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Unveiling Government Support in Shaping Farmers' Entrepreneurial Mindset and Intention

Abstract

Purpose: This study explores the critical role of government support in shaping smallholder farmers' sustainable entrepreneurial intentions, employing the Triple Bottom Line and governance framework.

Methodology: This study was conducted in four districts of Tamil Nadu, engaging 93 farmers in 6 focus group discussions with FPOs and FPCs (15 participants each) and personal interviews with 3 agripreneurs. Using qualitative methodologies, the research employed NVivo 15 for data organization and thematic analysis through an interpretive structural modeling approach to identify enabling factors of farmers' entrepreneurial intention.

The findings: The findings reveal interconnected enablers such as direct market access, financial and training support, community collaboration, sustainable farming practices, and good governance. These enablers enhance farmers' entrepreneurial mindset and intention and promote equity, innovation, and long-term sustainability. Sentiment analysis and thematic visualizations validate the insights, highlighting diverse patterns yet coherent stakeholder priorities aligned with the TBL and governance framework. The findings emphasize the importance of creating entrepreneurial ecosystems through financial schemes, capacity-building initiatives, and market access strategies.

Originality: This research provides actionable insights for agricultural policy, integrating governance into the Triple Bottom Line (TBL) framework to enhance decision-making, support Farmer Producer Organizations (FPOs), and boost community involvement.

Implications: This study bridges critical gaps in sustainability frameworks, empowering policymakers and stakeholders to develop inclusive, effective support systems tailored to smallholder farmers' unique needs. This will ultimately pave the way for resilient and sustainable agricultural entrepreneurship.

Keywords: Triple Bottom Line; Enablers; Entrepreneurship; Sustainability; Agriculture; Farmer.

1. Introduction

Rural communities, especially farmers, are increasingly facing challenges intensified by global crises such as economic downturns, climate change, and socio-political instability (Soumbara and El Ghini, 2023; Asai and Antón, 2024). These crises have disrupted traditional agricultural

practices, threatening the ability of farmers to maintain sustainable livelihoods. As a result, it reveals the importance of exploring new approaches to enhance resilience and risk-taking behavior and ensure long-term sustainability. One of these approaches is to promote an entrepreneurial mindset among farmers, which will boost agricultural productivity and strengthen farmers' ability to adapt and overcome this instability (Kademani *et al.*, 2024).

Sustainable entrepreneurship, an approach that integrates innovation with environmental, social, and economic stability, is crucial for farmers pursuing efforts to overcome the challenges posed by global crises (Kademani *et al.*, 2024). Governments worldwide continuously recognize the role of entrepreneurship in driving rural development, particularly in the agricultural sector (Stringer *et al.*, 2020; Menon and Schmidt-Vogt, 2022). Policymakers have introduced initiatives such as financial support, capacity-building programs, and incentives to foster innovation and entrepreneurship (NAAS, 2022; Touch *et al.*, 2024).

Across the globe, governments have launched numerous initiatives to support agricultural entrepreneurship with varying degrees of success (Kademani *et al.*, 2024). While these efforts have contributed to improvements in agricultural productivity, less attention has been paid to the impact of such policies on shaping farmers' entrepreneurial mindsets (Kademani *et al.*, 2024; RANA *et al.*, 2024). It is not enough to provide farmers with external resources; there is a pressing need to cultivate their mindset and entrepreneurial intentions to ensure these initiatives are fully realized (NAAS, 2022; Lone and Baba, 2024). Despite substantial financial and technical support, many farmers still face challenges engaging in entrepreneurial activities due to a lack of business education, limited risk-taking ability, and insufficient exposure to entrepreneurial practices (Stringer *et al.*, 2020; NAAS, 2022). Entrepreneurship's psychological and cognitive aspects, such as innovation, risk-taking, and long-term planning, are often neglected. This disparity draws attention to a fundamental issue: Government assistance must develop not only the assets but also the personal drive and competence that enable farmers to succeed as business owners (Stringer *et al.*, 2020). Although much research has been done on the more general facets of leadership and entrepreneurial culture, little qualitative research has been done on the impact of government policies and programs fostering these qualities among the farmers (Olsson, Westlund and Larsson, 2015; Waseem, Rashid and Akbar, 2021). This gap highlights the need for a deeper investigation into the interplay between government policies and the evolving needs of farmers to design more

effective and sustainable interventions that encourage entrepreneurial behavior and long-term success in the agriculture sector (Waseem, Rashid and Akbar, 2021).

In India, where agriculture forms the backbone of the economy, several government initiatives have significantly strengthened farmers' financial stability and market integration. For example, the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) provides direct income support annually. At the same time, the National Agriculture Market (eNAM) enhances price transparency and market access through a unified online trading platform. Immediate payment and pledge loan facilities ensure timely cash flow, complemented by Tamil Nadu's Farmers Development and Welfare Scheme (TFDWS), which promotes welfare through financial aid and training.

Additionally, support for food processing industries reduces post-harvest losses, and Uzhavar Santhai (farmer market) enables direct consumer sales (NAAS, 2022; Tripathi *et al.*, 2023; Kaleeswaran *et al.*, 2024). However, there is a limited understanding of how these policies influence farmers' entrepreneurial mindset and willingness to embrace innovative agricultural practices. Therefore, it is essential to explore how government policies can foster not only external resources but also internal motivations and cognitive capabilities that encourage sustainable entrepreneurial practices (Kademani *et al.*, 2024; RANA *et al.*, 2024).

This study aims to fill this gap by identifying the key enablers within government support that contribute to developing an entrepreneurial mindset among farmers. It will specifically explore how government programs shape entrepreneurial intention and investigate the role of initiatives like Farmer Producer Organizations (FPOs), Farmer Producer Companies (FPCs), and entrepreneurial programs in fostering entrepreneurial intentions with the following objectives:

Objective 1: To visualize key themes and patterns and analyze the sentiment patterns of the perception of government support and existing facilities in improving farmers' entrepreneurial mindset and intention.

Objective 2: To identify key enablers within the TBL framework and governance dimension from the government initiatives to improve farmers' entrepreneurial mindset and intention.

