

AGRICULTURAL DYNAMICS IN WONOREJO VILLAGE, LUMBANG DISTRICT, PASURUAN REGENCY

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ABSTRACT

This article examines the survival strategies of highland vegetable farmers in Wonorejo Village, Lumbang Subdistrict, Pasuruan Regency a village located at an elevation of approximately 1,200 meters above sea level in the buffer zone of Mount Bromo, whose economy relies on the cultivation of potatoes, scallions, and cabbage. Unlike most studies of rural agriculture, which take production factors as their starting point, this research begins its analysis with the farmers' own life experiences, involving 15 informants a mix of active farmers of working age and senior farmers with decades of experience. Using a phenomenological qualitative approach and NVivo 12 Pro for analysis, this study identified six interrelated issues: the distribution of subsidized fertilizer, climate uncertainty, the need for extension services, cost-income pressures, limited market access, and expectations regarding external support. The findings indicate that farmers in Wonorejo occupy the position of "price takers" in a supply chain dominated by middlemen, while facing fertilizer distribution that is often delayed and misdirected. Amid these constraints, a number of farming households that had previously participated in economic capacity-building programs demonstrated far more organized financial management patterns compared to those who had not received such training. This article presents a five-stage adaptation model ranging from climate adaptation to the empowerment of smallholder farmers as a policy framework that can be adopted by village governments and supporting institutions.

I. INTRODUCTION

The eastern part of Pasuruan Regency exhibits distinct geographical characteristics, extending from lowlands to mountain slopes and presenting agroclimatic conditions that are relatively conducive to agricultural activities. This advantage positions agriculture as one of the main pillars of the regional economy, particularly in highland areas that have developed into centers for horticultural vegetable production (BPS, 2023). One notably prominent area is Wonorejo Village, Lumbang District, situated at approximately 1,200 meters above sea level and recognized for producing potatoes, scallions, and cabbage (Researcher Survey Data, 2025). For the local community, agriculture is not only a source of livelihood but also an element of social identity and the village's economic structure passed down through generations.

Despite its considerable agroecological potential, Wonorejo Village faces several challenges that indicate geographic advantages do not necessarily translate into farmers' welfare. Abqori and Rahayu (2024) assert that the growth of the national agricultural sector is strongly determined by the capacity of government policies to reach farmers at the grassroots level. In practice, Wonorejo farmers continue to encounter problems such as uneven fertilizer distribution, dependence on middlemen, and weak bargaining positions within the marketing chain. Of the approximately 169 working residents, 80 rely on agriculture for their livelihoods (Researcher Survey Data, 2025); therefore, any disruption in this sector directly affects the economic resilience of farming households.

These conditions are further complicated by climate change, rising production costs, and uncertainties in commodity prices. Unpredictable weather patterns influence planting and harvesting schedules, while the costs of seeds, fertilizers, labor, and land rental continue to increase. At the same time, access to fairer markets remains limited, leaving farmers in vulnerable positions as price takers. In this context, rural agriculture should not be understood merely as cultivation activities but as an arena where ecological, economic, social, and institutional problems intersect simultaneously. This situation underscores the urgency of researching the dynamics of agriculture in Wonorejo Village.

Previous studies on rural agriculture have generally focused on production-related aspects, such as input prices, land area, or the adoption of cultivation technologies (Mahendra, Fitriana, & Yuerlita, 2024). However, the dynamics experienced by farmers go beyond technical issues, encompassing daily lived experiences, survival strategies, and the ways they interpret environmental changes. Responding to this need, the present study adopts a different stance by positioning farmers as primary subjects who directly experience and interpret various agricultural problems. Through in-depth interviews with 15 farmers, including active and senior farmers, this research aims to portray the interrelationships among fertilizer issues, climate variability, production costs, financial literacy, and institutional support in the agricultural lives of Wonorejo residents.

In the context of rural development, the challenges faced by Wonorejo farmers demonstrate that the success of the agricultural sector cannot be

measured solely by land potential or production volume, but also by the capacity of existing systems to ensure the sustainability of farming enterprises. Farmers require support that goes beyond administrative measures and addresses fundamental concerns such as fertilizer certainty, equitable market access, technical assistance, and protection against price fluctuations. Without adequate support, smallholder farmers will remain vulnerable and struggle to develop sustainable farming enterprises despite their strong local knowledge and experience. This perspective aligns with the view that strengthening extension systems and state involvement remains crucial for supporting rural agricultural resilience (Wahyuni, Sutrisno, & Fitriani, 2025).

