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VILLAGE GOVERNANCE IN THE IMPLEMENTATION OF THE GREENHOUSE PROGRAM: AN ANALYSIS OF INSTITUTIONAL ROLES AND POLICY EFFECTIVENESS IN KLASEMEN VILLAGE, PROBOLINGGO REGENCY

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Abstrak

Transformasi sektor pertanian di wilayah pedesaan menghadapi tekanan struktural yang bersumber dari perubahan iklim, keterbatasan sumber daya, serta menurunnya partisipasi generasi muda dalam aktivitas agrikultur. Kondisi tersebut mendorong kebutuhan terhadap inovasi pertanian yang adaptif dan berkelanjutan, salah satunya melalui pengembangan sistem greenhouse. Penelitian ini bertujuan untuk menganalisis peran pemerintah desa dalam implementasi Program Greenhouse di Desa Klasemen, Kabupaten Probolinggo, dengan menggunakan kerangka teori peran pemerintahan menurut Sondang P. Siagian yang mencakup fungsi fasilitator, regulator, motivator, dan dinamisator. Pendekatan yang digunakan adalah kualitatif deskriptif dengan teknik pengumpulan data melalui observasi, wawancara, dan dokumentasi, serta dianalisis menggunakan teknik analisis interaktif. Hasil penelitian menunjukkan pemerintah desa memainkan peran strategis yang terintegrasi dalam mendukung keberhasilan program. Sebagai fasilitator, pemerintah desa menyediakan infrastruktur, dukungan administratif, serta akses terhadap jejaring eksternal. Sebagai regulator, pemerintah desa menetapkan aturan dan mekanisme pengelolaan yang memastikan keteraturan pelaksanaan program. Sebagai motivator, pemerintah desa mendorong perubahan pola pikir masyarakat dan meningkatkan partisipasi petani dalam adopsi inovasi. Sementara itu, sebagai dinamisator, pemerintah desa menjaga keberlanjutan program melalui keterlibatan aktif, penguatan kolaborasi, dan pemeliharaan dinamika kelompok tani. Temuan ini memperlihatkan keberhasilan Program Greenhouse tidak hanya bergantung pada aspek teknis, melainkan juga pada kapasitas kelembagaan pemerintah desa dalam mengintegrasikan fungsi administratif dan sosial secara simultan. Penelitian ini memberikan kontribusi dalam memperkaya kajian administrasi publik, khususnya terkait tata kelola pemerintahan desa dalam implementasi inovasi pertanian berbasis komunitas. Selain itu, hasil penelitian ini dapat menjadi rujukan dalam pengembangan kebijakan desa

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yang berorientasi pada penguatan ketahanan pangan dan pembangunan berkelanjutan di tingkat lokal.

Kata Kunci: pemerintahan desa, greenhouse, inovasi pertanian, ketahanan pangan, pembangunan berkelanjutan.

Abstract

The transformation of the agricultural sector in rural areas is increasingly confronted with structural pressures arising from climate change, resource constraints, and the declining participation of younger generations in agricultural activities. These conditions necessitate the development of adaptive and sustainable agricultural innovations, one of which is the implementation of greenhouse systems. This study aims to analyze the role of village government in the implementation of the Greenhouse Program in Klasemen Village, Probolinggo Regency, employing Sondang P. Siagian's theory of governmental roles, which encompasses the functions of facilitator, regulator, motivator, and dynamizer. A descriptive qualitative approach was adopted, with data collected through observation, interviews, and documentation, and analyzed using an interactive analysis technique. The findings indicate that the village government performs an integrated and strategic role in supporting the success of the program. As a facilitator, the village government provides infrastructure, administrative support, and access to external networks. As a regulator, it establishes rules and management mechanisms that ensure orderly program implementation. As a motivator, it fosters changes in community mindset and enhances farmers' participation in adopting agricultural innovations. Meanwhile, as a dynamizer, it sustains program continuity through active involvement, strengthened collaboration, and the maintenance of group dynamics among farmers. These findings demonstrate that the success of the Greenhouse Program is not solely determined by technical aspects but is also significantly influenced by the institutional capacity of the village government in integrating administrative and social functions simultaneously. This study contributes to the enrichment of public administration literature, particularly in the context of village governance in implementing community-based agricultural innovations. Furthermore, the findings offer practical insights for the formulation of village-level policies aimed at strengthening food security and promoting sustainable development at the local level.

Keywords: village government, greenhouse, agricultural innovation, food security, sustainable development.

