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CONSTRUCTION OF THE CONVERGENCE COMMUNICATION MODEL: HARMONIZING SOCIAL AND DIGITAL CAPITAL IN INTERGENERATIONAL AGRICULTURAL COLLABORATION

Agus Kristian[1], Eko Purwanto[2]
Universitas Muhammadiyah Tangerang
E-mail: aguskristian08@umt.ac.id[1]*, eko.purwanto@umt.ac.id[2]

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Abstract

The global agricultural sector is currently facing a serious threat in the form of a farmer regeneration crisis amid the ambition to achieve sustainable food security. Although Smart Farming technology is available, its adoption rate is hindered by a sharp communication gap between senior farmers and the younger generation. This study aims to construct a convergence communication model capable of harmonizing the social capital of senior farmers and the digital capital of the younger generation. The method used is qualitative with a Systematic Literature Review approach. The analysis was conducted on various reputable literatures from Scopus, Web of Science, and Sinta databases within the last ten years. The results show a divergence in characteristics between the bonding social capital of senior farmers, which tends to be exclusive, and the digital capital of the younger generation, which is technocentric but lacks social relations. As a solution, this study constructs a Convergence Communication Model that integrates reverse mentoring strategies and cyclical dialogue to achieve mutual understanding. The implications of this model are the acceleration of inclusive farmer regeneration, increased resource efficiency based on the green economy, and the strengthening of national food stability through the synergy of resilient intergenerational assets.

Keywords: Convergence Communication, Social Capital, Digital Capital, Intergenerational Agriculture, Smart Farming.

INTRODUCTION

The global agricultural sector is currently at a critical crossroads, where the threat of a farmer regeneration crisis has become an existential challenge for human civilization (Ehrnström-Fuentes & Hokkanen, 2025). The phenomenon of an aging population in the agrarian workforce is no longer merely a sectoral issue, but a real threat to economic stability and global food availability (Hussain et al., 2025). In many developing countries, including Indonesia, the average age of farmers has exceeded 50 years, while the interest of younger generations in entering this sector continues to decline due to perceptions of the low economic value and social status of traditional agriculture (Giwu et al., 2025).

This condition creates a contradictory gap with the ambition to achieve sustainable food security. On the one hand, the continuously growing global population demands a more massive and efficient increase in food production (Toumbourou et al., 2023). On the other hand, the remaining workforce consists of groups with physical limitations and a reluctance to change long-established farming practices (Purc-Stephenson et al., 2025). Without a radical transformation in engaging younger generations, the goal of food sovereignty will be difficult to achieve due to stagnation in production methods and limitations in productive human resources (Cremaschi & Marín, 2025).

Along with technological advancements, the emergence of Smart Farming innovations based on the Internet of Things (IoT) offers a glimmer of hope to modernize this sector (Thilakarathne et al., 2025). Digital technology promises efficiency in the use of water, fertilizers, and real-time land monitoring, which should attract millennials and Gen Z who are familiar with the digital ecosystem (Balyan et al., 2024). However, reality in the field shows a technological paradox; although smart farming devices and systems are widely available, their adoption and implementation at the grassroots level remain very low and fragmented (Vasavi et al., 2025). The main barrier to adopting this innovation is not merely the availability of tools or infrastructure, but rather a sharp intergenerational communication gap (Sun et al., 2025). There is a knowledge dichotomy in which senior farmers control social capital in the form of land, practical experience, and local wisdom, while the younger generation controls digital capital in

the form of technological literacy and access to modern markets (Rahman & Huq, 2023). Unfortunately, these two pillars of strength rarely synergize harmoniously due to differences in mindset, communication styles, and mutual distrust regarding the effectiveness of traditional versus modern methods (Yılmaz, 2025).

