

Communication of Climate Risk and Food Security: A Study on Farmers' Perceptions of Climate Change in South Lampung Regency

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ABSTRACT: Climate change poses a tangible threat to the agricultural sector, which is highly dependent on weather and climate conditions. South Lampung Regency, one of the agricultural centers in Lampung Province, faces serious challenges including declining productivity, shifting planting seasons, and increased risk of crop failure. In this context, farmers' understanding of climate change risks and the ways they receive and interpret related information are crucial in supporting local food security. This study addresses the gap in understanding how risk communication can play a key role in shaping farmers' perceptions and adaptive responses to climate change. Using a descriptive qualitative approach supported by quantitative data, this research involved in-depth interviews, surveys, and participatory observations with farmers, community leaders, and agricultural extension agents in Panengahan and Bakauheni Districts. The findings reveal two main typologies of farmers' perceptions—traditional-reactive and adaptive-informational—each with distinct patterns of information access and adaptation strategies. Risk communication pathways are dominated by a mix of informal (social media, peer discussions) and formal (extension services, government programs) channels, yet a gap remains between the information provided and the farmers' practical needs. The study proposes a locally grounded risk communication model that integrates scientific information with traditional knowledge, aiming to enhance adaptive capacity and strengthen food security.

KEYWORDS: Risk Communication, Food Security, Farmers' Perception, Climate Change, South Lampung.

I. INTRODUCTION

Climate change is one of the most significant challenges currently faced by the agricultural sector, with impacts felt not only globally but also locally—particularly by farmers as the primary actors in food security systems. South Lampung Regency, a major agricultural hub in Lampung Province, is vulnerable to climate-related impacts such as rising temperatures, shifting rainfall patterns, droughts, floods, and unpredictable outbreaks of pests and diseases.

In this context, climate risk communication becomes crucial. How information related to climate change and its impacts is delivered, understood, and acted upon by farmers will greatly determine their ability to adapt and maintain agricultural productivity. However, limited research has examined farmers' perceptions of climate change in relation to how they receive and process risk information in their decision-making.

A gap exists between the availability of climate information and the level of understanding and adaptive action among farmers. While government agencies and related institutions have attempted to disseminate climate change information through various communication channels, many farmers still rely heavily on traditional knowledge or remain skeptical of formal information. This can hinder the effectiveness of adaptation strategies and exacerbate threats to local food security.

Given the complexity and urgency of this issue, an in-depth study is needed to understand how farmers in South Lampung perceive climate risks, how risk communication is developed at the grassroots level, and to what extent this affects household food security.

II. LITERATURE REVIEW

A. Risk Communication in the Context of Climate Change

Risk communication is the process of conveying information about potential hazards or uncertainties to the public to enhance understanding and decision-making capacity (Covello & Sandman, 2001). In the climate change context, risk communication aims to raise awareness of climate threats and encourage adaptive action (Moser, 2010).

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Moser and Dilling (2007) emphasize that effective risk communication depends on the contextualization of messages, credibility of sources, and audience participation. Similarly, Schmidt et al. (2013) highlight that climate risk perception is shaped by local experiences, cultural values, and psychosocial factors, not merely by scientific data.

In Indonesia, Supriatna and Nugroho (2020) found that climate change information delivery to farmers is often ineffective due to top-down approaches that overlook local diversity. As a result, farmers tend to ignore formal information and rely more on personal experiences or traditions.

B. Farmers' Perceptions of Climate Change

Farmers' perceptions are key to understanding responses to climate change. Grothmann and Patt (2005) argue that risk perception determines whether adaptation will occur. Studies in developing countries show that while farmers often recognize climate changes, they may have limited understanding of its causes and solutions (Deressa et al., 2011).

In Indonesia, Arifin et al. (2019) reported that farmers observe signs such as extreme weather and erratic rainfall patterns, but their adaptations are often reactive and unsustainable due to limited access to accurate information.

C. Food Security from a Climate Adaptation Perspective

Food security is defined as the condition in which all people have physical, social, and economic access to sufficient, safe, and nutritious food over time (FAO, 2008). Climate change threatens food security by disrupting production, distribution, and access (Wheeler & von Braun, 2013).