A. Introduction

The agricultural sector occupies a fundamental position in supporting food security while serving as the economic foundation of rural communities. This role is not limited to food provision, but also concerns socio-economic stability, particularly in areas whose livelihoods depend on agrarian activities. Over the past decade, global dynamics have shown increasing pressure on this sector due to climate change, environmental degradation, and volatility in international food markets. Recent literature emphasizes that changing weather patterns, shifts in planting seasons, and the rising frequency of

extreme events have significantly disrupted agricultural production cycles.[1] In the Indonesian context, this phenomenon is reflected in the uncertainty of harvest periods and declining productivity across various agrarian regions.[2]

At the same time, the agricultural sector faces a structural challenge in the form of declining interest among younger generations in engaging in agricultural activities. Economic transformation that drives urbanization, along with the perception of agriculture as a sector with low added value, has accelerated the exodus of young labor from villages. Empirical studies indicate that this phenomenon contributes to aging farmers, namely the dominance of older farmers, which has implications for low innovation adoption and limited regeneration of agricultural human resources.[3] This condition strengthens the structural vulnerability of villages in confronting development challenges while weakening their adaptive capacity in response to external changes.

This situation requires a transformation of agricultural development strategies that are oriented not only toward increasing production, but also toward systemic innovation capable of addressing the complexity of contemporary challenges. Technology-based agricultural innovation has become an increasingly relevant approach, particularly in improving production efficiency, reducing dependence on natural factors, and strengthening the sustainability of food systems. Within this framework, the role of local actors becomes crucial, especially village government as the institution closest to the community. Village government does not merely function as an administrative implementer, but also as an agent of change with the capacity to initiate, facilitate, and direct development innovation based on local potential.[4]

From the perspective of public administration, the position of village government reflects a dual role that is both structural and transformative. Structurally, village government performs the basic functions of governance, including public service delivery, population administration, and the implementation of village development. This function is inherent and does not depend on the social dynamics of the community. Ndraha emphasizes that the primary function of government constitutes the basic obligation of the state to ensure the provision of essential public services for citizens.[5] In the village context, this function becomes the main foundation for the continuity of stable and accountable governance.

[1] Food and Agriculture Organization, The State of Food and Agriculture 2021: Making Agrifood Systems More Resilient to Shocks and Stresses (Rome: FAO, 2021), Intergovernmental Panel on Climate Change, Climate Change 2022: Impacts, Adaptation and Vulnerability (Cambridge: Cambridge University Press, 2022).

[2] CNBC Indonesia, "Perubahan Iklim dan Dampaknya terhadap Sektor Pertanian di Indonesia," 2025.

[3] S. H. Susilowati, "Fenomena Penuaan Petani dan Implikasinya terhadap Regenerasi Tenaga Kerja Pertanian," Forum Penelitian Agro Ekonomi 34, no. 1 (2016): 35–55, World Bank, Transforming Agriculture and Food Systems in Indonesia (Washington, DC: World Bank Group, 2020).

[4] CNBC Indonesia, "Perubahan Iklim dan Dampaknya terhadap Sektor Pertanian di Indonesia"; OECD, Enhancing Rural Innovation in OECD Countries (Paris: OECD Publishing, 2020).

[5] Taliziduhu Ndraha, Kybernology (Ilmu Pemerintahan Baru) (Jakarta: Rineka Cipta, 2009).

On the other hand, village government also performs adaptive and contextual functions through its role in community empowerment. This function is no longer limited to the provision of administrative services, but develops toward strengthening the socio-economic capacity of rural communities. Village government acts as a facilitator, mediator, and catalyst in encouraging community participation and optimizing local potential. Suwandi explains that this role is realized through various forms of intervention, such as coaching, mentoring, and strengthening community institutions to achieve economic independence.[6]

In practice, this adaptive role is reflected in various innovation-based development initiatives, including the development of Village-Owned Enterprises (BUMDes), the strengthening of the local economic sector, and the facilitation of participatory development programs. Rukiyanto shows that village government has the capacity to become a primary driver in integrating community aspirations with development policy, thereby creating a more inclusive and sustainable development model.[7] This role becomes increasingly important in the context of agricultural transformation, where the success of innovation is strongly determined by the involvement of local actors and adequate institutional support.

