

Phenomenological Insights into Climate Adaptation among Rural Smallholder Farmers in Indonesia

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ABSTRACT

Climate change adaptation is a critical concern in development studies, particularly for rural agricultural communities in the Global South. While many studies emphasize technical solutions and policy frameworks, the lived experiences of farmers adapting to climate-related disruptions remain underexplored. This study investigates how smallholder farmers perceive, interpret, and give meaning to climate adaptation, particularly in settings where cultural identity and ecological uncertainty converge. Using an interpretative phenomenological approach, the research explores the adaptation experiences of smallholder farmers in relation to local food security. Twelve farmers from climate-vulnerable rural areas were interviewed in depth. Three key experiential themes emerged: 1) Perceptual disorientation caused by unpredictable environmental changes. 2) Emotional tension arising from the need to abandon traditional agricultural practices. 3) The development of collective adaptation strategies based on local knowledge. 4) These findings suggest that adaptation is not merely a rational or technical adjustment but a deeply meaningful process, shaped by values, identity, and community relationships. Interpretative phenomenological analysis offers insights into the internal, cultural, and symbolic dimensions of adaptation. This human-centered perspective complements and challenges dominant adaptation frameworks. The study's insights inform the creation of inclusive, culturally sensitive adaptation policies and point to new directions for interdisciplinary research on climate resilience.



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INTRODUCTION

Climate change is one of the most urgent global challenges, affecting both ecological systems and the socio-economic structures of communities that depend on natural resources. Smallholder farmers in rural areas of developing countries are among the most vulnerable, as their agricultural practices rely heavily on seasonal rhythms and environmental predictability. In these communities, increasingly frequent extreme weather events, erratic rainfall patterns, and shifting climatic conditions have severely disrupted traditional farming cycles, posing significant risks to livelihoods and food security.

In the context of Development Economics, adaptation to climate change is often discussed through the lenses of institutional policy, infrastructure investment, and technological innovation. While these approaches are critical, they may inadequately capture the everyday realities of those at the frontline of climate impact. The experiential dimensions of adaptation—how individuals perceive, emotionally engage with, and culturally interpret environmental changes—remain underrepresented in scholarly discourse (e.g., [insert citation here], [insert another citation]).

Farmers' responses to climate stressors are shaped not only by external interventions but also by internalized meanings rooted in cultural identity, collective memory, and emotional resilience. These subjective experiences influence both the strategies employed and the values assigned to them, highlighting the need for interpretative inquiry into the human side of adaptation. This study addresses this gap by adopting a phenomenological approach to explore how smallholder farmers in rural Indonesia understand and navigate climate change in their daily lives.

The relevance of this phenomenon extends beyond practical survival; it touches upon issues of dignity, identity, and resilience. For many farmers, adaptation is not merely a reaction to environmental

stressors but a process that reshapes their relationship with the land, their cultural traditions, and their sense of self. The subjective meanings they ascribe to change, loss, and continuity play a crucial role in shaping their adaptive capacities. As such, understanding these meanings offers valuable insights into the human dimension of climate resilience, especially in regions where formal support systems are limited or inconsistent.

Despite growing recognition of the human side of climate change, there remains a significant gap in empirical literature that captures the subjective experiences of farmers navigating this crisis. The need for phenomenological inquiry—focused on the exploration of lived experience—is therefore both timely and essential. Such an approach allows for a deeper engagement with the voices of those directly affected, revealing how adaptation is experienced, interpreted, and negotiated in everyday life.

In recent years, research on the subjective experiences of individuals facing environmental stressors has gained increased scholarly attention, particularly within the context of climate change and rural livelihoods. Scholars have begun to acknowledge that farmers are not merely passive recipients of ecological disruption but active agents whose perceptions, emotions, and cultural frameworks shape their responses to environmental uncertainty. The exploration of these lived experiences is essential to develop a comprehensive understanding of adaptation that encompasses both behavioral changes and internal meaning-making processes.