A study by Firman et al. (2022) in coastal Sumatra found that farmers' food security is strongly influenced by their adaptive capacity, including crop diversification, water management, and local knowledge. The study recommends a community-based communication approach to enhance resilience.

III. METHODOLOGY

A. Research Design and Approach

This research employed a descriptive qualitative approach supported by quantitative data. The qualitative component aimed to explore farmers' narratives, experiences, and interpretations of climate change, while the quantitative component provided descriptive statistics to map patterns of perception and information sources.

B. Research Location and Period

The study was conducted in Panengahan and Bakauheni Districts of South Lampung Regency—two agricultural areas significantly affected by climate variability. The research period spanned from March to August 2025, covering planning, data collection, analysis, and reporting stages.

C. Data Collection Techniques

Primary Data: In-depth interviews with farmers, community leaders, and agricultural extension agents; perception surveys; and participatory field observations.

Secondary Data: Climate data from BMKG, agricultural adaptation program documents from the local agricultural office, and relevant literature.

D. Data Analysis

Qualitative data were analyzed thematically to identify narrative patterns and categorize meanings from farmers' perceptions and experiences. Quantitative data were analyzed descriptively to determine the frequency, percentage, and distribution of perceptions and information sources.

Table I. Research Roadmap (2024–2028)

Year	Research Focus	Output
2024	Study of perceptions and climate risk communication	Map of farmers' perceptions and communication channels
2025	Development of a locally based risk communication model	Participatory communication model
2026	Pilot testing of the model in selected villages	Climate adaptation communication guidelines

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2027	Evaluation of model effectiveness	Evidence-based policy recommendations
2028	Replication of the model in other regions	National guidebook for agricultural risk communication

IV. RESULTS AND DISCUSSION

A. Profile of the Study Area

South Lampung Regency is a strategic agricultural hub in Lampung Province, serving as the gateway to Sumatra from Java through Bakauheni Port. The regency's topography varies from lowland coastal areas—vulnerable to sea level rise—to highlands prone to erosion and rainfall pattern changes.

B. Farmers and Agricultural Sector Conditions

Most residents rely on agriculture, either as landowners, farm laborers, or agricultural entrepreneurs. Farmers range from traditional smallholders to more organized modern farmers, with varying education levels and access to technology. Seasonal cropping patterns depend heavily on the rainy and dry seasons; changes in these cycles disrupt planting schedules, harvests, and productivity.

C. Major Agricultural Commodities

Food Crops: Rice and maize are the main staples supporting local food security.

Plantations: Coffee, pepper, rubber, and oil palm are cultivated extensively.

Horticulture: Vegetables and fruits such as bananas and papayas supply local and regional markets.

D. Climate Patterns and Observed Changes

Farmers reported significant climate anomalies in recent years: seasonal shifts, extreme rainfall, prolonged droughts, and rising temperatures leading to pest and disease outbreaks.

E. Role of Agricultural Extension Agents

Extension agents act as intermediaries between the government/research institutions and farmers. They provide technical guidance, socialize programs, and assist in the field. However, challenges remain, including a high farmer-to-extension agent ratio, limited resources, and the need for more relevant, localized content.

V. CONCLUSION

This study highlights that farmers in South Lampung Regency have a high level of awareness regarding climate change, recognizing tangible impacts such as unpredictable seasons, prolonged droughts, emergence of new pests, and declining crop yields. Two distinct typologies emerged: the traditional-reactive group, which relies on inherited knowledge and responds individually, and the adaptive-informational group, which actively seeks and applies information from both formal and informal sources. Risk communication channels are dominated by a combination of informal (social media, peer discussions) and formal (extension services, government programs) pathways. However, a significant communication gap persists between the information disseminated by formal institutions and the practical needs of farmers. Most adaptive measures remain individually initiated, lacking structured community-based strategies.

The proposed locally grounded risk communication model integrates digital platforms, empowered extension agents, community collaboration, and cultural sensitivity, aiming to enhance adaptive capacity and strengthen local food security.

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