Strengthening food security at the local level is increasingly directed toward the utilization of agricultural technologies capable of improving production efficiency while reducing vulnerability to external factors. One innovation that has developed in this context is greenhouse-based cultivation systems, which enable more precise control over plant growing environments. This system offers a production approach that no longer relies entirely on natural climatic conditions, but instead utilizes environmental engineering to create optimal conditions for plant growth. Recent literature indicates that agriculture based on controlled environment agriculture has significant potential to enhance productivity while maintaining production stability throughout the year.[8]

In the rural context, the adoption of greenhouse technology is not solely related to technical production aspects, but also involves innovation-based development strategies that engage local institutional actors. Village governments possess relatively broad policy space in allocating resources, particularly through the utilization of Village Funds directed toward productive sector development. This intervention includes the construction of modern agricultural infrastructure, the provision of production facilities,

[6] Suwandi, "Peran Pemerintah Desa dalam Pemberdayaan Masyarakat," Jurnal Ilmu Pemerintahan 6, no. 2 (2018): 45–58.

[7] B. A. Rukiyanto, "Peran Pemerintah Desa dalam Pembangunan Partisipatif," Jurnal Administrasi Publik 11, no. 1 (2020): 1–12.

[8] Kurt Benke and Bruce Tomkins, "Future Food-Production Systems: Vertical Farming and Controlled-Environment Agriculture," Sustainability 9, no. 10 (2017): 1–17, Ramin R. Shamshiri et al., "Advances in Greenhouse Automation and Controlled Environment Agriculture: A Review," Biosystems Engineering 170 (2018): 70–94.

and the strengthening of farmers' capacities through training and mentoring. Findings by Dhiya'Ulhaq demonstrate that the development of greenhouse systems at the village level constitutes part of a strategy to enhance local food production, integrated with farmer group empowerment and the optimization of village land utilization.[9]

The long-term investment dimension also represents an important aspect of greenhouse development. This infrastructure functions not only as a production facility, but also as a strategic instrument for building a more resilient food system. Wibowo identifies that village resource allocation for greenhouse development encompasses various components, ranging from physical construction and the provision of superior seeds to the strengthening of farmers' technical capacities in implementing environmentally friendly agricultural practices.[10] This approach aligns with the sustainable development paradigm, which emphasizes the integration of economic efficiency, environmental sustainability, and social welfare.[11]

The linkage between greenhouse development and national food security policy further reinforces the relevance of this innovation within the context of village development. Villages are positioned as the frontline of food program implementation, particularly through policy decentralization and the strengthening of local capacity. Sari explains that the utilization of Village Funds for greenhouse development represents the commitment of village governments to promote community-based food security while expanding community participation in agricultural innovation.[12] This orientation reflects a paradigm shift from top-down approaches toward more participatory and locally grounded development models.

From a technical perspective, greenhouse systems provide advantages in controlling environmental variables that determine the success of plant cultivation. The regulation of temperature, humidity, light intensity, and air circulation enables the creation of a stable and optimal microclimate. Hasril and Mubarak emphasize that control over these factors has direct implications for improving both the quality and quantity of production outputs.[13] In addition, this system minimizes the risk of pest attacks and reduces dependence on chemical pesticides, thereby supporting more sustainable agricultural practices.

[9] M. Dhiya'Ulhaq, "Strategi Pemerintah Desa dalam Pengembangan Greenhouse untuk Ketahanan Pangan Lokal," Jurnal Pembangunan Desa 5, no. 2 (2021): 45–58, M. Dhiya'Ulhaq, "Pemanfaatan Dana Desa dalam Pengembangan Greenhouse Berbasis Pemberdayaan Kelompok Tani," Jurnal Administrasi Publik Indonesia 10, no. 1 (2024): 77–89.

[10] A. Wibowo, "Peran Pemerintah Desa dalam Pengembangan Pertanian Berkelanjutan melalui Greenhouse," Jurnal Ekonomi Pembangunan 21, no. 2 (2020): 89–102

[11] United Nations, Sustainable Development Goals Report 2019 (New York: United Nations, 2019)

[12] R. P. Sari, "Pemanfaatan Dana Desa dalam Pembangunan Greenhouse untuk Ketahanan Pangan Berbasis Masyarakat," Jurnal Kebijakan Publik 13, no. 2 (2022): 101–112

[13] H. Hasril and A. Mubarak, "Teknologi Greenhouse sebagai Solusi Pertanian Modern dalam Menghadapi Perubahan Iklim," Jurnal Agritech 40, no. 2 (2020): 123–130

A similar perspective is emphasized by Budisanjaya and Sucipta, who demonstrate that greenhouse technology allows precise management of plant growth conditions, resulting in more stable productivity that is less affected by extreme weather fluctuations.[14] In practice, this technology creates opportunities for farmers to intensify production without expanding land area, thereby contributing to more efficient resource utilization. Recent studies even show that the integration of digital technologies into greenhouse systems further enhances the accuracy of environmental management, including through automated sensors and smart irrigation systems.[15]

Conceptually, greenhouse-based agriculture represents a concrete form of sustainable agriculture innovation. This approach emphasizes resource optimization, environmental impact reduction, and the improvement of farmers' welfare in the long term. The implementation of this innovation at the village level requires synergy among technology, institutional structures, and community capacity. The involvement of village government in this process becomes a determining factor in ensuring successful innovation adoption, particularly in creating an ecosystem that supports program sustainability.