Senior farmers often perceive digital innovation as a threat to traditional values, while young farmers consider senior knowledge to be no longer relevant in the digital era (Bekee et al., 2024). The absence of a common ground in communication results in strong social capital among seniors being unable to support the digital capital brought by the younger generation (Watkin & Conway, 2022). Consequently, knowledge transfer does not occur, innovation stagnates, and intergenerational collaboration expected to drive the Green Economy remains merely a policy discourse (Zhou et al., 2025).

In the context of development communication, a more dialogical approach is required rather than a linear diffusion of innovation model (Chen et al., 2023). The Convergence Communication Model emerges as a conceptual solution to bridge this divide through a cycle of information exchange aimed at achieving mutual understanding (Zhang et al., 2026). Through convergence, communication is no longer viewed as instruction, but as a process of harmonization in which each generation feels its contribution is valued, both in terms of empirical experience and technical skills (Agus et al., 2025).

Although studies on farmer regeneration have been widely conducted (O'Donoghue et al., 2022; Beacham et al., 2023; Schreefel et al., 2022), there is a significant gap in the current literature, where most studies still overlook intergenerational relational dynamics in the process of capital convergence (Ozgun et al., 2022; Glass, 2023; Arjaliès & Banerjee, 2024). The novelty of this study lies in integrating the Convergence Communication Theory to harmonize the social capital of senior farmers and the digital capital of young farmers, which have long been considered divergent. This study views the generational gap not as a static barrier, but as a potential synergy that can be constructed through continuous dialogue.

Therefore, this study seeks to construct a convergence communication model that specifically integrates social capital and digital capital within an intergenerational agricultural ecosystem. Through an in-depth literature synthesis, it is expected to produce a framework that can guide stakeholders in building an effective collaboration narrative. The success in harmonizing these intergenerational assets will not only accelerate the adoption of smart farming but also serve as a fundamental foundation in ensuring sustainable food security through planned and dignified farmer regeneration. The objective of this study is to analyze various factors causing misalignment or divergence in communication between holders of social capital and digital capital within an intergenerational agricultural ecosystem, while also constructing a convergence communication model as a new framework to synergize intergenerational potential in accelerating inclusive digital agricultural transformation.

LITERATURE REVIEW

Convergence Communication Theory

Convergence Communication Theory views communication as a dynamic process in which participants share information to achieve mutual understanding, rather than merely a one-way transmission of messages. Lawrence Kincaid (1979) emphasizes that convergence occurs through continuous cycles of information exchange to reduce differences in perception among actors until a common ground is reached. In line with this, Everett M. Rogers (2003), in the refinement of his theory, states that the success of an innovation largely depends on the quality of dialogue that enables the convergence of interests between innovators and adopters. Meanwhile, Jürgen Habermas (1984), through the concept of communicative action, reinforces this argument by emphasizing the importance of a domination-free dialogical space so that consensus or "mutual understanding" in development can be achieved authentically.

Social Capital in Agricultural Sociology

Social capital in the agricultural ecosystem is a foundation of stability that relies more on the strength of human relationships than on physical assets. Robert Putnam (1993) defines social capital as a combination of trust, norms, and networks that facilitate coordination for mutual benefit, which in agriculture is reflected in the cohesion of traditional farmer groups. Pierre Bourdieu (1986) adds the perspective that social capital is the accumulation of resources linked to the possession of institutionalized networks that provide "prestige" and bargaining power for senior farmers within their local environments. On the other hand, Francis Fukuyama (1995) emphasizes that a high level of trust within a community is the main capital that determines economic efficiency and the sustainability of social organizations, including in preserving local wisdom in the agrarian sector.

Digital Capital and Agriculture 4.0

Digital capital emerges as an evolution of capital in the information society era, determining the ability of actors to navigate the Agriculture 4.0 ecosystem. Massimo Ragnedda (2018) defines digital capital as the accumulation of digital competencies and access to technology that can be converted into social and economic advantages in the real world. According to Jan van Dijk (2005), digital capital is strongly influenced by the level of literacy and accessibility to data, which for the younger generation (Millennials and Gen Z) becomes a key strength in adopting agritechnological innovations. Furthermore, Mark Prensky (2001), through the concept of Digital Natives, explains that the inherent characteristics of younger generations who are familiar with technology create a unique form of digital capital, which, however, often requires a communication bridge to synergize with existing traditional social structures.

