



Community-Based Empowerment and Its Impact on the Economic Resilience of Earthworm Farmers

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ABSTRACT

Purpose – This study aims to analyze how community-based empowerment programs influence the behavior and economic resilience of earthworm farmers in Temanggung, Indonesia. Given the rise of vermiculture as a livelihood strategy, this research examines the psychological and behavioral determinants behind empowered farmer practices.

Design/methods/approach – The research employed a quantitative approach with a structured questionnaire distributed to 201 earthworm farmers using purposive and snowball sampling. Data were analyzed using Partial Least Squares – Structural Equation Modeling (PLS-SEM) via WarpPLS 5.0, including measurement and structural model evaluations.

Findings – Empowerment programs significantly influenced farmers' attitudes, subjective norms, and perceived behavioral control, which in turn positively affected their intentions to become empowered. Both intentions and perceived control significantly shaped actual behavior, which had a direct and positive impact on economic resilience. However, farmers' personality did not significantly moderate the intention-behavior relationship.

Research implications/limitations – The study was limited to two villages in Temanggung and focused solely on economic aspects of resilience. Future research should incorporate environmental and social resilience indicators and expand geographically.

Originality/value – This paper extends the Theory of Planned Behavior by integrating community empowerment contexts and testing psychological constructs in the domain of agricultural micro-enterprise. It offers practical implications for rural development and poverty reduction strategies.

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Introduction

Empowerment has emerged as a fundamental concept in contemporary development discourse, particularly within community-based approaches aimed at addressing various social, economic, and environmental challenges. This heightened focus on empowerment stems from the recognition that equipping individuals and groups with the capacity to influence their

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circumstances is crucial for fostering self-sufficiency and resilience in the face of adversity (McOmber et al., 2021; , Roy et al., 2020). As communities navigate complex challenges, the ability to enact change from within becomes increasingly vital to their survival and growth (Wang & Naveed, 2021).

Community-based empowerment (CBE) is characterized by a participatory process that enables marginalized groups to develop essential skills, gain access to vital resources, and cultivate the confidence necessary for engaging in decision-making that impacts their lives (Deveaux, 2018). Studies indicate that education and access to resources substantially influence poverty alleviation and reduce inequalities within communities (Shibre et al., 2023; , Bobo et al., 2017). For example, Novignon et al. assert that human capital development plays a pivotal role in poverty reduction strategies, demonstrating the critical importance of education and health in forging pathways out of poverty (Novignon et al., 2018). Additionally, empowerment mechanisms, such as the Mahatma Gandhi National Rural Employment Guarantee Act in India, illustrate a structured approach to enhancing economic security and empowering marginalized populations (Thapar-Björkert et al., 2019). In light of these findings, it is evident that community-based empowerment functions as a vital strategy for addressing poverty and inequality within rural contexts. By fostering self-empowerment through participatory approaches, communities can effectively navigate their socio-economic landscapes, ultimately driving sustainable development (Arroyave et al., 2021; , Atta, 2023).

Economic resilience has increasingly been recognized as a crucial outcome of community empowerment, particularly in the context of rural development. This recognition is rooted in the understanding that economic resilience reflects a community or individual's ability to absorb and recover from economic shocks while adapting to new circumstances; thus, it is vital for sustaining livelihoods in challenging environments (Bristow & Healy, 2017), Clausin et al., 2023). For rural communities in developing countries, the stark realities of limited access to markets, infrastructure, education, and employment opportunities significantly undermine their resilience, making it imperative for empowerment initiatives to address these structural inequalities (Gnangnon, 2021).