Within the framework of public administration, the implementation of greenhouse programs can be analyzed through the perspective of Old Public Administration (OPA), which emphasizes the importance of formal bureaucratic structures, adherence to regulations, and clear role division within governmental organizations. Marliani, Henriyani, and Djadjuli explain that the OPA paradigm positions public administration as an instrument for policy implementation oriented toward stability, efficiency, and procedural certainty.[16] Iacovino, Barsanti, and Cinquini also demonstrate that this model remains relevant in the context of local governance, particularly within systems that rely on hierarchical structures and formal administrative mechanisms.[17]

The implementation of greenhouse programs through village government reflects the characteristics of OPA, where planning, budgeting, execution, and supervision processes are conducted through structured bureaucratic mechanisms. The success of implementation is strongly influenced by the consistency of village officials in adhering to administrative procedures and regulatory frameworks. Widiastuti identifies bureaucratic stability as a key factor in ensuring the sustainability of village development

[14] I. P. G. Budisanjaya and I. N. Sucipta, "Pengaruh Greenhouse terhadap Produktivitas Tanaman Hortikultura dalam Sistem Pertanian Modern," Jurnal Teknik Pertanian Lampung 8, no. 3 (2019): 191–200.
[15] Shamshiri et al., "Advances in Greenhouse Automation," 70–94.
[16] L. Marliani, E. Henriyani, and R. D. Djadjuli, "Relevansi Paradigma Old Public Administration dalam Tata Kelola Pemerintahan Modern," Jurnal Administrasi Publik 11, no. 1 (2025): 1–12
[17] N. M. Iacovino, S. Barsanti, and L. Cinquini, "Public Organizations between Old Public Administration, New Public Management, and Public Governance: The Case of Italy," Public Organization Review 17, no. 1 (2015): 61–82.

programs.[18] On the other hand, contemporary literature also critiques the limitations of OPA, which tends to be less adaptive to social dynamics and innovation, while providing limited space for public participation.[19]

The normative foundation regarding the strategic position of village government in local development gains strong legitimacy through the national legal framework. Law Number 6 of 2014 concerning Villages grants broad authority to village governments to regulate and manage community interests based on local initiatives, traditional rights, and prevailing social values. Article 72 paragraph (1) emphasizes the fiscal capacity of villages through Village Funds allocated for infrastructure development, local economic potential development, and sustainable resource utilization. This policy design reflects a decentralization-oriented development approach that provides greater autonomy for villages to determine development priorities in accordance with their regional characteristics. In practice, this authority opens opportunities for village governments to initiate innovative programs in the agricultural sector, including greenhouse development as part of a local food security strategy.

Within this framework, village government does not merely function as a policy implementer, but also as an actor possessing discretionary capacity in determining the direction of village development. This role includes functions as regulator, facilitator, and initiator in integrating national policies with local needs. Literature on village development governance indicates that the effectiveness of program implementation is highly influenced by the ability of village governments to manage resources, build institutional coordination, and encourage community participation.[20] This capacity becomes increasingly relevant in the context of agricultural innovation adoption, where program success depends not only on technological availability, but also on the institutional and social readiness of the community.

This phenomenon can be empirically observed in Klasemen Village, Gending District, Probolinggo Regency, which has begun to develop a greenhouse-based agricultural system as a response to productivity challenges and climate change. This initiative reflects an effort to transform conventional farming practices into a more modern and controlled cultivation system. The implementation of greenhouse systems in the village has not only resulted in increased agricultural output, but has also stimulated changes in the community's mindset toward agricultural practices. Farmers have begun to adopt more scientific approaches in managing plant growing

[18] R. Widiastuti, "Implementasi Kebijakan Pembangunan Desa dalam Perspektif Administrasi Publik," Jurnal Governance 6, no. 1 (2021): 55–67.
[19] F. P. Kalalo, "Kritik terhadap Paradigma Old Public Administration dalam Dinamika Pelayanan Publik Kontemporer," Jurnal Ilmu Administrasi Negara 12, no. 1 (2024): 15–28.
[20] Hans Antlöv, Anna Wetterberg, and Leni Dharmawan, "Village Governance, Community Life, and the 2014 Village Law in Indonesia," Bulletin of Indonesian Economic Studies 52, no. 2 (2016): 161–183

environments, including irrigation regulation, variety selection, and pest and disease control.

