, "Rain is unpredictable, sometimes it doesn't come for a long time. When that happens, the rice can all die" (Interview, Farmer 3). This finding supports the research of Hidayati and Suryanto (2015) and Aini et al. (2015), which showed that dryland farmers are at high risk due to climate change and extreme weather.

Psychologically, this study reinforces earlier findings that crop failures often trigger stress, frustration, and anxiety. One respondent said, "When the harvest fails, I cannot sleep. I keep thinking about how to pay for my children's schooling" (Interview, Farmer 5). This is consistent with the findings of Septiani et al. (2020) and Fitria & Riyadi (2022), who reported significant psychological distress among farmers following crop failure. (Yazd et al., 2019), farmers are at increased risk of depression, anxiety, and even suicide due to climate pressures and financial losses.

Beyond individual coping, social support plays an important role in building resilience. One farmer shared, "If there are problems, we usually discuss them in the farmer group. Even if we don't always find a solution, at least there are people to talk to" (Interview, Farmer 2). This aligns with previous studies by Marseva et al. (2016) and Putra et al. (2021), which argued that education, experience, and social support enhance adaptive capacity.

The adaptive strategies employed by Bena farmers—adjusting planting times, using organic fertilizers, and relying on prayer and family encouragement—demonstrate a combination of technical and psychosocial adaptation. One respondent emphasized, *"I keep believing that God will show us a way. The important thing is to work hard and not give up"* (Interview, Farmer 4). This corresponds with (Prakoso et al., 2025), which emphasizes that social capital, such as family support, trust, and interpersonal relationships, play an important role in improving farmers' ability to

survive and recover from the pressures of crop failure. Thus, the resilience of Bena farmers is not determined solely by individual strength but by the complex interaction between environmental stressors, personal coping strategies, and social support. This study underscores the importance of integrated policies that combine technical interventions (such as irrigation and pest management) with psychosocial programs (coping training, mental health services, and strengthening farmer groups).

Conclusion

This study describes the resilience of farmers in Bena Village, a dryland area, in the face of crop failure. Based on Reivich and Shatté (2002), farmers demonstrate high resilience through their ability to bounce back, adapt, and maintain their farming activities amid natural challenges (drought, excessive rainfall, pests) and social challenges (poor irrigation, inter-farmer conflicts). Despite experiencing negative emotions such as stress and disappointment, farmers manage these feelings through adaptive strategies, including blaming the situation as a defense mechanism.

The main reasons for persevering are family responsibilities, land ownership, positive thinking, spiritual beliefs, self-confidence, and dependence on agriculture. Specifically, farmers also make various efforts such as accepting reality, seeking additional income, borrowing funds, adjusting planting patterns, and strategically utilizing water and fertilizers. Their resilience is reflected in their mental strength, adaptability, and courage to face the risk of crop failure.

Suggestion

To strengthen the agricultural sector, the government and related institutions should prioritize infrastructure and educational support. This includes improving irrigation systems and supervision, providing specialized training on agricultural adaptation to climate change and pest management, and ensuring easier access to capital for farmers struggling with crop failures. Additionally, future researchers are encouraged to conduct social and psychological intervention studies

to build deeper resilience, while incorporating quantitative approaches to measure these resilience levels more objectively.

Farmers should focus on fostering stronger communication and cooperation to mitigate potential social conflicts. By developing positive attitudes and pursuing business diversification, farmers can better navigate environmental uncertainties. Enhancing technical skills and maintaining collaborative networks will serve as a vital foundation for long-term stability and adaptation in the face of evolving agricultural challenges.

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