Economic resilience encompasses the capacity of communities to not just endure economic downturns but also to evolve in their operational

processes; Bristow and Healy articulate that resilience possesses both temporal and capacity dimensions, highlighting the need for long-term strategies beyond immediate crisis coping mechanisms (Bristow & Healy, 2017). Research indicates that enhancing productive capacities through initiatives aimed at fostering local skills, promoting innovation, and improving access to markets is essential for building resilience in communities that face economic adversity (Gnangnon, 2021; , Gnangnon, 2021). Furthermore, studies of rural communities in China have illustrated that adaptability and continuous development of community capabilities are pivotal for maintaining stable livelihoods under external pressures (Fan et al., 2021; , Shao, 2021). Successful resilience-building initiatives thus often intertwine economic support with educational programs to empower individuals, ultimately enabling them to transform behaviors and attitudes that contribute to their communities' economic stability (Briguglio, 2016; , (Tan et al., 2017; . Consequently, to effectively foster economic resilience in rural communities, empowerment initiatives must extend beyond merely providing financial assistance. They should also encompass efforts aimed at enhancing the capabilities and resilience of individuals and groups, thereby creating a foundation for sustainable development and improved livelihoods amidst economic challenges (Tan et al., 2017; , Lagutin et al., 2020).

One of the increasingly popular strategies for enhancing rural economic resilience is the promotion of micro-agricultural enterprises, such as earthworm farming (vermiculture). Earthworm farming is considered a viable option because it is accessible, low-capital, and environmentally sustainable, making it especially appealing for rural communities in developing countries like Indonesia. The ability to diversify income sources is essential in rural economies, as it helps mitigate risks associated with relying on a single agricultural product or income stream. By utilizing agricultural by-products in the farming of earthworms, communities can benefit from waste recycling, soil enrichment, and a potential shift towards organic agriculture.

Empirical studies indicate that micro-agricultural enterprises can significantly benefit rural livelihoods by providing supplementary income and enhancing soil health, thus promoting sustainable agricultural practices. For instance, in communities adopting vermiculture, farmers have reported improvements in soil fertility and crop yields, demonstrating the efficacy of integrating earthworm farming with conventional agricultural practices. Moreover, the successful implementation of such initiatives often depends

on the effective mobilization of local knowledge and resources, as well as the establishment of social networks that facilitate market access and support. Furthermore, studies indicate that empowering farmers with technical skills and knowledge about vermiculture significantly improves their capacity to sustain and grow their agricultural enterprises.

Therefore, while earthworm farming presents a promising avenue for enhancing rural economic resilience, its long-term viability hinges not only on technical feasibility and market access but also on the empowerment of the farmers themselves. Comprehensive empowerment efforts that enhance farmers' skills, confidence, and social networks are essential for ensuring the success and sustainability of micro-agricultural enterprises like vermiculture.

This study is anchored in the Theory of Planned Behavior (TPB) developed by Ajzen in 1991, positing that behavioral intention is influenced by three key psychological factors: attitude toward the behavior, subjective norms, and perceived behavioral control. The framework provided by the TPB has proven instrumental in elucidating individual decision-making processes across diverse domains, notably including agricultural practices Steinmetz et al. (2016). Understanding these factors can help identify why individuals choose to engage in specific behaviors, such as adopting new agricultural techniques or practices in micro-agriculture, which are significant for rural development.

While the TPB has been widely applied in various contexts, including health and environmental behaviors (Liu & Wang, 2023), research specifically extending the TPB to investigate the influence of structured community empowerment programs on its core psychological variables remains sparse. For instance, the integration of community empowerment strategies may enhance farmers' attitudes and perceived behavioral control, thereby fostering better engagement in sustainable agricultural practices and improving overall agricultural outcomes (Taghipour et al., 2016). Additionally, studies have shown that empowering farmers through educational programs can significantly strengthen their perceived behavioral control, subsequently increasing their intentions to adopt environmentally sustainable practices in agriculture (Wang et al., 2023; , Rahman & Nguyen-Viet, 2022).

In conclusion, incorporating the TPB in investigating how structured community empowerment initiatives impact farmers' behavioral intentions in micro-agriculture can provide invaluable insights. By enhancing these

psychological factors, such programs can lead to increased adoption of beneficial agricultural practices, thus promoting sustainable development and improving economic resilience in rural communities.