2. Literature review

2.1. Government Support and Sustainable Entrepreneurship

Government support serves as a vital enabler of sustainable entrepreneurship by dismantling structural barriers and incentivizing innovation. Prior studies affirm that macro-level

interventions, such as tax incentives, infrastructure, and mandatory entrepreneurship education, enhance entrepreneurial ecosystems (Chillakuri, Vanka and Mogili, 2020; Khokhawala and Iyer, 2022; Ipinge and Narang, 2022; Reddy *et al.*, 2023; Chouhan, 2024). Waseem, Rashid, and Akbar (2021) emphasize that education boosts youth self-efficacy, a critical psychological factor for entrepreneurship. However, the effectiveness of such policies often varies depending on implementation mechanisms and contextual needs. As Apostolopoulos *et al.* (2021) argue, the rigidity of one-size-fits-all policy models may hinder context-specific entrepreneurial growth, especially in agri-food systems during crises like COVID-19. Sustainability in entrepreneurship is prominently highlighted through Uganda's Climate-Smart Agriculture (CSA) initiatives. These policies integrate capacity-building programs and public-private partnerships to educate farmers on sustainable practices and foster entrepreneurial innovation. CSA programs provide access to resources and training, leading to increased adoption of sustainable farming methods and showcasing the effectiveness of targeted interventions in agriculture (Kirungi *et al.*, 2023). Yet, many initiatives focus on output rather than long-term capability-building. Institutional frameworks play a decisive role by lowering entry barriers and enabling access to finance (Shirokova *et al.*, 2022). Aguilar *et al.* (2021) highlight that while government incentives encourage entry, weak monitoring and poor governance can dilute policy outcomes. Thus, the literature suggests a clear need for more context-sensitive, governance-anchored models that extend beyond access to include institutional trust and inclusive stakeholder involvement.

2.2. Farmer Entrepreneurship and Sustainability

Farmer entrepreneurship increasingly intersects with sustainability as farmers face both climate threats and market pressures. Scholars identify psychological traits, like motivation, self-efficacy, and confidence, as core drivers of entrepreneurial transition (Bhujel and Joshi, 2024; Maltby, 2024). However, most studies stop at behavioral determinants and overlook the structural enablers that convert mindset into action. As Haugen & Jostein (2008) point out, the mindset alone is insufficient in regions lacking supportive ecosystems or governance capacity. The Integrated Motivation Model enriches this view by adding community influence and innovation competence, highlighting that entrepreneurial decisions also depend on peer norms and institutional reinforcement (Maltby, 2024). Additionally, Socio-economic elements like education, age, and market access impact farmers' ability to adopt sustainable practices, with barriers such as limited

environmental awareness and inadequate resources in developing countries (Bhujel and Joshi, 2024; Chao *et al.*, 2024).

Begho *et al.* (2022) and Sulaiman, Misnan, and Rashid (2022) argue for holistic institutional interventions to tackle the dual challenge of poverty and environmental degradation. Education emerges at a major level. Entrepreneurial training that integrates sustainability not only builds business acumen but shifts long-term attitudes (Yeung, 2015; Savastano *et al.*, 2022), Rossi *et al.* (2023) reinforce this by showing that contract farming enhances both economic viability and social cohesion. However, Kaur & Gupta (2023) caution that such models often exclude marginalized farmers, particularly women, unless accompanied by inclusive training and flexible financing models. While much of the literature emphasizes benefits, few studies critically assess power dynamics and institutional voids that persist in rural entrepreneurial ecosystems.

2.3. Enablers and Barriers to Sustainable Farmer Entrepreneurship

Financial capital and technological access frequently appear as top enablers in the literature (Malik and Kajale, 2024; Arumugam and Manida, 2023). These factors allow farmers to adopt resource-efficient technologies and shift from subsistence to growth-oriented enterprises. However, innovation alone cannot overcome deep-rooted systemic barriers. Aguilar (2021) argues that rural entrepreneurship requires not just support but strategic alignment between public goals and farmer agency, especially in post-crisis recovery contexts.

Farmer Producer Organizations (FPOs) facilitate knowledge sharing, build trust, and help scale innovations. Yet, their impact varies depending on governance and inclusivity (Malik and Kajale, 2024). Infrastructure and market linkages remain underdeveloped in many regions, often due to fragmented policy coordination (Somhlahlo, Patmond Mbhele, and Kunene, 2016). Moreover, Campuzano *et al.* (2023) find that while private sector partnerships improve efficiency, they often marginalize smaller farmers unless equity safeguards are in place.

However, barriers such as financial constraints, complicated funding processes, and excessive regulations hinder the development of sustainable entrepreneurship (Savastano *et al.*, 2022). Cultural resistance, including gender discrimination, also limits opportunities for new entrants, particularly women (McDonagh *et al.*, 2024). However, these must be paired with transparent governance mechanisms. Literature increasingly supports integrating governance as a fourth dimension into the Triple Bottom Line (da Silva, Baggio, and Santos, 2022; Cervantes *et al.*,

2023). This expanded TBL model, comprising economic, environmental, social, and governance aspects, offers a more comprehensive approach to sustainability entrepreneurship. It emphasizes accountability, inclusivity, and long-term resilience, aligning well with the structural modeling approach used in this study.

2.4. Theoretical framework

This study examines the role of government support in shaping farmers' entrepreneurial intention and mindset through the integrated lens of the Triple Bottom Line (TBL) and governance framework as presented in Figure 1. TBL, encompassing people, planet, and profit, provides a holistic model for sustainable entrepreneurship, revealing how institutional support influences farmers' ability to establish and sustain agribusiness ventures. Prakash et al. (2023) highlight the impact of people-planet interactions on entrepreneurial behavior within Indian Micro, Small, and Medium Enterprises, reinforcing the relevance of TBL in agricultural entrepreneurship. Governance strengthens this framework by ensuring structure, accountability, and policy alignment, with human capital, education, and social norms as key entrepreneurial drivers (Mabhena & Ncube, 2024). It translates TBL principles into practical support through policies, training, subsidies, and institutional trust. By applying the concept of Interpretative Structural Modeling (ISM), this study identifies and maps the hierarchical relationships among these enablers.

To further reinforce this framework, the Theory of Planned Behavior (TPB) and Resource-Based Theory (RBT) serve as supporting theoretical foundations. TPB demonstrates how government support enhances farmers' attitudes, perceived behavioral control, and social norms through structured interventions such as training programs, financial incentives, and policy-driven initiatives (Sargani et al., 2020). By embedding sustainability principles within government policies, TPB provides a behavioral pathway for strengthening farmers' entrepreneurial intentions. Additionally, RBT underscores the role of government-driven resource accessibility in improving farmers' ability to leverage their assets. Instead of direct farmer-driven resource utilization, RBT shows how government support, such as training programs, infrastructure development, and financial assistance, enhances farmers' capability to capitalize on their unique resources like land, skills, and institutional networks (Marlina, 2024; Yigit et al., 2024). When integrated with TBL and governance, these theories illustrate how government interventions foster sustainability-

oriented attitudes, strengthen community engagement, and enhance entrepreneurial capacity, thereby ensuring a structured approach to agribusiness development.