The socio-economic dimension of greenhouse development also reveals a dynamic transformation. This program contributes to increasing farmers' income through production stability and improved product quality. In addition, greenhouse development creates opportunities for agricultural diversification, including the cultivation of high-value horticultural products that were previously difficult to produce under open-field farming systems. From the perspective of village development, this transformation strengthens the position of agriculture as a source of local economic growth while simultaneously enhancing the attractiveness of the sector for younger generations. Studies on agricultural transformation indicate that the integration of technology into farming practices has the potential to increase youth engagement in the agrarian sector.[21]

From an environmental standpoint, the implementation of greenhouse systems in regions such as Probolinggo holds significant relevance, considering the area's vulnerability to drought during prolonged dry seasons. Greenhouse-based agriculture enables more efficient water usage through controlled and measurable irrigation systems. This approach contributes to reducing pressure on water resources while supporting climate change adaptation efforts. The concept of community-based climate adaptation positions local communities as primary actors in responding to environmental changes through community-driven innovation.[22] In this context, village government functions as a connecting agent between climate adaptation policies and their implementation at the local level.

Although these positive potentials have been identified, empirical studies that specifically examine the institutional role of village government in the implementation of greenhouse programs remain limited. Most existing research tends to focus on technical cultivation aspects or economic impacts, while governance dimensions and policy effectiveness at the village level have received insufficient attention. This gap highlights the importance of conducting a more in-depth analysis of how village governments manage, direct, and ensure the sustainability of agricultural innovation programs.

Within this context, the present study is directed toward analytically examining the role of Klasemen Village government in the implementation of the greenhouse program, with a particular emphasis on institutional aspects and policy effectiveness. The analysis

[21] International Fund for Agricultural Development, Creating Opportunities for Rural Youth: 2019 Rural Development Report (Rome: IFAD, 2019).

[22] Intergovernmental Panel on Climate Change, Climate Change 2022; Organisation for Economic Co-operation and Development, A Territorial Approach to the Sustainable Development Goals: Synthesis Report (Paris: OECD Publishing, 2020).

includes how the village government allocates resources, builds coordination with local actors, and encourages community participation in the development of agricultural innovation. This approach is expected to provide an empirical contribution to enriching public administration studies, particularly in relation to innovation-based village development governance, while also expanding the understanding of strategies for strengthening food security at the local level.

B. Results and Discussion

1. Facilitator Aspect: The Role of Village Government in Supporting Infrastructure and Access to Resources

Within the theoretical framework of governmental roles proposed by Sondang P. Siagian, the facilitator function positions government as an actor that provides enabling conditions for communities to effectively carry out development processes. This function extends beyond the provision of physical infrastructure, encompassing technical support, access to resources, and the ability to bridge relationships between communities and external stakeholders. This perspective aligns with the enabling government approach in modern public administration, which emphasizes the importance of the state's role in creating a conducive ecosystem for community empowerment.[23]

In the context of the Greenhouse Program implementation in Klasemen Village, the facilitator role is manifested through concrete interventions undertaken by the village government in providing initial infrastructure and facilitating access to strategic resources. The village government supports the provision of land that can be collectively utilized by farmer groups, while also assisting in the procurement of greenhouse facilities as a foundation for modern agricultural production. This intervention reflects the institutional capacity of the village to allocate resources in a targeted manner to support technology-based agricultural innovation.

Beyond physical aspects, the facilitation dimension is also evident in the village government's efforts to connect farmer groups with external networks. Relationships with agricultural agencies, field extension officers, and other technical institutions provide access to knowledge, technology, and assistance that cannot be independently obtained by farmers. Studies in rural development indicate that the success of agricultural innovation is strongly influenced by the quality of institutional networks that facilitate the flow of information and technology transfer.[24] In the case of Klasemen

[23] Stephen P. Osborne, "From Public Service-Dominant Logic to Public Service Logic: Are Public Service Organizations Capable of Co-Production and Value Co-Creation?," Public Management Review 20, no. 2 (2018): 225–231.