METHOD

This study employs a qualitative approach with a descriptive-analytical nature using a literature study (library research) method. According to Creswell (2014), qualitative research is a method for exploring and understanding the meaning that individuals or groups ascribe to social or human problems. In this context, the researcher acts as the key instrument to examine intergenerational communication phenomena through texts. In line with this, Moleong (2017) states that qualitative research aims to understand phenomena experienced by research subjects holistically through descriptions in the form of words and language. Through this method, the researcher seeks to construct an in-depth theoretical framework regarding patterns of harmonization between social capital and digital capital as recorded in previous academic works.

The data collection procedure was carried out through documentation study techniques across various reputable databases such as Scopus, Web of Science, Google Scholar, and Sinta. Sugiyono (2018) states that document study complements observation and interview methods in qualitative research to achieve higher research credibility through authentic secondary data. Data were collected using specific keywords such as "Intergenerational Farmer", "Convergence Communication", and "Social vs Digital Capital". The researcher conducted a rigorous selection of literature by considering inclusion and exclusion criteria to ensure that the data sources used had sufficient relevance and quality to address the research problem regarding communication convergence in the agricultural sector.

The data analysis technique in this study used content analysis and integrative synthesis of the collected literature. Sugiyono (2018) explains that in qualitative research, data analysis is conducted before entering the field and continues until completion, which in literature studies means that analysis is carried out simultaneously during document review. The researcher performed data reduction, data display, and conclusion drawing through an Integrative Literature Review to generate new perspectives from various article findings. Thematic analysis was then used to identify emerging patterns of harmonization. This process, as stated by Creswell (2014), aims to reduce data into meaningful themes in order to construct a comprehensive, systematic conceptual model with theoretical novelty.

RESULTS AND DISCUSSION

Characteristics of the Divergence of Social Capital and Digital Capital in Agricultural Communication

The differences between the social capital of senior farmers and the digital capital of the younger generation constitute a major barrier to communication in the adoption of agricultural innovation. Therefore, understanding the characteristics of this divergence is essential as a foundation for building intergenerational synergy toward sustainable agriculture.

1. Exclusivity of Senior Farmers' Social Capital

Senior farmers tend to possess bonding social capital (inward-oriented), which, according to Robert Putnam (2000), strengthens internal loyalty but often creates exclusivity that hinders the entry of external innovations. This social structure functions as a support system that maintains community resilience through strong trust among long-standing members. However, its exclusive nature often leads to new ideas from outside the group being perceived as threats to the established social cohesion. Pierre Bourdieu (1986) adds that this social capital represents an accumulation of prestige and institutional networks that make senior farmers highly dependent on traditional group norms to maintain social stability and their bargaining position within rural hierarchies.

From the perspective of agricultural sociology, this dependency is not only technical but also ideological. In line with this theory, recent research published in the Journal of Rural Studies (2023) reveals that a high dependence on local wisdom creates a "psychological barrier" that rejects the logic of digital efficiency. Senior farmers perceive Internet of Things (IoT) technology not merely as a tool, but as a threat to the spiritual and empirical intuition of

farming, which has been passed down for generations over decades. For them, losing manual control over land equates to losing their identity as wise "guardians of nature." The impact of this exclusivity is the formation of passive yet strong communicative resistance. Literature analysis indicates that although senior farmers are often open on a personal level, they tend to be professionally closed to managerial systems that are mathematical in nature. This is exacerbated by the fear of marginalization, where the presence of advanced technology is perceived as potentially displacing their central role within the community. As a result, social capital, which should serve as a source of strength, instead transforms into a barrier to the circulation of innovative information, as the authority of senior knowledge fails to find common ground with the fast-paced logic of digital mechanization.