3. Methodology

3.1. Study Area and Populations

The study was conducted in Tamil Nadu, India, focusing on the Tiruvannamalai, Vellore, Ranipet, and Tirupattur districts, key rice and groundnut cultivation regions. Tiruvannamalai was selected as it ranks first in the groundnut cultivation area and third in paddy cultivation in the state. The neighboring districts of Vellore, Ranipet, and Tirupattur were included due to their geographical proximity, ensuring a continuous study area for comparative analysis. Until 2019, these three districts were part of Vellore, sharing similar agro-climatic and socio-economic conditions. Additionally, a lack of prior studies covering these districts highlights a research gap. This study addresses this gap, offering valuable insights into regional agricultural trends and supporting policy development. This study offers contextual depth rather than statistical generalizability, which is not the aim of qualitative research. One Farmer Producer Organization (FPO) or Farmer Producer Company (FPC) was chosen from each district based on existing partnerships with Agricultural Extension Services, Agribusiness and Marketing Department, and relevance to the target crops. Participation was limited to organizations actively engaged and willing to participate in this study. Each FPO consists of 1,000 farmers, and 15 sub-leaders (unit heads) were selected to represent their members in focus group discussions. Using snowball sampling, two additional FPCs and three key informants, beneficiaries of government agribusiness programs, were interviewed.

With the support of the Agricultural Extension Center from each district, the Farmers Producers Organizations (FPOs), Farmers Producer Companies (FPCs), and farmers engaged in entrepreneurial initiatives were selected. Data was collected through:

- ❖ 6 focus group discussions: Conducted with 15 farmers per group, comprising 2 FPOs and 4 FPCs.
- ❖ 3 key informant interviews: In-depth interviews with key farmer-beneficiaries of government schemes through the Agribusiness and Marketing Department.

This strategy ensured focused, experience-based data from actors directly involved in entrepreneurial activities supported by government schemes.

3.2. Data Type

The data collected for this study were purely qualitative, focusing on the perceptions of government support and the existing facilities influencing farmers' entrepreneurial mindset and intention. A semi-structured questionnaire with open-ended questions was employed to elicit detailed and nuanced responses.

3.3. Data analysis

This study employs a qualitative analytical approach that integrates manual coding and NVivo 15 software to explore farmers' entrepreneurial mindset and intention. NVivo facilitates systematic data organization through hierarchical coding, node classification, and text analytics, ensuring transparency, traceability, and reproducibility (Sharma and Gupta, 2021; Limna, 2023). The analysis focuses on capturing farmer perceptions of government support, available facilities, and the enabling factors for sustainable entrepreneurship.

Coding followed a dual strategy: emic and etic approaches. The emic approach captured local perspectives by analyzing narratives directly from interviews and focus group discussions. In contrast, the etic approach, as presented in Table 1, applied external theoretical constructs, collected from the literature, to frame farmer responses within the dimensions of the Triple Bottom Line (TBL), economic, social, and environmental, as well as governance (Tomar, Sharma and Kumar, 2024). This combination enriched interpretation and allowed for structured comparison between perceived realities and theoretical expectations.

Auto-coding was conducted using NVivo to perform sentiment analysis, allowing for the identification of emotionally charged content and general attitudes toward enabling factors. NVivo's structured approach provided both automated and manual sentiment coding options (e.g., Very Positive, Moderately Positive, Neutral), enhancing the transparency, consistency, and replicability of the analysis (Bazeley and Jackson, 2013). Additionally, word frequency analysis and word clouds were employed to visually surface dominant themes and patterns in participants' responses.

While the study draws inspiration from Interpretive Structural Modeling (ISM) to identify interrelationships between enablers, it does not follow the full ISM process involving the Structural Self-Interaction Matrix (SSIM) or level partitioning (Singh and Srivastava, 2022). Instead, ISM is used here conceptually, as a framing tool to guide the mapping of relationships between themes derived from qualitative coding. The validated emic codes were cross-linked with

etic constructs from the literature. Using NVivo's project mapping tools, the study visualized how these enablers interact across dimensions.

This approach culminated in a conceptual interaction map (see Figure 2), reflecting a simplified structural model. It highlights how government support and institutional arrangements influence the entrepreneurial mindset of farmers under the TBL and governance dimensions. To enhance the credibility and trustworthiness of the findings, the study included peer debriefing sessions during data analysis.

4. Results and discussions

4.1. Sentiment Trends and Word Cloud Insights

Sentiment Analysis of Perception of Government Support and Existing Facilities in Shaping Farmers' Entrepreneurial Mindset and Intention

After auto-coding of the text data, sentiment analysis was performed, and the responses and associated emotions are presented in Table 2.

Sentiment analysis was performed to identify emotional tones (positive, negative, neutral) and uncover patterns. It simplified qualitative data to provide actionable insights and measurable trends that support the interpretative structure modeling approach. Figure 3 presents the sentiment analysis of government support, revealing a predominantly "moderately positive" sentiment of farmer entrepreneurs and FPO/FPC.

Out of 140 sentences (farmers' responses), 9 were coded as very negative, 12 as moderately negative, 87 as moderately positive, and 32 as very positive. These results suggest a realistic and balanced perspective among participants, with a notable lean toward moderate positivity. Importantly, the consistency and clarity of these coded sentiments reinforce the reliability of the data. As Liu (2012) notes, even small datasets can yield valid sentiment patterns when the analysis is methodical. This is further supported by Gibbs (2021), who emphasizes that rich, information-dense responses can support robust thematic and sentiment insights regardless of sample size. The use of NVivo, as described by Bazeley and Jackson (2013), ensures that auto-coding and sentiment classification remain systematic and context-sensitive. Together, these sources confirm that the sentiment analysis performed is methodologically sound and suitable for identifying enablers of the TBL and governance dimensions.

Word cloud visualization of themes

Figure 4 shows the word cloud conducted to visualize key themes and patterns among the data for a more comprehensive insight into the participants' perception of government support and existing facilities in improving farmers' entrepreneurial mindset and intention among the study population. The word clouds highlight key themes shaping entrepreneurship among smallholder farmers. The left cloud (FPO/FPC perception data) emphasizes financial support, capacity building, and institutional enablers, with terms like "subsidy," "business," "schemes," and "training" showcasing the importance of structured programs to empower farmers. The right cloud (Farmer in-person interview perception data) focuses on market-related priorities, featuring "products," "market," "quality," and "prices," which underline the need for robust market access, fair pricing, and quality enhancement. Together, these themes illustrate that financial and training support, combined with market-oriented strategies, are essential for fostering entrepreneurial potential and ensuring the sustainability and profitability of smallholder farming activities.

4.2. Key enablers of smallholder farmers' entrepreneurial mindset and intention enhancement

The study employs a content analysis grounded in the Triple Bottom Line (TBL) sustainability framework and governance approach to identify and highlight key economic, social, environmental, and governance enablers. Using an interpretive structural modeling approach, it further explores and illustrates the interconnectivity among these enablers.

Economic enablers and interactions

The economic dimension identified several enablers enhancing smallholder farmers' entrepreneurial mindset and intention. By aligning with government initiatives and support systems, these enablers promote sustainable entrepreneurship and contribute to long-term economic resilience (Figure 5).