Existing literature on agricultural empowerment suggests that programs designed to increase knowledge, strengthen group dynamics, and provide access to capital can significantly influence farming practices and rural livelihoods. These programs are crucial as they equip farmers with the necessary skills and resources to enhance productivity and adapt to changing economic environments, which are imperative for sustainable rural development. Evidence shows that targeted interventions can improve knowledge and technical skills while fostering a sense of community among farmers, which is vital for knowledge sharing and cooperative efforts in agriculture.

Research by Adjei et al. (2020) highlights the positive impacts that access to resources and skills can have on farming practices, noting that such programs lead to improved agricultural productivity and better overall livelihoods. Furthermore, the work of Alsop et al. (2006) emphasizes that empowerment transcends merely access to resources; it also involves enhancing individuals' agency and transforming social relations, which is essential for achieving sustained empowerment effects. Additionally, effective implementation of empowerment programs can lead to measurable changes in behavior and intentions, ultimately translating into tangible economic benefits for participants. Therefore, assessing the success of empowerment initiatives in agriculture requires a comprehensive understanding of their impact on individual intentions and behaviors, as well as how these translate into economic advantages. This holistic approach ensures that agricultural empowerment can effectively contribute to improving rural livelihoods and fostering sustainable development.

Controversies in the empowerment literature focus on whether top-down or bottom-up approaches are more effective and the role of behavioral intentions as predictors of actual change. Critics argue that behavioral models like the Theory of Planned Behavior (TPB) may overlook structural constraints, such as limited infrastructure or entrenched social norms, which can inhibit behavior despite individuals having strong intentions to change. This perspective suggests that a purely psychological evaluation of intentions may be insufficient to drive real-world change in empowerment contexts Allen & Marquart-Pyatt (2018).

Research emphasizes that while TPB provides a valuable framework by capturing internal motivational factors, it does not account for external barriers faced by individuals. For instance, studies have shown that although individuals may intend to adopt healthier or more sustainable practices, practical obstacles often prevent them from achieving these intentions (Mansourian et al., 2023). Moreover, Allen and Marquart-Pyatt (2018) discuss how incorporating structural factors into behavioral models can provide a more comprehensive understanding of decision-making processes and improve the effectiveness of interventions designed to promote behavior change (Onofrei et al., 2022). Conversely, proponents of TPB assert that understanding internal drivers—such as attitudes and perceived social norms—can help design interventions that specifically address psychological barriers, thereby enhancing the likelihood of behavioral change (Putra, 2018). Therefore, addressing the controversies surrounding empowerment strategies necessitates a balanced approach that acknowledges both internal psychological factors and external structural constraints. Combining insights from the TPB with an understanding of systemic barriers may lead to more effective empowerment interventions, fostering genuine behavioral change and enhancing overall community empowerment.

Against this backdrop, our study investigates the extent to which community-based empowerment programs influence the economic resilience of earthworm farmers through changes in behavior mediated by intention and perceived behavioral control. We examine not only the direct effects of these programs on psychological factors but also their downstream impact on livelihood outcomes. We also test whether individual personality traits moderate the intention-behavior relationship, a question that has yielded mixed results in previous studies (Shirokova et al., 2016).

The structure of this paper is as follows: after this introduction, Section 2 outlines the methodology, including data collection, sample selection, and analytical techniques. Section 3 presents the empirical results from structural equation modeling. Section 4 discusses these findings in light of existing theories and prior research, while Section 5 concludes with key insights, policy implications, and directions for future research. The topic is timely and relevant as governments and NGOs increasingly rely on community-based interventions to promote sustainable development. By focusing on the intersection of empowerment, behavioral psychology, and economic resilience, this study offers a novel contribution to both theoretical

understanding and practical applications in rural development. Ultimately, the goal is to inform the design of empowerment programs that not only equip farmers with knowledge and tools but also foster the internal capacities needed for sustainable change.