However, methodological challenges persist in capturing the depth and nuance of such experiences. Much of the existing literature on climate adaptation remains dominated by quantitative approaches that prioritize generalizability over contextual specificity. These methods, while valuable for measuring trends and evaluating outcomes, often fail to account for the complex emotional, moral, and identity-related dimensions of adaptation. As a result, the individual narratives and interpretive frameworks through which farmers navigate change are frequently underexplored or entirely absent from academic discourse.

This limitation is particularly evident in studies conducted in rural agricultural communities, where adaptation practices are tightly interwoven with local knowledge, spiritual beliefs, and intergenerational wisdom. Standardized survey instruments and statistical models are ill-equipped to access these layers of meaning, leading to an incomplete picture of how adaptation is truly experienced on the ground. Consequently, the use of phenomenological approaches—which prioritize depth over breadth and aim to uncover the essence of lived experience—has become increasingly relevant in this research domain. These approaches allow researchers to attend to the voices, metaphors, and emotional landscapes of those most directly affected, offering richer and more human-centered insights into the realities of climate resilience.

Existing efforts to address climate change adaptation in the agricultural sector have predominantly relied on pragmatic frameworks—such as the dissemination of climate-resilient seeds, provision of subsidies, or training on adaptive farming techniques. These solutions, while valuable in addressing immediate vulnerabilities, are largely rooted in technical and behaviorist paradigms that prioritize functional change over experiential understanding. As such, they often overlook the complex and personal processes through which farmers interpret, internalize, and respond to environmental disruptions.

The predominant reliance on surveys, predictive models, and impact assessments fails to capture the rich, subjective dimensions of adaptation, including emotional distress, identity negotiation, and cultural dissonance. Consequently, the current body of knowledge remains limited in its ability to reflect how farmers make sense of change within their lived context. Studies that acknowledge the psychosocial and cultural facets of adaptation remain rare, and even fewer attempt to access these through methodological frameworks capable of doing so meaningfully.

This gap calls for a deeper, more holistic inquiry into how farmers experience climate change and assign meaning to their adaptation processes. A phenomenological approach offers a powerful alternative, allowing researchers to explore the inner landscapes of individuals as they confront ecological instability. By prioritizing lived experience and subjective interpretation, phenomenology can illuminate aspects of adaptation that are often hidden beneath statistical summaries or technical evaluations. It is through this lens that the current study seeks to contribute a more nuanced and human-centered understanding of agricultural adaptation under climate stress.

Previous research on climate change adaptation among farmers has primarily focused on measurable outcomes such as crop yields, income fluctuations, or the effectiveness of agricultural

technologies. While valuable, these studies often overlook the internal experiences and meaning-making processes of individuals who directly confront environmental changes. A few qualitative studies have explored farmers' perceptions, yet they tend to generalize emotional or cultural responses without engaging deeply with subjective narratives. The lack of studies rooted in experiential insight leaves a gap in understanding how adaptation is interpreted and lived by those most affected. This study builds on that gap by exploring how farmers assign meaning to adaptation in their daily lives.

To address this, an interpretative phenomenological approach was adopted. This method allows for a deep exploration of how individuals make sense of complex phenomena in their own terms. It was chosen because it aligns with the study's aim to understand the inner realities of farmers as they respond to climate disruptions. Through this approach, the study uncovers rich, layered accounts that reveal how adaptation is not merely a strategy, but a lived and evolving experience. In doing so, it provides an answer to the earlier question of how adaptation is experienced and understood beyond technical metrics.

This article is structured into several parts. The introduction presents the background, identifies the knowledge gap, and justifies the study's focus. The methodology section outlines the phenomenological approach, data collection, and analytical procedures used. The results section describes the major themes that emerged from the farmers' narratives. The discussion explores the implications of these themes in relation to existing literature and theory. Finally, the conclusion highlights the study's contributions and suggests directions for future research.

RESEARCH METHODS

Study Design

This study employed an interpretative phenomenological design to explore how smallholder farmers subjectively experience climate change and its effects on local food security. Phenomenology as a qualitative approach aims to understand individual perceptions and lived experiences. The interpretative variant, informed by the Heideggerian tradition, emphasizes meaning-making as a co-constructed process between the individual and their sociocultural context. This design was chosen to align with the research objective of examining how farmers internalize and respond to ecological uncertainty and disruptions in food systems.