[24] World Bank, Transforming Agriculture and Food Systems in Indonesia (Washington, DC: World Bank Group, 2020), Food and Agriculture Organization, The State of Food and Agriculture 2021: Making Agrifood Systems More Resilient to Shocks and Stresses (Rome: FAO, 2021).

Village, this bridging role strengthens farmers' adaptive capacity in managing greenhouse systems more effectively.

Administrative facilitation also constitutes a significant element that illustrates the depth of the village government's role. Village officials are involved in preparing assistance proposals, managing farmer group administration, and providing information regarding relevant agricultural programs. Such administrative support is often overlooked, despite its substantial impact on program sustainability. Literature on local governance emphasizes that administrative capacity is a key factor in ensuring community access to development resources.[25]

The implications of this facilitator role are reflected in the increasing level of community participation in the Greenhouse Program. Farmers are no longer merely beneficiaries but have transformed into active participants involved in the management and development of the program. This involvement strengthens social cohesion and fosters collaborative practices based on mutual cooperation. In the context of community-based development, this condition reflects the emergence of collective action as a foundation for sustaining innovation at the local level.[26]

2. Regulator Aspect: Strengthening Governance and Regulatory Certainty in Program Implementation

From a public administration perspective, the regulatory function occupies a central position in ensuring the orderliness and sustainability of a development program. Riant Nugroho conceptualizes regulation as a policy instrument that serves to direct, control, and provide legal certainty for the implementation of public programs. Regulation does not merely function as a control mechanism, but also as a normative framework that shapes patterns of interaction among actors within a development system.[27]

In the implementation of the Greenhouse Program in Klasemen Village, the regulatory role is reflected in the establishment of rules and agreements governing the operational management of the program. The village government formulates norms regarding the use of greenhouse facilities, including mechanisms for utilization, maintenance, and the distribution of responsibilities among farmer group members. The clarity of these rules creates an organized institutional structure and reduces the potential for dysfunction in program implementation.

Understanding the regulatory function becomes essential when distinguished from facilitation. Facilitation focuses on providing support, whereas regulation emphasizes

[25] Hans Antlöv, Anna Wetterberg, and Leni Dharmawan, "Village Governance, Community Life, and the 2014 Village Law in Indonesia," Bulletin of Indonesian Economic Studies 52, no. 2 (2016): 161–183.
[26] Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action (Cambridge: Cambridge University Press, 2015).
[27] Riant Nugroho, Public Policy: Teori, Manajemen, Dinamika, Analisis, Konvergensi, dan Kimia Kebijakan (Jakarta: Elex Media Komputindo, 2017).

the control and structuring of the behavior of involved actors. In this context, the village government performs a dual role that is mutually reinforcing, where the support provided through facilitation is strengthened by a system of rules that ensures program sustainability.

Empirically, the regulatory role of the village government in the Greenhouse Program can be identified through several key practices. First, the establishment of rules governing the use and maintenance of greenhouse facilities that bind all members of the farmer group. Second, the formulation of collective agreements regarding the distribution of duties and responsibilities, reflecting participatory principles in group governance. Third, the implementation of supervisory functions to ensure that activities are aligned with the program's original objectives. Fourth, the provision of direction and corrective measures in the event of deviations in field practices.

The presence of clear regulations provides certainty for all actors involved in the program. Each member of the farmer group shares a common understanding of rights and obligations, thereby minimizing the potential for internal conflict. Public policy literature indicates that clarity of rules constitutes a fundamental prerequisite for achieving effective and sustainable governance.[28] In the context of Klasemen Village, the regulatory function strengthens the institutional structure of farmer groups while maintaining the stability of the Greenhouse Program's implementation.

3. Motivator Aspect: Strengthening Participation and Transforming Community Mindsets

In public administration studies, the role of government as a motivator positions state institutions as sources of psychological and social encouragement capable of mobilizing community participation. Sondang P. Siagian emphasizes the importance of the motivational dimension in development processes, particularly in innovative programs that require changes in behavior and community perspectives. This perspective aligns with the behavioral public administration approach, which demonstrates that the success of public policy is determined not only by program design but also by the cognitive and affective responses of society to the program.[29]

In the implementation of the Greenhouse Program in Klasemen Village, the motivational dimension becomes a crucial factor, especially during the initial stage of innovation adoption. The greenhouse-based agricultural system introduces significant changes compared to conventional practices that have long been employed by farmers. These changes include the use of technology, the management of plant growth environments, and more structured work patterns. Such conditions require an

[28] Michael Hill and Peter Hupe, Implementing Public Policy: An Introduction to the Study of Operational Governance, 3rd ed. (London: Sage Publications, 2014), Michael Howlett, Designing Public Policies: Principles and Instruments (London: Routledge, 2019).