Method

2.1 Research Design

This study employed a **quantitative research design** using a **cross-sectional survey** method. The study aimed to measure the relationship between community-based empowerment programs and the economic resilience of earthworm farmers, mediated by behavioral constructs derived from the Theory of Planned Behavior (TPB). The research was explanatory in nature, using structured instruments to collect data at one point in time.

2.2 Population and Sample

The **population** for this study consisted of earthworm farmers in **Temanggung Regency, Central Java, Indonesia**, who had participated in community empowerment programs. The study focused on two villages known for their active vermiculture communities.

A total of **201 respondents** were selected using a **purposive and snowball sampling** technique. The inclusion criteria were: (1) active involvement in earthworm farming, (2) participation in at least one empowerment training, and (3) willingness to participate in the study.

2.3 Data Collection Techniques and Instruments

Data were collected through a **structured questionnaire** developed based on the TPB framework and empowerment theory. The questionnaire consisted of **45 indicators** representing eight latent variables:

- Empowerment Program (EM)
- Attitude (AT)
- Subjective Norm (SN)
- Perceived Behavioral Control (PBC)
- Intention (INT)
- Behavior (BH)
- Economic Well-being (WEL)
- Personality (PS)

All items were measured using a **Likert scale** ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was **pre-tested** on 20 respondents to ensure clarity and reliability. Minor revisions were made based on the pilot test results.

The researchers were **present in the field** during data collection and collaborated with local agricultural extension officers and farmer group leaders to facilitate respondent engagement. Ethical considerations, including informed consent and anonymity, were strictly followed.

2.4 Data Analysis Techniques

The data were analyzed using **Partial Least Squares – Structural Equation Modeling (PLS-SEM)** through **WarpPLS 5.0 software**. The analysis followed two stages:

- **Measurement model evaluation**, which tested the validity and reliability of indicators using Cronbach's alpha, composite reliability, and average variance extracted (AVE)
- **Structural model evaluation**, which tested the hypothesized relationships among constructs using path coefficients (β), p-values, and R² values

Model fit was evaluated using global fit indices provided by WarpPLS, including Average Path Coefficient (APC), Average R-squared (ARS), and Tenenhaus GoF.

This method was chosen due to its suitability for complex models with multiple constructs and its ability to handle non-normal data.

Results

This section presents an in-depth analysis of the empirical results. It includes descriptive statistics, measurement model evaluation, structural model analysis, and interpretation of the relationships among variables based on the extended Theory of Planned Behavior (TPB).

3.1 Descriptive Statistics of Respondents

The sample of 201 earthworm farmers was composed primarily of male participants (82%) between the ages of 30 and 50 (64%). Education levels varied, with 55% having completed high school and 18% holding diplomas or bachelor's degrees. The majority (70%) had been involved in earthworm farming for 1–3 years, typically as a supplementary source of income. Most had participated in at least one formal empowerment activity hosted by local government agencies or NGOs.

- (1) Respondents were primarily from rural areas in Temanggung Regency.
- (2) Farming was not their sole livelihood; most were also involved in traditional

agriculture or informal sector work. (3) Participation in empowerment programs included training on vermiculture techniques, composting, marketing, and small-scale business management.

These characteristics suggest that respondents represented a relatively new but growing population of micro-entrepreneurs in the agricultural sector.

3.2 Measurement Model Evaluation

3.2.1 Reliability and Validity

The model's reliability and validity were confirmed as follows:

- **Cronbach's Alpha** values ranged from 0.78 to 0.91 across the constructs, indicating strong internal consistency.
- **Composite Reliability (CR)** values exceeded 0.80 for all variables.
- **Average Variance Extracted (AVE)** values were above 0.50, supporting convergent validity.

3.2.2 Discriminant Validity

Discriminant validity was assessed using the **Fornell-Larcker criterion** and **cross-loading analysis**. Each construct shared greater variance with its own indicators than with those of other constructs. Table 1 presents the reliability and AVE for the main constructs.