One significant enabler is direct market access, which allows farmers to bypass intermediaries and engage in direct sales. This connection to broader markets reduces dependence on intermediaries, fostering independence and giving farmers more control over pricing and distribution. The importance of direct market access in raising farmers' income levels and promoting sustainability is emphasized in recent research, highlighting its transformative impact on economic resilience (Arun et al., 2024; Malik & Kajale, 2024). Furthermore, government-facilitated market linkages provide the necessary infrastructure and platforms for farmers to access new markets and capitalize on emerging opportunities, as supported by Arun et al., (2024) who highlight the

importance of government support to overcome some challenges of FPO's and enabling them to access new opportunities, such as e-commerce platforms and export markets.

Entrepreneurial training emerges as another critical enabler, equipping farmers with the skills to manage market opportunities effectively. Training programs foster a mindset oriented towards sustainable entrepreneurship and enable farmers to innovate and adapt to changing market conditions. This is supported by Shao *et al.*, (2024), who underscore the importance of capacity-building initiatives in driving long-term growth. Additionally, specialized training in processing and packaging enhances product competitiveness and marketability by supporting value addition and diversification. These findings align with government-supported initiatives that provide farmers access to advanced processing equipment and workshops, enabling them to improve product quality and explore export markets (Arun *et al.*, 2024).

Cost efficiency is vital in enhancing smallholder farmers' financial stability by reducing operational expenses. For instance, bulk purchasing and collective bargaining effectively lower input costs, increasing overall profitability. This is highlighted by Clancy and Narayanaswamy (2014), who demonstrate how shared resources, such as machinery, enhance resource utilization, reduce production costs, and minimize waste. These practices enable farmers to improve operational efficiency and reinvest in entrepreneurial ventures prioritizing sustainable growth. Financial support, provided through government interventions such as subsidies and loans, further strengthens farmers' capacity to overcome financial constraints. These mechanisms empower farmers to invest in innovative practices and diversify their income streams by alleviating immediate financial pressures. This is illustrated by Coşkun Aslan and Kısacık, (2017), who show how financial support facilitates exploring new opportunities, including nursery management and value-added products. These investments reduce barriers to entry and promote long-term sustainability-focused initiatives.

Finally, integrating entrepreneurial training with financial resources amplifies the impact of these enablers, enhancing farmers' ability to expand their market presence. This combined approach supports strategic market expansion, drives profitability, and fosters competitive pricing strategies. Laurell *et al.*, (2019) Provide evidence that entrepreneurial training equips farmers to navigate complex market dynamics while Svensson *et al.*, (2016) Emphasize the importance of competitive pricing in sustaining long-term success. The ISM map highlights financial incentives,

market access, and infrastructure as foundational enablers, illustrating how economic factors structurally support entrepreneurial intention. This visual prioritization advances empirical understanding by clarifying their interdependencies within real-world farming systems.

Social enablers and interactions

The social dimension depicted in Figure 6 highlights enablers that cultivate smallholder farmers' entrepreneurial mindset and intention through empowerment, inclusivity, and government support. Community collaboration and collective decision-making play a foundational role in this process. For example, FPOs, through their structured group formation, serve as critical mechanisms for equitable governance and shared initiatives. These organizations create a sense of collective purpose, empowering farmers socially while nurturing an entrepreneurial spirit. This is supported by Pratheep and Narayanan (2024), who highlight the role of community collaboration within FPOs in building strong farmer networks that enhance governance, market participation, and sustainability.

Inclusivity emerges as another pivotal enabler, ensuring marginalized farmers are integrated into decision-making processes and equitable profit-sharing models. By addressing social inequities, inclusivity strengthens collective governance and social equity. (Clancy and Narayanaswamy, 2014) Emphasize that inclusive governance structures promote broader representation across market networks and ensure fair profit distribution, enriching social equity. Furthermore, the role of awareness campaigns in increasing farmers' understanding of and access to government schemes is critical. This aligns with entrepreneurial goals by fostering trust in government initiatives, as highlighted by Pratheep and Narayanan (2024), who demonstrate how these campaigns empower farmers to make informed decisions and enhance the effectiveness of government support.

Capacity building and upskilling also play a significant role in fostering social profit within the framework. These initiatives provide farmers with technical and entrepreneurial skills, enabling them to participate in market networks and utilize collective resources effectively. (Thom *et al.*, 2024) Emphasize that training programs foster innovation and encourage a shift toward business-oriented farming practices. Moreover, success stories and recognition efforts reinforce farmers' trust in collective initiatives, inspiring them to explore entrepreneurial opportunities. (Pratheep and Narayanan, 2024) Further, this is supported by illustrating how such recognition motivates sustained engagement with market-driven activities and strengthens the entrepreneurial spirit. The

supportive ecosystem created by FPOs, characterized by knowledge and resource sharing, enhances collective decision-making processes.

This ecosystem integrates diverse market networks, including local exhibitions and government supported linkages, providing farmers with platforms to reach customers and achieve financial stability. Transparent profit-sharing mechanisms within FPOs ensure social equity, foster trust among members, and encourage broader participation. (Pratheep and Narayanan, 2024) Underscore the importance of these mechanisms in creating an environment conducive to sustainable entrepreneurial activities and inclusive governance.

Confidence in government schemes encourages farmers to utilize available resources fully, reinforcing their entrepreneurial mindset. (Anisa, Kusnadi and Rachmina, 2021) Highlight that trust in government support is essential for fostering cohesive frameworks that promote sustainable development and long-term entrepreneurial success. The model reveals how community networks, trust, and farmer education influence mindset transformation, placing social cohesion as a mid-level driver. This expands theory by showing that social capital is not peripheral but structurally central in sustainable entrepreneurship.

Environmental enablers and interactions

Figure 7 shows the environmental enablers for fostering smallholder farmers' entrepreneurial mindset and intentions. Sustainable farming practices, such as organic and zero-budget natural farming, reduce chemical inputs while enhancing soil health and biodiversity. These methods foster natural pest resistance and build climate resilience, aligning with broader environmental goals.

This is supported by (Makinde, 2024; Oke *et al.*, 2024), who highlight the benefits of organic farming in improving soil health and promoting biodiversity as essential for long-term sustainability. Organic farming reduces the use of synthetic chemicals, promotes soil health, and enhances biodiversity. Similarly, zero-budget natural farming reduces reliance on external inputs and enhances ecological and economic viability. This method involves using natural resources and biological processes to maintain soil fertility and control pests, reducing the need for external inputs and promoting sustainability, as emphasized by (Makinde, 2024).