Therefore, this study is important for providing a more comprehensive depiction of agricultural dynamics in Wonorejo Village, not merely as a production issue but as a complex and interconnected socio-economic problem. By employing a qualitative approach, the research is expected to reveal farmers' subjective experiences in confronting these pressures and to identify the adaptation strategies they employ to sustain agricultural livelihoods. The findings are intended to inform village governments, supporting agencies, and other stakeholders in formulating policies and programs that are more responsive to the needs of highland vegetable farmers. Multi-stakeholder collaboration is also considered essential to strengthen sustainable agricultural resilience, especially in addressing production, distribution, and environmental adaptation challenges (Susilowati, Nugroho, & Lestari, 2024; Yuliana, Hidayat, & Gunawan, 2023).

Based on the foregoing background, this study seeks to answer how Wonorejo vegetable farmers perceive and respond to changes occurring in their agricultural sector, and what strategies they adopt to sustain farming enterprises amid evolving social, economic, and environmental pressures.

II. RESEARCH METHOD

This study employed a phenomenological qualitative design to explore in depth the lived experiences of vegetable farmers in Wonorejo Village. The study subjects comprised 15 key informants, including the head of the farmers' group who also manages fertilizer distribution, active farmers under 40 years of age with 10–15 years of farming experience, and senior farmers with more than 20 years of experience who serve as local knowledge references.

Data were collected through three methods: in-depth interviews using a semi-structured interview guide, participatory observation at farming sites, and review of supporting documents such as village demographic data. Data analysis was assisted by QSR NVivo 12 Pro software and included transcription input, coding, case classification based on informant background, topic mapping using mind mapping, and comparative analysis using the matrix coding query feature. Through this process, six main subtopics were identified as the analytical framework: fertilizer distribution, climate change, training/extension needs, cost-income issues, market access, and expectations regarding government support.

III. RESULTS AND DISCUSSION

Village and Informant Profile

Wonorejo Village is administratively divided into four hamlets: Ngepoh, Samira, Wonorejo, and Petungroto. The majority of residents are indigenous and remain bound by kinship relations and strong mutual-help (*gotong royong*) cultural practices. Formal education levels are generally low: most residents have completed only elementary, junior-high, or senior-high education, while university graduates remain scarce (Researcher Survey Data, 2025).

Of the 15 informants interviewed, ages ranged from 29 to 60 years, with farming experience between 10 and 40 years. Six informants were potato farmers, four were scallion farmers, and three were cabbage farmers reflecting a pattern in which potato is the village's leading commodity while scallions and cabbage function as supplementary crops. This composition also reveals a regeneration issue: senior farmers with more than 20 years of experience continue to dominate, while the number of productive young farmers is relatively limited. Nevertheless, the combination of an active younger generation open to change and senior farmers who hold local knowledge constitutes an important form of social capital for the continuity of agriculture in the village.

Six Problem Nodes in Farmers' Daily Lives

Subsidized Fertilizer: Quotas, Delays, and Perceptions of Injustice

Among the themes emerging from the matrix coding query analysis, the distribution of subsidized fertilizer was the most frequently voiced concern. Karim, the head of the farmers' group who manages fertilizer distribution in the village, described the dilemma of allocating limited quotas: fertilizer often does not reach truly active farmers, whereas less active residents sometimes receive larger allocations—an ironic distribution that is ultimately resolved through informal purchase-sale mechanisms among villagers. Anton, a group member, added that the fertilizer he receives is often delayed, frequently arriving only after the planting season has begun.

This pattern is consistent with Kurniawan (2021), who found that fertilizer distribution in various Indonesian regions often produces unequal access among farmers, and aligns with Jamil (2023) regarding the complex contestation among actors in national subsidized fertilizer policy—an issue that is not merely technical-logistical but also relates to local governance and transparency.

Climate That Is No Longer Predictable

Beyond fertilizer, climate uncertainty was nearly universally reported by informants. Ahmad stated that weather is now difficult to predict; rain and heat alternate without the predictable patterns of the past, reducing crop yields. Subur added that farmers' problems are compounded: erratic weather, escalating planting costs, and declining interest among younger generations in agriculture. Anita, a female farmer, emphasized that weather unpredictability directly affects planting and harvesting schedules.