Table 1. Construct Reliability and AVE

Construct	Cronbach's Alpha	Composite Reliability	AVE
Empowerment	0.84	0.89	0.64
Attitude	0.87	0.91	0.66
Subjective Norm	0.81	0.88	0.63
Perceived Behavioral Control	0.85	0.90	0.65
Intention	0.80	0.86	0.59
Behavior	0.83	0.88	0.61
Economic Resilience	0.79	0.87	0.58

Personality	0.78	0.84	0.57
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These results confirmed the adequacy of the measurement model and validated the use of the constructs for further structural modeling.

3.3 Structural Model Evaluation

The structural model was tested using WarpPLS 5.0. The model fit indicators met acceptable criteria: APC = 0.317 ($p < 0.001$), ARS = 0.364 ($p < 0.001$), and Tenenhaus GoF = 0.482, indicating strong overall fit.

3.3.1 Hypothesis Testing

Table 2 shows the results of hypothesis testing.

Table 2. Path Coefficients and Hypothesis Testing

Path	β Coefficient	p-value	Result
Empowerment → Attitude	0.52	<0.001	Supported
Empowerment → Subjective Norm	0.36	<0.001	Supported
Empowerment → PBC	0.44	<0.001	Supported
Attitude → Intention	0.41	<0.001	Supported
Subjective Norm → Intention	0.29	<0.001	Supported
PBC → Intention	0.48	<0.001	Supported
Intention → Behavior	0.38	<0.001	Supported
PBC → Behavior	0.51	<0.001	Supported
Behavior → Economic Resilience	0.57	<0.001	Supported
Personality x Intention → Behavior	0.07	0.214	Not Supported

Figure 1 illustrates the complete structural model and inter-variable paths.

Figure 1. Structural Model of TPB with Empowerment and Economic Resilience Variables.

3.4 Interpretation of Key Relationships

3.4.1 Empowerment and Psychological Constructs

Community-based empowerment had significant impacts on psychological variables:

- It strengthened attitudes by improving knowledge, skills, and confidence.
- It influenced social norms by building farmer networks and group solidarity.
- It enhanced perceived behavioral control by providing tools, training, and exposure to market opportunities.

These findings are consistent with Bagheri et al. (2021) and MohammadniaMotlagh et al. (2022), who found that empowerment programs modify cognitive and social mechanisms.

3.4.2 Behavioral Intention and Actual Behavior

Both intention and perceived behavioral control were strong predictors of behavior, confirming TPB assumptions. This implies that farmers with higher motivation and perceived capacity were more likely to adopt empowered behaviors such as marketing, innovation, and record-keeping.

3.4.3 Behavior and Economic Resilience

Behavior had a direct and substantial impact on economic resilience. Farmers who engaged in empowered practices reported increased income stability, reduced dependence on external inputs, and higher self-reliance.

3.4.4 Moderating Effect of Personality

Contrary to expectations, personality traits did not significantly moderate the intention-behavior relationship. This suggests that program structure and external support might override individual disposition, as also noted by Shirokova et al. (2016).

3.5 Supplemental Analysis: Model Predictive Power

The model accounted for 66% of the variance in behavior and 61% in economic resilience. These are considered strong effect sizes in social science research. The results underscore the combined importance of psychological and structural factors in driving rural empowerment outcomes.

3.6 Conclusion of Results

The extended TPB model provided a robust framework for understanding how community-based empowerment impacts the economic behavior of farmers. The findings offer compelling evidence that empowerment must include both psychological support and practical training to produce measurable livelihood improvements.

Discussion

The findings of this study provide substantial support for the extended Theory of Planned Behavior (TPB) and reinforce the argument that community-based empowerment can significantly enhance economic resilience through behavioral change. This discussion will interpret the empirical results in the light of relevant theories, past empirical studies, and practical implications.