Resource optimization plays a pivotal role in promoting sustainable practices. Resource optimization refers to the efficient use of resources to achieve maximum productivity. Efficient irrigation systems like drip irrigation and water conservation techniques are central to achieving

resource efficiency. These strategies minimize water wastage while maintaining productivity. (Askaraliev *et al.*, 2024) Demonstrate that drip irrigation significantly reduces water consumption and is crucial for sustainable agriculture. Waste reduction and reuse strategies, including composting and bio-oil production, contribute to soil health management while lowering reliance on synthetic fertilizers. This aligns with findings by researchers who emphasize the role of these practices in reducing the carbon footprint of farming operations. By implementing these strategies, farmers can feel responsible and environmentally conscious, contributing to the overall sustainability of their operations. (Huzenko and Kononenko, 2024) emphasize the role of these practices in reducing the carbon footprint of farming operations. Environmental practices like resource conservation and climate resilience appear as reinforcing elements, linked to both economic and social drivers. This positioning challenges linear models and empirically demonstrates how sustainability behaviors emerge from complex relational dynamics.

Governance enablers and interactions

The governance enablers displayed in Figure 8 are critical in building robust systems that support smallholder farmers' entrepreneurial mindset and intention. Transparency and accountability serve as foundational principles, enabling clarity in management structures and fostering shared responsibility. These elements build trust and ensure equitable decision-making processes. Mechanisms such as audits and collective decision-making are pivotal in achieving these outcomes. (Azizah, Linawati and Sugeng, 2024; Pratiwi, Haliah and Kusumawati, 2024) Highlight that such mechanisms allow stakeholders to access information and hold governance structures accountable for their actions. This strengthens governance frameworks, creating an environment conducive to sustainable entrepreneurial practices.

Inclusivity is another essential enabler, ensuring that diverse farmer groups are represented and actively engaged in governance. This inclusivity fosters equity in decision-making processes by addressing the varied needs of farmers and promoting fairness in resource allocation. (Sánchez Soriano *et al.*, 2024) emphasize that inclusive governance structures provide equal opportunities for participation, thereby enhancing equity and long-term sustainability. Additionally, training programs empower farmers from different backgrounds to actively engage in governance, equipping them to contribute meaningfully to collective decision-making processes. (Azizah, Linawati and Sugeng, 2024) further support this by illustrating how such programs strengthen farmers' governance capabilities.

Efficiency, responsiveness, and effectiveness also emerge as critical governance enablers, allowing systems to adapt to evolving market demands. Improved infrastructure and regular training initiatives enable governance systems to address emerging needs promptly. (Sánchez-Soriano *et al.*, 2024) Underscore the importance of participatory feedback mechanisms, which are facilitated through effective communication and market linkages, in ensuring that governance systems respond dynamically to changing contexts while maintaining stakeholder satisfaction.

(Saqib, Xu and Luo, 2024) Highlight that these mechanisms integrate transparency with operational effectiveness, reducing costs through bulk input purchasing and optimizing resource allocation. Participation in governance enhances responsiveness and fosters innovation and sustainable practices within FPOs. Governance systems that emphasize participatory decision-making benefit from farmers' feedback in shaping strategies that align with market demands: transparent pricing strategies and optimized resource management further support operational efficiency and equity. (Azizah, Linawati and Sugeng, 2024) Underscore the importance of accountability frameworks within FPC structures, noting that these systems foster trust and innovation, ensuring that governance frameworks remain adaptable and forward-thinking. Collectively, these enablers establish a governance ecosystem that promotes equitable participation, sustainability, and adaptability to evolving challenges. By ensuring transparency, inclusivity, and responsiveness, governance frameworks empower smallholder farmers to participate actively in decision-making processes and adopt sustainable practices. The model uniquely embeds governance, policies, institutional support, and transparency as a top-tier enabler, structurally influencing all other dimensions. This empirical mapping provides a theoretical contribution by framing governance not as context but as an integrated pillar of the sustainability model.

5. Conclusion

This study unveils the critical role of government support in shaping sustainable entrepreneurial intention among smallholder farmers by incorporating the governance dimension into the Triple Bottom Line (TBL) framework. Integrating economic, social, environmental, and governance dimensions emerges as a robust model for fostering sustainable agricultural entrepreneurship. By utilizing a qualitative approach, the study captures the nuanced and context-specific phenomena impacting smallholder farmers, providing a comprehensive understanding of enablers for

sustainable development. The findings underscore the interconnectedness of direct market access, financial and training support, community collaboration, sustainable farming practices, and governance mechanisms in enhancing farmers' entrepreneurial mindsets. These enablers foster resilience, equity, and innovation within smallholder farming communities, paving the way for sustainable agricultural practices and entrepreneurial growth. The study's sentiment analysis and thematic visualization further validate these findings, highlighting the shared priorities of stakeholders and their alignment with the FBL framework.

The study findings have significant implications across multiple domains, particularly in shaping agricultural policies, enhancing decision-making processes, and fostering sustainable development. This study advances existing literature by explicitly integrating governance as a fourth dimension into the Triple Bottom Line (TBL) framework, focusing on how government support influences farmer entrepreneurial intention. Unlike prior studies that treat governance as an external factor, this research embeds it within the sustainability model, highlighting its structural role in enabling entrepreneurship. The conceptual model developed, based on emic and etic coding, maps the dynamic interaction between governance and TBL dimensions. This approach uncovers overlooked linkages between institutional support and mindset development, offering a novel framework for understanding sustainable farmer entrepreneurship in underrepresented agricultural sector. Furthermore, the qualitative approach utilized in the study underscores the importance of understanding farmers' lived experiences and challenges, enabling empathetic and grounded policy decisions that address real-world constraints and opportunities. This is a holistic model for guiding Farmer Producer Organizations (FPOs), cooperatives, and agribusinesses toward sustainability by promoting equitable governance, resource efficiency, and community engagement. Additionally, the findings highlight the necessity of fostering an entrepreneurial ecosystem through financial schemes, capacity-building initiatives, and enhanced market access, which collectively drive profitability and sustainability for smallholder farmers.

Practical suggestions for FPOs and FPCs

- ❖ Develop governance literacy programs for sub-group leaders to strengthen decision-making and align leadership practices with sustainability priorities.
- ❖ Establish transparent information-sharing platforms to ensure timely communication about government schemes, reducing access delays and enhancing trust.

- ❖ Involve FPOs and FPOs representatives in district-level agricultural planning committees to enable the co-creation of governance mechanisms tailored to local needs.
- ❖ Create social audit units, composed of elected farmer members, to monitor and report on scheme implementation and institutional accountability.
- ❖ Introduce green certification systems jointly managed by FPOs and local authorities to validate and promote sustainable farming practices in the market.
- ❖ Digitize existing rotational savings groups through mobile-based applications integrated with local governance structures, improving working capital access and financial transparency.