2. Characteristics of Digital Capital of the Younger Generation

The younger generation (Millennials and Gen Z) possesses a dominance of digital capital, which Massimo Ragnedda (2018) defines as the ability to convert technical competencies into economic benefits and social opportunities in the real world. This capital includes high digital literacy, the ability to process large volumes of data, and agility in adopting digital marketing platforms. Jan van Dijk (2005) emphasizes that the effectiveness of this capital is highly dependent on information literacy and data accessibility, which are inherent characteristics of this generation as digital natives, enabling them to perceive agriculture as a business ecosystem that can be optimized through algorithms and precision.

However, the abundance of digital capital is often not accompanied by the maturity of traditional social capital within agrarian environments. Findings in the journal Sustainability (2024) indicate that although young farmers excel in operating smart farming systems, they experience a deficit in "relational capital" within rural sociological structures. They often struggle to build trust with local communities due to communication styles perceived as overly technical, individualistic, and lacking empathy for the traditional social ethics upheld by senior farmers. This gap causes the innovations they introduce to be viewed as "foreign objects" that lack cultural grounding in the village context Further analysis reveals that young farmers tend to view land purely as an economic asset, in contrast to senior farmers who see it as ancestral heritage. The inability of the younger generation to translate the technical values of smart farming into the "language" of local wisdom often leads to their ideas being subtly rejected. This condition creates a vicious cycle in which young farmers feel unappreciated and eventually choose to work in isolation or even leave the agricultural sector altogether, resulting in their digital capital never being fully converted into meaningful social change for the broader community.

3. Point of Divergence: Analysis of Intergenerational Communication Barriers

The point of divergence in agricultural communication arises from a clash of authority and sharp differences in risk perception between the two generational groups. Lawrence Kincaid (1979) explains that this communication failure occurs due to the absence of a two-way information cycle aimed at achieving mutual understanding, causing information to stop at the level of exposure without becoming shared meaning. Meanwhile, Everett M. Rogers (2003) interprets this phenomenon as a failure in the innovation diffusion process due to excessive social distance between digital innovation carriers and holders of land-based social capital, resulting in psychological friction that hinders harmonization.

Based on a comprehensive study in the International Journal of Agricultural Extension (2025), these barriers are further exacerbated by imbalances of authority within formal organizations such as farmer groups. Senior farmers tend to maintain the leadership status quo and traditional values as a form of protection for their existence. On the other hand, young farmers tend to withdraw from formal organizations because they feel their digital ideas do not receive adequate sociological validation. This condition creates a stagnant situation where knowledge transfer does not occur bidirectionally: seniors do not learn technology, and the younger generation does not learn practical wisdom.

Theoretically, this divergence is caused by differences in "cognitive maps" in envisioning the future of agriculture. Senior farmers prioritize stability and the sustainability of tradition, while the younger generation prioritizes scalability and technological efficiency. Without intervention in the form of a convergent communication model, these two forms of capital (social and digital) will continue to operate in parallel without ever intersecting. This not only hinders the adoption of smart farming but also accelerates the farmer regeneration crisis due to the absence of a collaborative space that is comfortable and mutually respectful for both parties.

Table 1 Characteristics of the Divergence of Social Capital and Digital Capital in Agricultural Communication

Comparison Dimension	Social Capital (Senior Farmers)	Digital Capital (Younger Generation)
Main Characteristics	Bonding Social Capital: inward-oriented, high internal loyalty, and exclusive.	Digital Capital: technical capabilities, data literacy, and conversion of digital opportunities into economic value.
Theoretical Foundation	Robert Putnam (2000), Pierre Bourdieu (1986).	Massimo Ragnedda (2018), Jan vanDijk (2005).
Value Orientation	Tradition, local wisdom, spiritual intuition, and preservation of ancestral heritage.	Efficiency, scalability, algorithmic logic, and business ecosystem.
Communication Pattern	Closed to mathematical managerial systems; maintains social harmony.	Technical, individualistic, and data-driven; often lacking cultural empathy.
Perception of Land	A subject of identity and a "trust" to be preserved (guardian of nature).	An economic object to be optimized through precision (smart farming).
Main Barriers	"Psychological barrier" toward technology; fear of role marginalization.	Deficit of relational capital; failure to build trust with local communities.
Communicative Risks	Passive resistance; closed to external innovations.	Professional isolation; ideas perceived as "foreign objects" by the community.
Main Objectives	Social stability and sustainability of tradition.	Business scalability and technological efficiency.