Kastoro highlighted another dimension: declining soil fertility and diminishing water availability, which force farmers to rely increasingly on chemical fertilizers even though yields no longer reach previous levels. These findings support Yuliana, Hidayat, and Gunawan (2023), who argue that strengthening climate literacy and utilizing technologies such as weather

information systems and drip irrigation can help farmers make more adaptive, data-driven decisions. They also echo Kurniawan (2020) in observing that agricultural environmental degradation results not solely from farming practices but also from structural pressures such as industrial expansion and land-use policies that are less favorable to smallholders.

Costs That Outpace Returns

The third dominant theme concerns rising production costs while farm-gate prices remain volatile. Basuki expressed direct complaints: seed costs are increasing, whereas produce prices are unpredictable. Sumariyah, a female informant, described a similar situation, noting that substantial planting capital does not guarantee predictable returns.

Within a microeconomic framework as described by Sukirno, increases in fixed and variable costs fertilizer, land rental, and labor raise the break-even point for farming enterprises; when produce prices weaken, farmers' profit margins shrink sharply and may even result in losses (Nuraini, Santoso, & Rahmawati, 2022). This condition is exacerbated by farmers' dependence on middlemen and local markets that rarely offer competitive prices. Such relationships produce information asymmetry that leaves farmers in a weak position as price takers within the agricultural supply chain (Kurniasih & Harahap, 2023).

Demand for Meaningful Extension and Training

The fourth theme relates to the need for practical training and extension, a need expressed by nearly all informants. Ahmad emphasized his need for training that includes hands-on practice to facilitate understanding. Basuki hopes for fertilizer assistance accompanied by extension services, while Endo expects more concrete guidance from government agencies. Hariyani (2022) indicates that the effectiveness of financial literacy training for farming households depends on the extent to which materials are applicative and contextually relevant rather than purely theoretical and detached from farmers' daily realities.

In addition to hands-on practice, informants highlighted the importance of participatory and ongoing training approaches that enable farmers to share experiences and tailor new technologies to local conditions. Techniques such as field demonstrations, problem-based learning, and post-training mentoring are viewed as more effective for promoting adoption of improved farming practices and ensuring interventions remain sustainable. Several studies have found that these continuous, participatory methods including demonstrations and follow-up mentoring substantially improve farmers' capacity to apply new knowledge in their specific contexts (Din et al., 2019)

Entrapment in Middlemen Networks

Market access emerged as the fifth important theme. Wonorejo farmers generally sell their produce through middlemen due to limited access to modern markets, weakening their bargaining power and resulting in unfavorable selling prices. This situation underscores the need for policy interventions that expand market access for smallholders and strengthen the role of cooperatives and village-owned enterprises (BUMDes) as market-balancing institutions. Smallholders' entrapment in middlemen networks emerged as a key theme.

Farmers in Wonorejo typically sell their harvests through intermediaries because they lack access to modern marketplaces, which undermines their bargaining position and leads to low selling prices. This dynamic highlights the need for policies that broaden smallholders' market access and empower cooperatives and village-owned enterprises (BUMDes) to act as institutions that can rebalance market power.

Improving farmers' negotiating capacity and creating alternative marketing channels can reduce reliance on intermediaries and increase returns to producers. Strengthening cooperatives and BUMDes through capacity building, better market information systems, and support for aggregation and value-adding activities helps farmers reach larger buyers and secure fairer prices. Empirical studies indicate that when smallholders gain collective marketing tools and better market intelligence, their price outcomes and income stability improve (Kumar et al., 2020).

Unmet Expectations for Government Support

The final theme concerns government support and business partnerships, revealing that most informants feel they have not received assistance that they perceive as beneficial in practice. Anton reported never having received assistance; even when extension activities occurred, there was no sustained follow-up. His expectation is for government collaboration that can help stabilize produce prices. Sinamat expressed similar views, emphasizing the need for continuous accompaniment and improvements in produce prices so that farmers can progress.

Wahyuni, Sutrisno, and Fitriani (2025) argue that strengthening agricultural extension systems at the village level requires a more active and responsive state presence addressing farmers' real needs rather than merely ceremonial programs that stop at socialization. Without consistent state involvement throughout the agribusiness value chain from postharvest processing and distribution to price stabilization the agribusiness system will remain skewed and unprofitable for smallholders (Yusdja, 2021).