Looking ahead, future research directions emphasize expanding the scope and validating this framework to amplify its impact. Conducting similar studies in other states of India and internationally can uncover regional variations and refine the framework for global adaptability, to extend the research by developing a quantitative scale in the future. Transitioning to a quantitative approach for future research will allow for developing a standardized framework scale, enabling quantitative data collection and empirical validation of governance's role in sustainable entrepreneurship. Moreover, the framework's adaptability can be explored across other agricultural sectors, such as fisheries, forestry, and agribusiness value chains, to assess its broader relevance. Finally, investigating the role of emerging technologies, such as digital agriculture and renewable energy systems, within this framework offers an exciting avenue for understanding their potential to amplify sustainability and governance outcomes in agriculture.

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Ethical approval

All research was conducted in accordance with relevant guidelines and regulations applicable to studies involving human participants. Ethical approval was obtained from the Institutional Ethical Committee for Human Studies, Vellore Institute of Technology, Vellore, India, under approval number VIT/IECH/2025/16 IECH/8 February 2025/30, granted on March 3, 2025, for one year. The committee members included Dr. S. Sivakumar, Dr. Pragasam Viswanathan, Dr. Rajesh N. G., Dr. C. P. Girish Kumar, Dr. Kalaiselvi, Dr. S. Sreeja, Dr. N. Aravind Yuvaraj, Dr. Prasanna Samuel, Dr. Nagaraju Gundemeda, Dr. Venkatesan Kuppusamy, and Mr. M. R. Ravishankar. The study was independently reviewed by the ethics committee and deemed to have scientific and social value while minimizing risks to participants. The scope of approval includes collecting quantitative and qualitative data from consent-informed respondents, conducting statistical and thematic analysis based on the self-collected data, and sharing results with the public without releasing respondents' personal information.

Informed consent

Informed consent was obtained through signed consent forms from all respondents after providing detailed information about the study's objectives, risks, and benefits in Tamil language. The respondents included are the members of Farmers' Producer Companies, Farmers' Producer Organizations, and key informant farmers. Mr. Atsu Ihou conducted focus group discussions and key informant interviews in March 2025. The consent covered respondents' willingness, data use, and publication. Since this study did not involve interventions and relied on surveys and questionnaires, respondents were assured of their anonymity, the research purpose, and potential risks. No vulnerable individuals, such as minors, patients, or refugees, were involved.

Table 1: Ethic Code on TBL, Governance dimensions of Farmers' sustainable entrepreneurship enablers

Dimension	Enablers (literature)	Authors
Economic	Revenue Diversification	Arun et al. (2024); Malik & Kajale (2024); Coşkun Aslan and Kısacık (2017)
	Market Expansion	
	Direct Market Access & Linkage	
	Access Support & Subsidy	Shao <i>et al.</i> (2024); Arun et al. (2024)
	Entrepreneurial Training	Laurell <i>et al.</i> (2019); Svensson <i>et al.</i> , (2016)
	Profitability & Competitive Pricing	Clancy and Narayanaswamy (2014)
	Value Addition	
	Cost efficiency & bulk purchase	
	Reduction in production cost	
Efficient resource utilization		
Social	Market Network	Anisa, Kusnadi and Rachmina (2021)
	Inclusive Participation	Clancy and Narayanaswamy (2014)
	Community collaboration	
	Awareness & Accessibility	Pratheep and Narayanan (2024)
	Entrepreneurial spirit	
	Recognition & Empowerment	
	Building trust	Thom <i>et al.</i> (2024)
	Equity profit sharing	
Capacity building & upskilling		
Environmental	Sustainable farming practice	Makinde (2024); Oke <i>et al.</i> (2024) Askaraliev <i>et al.</i> (2024); Huzenko and Kononenko (2024)
	Waste reduction & reuse	
	Resources optimization	
Governance	Transparency	Saqib, Xu, and Luo, 2024
	Accountability	
	Sustainability	Azizah, Linawati and Sugeng, 2024; Pratiwi, Haliah and Kusumawati, 2024
	Responsiveness	
	Participation	
	Equity & inclusiveness	Sánchez Soriano <i>et al.</i> , 2024
Efficiency effectiveness		

Table 2: Sentiment Analysis of Perception of Government Support and Existing Facilities

Files	Responses	Emotions
FPC6	The government support reduces the burden on individual farmers, who would otherwise struggle to navigate the complex bureaucracy independently.	Very negative
FPO1	Before the FPC, we sold our products in external markets without profit.	
FPO2	Poor infrastructure in rural areas and a lack of storage facilities for perishable products also hinder the growth of FPOs.	
FPO3	Logistical challenges such as transportation and storage facilities have hindered the efficient distribution of our products.	
FPC4	While the FPC has managed to overcome some of these challenges with support from government schemes, competition from larger commercial entities and the need for better market access continue to present obstacles.	Moderate negative
FPC6	This support ensures we can continue producing even in difficult times.	
FPO3	Additionally, market competition remains a constant struggle, as larger commercial producers often have access to more resources and broader market channels.	
FPC4	Additionally, the agriculture marketing department helped us educate the farmers about selling products effectively and earning profits.	Very positive
FPC4	This shift toward entrepreneurial thinking has dramatically enhanced our ability to manage our farms more efficiently and profitably.	
FPC5	With the support of the Agriculture Department and our efforts, we've become more entrepreneurial in managing our farms, processing our products, and marketing them.	
FPO3	Furthermore, the government facilitated access to resources, agricultural tools, and knowledge sharing.	
KI_11	The subsidy has nonetheless been beneficial in setting up additional units on my farm.	
FPC4	Through training and access to resources, we were empowered to view our work not just as cultivation but as a business, focusing on maximizing profits.	Moderate positive
FPC4	Through the Agriculture Department's training programs, we now consider various aspects of the agricultural value chain, including marketing, pricing, and customer relations.	
FPC5	However, with guidance from the Agriculture Department and the help of our collective strength, we have stabilized our sales.	
FPC6	This 100% subsidy drastically reduced our financial burden, allowing us to upgrade our operations without worrying about upfront costs.	