Based on the data in Table 1, it can be concluded that communication barriers in the agricultural sector are not merely rooted in technical issues, but in a sharp clash of cognitive maps in which senior farmers perceive technology as a threat to their intuitive authority and spiritual values, while the younger generation tends to be trapped in the logic of digital efficiency that overlooks local cultural foundations (social distance). This stagnant condition hinders two-way knowledge transfer and creates divergence which, if not immediately bridged through a convergent communication model to unify practical wisdom with digital innovation, will exacerbate the farmer regeneration crisis in the future.

Construction of the Convergence Communication Model: Synergy of Intergenerational Assets

After examining the barriers in the previous section, this section formulates strategic steps to harmonize the potential of senior and young farmers into a collaborative ecosystem.

1. Convergence Mechanism: Achieving Mutual Understanding

The convergence mechanism begins by shifting communication patterns from linear-instructive to cyclical-dialogical. According to Lawrence Kincaid (1979), convergence does not mean that all parties become the same, but that all parties move toward a shared understanding of meaning through repeated information exchange. In this context, the dialogical stage begins by creating an equal discussion space where senior farmers present their empirical experiences and young farmers present technological potential, until a value agreement is reached on how technology can strengthen local wisdom rather than replace it.

One of the main strategies in this mechanism is the implementation of Reverse Mentoring. This strategy reverses the traditional learning hierarchy: young farmers act as "digital mentors" who guide seniors in technological literacy (Smart Farming), while senior farmers act as "local wisdom mentors" who transfer practical knowledge regarding soil and climate characteristics. Literature analysis in the journal Agricultural Systems (2024) shows that reverse mentoring can reduce intergenerational sectoral ego, as each party feels their contribution is functionally recognized.

2. Integration of Social Capital and Digital Capital

This integration positions social capital as the "entry point" and digital capital as the "accelerator." Francis Fukuyama (1995) emphasizes that trust is a prerequisite for economic efficiency; in this study, the trust that senior farmers have in the integrity of the younger generation becomes the key before technology can be adopted. Once

trust is established through the convergence process, social capital in the form of farmer group networks becomes a powerful platform for distributing digital capital collectively, so that technology is no longer individualistic.

The harmonization of these assets creates a strong symbiotic mutualism. Senior farmers provide assets in the form of land, legitimacy, and experience in mitigating natural risks (Social Capital), while young farmers inject efficiency through the use of IoT sensors, automation, and direct access to digital markets (Digital Capital). Literature in the journal Land Use Policy (2025) confirms that this integration produces a more resilient "New Capital," where the intuitive sharpness of senior farmers is validated by precise data from the younger generation, thereby minimizing crop failure and maximizing economic gains.

3. Visualization of the Intergenerational Convergence Communication Model

The model constructed in this study is visualized as an interactive cycle that moves from a condition of divergence toward convergence. The flow of this model consists of three main components:

1. **Input (Intergenerational Capital):** Identifying social capital (senior) and digital capital (young) as the raw materials of collaboration.
2. **Process (Communication Convergence):** The intermediate space where reverse mentoring and two-way dialogue take place to reduce prejudice and build mutual understanding.
3. **Output (Sustainable Food Security):** The final outcome in the form of inclusive digital agricultural transformation, stable farmer regeneration, and the achievement of sustainable food security.