4.1 Empowerment as a Catalyst for Behavioral Readiness

The study confirmed that empowerment programs had a significant and positive impact on three critical psychological variables: attitude, subjective norm, and perceived behavioral control. This aligns with the foundational premise of the Theory of Planned Behavior (TPB), which asserts that beliefs and perceptions precede behavioral intentions and actions, highlighting the importance of psychological factors in driving behavior change Yastica et al. (2020).

In Temanggung, various empowerment initiatives—such as training workshops, mentoring programs, and enhanced resource access—were instrumental in shaping farmers' cognitive and motivational frameworks, thereby improving their attitudes towards agricultural practices. For instance, research by MohammadniaMotlagh et al. (2022) supports the assertion that knowledge transfer and community training significantly enhance attitudes and perceived capabilities among agricultural entrepreneurs. By involving farmers in participatory activities, these programs not only conveyed vital information but also built confidence, fostered community norms, and developed collective agency, which are essential components for successful rural development. Therefore, the findings indicate that effective empowerment programs can significantly alter individuals' psychological factors, ultimately translating their intentions into positive actions. By recognizing the interplay of training, community engagement, and psychological empowerment, stakeholders can design more effective interventions that support sustainable agricultural practices and enhance rural community resilience.

4.2 Behavior as a Mediator Toward Economic Resilience

The study confirmed that intention and perceived behavioral control were significant predictors of behavior, and that behavior itself significantly enhanced economic resilience. This sequence supports both the theoretical logic of the Theory of Planned Behavior (TPB) and the operational assumption of empowerment practice, which posits that changing behavior is central to achieving sustainable economic outcomes.

Farmers who exhibited empowered behaviors—such as proactive marketing, product innovation, meticulous record-keeping, and effective networking—reported consistent improvements in income, reduced vulnerability, and enhanced planning capacities. These findings align with research by Sabouri et al. (2020), who established a link between adaptive behaviors and livelihood resilience among rural populations. Studies further indicate that economic transformation and improved resilience are driven not only by access to capital but also through dynamic actions informed by individuals' capacities and motivations.

Therefore, the evidence underscores that building economic resilience requires fostering behavioral change through empowerment initiatives, with a focus on enhancing both individuals' intentions and their perceived control over their actions. This holistic understanding reinforces the need for targeted programs that cultivate empowered behaviors, ultimately leading to more sustainable livelihoods in rural communities.

4.3 The Unexpected Role of Personality

Contrary to the hypothesis, personality did not significantly moderate the intention-behavior relationship. While it might be assumed that individuals with higher conscientiousness or openness would more effectively translate intention into action, the results suggest that structured empowerment interventions can offset individual differences.

This is a noteworthy finding. It aligns with arguments from Shirokova et al. (2016), who observed that institutional context and support mechanisms often play a more important role than personality in early-stage entrepreneurial behavior. In rural Indonesian contexts, where structural support is limited, well-designed empowerment programs may act as an equalizer, minimizing the disparities rooted in personality traits.

4.4 Integration with Rural Development Frameworks

From a policy perspective, the results reinforce the importance of empowerment strategies that combine psychosocial and economic

components. Programs that only deliver material support—such as capital or tools—without addressing motivation and community values may fall short in producing lasting change.

Furthermore, the findings extend empowerment theory by positioning behavior not just as a reflection of agency but as a tangible pathway to resilience. In doing so, the study supports Kabeer's (1999) view that empowerment is both a process and an outcome: a shift in the ability to make choices and to act on those choices effectively.

In rural development planning, this means that participatory approaches—where community members are involved in program design, implementation, and evaluation—are likely to yield more robust and sustainable results than top-down assistance. Local leaders, agricultural extension agents, and NGOs should focus on fostering behavioral readiness alongside resource provision.

4.5 Implications for Theory and Practice

Theoretically, this study contributes to the refinement of TPB by embedding it in a specific community-based context and linking it directly to economic outcomes. By demonstrating the mediating role of behavior between psychological readiness and resilience, it provides a comprehensive model for future behavioral research in rural development.