Source: Author's data (2024)

Foundations of Farmers' Sustainable Entrepreneurship

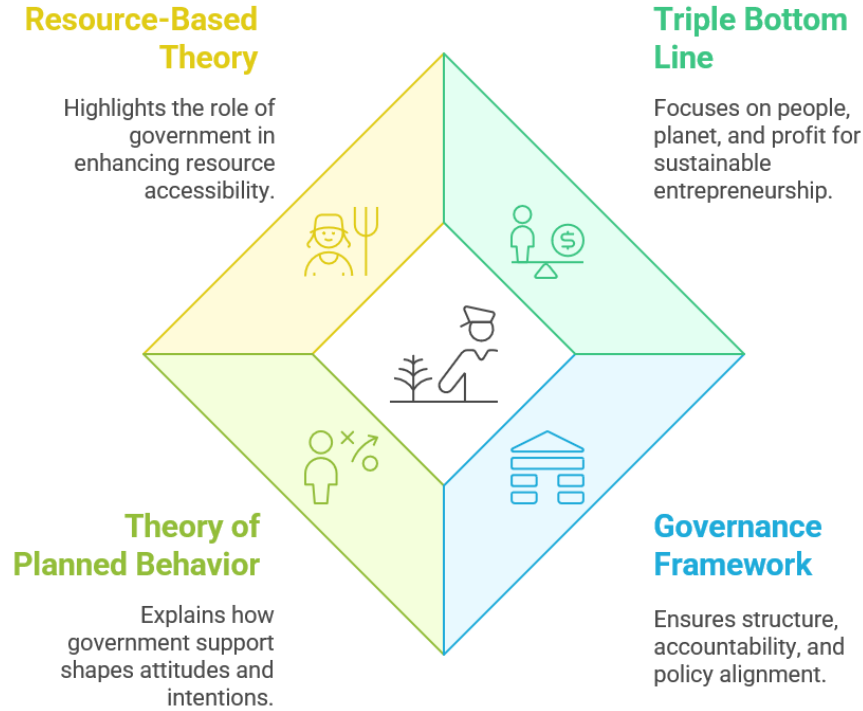
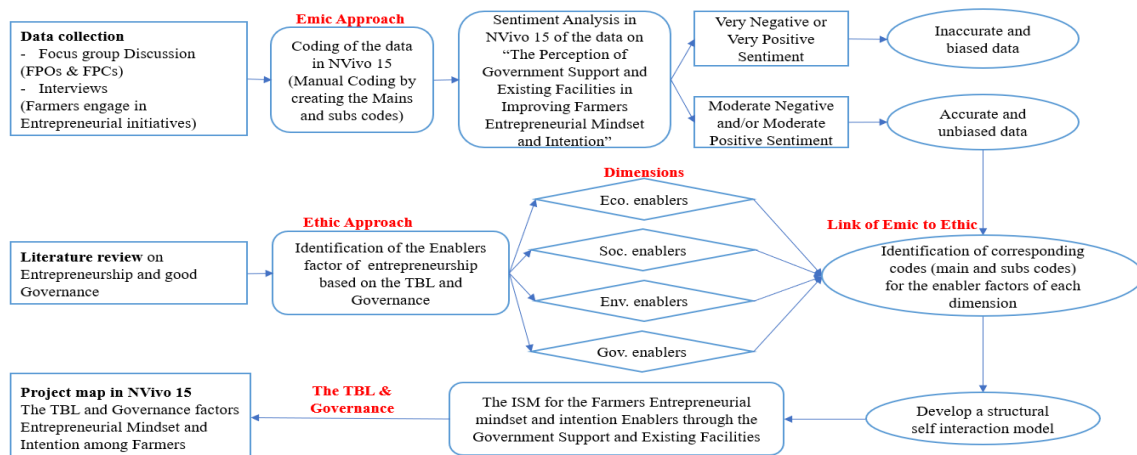


Figure 1: Theoretical framework
Source: Author's Compilation



Eco. = Economic; Soc. = Social; Env. = Environmental and Gov. = Governance

Figure 2: The Interpretive Structural Modeling Method
Source: Author's Compilation

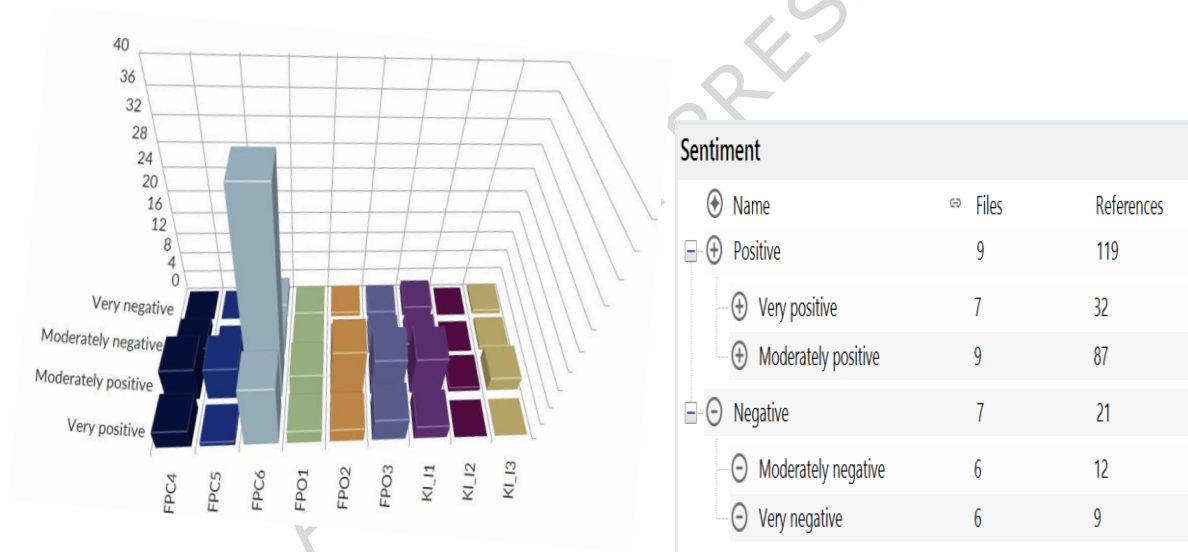


Figure 3: The sentiments analysis of the perception of government support and existing facilities in improving farmers' entrepreneurial mindset and intention

Source: Author's data (2024)