The explanation of these model components emphasizes that without a convergence process in the middle, social and digital capital inputs will remain parallel assets without real impact. This model offers theoretical novelty by positioning communication not merely as a tool for message delivery, but as a "space of harmonization" that transforms generational differences into competitive advantages in the agrarian sector. Thus, this model becomes a strategic framework for agricultural development policies that not only pursue technological targets but also the sustainability of human relationships.

Table 2 Construction of the Convergence Communication Model: Synergy of Intergenerational Assets

Model Component	Implementation Mechanism	Strategic Function and Objective
Communication Pattern	Transition from Linear-Instructive to Cyclical-Dialogical patterns (Kincaid, 1979).	Achieving mutual understanding where technology strengthens local wisdom rather than replacing it.
Main Strategy	Reverse Mentoring (exchange of roles between digital mentors and local wisdom mentors).	Reducing sectoral ego and providing functional recognition of each generation's contribution.
Capital Integration	Positioning Social Capital (Senior) as the entry point and Digital Capital (Youth) as the accelerator.	Building trust (Fukuyama, 1995) so that technology is not perceived as individualistic but as a collective asset.
Asset Symbiosis	Senior (Land, Experience, Risk Mitigation) + Youth (IoT, Automation, Digital Market Access).	Creating a resilient "New Capital": senior intuition validated by precise data from the younger generation.
Input (Assets)	Identification of Senior Social Capital and Youth Digital Capital.	Providing raw materials for collaboration from two distinct competency poles.
Process (Intermediate Space)	Two-way dialogue, value negotiation, and reciprocal knowledge transfer.	Reducing sociological prejudice and harmonizing differences into competitive strengths.
Output (Outcomes)	Sustainable Food Security and Inclusive Digital Agriculture.	Realizing stable farmer regeneration and socially-technically sustainable food security.

This convergence communication model reconstructs intergenerational relationships that previously operated in parallel or divergence into a mutually reinforcing cycle. Through the process phase involving reverse mentoring mechanisms, psychological barriers can be dismantled, enabling senior farmers to acquire technological literacy without feeling a loss of their traditional authority, while the younger generation gains sociological validation and practical ecological understanding that cannot be found in algorithms. This integration emphasizes that the success of future digital agricultural innovation depends not only on the sophistication of hardware such as the Internet of Things (IoT), but also on the quality of a communication harmonization space capable of transforming generational differences into strategic advantages for national food security.

Implications of the Model for Sustainable Food Security and Green Economy

The construction of this model provides strategic implications that go beyond mere technological adoption, namely creating food system stability through the integration of value meanings among humans, nature, and technology.

1. **Acceleration of Inclusive Farmer Regeneration**

The convergence communication model functions as a key catalyst in accelerating farmer regeneration, which has long been hindered by stigma and relational gaps. With the presence of an equal dialogical space, the younger generation no longer feels like "outsiders" or merely "technology laborers" on farmland, but rather as strategic partners with functionally recognized roles by senior farmers.

Literature analysis shows that inclusive regeneration occurs when there is a two-way value transfer. Young farmers gain social legitimacy through the endorsement and guidance of senior farmers (Social Capital), while senior farmers feel they remain relevant in the modern era because they are involved in the digital transformation process (Digital Capital). This model ensures that land leadership transitions do not occur abruptly or conflictually, but rather through a harmonious "relay of knowledge," thereby maintaining agriculture as an attractive sector for young talent without uprooting its local cultural foundations.

2. **Impact of Convergence on Resource Efficiency (Green Economy)**

The implementation of this model directly supports Green Economy principles through data-driven and locally grounded resource efficiency. Communication convergence enables the creation of "Community-Based Precision Agriculture." For example, the use of IoT-based soil sensors (Digital Capital), combined with the deep understanding of natural cycles possessed by senior farmers (Social Capital), results in far more accurate and minimal-waste use of fertilizers and water.