Participants

Participants were smallholder farmers living in rural areas known for high climate variability. Inclusion criteria required participants to (1) be actively engaged in farming for at least five years, (2) have encountered significant climate-related disruptions, and (3) be willing to reflect meaningfully on their experiences. Exclusion criteria included lack of direct farming involvement or insufficient exposure to climate-related events.

Purposive sampling was employed, with additional snowball techniques to identify individuals with rich experiential backgrounds. Participants were recruited through local agricultural extension offices, farmer cooperatives, and community leaders. The final sample included twelve participants (eight male and four female), aged between 34 and 67 years (mean: 49.5 years). To ensure regional diversity, participants were drawn from three distinct agroecological zones across West and Central Indonesia, each characterized by different climatic risks (e.g., drought-prone, flood-prone, and transitional regions). This helped capture variability in adaptive strategies and contextual meanings.

Data Collection

Data were collected through semi-structured, in-depth interviews, conducted in participants' chosen settings (typically homes or fields), which supported comfort and contextual grounding. An interview guide directed discussions around climate perceptions, emotional responses, and adaptive actions. Each interview lasted between 45 and 90 minutes and was audio-recorded with prior consent. All interviews were conducted in the local language, transcribed verbatim, and later translated into English.

The setting for data collection was designed to respect cultural sensitivities, enabling authentic and nuanced storytelling. Reflexive field notes were taken after each interview to capture contextual cues and non-verbal expressions that could inform later interpretation.

Data Analysis

Interpretative Phenomenological Analysis (IPA) was used to analyze the data, guided by Smith et al.'s procedural framework. The process involved five key stages: (1) repeated transcript readings, (2) noting descriptive and conceptual observations, (3) formulation of emergent themes, (4) detection of patterns across cases, and (5) synthesis of superordinate themes. NVivo 12 software was employed to support data management and coding. A coding framework was developed iteratively, with codes reviewed and refined throughout the process. To ensure reliability, intercoder agreement was tested by involving a second researcher in reviewing a subset of transcripts. Discrepancies were discussed until consensus was reached. While the software aided in structuring data, interpretative engagement with the participants' narratives remained central to theme construction.

Ethical Considerations

Ethical approval was granted by the Research Ethics Committee of Universitas Islam Negeri Sunan Gunung Djati Bandung (Approval No: [insert approval number here]). Informed written consent was obtained from all participants. They were assured of confidentiality and the voluntary nature of participation. All identifiable information was anonymized, and data were stored securely in encrypted digital files. The study adhered to ethical principles outlined in the Declaration of Helsinki, emphasizing autonomy, confidentiality, non-maleficence, and informed participation.

RESULTS AND DISCUSSION

This study revealed rich and nuanced experiences of farmers navigating the complexities of climate change and its implications for local food security. The data, derived from in-depth interviews, were thematically analyzed using Interpretative Phenomenological Analysis (IPA), yielding four major themes that encapsulate the farmers' lived realities. Each theme represents a dimension of subjective adaptation shaped by socio-cultural, environmental, and psychological contexts.

Sensing the Shift — Farmers' Intuitive Perception of Climate Disruption

Farmers described their deep, embodied connection with natural cycles and the disconcerting awareness of their disruption. The change was often perceived not through scientific terms, but through sensorial and emotional dissonance with seasonal expectations.

"The rain no longer listens to the calendar. It comes when it wants, sometimes too much, sometimes not at all. My body used to know when to plant—now it feels confused." (Participant 3)

The confusion and unpredictability led many farmers to feel a sense of displacement, not from their land, but from the patterns that once governed it. This intuitive disorientation formed the emotional backdrop for subsequent adaptive responses.

Shifting Practices — Pragmatic and Cultural Adjustments in Farming

Faced with changing conditions, participants adapted not only their techniques but also their farming calendars and choice of crops. Adaptation emerged as a form of experimentation under pressure, often lacking institutional support.