[29] Stephan Grimmelikhuijsen et al., "Behavioral Public Administration: Combining Insights from Public Administration and Psychology," Public Administration Review 77, no. 1 (2017): 45–56.

adaptation process that does not occur automatically, particularly among communities accustomed to traditional practices.

The role of the village government in this context is evident in its efforts to build community trust and confidence in the benefits of greenhouse innovation. Village officials actively engage in interpersonal communication with farmers, conveying long-term benefits and providing concrete illustrations of potential increases in production. This approach reflects the application of participatory persuasion strategies, where the community is not positioned as an object of policy but as a subject invited to understand and rationally accept innovation.

Motivation is also fostered through continuous interaction between the village government and farmer groups. Regular meetings, group discussions, and ongoing mentoring activities serve as important mediums for cultivating collective enthusiasm. The presence of village officials at every stage of program activities provides a strong signal of moral support, enabling farmers to perceive the government as a partner in program implementation. Literature on participatory development indicates that active governmental involvement in social communication processes enhances community trust in development programs.[30]

Initial resistance to innovation represents a common phenomenon in the process of technological diffusion. Rogers, in the diffusion of innovation theory, explains that the adoption of new technologies is influenced by community perceptions regarding complexity, relative advantage, and compatibility with existing values.[31] In the context of Klasemen Village, some farmers exhibited hesitation during the early stages of greenhouse implementation. The motivational role performed by the village government contributed to reducing such resistance through persuasive and educational approaches.

The transformation of farmers' mindsets serves as an important indicator of the effectiveness of the motivational function. Farmers begin to perceive agriculture as an activity that can be managed scientifically, rather than merely following natural patterns. This shift reflects an increase in the cognitive capacity of the community in understanding modern agricultural practices. Within the framework of sustainable development, such transformation constitutes a fundamental prerequisite for the long-term sustainability of innovation at the local level.[32]

[30] John M. Cohen and Norman T. Uphoff, Participation's Place in Rural Development: Seeking Clarity through Specificity (Ithaca: Cornell University Press, 2015).
[31] Everett M. Rogers, Diffusion of Innovations, 5th ed. (New York: Free Press, 2003).
[32] United Nations Development Programme, Human Development Report 2020: The Next Frontier—Human Development and the Anthropocene (New York: UNDP, 2020).

4. Dynamizer Aspect: Maintaining Sustainability and Collective Dynamics in the Program

The role of the dynamizer in Sondang P. Siagian's theoretical framework emphasizes the government's capacity to mobilize and sustain community activities within a development program. This function is closely associated with efforts to create productive social dynamics, ensuring that a program does not stagnate at the initiation stage but continues to develop over time. In contemporary public administration literature, this role is often linked to the concept of collaborative governance, in which the government acts as a catalyst for interaction among actors in achieving shared objectives.[33]

In the implementation of the Greenhouse Program in Klasemen Village, the dynamizer role is reflected in the active involvement of the village government in maintaining the rhythm of farmer group activities. The village government is not only present during the planning or initial construction phases, but continuously monitors program progress through field observations and sustained communication. This consistent involvement establishes continuity in program activities, which is essential for maintaining stability.

The dynamizer dimension is also evident in the village government's ability to build collaborative networks with various supporting actors. Connections with agricultural extension workers, technical agencies, and other stakeholders with expertise in agriculture create opportunities for continuous knowledge transfer. These interactions generate a process of collective learning that enhances farmers' capacity to manage greenhouse systems. Studies on rural innovation indicate that program sustainability is highly dependent on the intensity of interaction among actors within collaborative networks.[34]

Furthermore, the village government plays a crucial role in maintaining the social cohesion of farmer groups. Through deliberative forums and open communication, the village government fosters a harmonious working environment. This condition is important for minimizing potential conflicts that may hinder program implementation. Literature on social capital emphasizes that trust and cooperation among group members are key determinants of the success of community-based programs.[35]

The dynamizer role is also associated with the government's capacity to maintain program orientation in alignment with its initial objectives. In practice, the village government provides strategic direction and conducts evaluations of greenhouse

[33] Chris Ansell and Alison Gash, "Collaborative Governance in Theory and Practice," Journal of Public Administration Research and Theory 18, no. 4 (2008): 543–571, Kirk Emerson, Tina Nabatchi, and Stephen Balogh, "An Integrative Framework for Collaborative Governance," Journal of Public Administration Research and Theory 22, no. 1 (2012): 1–29.