3. **Strengthening National Food Stability**

The impact of this harmonization includes reduced environmental degradation caused by excessive chemical use and more sustainable land optimization. From a green economy perspective, this model converts technical efficiency into ecological sustainability. The digital literacy of the younger generation helps monitor carbon footprints and energy efficiency, while the environmental ethics discipline of senior farmers ensures that technology is not used exploitatively, thereby creating a balance between economic profitability and ecosystem preservation.

At the macro level, the implication of this convergence communication model is the creation of a more resilient national food system capable of withstanding shocks. When social capital and digital capital synergize, the food supply chain becomes more transparent and efficient. Young farmers can utilize digital platforms to shorten long distribution chains, while senior farmers ensure production consistency through their experience in climate risk mitigation.

This stability is achieved through an intergenerational "Information Security System," where the risk of crop failure is minimized by precise data, and market uncertainty is mitigated by strong social networks. This model emphasizes that sustainable food security cannot be achieved merely by acquiring machines or applications, but by building a "communication infrastructure" that enables all intergenerational actors to move convergently toward a shared goal: sovereign and modern food independence.

Table 3 Implications of the Model for Sustainable Food Security and Green Economy

Implication Dimension	Transformation Mechanism	Strategic Impact
Inclusive Farmer Regeneration	Two-way value transfer: social legitimacy for youth and role relevance for seniors.	Eliminates the stigma of "technology laborers," creates a harmonious relay of land leadership, and attracts young talent without uprooting cultural foundations.
Resource Efficiency (Green Economy)	Integration of IoT sensors (Digital Capital) with understanding of natural cycles (Social Capital).	Creation of "Community-Based Precision Agriculture" that minimizes chemical waste, optimizes water use, and prevents land exploitation.
National Food Stability	Synergy between digital supply chain transparency and experience-based climate risk mitigation.	Establishment of a food system resilient to market shocks and weather changes through intergenerational communication infrastructure.
Ecological Sustainability	Carbon footprint monitoring literacy combined with traditional environmental ethics.	Balance between short-term economic profitability and long-term ecosystem sustainability..

The implementation of the convergence communication model produces impacts that go beyond mere adoption of technical tools by creating food system stability through the integration of values among humans, nature, and technology. This model functions as a catalyst for farmer regeneration, where the younger generation gains social legitimacy through the guidance of senior farmers, while senior farmers remain relevant in the modern era through digital involvement. In the realm of the Green Economy, this harmonization results in remarkable resource efficiency; precise data from digital technologies ensures accurate use of agricultural inputs, while local wisdom ensures that these practices remain aligned with environmental carrying capacity. At the macro level, this synergy strengthens national food security by minimizing the risk of crop failure through data and shortening distribution chains through digital platforms, thereby achieving sovereign, modern, and sustainable food independence.

CONCLUSION

This study successfully constructs a Convergence Communication Model as a solution to the problem of intergenerational divergence in the agricultural sector by addressing the psychological clash between the exclusive social capital of senior farmers and the technocentric digital capital of the younger generation. Through the reverse mentoring mechanism, this model transforms the traditional learning hierarchy into an equal cyclical dialogue, where youth act as technology mentors and seniors as mentors of practical wisdom to reduce sectoral ego. The synergy between social trust and digital precision ultimately creates a resilient "New Capital," which not only accelerates inclusive farmer regeneration and improves resource efficiency based on the Green Economy, but also strengthens national food stability through a robust intergenerational information system.

RECOMMENDATIONS

Based on the findings of this study, it is recommended that future researchers conduct empirical field studies to validate the effectiveness of the Convergence Communication Model across various commodities and regions, while governments are expected to shift their focus from merely providing physical assistance toward extension programs that facilitate equal intergenerational dialogue. In addition, practitioners and agricultural facilitators should adopt a reverse mentoring approach through informal dialogue spaces to ensure that the transfer of local wisdom and digital literacy occurs naturally, so that smart farming technology has a strong cultural foundation and remains sustainable at the rural level.

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