"I stopped growing chili; it just couldn't survive the new weather. I now grow cassava because at least it survives—even though it doesn't sell as well." (Participant 7)

This theme highlighted a tension between economic viability and ecological feasibility. Some adjustments were practical, while others were symbolic gestures of persistence or resignation. Farmers reported that adaptation was an act of survival, not transformation.

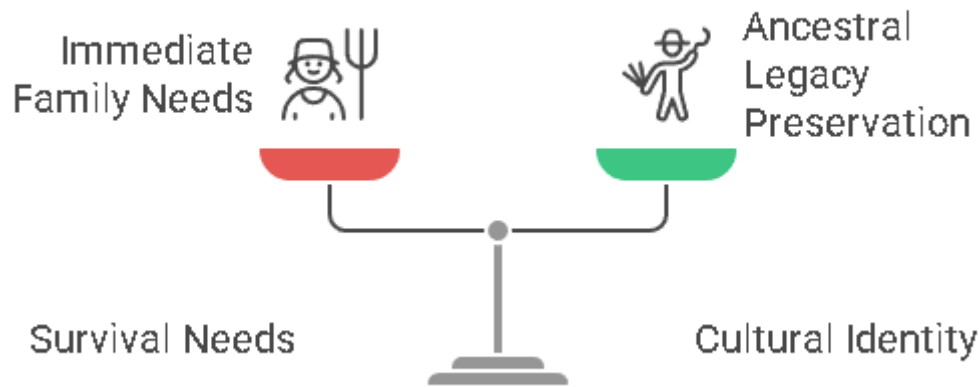
Emotional Toll and Moral Dilemmas — Between Survival and Identity

Adaptation was not purely technical—it was also emotional and moral. Many farmers expressed grief, frustration, and guilt over abandoning ancestral techniques or failing to feed their families adequately.

"My father used to say, 'the land is our soul.' Now I buy rice from the market. What does that make me?" (Participant 1)

This identity crisis, intertwined with socioeconomic pressures, revealed how adaptation to climate change also meant renegotiating one's self-worth and cultural legacy. The moral burden often went unspoken in public discourse, but emerged strongly in private narratives.

Balancing Survival and Identity in Climate Adaptation



Seeking Support and Community-Based Resilience

While individual adaptation was a dominant narrative, several participants emphasized the importance of collective strategies. Informal community networks, mutual labor exchanges, and shared knowledge became vital sources of resilience.

“We no longer wait for government help. We share seeds and stories among us, that’s how we survive.” (Participant 6)

Community adaptation fostered a sense of agency and hope, even amidst uncertainty. This theme revealed how local resilience was sustained not only through material resources but also through social solidarity and indigenous knowledge-sharing.

The lived experiences of farmers adapting to climate change reflect a complex interplay between environmental uncertainty, emotional vulnerability, cultural identity, and communal resilience. These narratives do not merely document responses to climate variability—they illuminate the deep human meanings embedded in the struggle to secure local food systems amid ecological instability.

The findings of this study reveal that farmers experience climate change not merely as an environmental event, but as a deeply personal disruption that alters their sense of time, identity, and relationship to the land. Through the lens of interpretative phenomenological analysis, the core of this experience lies in the adaptive meaning-making processes farmers engage in to preserve both survival and dignity amid ecological uncertainty.

These findings directly address the central research question concerning how smallholder farmers in rural regions experience and interpret their adaptation to climate change. Unlike prior studies that focus on technical adaptation, this research contributes a unique lens by foregrounding the emotional and cultural dimensions of the process. The shifting perceptions of seasonal cycles, the moral conflict in abandoning ancestral practices, and the emergence of collective resilience strategies illustrate that adaptation is not simply a rational choice, but a negotiation of values, identity, and agency. This phenomenological insight offers a richer, human-centered understanding of climate adaptation that cannot be captured through behavioral models alone.