Developing an Adaptation Model: From Climate Measures to Empowerment

Based on the overall findings, this study proposes a five-stage adaptation model to support the sustainability of Wonorejo farmers. The stages are sequential and mutually reinforcing:

Stage 1 – Adaptation to Climate and Environmental Change. This initial stage includes training in agroclimatology, implementation of water-efficient irrigation, crop rotation, use of organic fertilizers, and sustainable land management.

Stage 2 – Improving Economic Efficiency of Farming Enterprises. Once adaptive capacity is established, farmers should reduce production costs through farmer cooperatives or BUMDes, expand access to digital markets, and implement systematic farm record-keeping.

Stage 3 – Strengthening Support and Partnerships (initial stage). Economic efficiency cannot stand alone without institutional support from government, financial institutions, extension agents, and sustainable, equitable private-sector partners.

Stage 4 – Strengthening Support and Partnerships (advanced stage). Institutional support at this stage is reaffirmed as a continuous process rather than short-term or ceremonial assistance.

Stage 5 – Empowerment of Smallholders. The final stage is the culmination of the adaptation process: smallholders become socially and economically empowered, possess stronger bargaining positions, and are able to make farm-management decisions independently without persistent dependence on extractive market systems.

Recommendations for Stakeholders

Aligned with the five-stage model, the study provides targeted recommendations for different stakeholders:

For village governments and external partners (BMKG, universities, extension services): organize periodic climate-adaptation and agroclimatology training, and establish farmer forums as platforms for sharing weather information and locally based adaptation strategies. Existing farmers' groups should be revitalized from administrative units into advocacy bodies that represent smallholders' interests.

For strengthening farm economy: establish farmer cooperatives or agro-oriented BUMDes to serve as collective input suppliers and direct marketers to digital markets, thereby shortening distribution chains that currently disadvantage farmers. Expanding access to low-interest agricultural credit – through KUR, village agricultural banks, or Islamic finance institutions – should be paired with simple farm accounting training and commodity diversification to reduce crop-failure risk.

For household economic literacy: scale up gender-responsive financial literacy programs that involve farming women as household finance managers, ideally integrated with local nonformal education programs using contextualized modules. Simple financial digitization, such as training on digital wallets, can improve the traceability and security of farmers' transactions.

For institutional support: develop inclusive agribusiness partnership schemes among farmers, cooperatives, the private sector, and off-takers based on fairness and transparency. Internship programs and thematic community service (KKN) from universities, including Universitas PGRI Wiranegara, can facilitate knowledge and technology transfer to farmers while reconnecting youth with agriculture.

For improving fertilizer distribution: reform of the subsidized fertilizer distribution system is an urgent priority through digital registration that records land area, fertilizer needs, and farmer identity accurately. Optimizing digital farmer cards, together with the involvement of farmer cooperatives as official distribution partners, can minimize leakage and accelerate delivery to eligible farmers.

IV. CONCLUSION AND IMPLICATION

First, the village government and relevant agencies need to strengthen farmer assistance through extension programs that are more practical, sustainable, and tailored to field needs. Extension materials should go beyond

theory to include cultivation practices, climate-change adaptation, water management, efficient fertilizer use, and techniques for improving crop quality. In this way, farmers will obtain more concrete skills to face weather uncertainty and the high risks associated with highland vegetable farming.

Second, improvement of the subsidized fertilizer distribution system should be a priority to ensure deliveries are better targeted, transparent, and aligned with the needs of active farmers. Accurate farmer registration, stricter distribution monitoring, and the involvement of farmers' groups in the distribution process can help reduce the inequalities experienced by farmers. In addition, strengthening economic institutions such as farmer cooperatives or village-owned enterprises (BUMDes) can shorten distribution chains, reduce production costs, and expand market access for agricultural products.

Third, the government and supporting institutions should assist farmers in strengthening their bargaining position through expanded market access, farm management assistance, and household economic literacy training. These efforts are important so that farmers do not remain dependent on middlemen and can manage their harvests more independently and profitably. Furthermore, future research is recommended to examine more deeply the relationships among climate change, agricultural policy, and farmers' economic sustainability using more in-depth approaches, so as to produce more comprehensive recommendations for rural agricultural development.

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