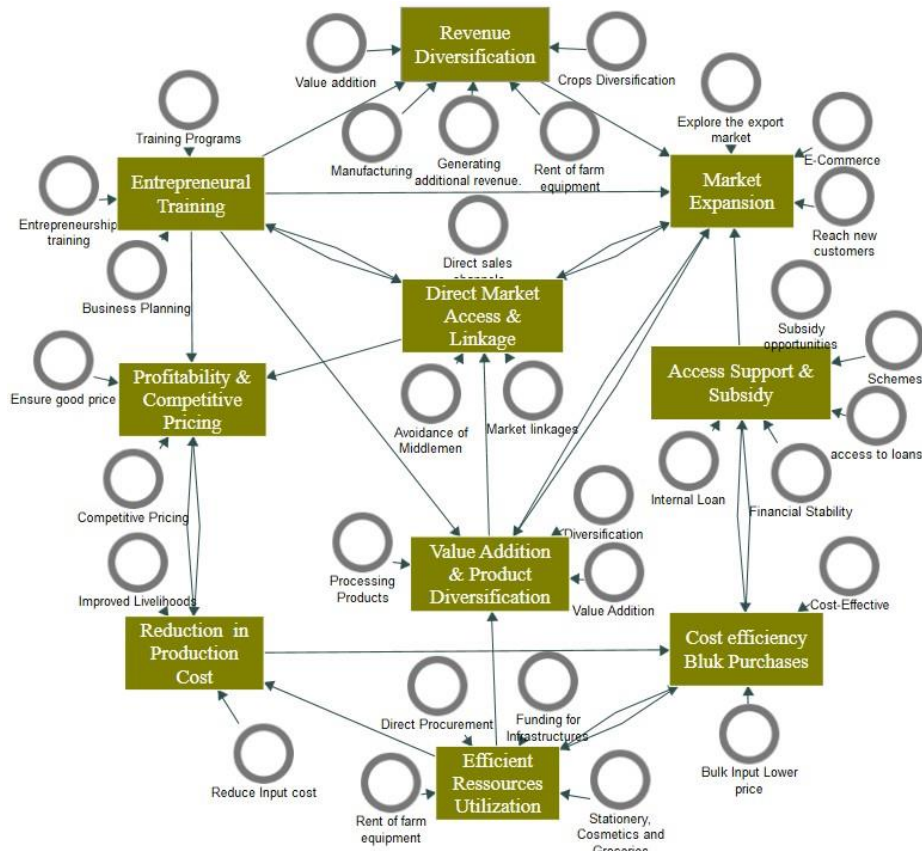


Figure 5: The Concept map of the ISM model showing cross-enablers interactions
 Source: Author's data (2024)

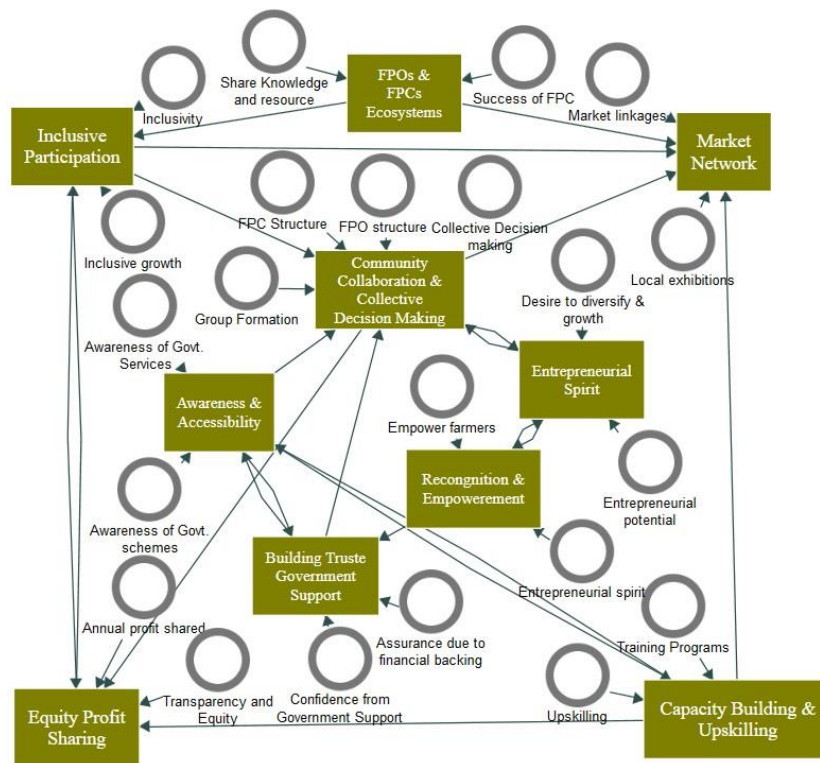


Figure 6: The concept map of the ISM model showing social enablers and interactions

Source: Author's data (2024)

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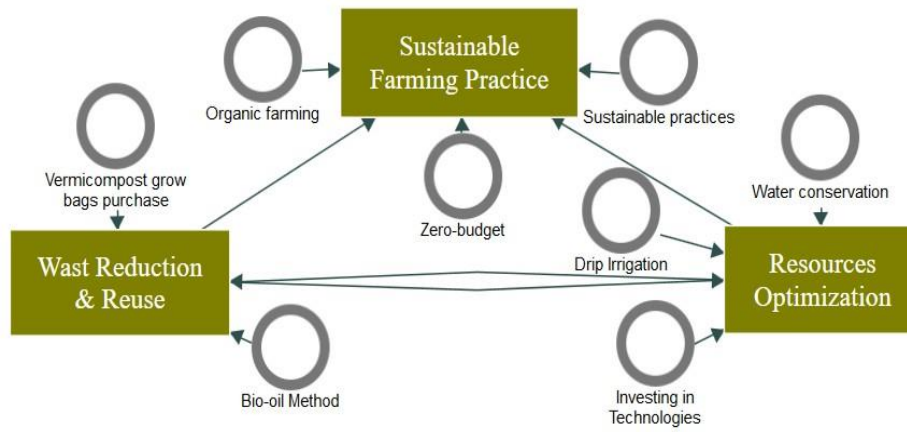


Figure 7: The Concept map of the ISM model showing environmental enablers and interactions

Source: Author's data (2024)

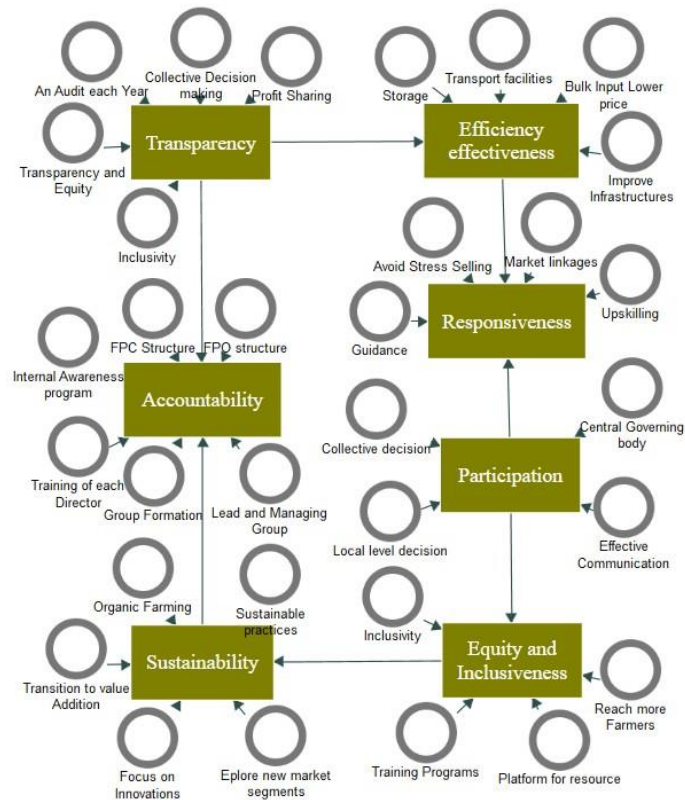


Figure 8: The Concept map of the ISM model showing governance enablers and interactions
Source: Author's data (2024)