The themes that emerged in this study resonate with and extend existing research in climate adaptation. For instance, the embodied disruption of seasonal knowledge supports Kabeer’s (2017) notion of epistemic dissonance under structural change. Similarly, the findings align with Mahmud’s (2019) work on the psychosocial strain of marginalized populations adapting to change, but go further

by illustrating how such strain manifests in symbolic acts—such as crop substitution experienced as cultural loss. The theme of collective resilience echoes the insights of Rahmawati (2023), who emphasizes the role of local knowledge systems in buffering institutional inadequacies. However, this study deepens those arguments by revealing the internal narratives farmers construct to maintain coherence amid ecological chaos, offering an interpretive complement to existing empirically grounded but less experiential research.

Implications of the Findings

The insights gained from this study carry important implications both scientifically and practically. At a social level, the farmers' narratives reveal how climate change challenges not only physical subsistence but also cultural continuity, psychological stability, and communal identity. These findings suggest that adaptation policies must go beyond technical interventions to consider emotional resilience, identity preservation, and locally embedded meaning systems. Practitioners working in rural development, agricultural extension, and climate resilience planning should engage with farmers' subjective experiences to co-design strategies that are not only effective but also culturally and emotionally sustainable. On a broader scale, these narratives may reflect similar experiences among smallholder farmers across global South regions, especially where ecological precarity intersects with social marginality.

Limitations of the Study

As with all qualitative research, the findings of this study are context-bound and cannot be generalized across all farming populations. The use of purposive sampling and the focus on a limited geographic region mean that the perspectives captured may not represent the full diversity of farmer experiences under climate stress. Additionally, the reliance on retrospective self-reporting in interviews introduces the possibility of recall bias or selective emphasis. While interpretative phenomenological analysis allows for rich meaning-making, it inherently prioritizes depth over breadth. These limitations, however, are consistent with the epistemological stance of phenomenology, which values insight into lived experience over generalizable claims, and they offer important direction for future research.

Prospective Directions for Future Research

Future research could expand upon these findings by exploring how gender, generational status, or indigenous knowledge systems influence the subjective experience of adaptation. Comparative studies across regions or cultural groups would help to illuminate both universal and culturally specific elements of climate-related meaning-making. Furthermore, longitudinal designs could capture how these experiences evolve over time as climate impacts intensify or adaptation interventions are introduced. There is also potential for interdisciplinary collaboration, combining phenomenological insights with ecological, policy, or psychological frameworks to develop more integrative responses to climate adaptation. Ultimately, this research affirms the value of listening to those directly affected by environmental change—and doing so not only for empirical insight, but for ethical and equitable climate governance.

CONCLUSION

This study investigated how smallholder farmers in rural Indonesia subjectively experience and respond to climate change, particularly in relation to local food security. By employing an interpretative phenomenological approach, the research addressed the central question of how adaptation is understood and internalized in contexts marked by ecological uncertainty and cultural complexity. The findings demonstrate that climate adaptation is not solely a matter of technical intervention but also a deeply personal and affective process. Farmers reported feelings of disorientation resulting from disrupted seasonal rhythms, emotional conflict when departing from inherited agricultural traditions, and the gradual formation of collective resilience grounded in shared knowledge and cultural values.

These insights bridge a critical gap in the climate adaptation literature by revealing the lived realities that are frequently marginalized in policy and technocratic frameworks. Integrating such subjective experiences into adaptation planning is essential for the development of strategies that are

not only effective but also culturally and emotionally attuned. In terms of policy implications, the study calls for adaptation programs that prioritize participatory design, recognize local knowledge systems, and incorporate psychosocial support mechanisms. Policymakers should engage farmers as co-creators of adaptation strategies, rather than as passive recipients of external interventions. This would foster greater relevance, legitimacy, and sustainability of climate initiatives at the grassroots level. Finally, the use of a phenomenological approach proved crucial in capturing the depth and nuance of farmers' experiential realities. This methodological lens allows for a richer understanding of adaptation as a human process, shaped by values, identity, and meaning-making. Its broader significance lies in challenging dominant paradigms that reduce adaptation to metrics and models, offering instead a more holistic and empathetic foundation for future interdisciplinary research. Future research should consider comparative studies across agroecological zones and longitudinal designs to track how adaptation experiences and interpretations evolve over time.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest..

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