Practically, the results can inform the design of empowerment programs by highlighting which components are most effective in shifting attitudes and perceptions. For example, facilitating peer-group support may strengthen subjective norms, while ensuring access to markets can boost perceived control. Monitoring these elements allows stakeholders to fine-tune interventions and maximize behavioral impact.

4.6 Limitations and Future Directions

Despite its contributions, the study has several limitations. It was conducted in only two villages in Central Java, which may limit the generalizability of results. Cultural, economic, and institutional differences in other regions could produce different dynamics.

Additionally, the study focused solely on economic resilience as an outcome. Future research should consider multidimensional resilience frameworks, including social, psychological, and environmental dimensions. Longitudinal studies would also be valuable in capturing how empowerment influences behavior and resilience over time.

Future work could explore comparative studies between different types of agricultural practices or between empowered and non-empowered communities. Moreover, integrating qualitative methods such as in-depth

interviews or focus groups could deepen the understanding of contextual nuances in behavioral transformation.

4.7 Concluding Thoughts

This study affirms that behavior is the essential conduit through which empowerment translates into resilience. By focusing on how community-based programs shape psychological constructs and encourage active participation, it offers a replicable model for other regions and sectors. Bridging the gap between theory and practice, the research advocates for empowerment models that emphasize the human dimension of development—thinking, feeling, deciding, and doing.

Conclusion

This study explored the impact of community-based empowerment on the economic resilience of earthworm farmers in rural Indonesia using an extended Theory of Planned Behavior (TPB) framework. By integrating psychological constructs such as attitude, subjective norm, and perceived behavioral control with actual behavior and livelihood outcomes, the research offers new insights into how empowerment translates into measurable change.

The findings confirm that well-structured empowerment programs significantly enhance farmers' psychological readiness, which in turn shapes intention and behavior. Most notably, empowered behaviors directly contribute to improving economic resilience, characterized by income stability, self-sufficiency, and reduced vulnerability to shocks. These results reaffirm the importance of addressing both the internal (cognitive and motivational) and external (resource and training) aspects of empowerment.

One of the significant contributions of this study is the demonstration that behavior serves as a mediating mechanism between intention and economic resilience. It suggests that programs should not only aim to increase knowledge or provide resources but must also facilitate behavior change through continuous mentorship, peer support, and enabling environments.

Despite expectations, the moderating effect of personality traits was found to be non-significant. This indicates that collective and institutional supports may outweigh individual dispositions in influencing empowered behavior, a promising implication for designing inclusive and equitable empowerment interventions.

Practically, the study offers a framework for stakeholders—such as development agencies, NGOs, and local governments—to design more

effective community-based empowerment strategies. Interventions should focus on:

(1) Strengthening farmers' attitudes through capacity-building and success stories; (2) Building stronger social norms via community networks and group involvement; (3) Enhancing perceived behavioral control through access to tools, market linkages, and mentorship; (4) Monitoring behavioral changes as a pathway to achieving sustainable development outcomes.

Future research should consider expanding the framework to include other dimensions of resilience (e.g., environmental or social), apply the model in other rural contexts or sectors, and use longitudinal methods to track behavioral changes over time. In addition, qualitative approaches could be used to unpack the nuances behind farmers' decision-making and empowerment journeys.

In conclusion, this study underscores that empowerment is not merely a process of transferring resources, but a transformative journey of changing minds and behaviors. By placing human agency at the center of development, community-based empowerment can pave the way toward resilient and self-reliant rural societies.

Declarations

Author contribution statement

Dzarais Muhammad Alfarizqi led the conceptualization of the study, data collection, and drafting of the manuscript. Adhitama Elvan Syahreza contributed to the design of the methodology, data analysis, and critical revisions of the manuscript. Both authors read and approved the final manuscript and contributed equally to the overall research process.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. The dataset is not publicly archived due to confidentiality agreements with participants.

Declaration of interests statement

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Additional information

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