[34] OECD, Enhancing Rural Innovation in OECD Countries (Paris: OECD Publishing, 2020).

[35] Robert D. Putnam, Bowling Alone: The Collapse and Revival of American Community, updated ed. (New York: Simon & Schuster, 2015).

activities. This process ensures that the program does not experience stagnation or deviate from its intended goals. Within the framework of policy implementation, this function reflects the importance of feedback mechanisms as part of the public policy cycle.[36]

The presence of the village government as a dynamizer illustrates how local institutions function as primary drivers in sustaining innovation. Greenhouse activities extend beyond production processes, evolving into a space for social learning that strengthens the collective capacity of rural communities. This dynamic demonstrates the integration of institutional roles and community participation in creating adaptive and sustainable agricultural systems.

An examination of the research findings reveals that the role of the village government in the Greenhouse Program in Klasemen Village does not operate in isolation, but rather forms an integrated institutional configuration. The framework of roles—facilitator, regulator, motivator, and dynamizer—is more appropriately understood as a sequence of functions that move from providing support, structuring rules, shaping behavioral orientation, to maintaining program sustainability. This structure indicates that program effectiveness is not determined by a single administrative action, but by the village government's capacity to consolidate material, normative, social, and organizational dimensions into operational local development practices.[37]

The facilitator role serves as the initial stage, as agricultural innovation cannot proceed when communities face limited access to land, production facilities, technical information, and institutional networks. Such support provides the material foundation that enables program implementation. The availability of facilities alone does not guarantee success. Infrastructure that has been established risks losing its function if it is not accompanied by clear rules regarding utilization, division of responsibilities, and supervisory mechanisms. At this stage, the regulatory function becomes relevant, as it ensures orderly management of collective resources and prevents the emergence of conflicts of interest.

The relationship between facilitation and regulation highlights the necessity of balancing supportive capacity with controlling capacity. Literature on village governance indicates that post-Village Law decentralization has created opportunities for village governments to design development based on local needs, including in resource management and productive economic development. The effectiveness of this authority

[36] Michael Howlett, Designing Public Policies: Principles and Instruments (London: Routledge, 2019).

[37] Sondang P. Siagian, Administrasi Pembangunan: Konsep, Dimensi, dan Strateginya (Jakarta: Bumi Aksara, 2003); Stephen P. Osborne, "From Public Service-Dominant Logic to Public Service Logic: Are Public Service Organizations Capable of Co-Production and Value Co-Creation?," Public Management Review 20, no. 2 (2018): 225–231.

is strongly influenced by institutional capacity, clarity of operational guidelines, and the ability of local actors to coordinate policy implementation.[38] This is consistent with Law Number 6 of 2014, which integrates governance, development, community guidance, and empowerment into a unified framework of village administration.[39]

Beyond these structural dimensions, the findings reveal the importance of socio-psychological aspects in innovation implementation. The greenhouse program introduces fundamental changes in agricultural practices, ranging from work methods to decision-making processes. This situation requires a complex adaptation process. The village government's role extends beyond providing facilities and regulations, encompassing efforts to build trust, reduce resistance, and foster a sense of ownership among farmers. Within the perspective of behavioral public administration, policy success is influenced by how communities perceive programs, process them cognitively, and translate them into concrete actions.[40]

In the context of Klasemen Village, the motivator function appears significant, as innovation adoption does not occur automatically. Some farmers expressed hesitation during the early stages, particularly due to the fundamental differences between conventional and greenhouse-based agricultural systems. The village government responded through intensive communication, active presence in group forums, and continuous mentoring, which contributed to shifts in community attitudes. This process demonstrates that the success of innovation depends not only on technical aspects, but also on leadership capacity in fostering trust and collective commitment.[41]

The dynamizer function explains how programs are sustained and developed beyond the initial implementation phase. Many village development programs experience stagnation when initial support declines or coordination among actors weakens. Findings from the Greenhouse Program reveal a contrasting pattern, where the village government remains actively involved in monitoring, deliberation, and stakeholder coordination. In the literature on collaborative governance, program sustainability is largely determined by the quality of interaction among stakeholders, particularly through dialogue, trust, and shared commitment to collective goals.[42]

An integrative reading of these four roles reveals a complementary functional pattern. The facilitator provides resources, the regulator ensures order, the motivator

[38] Hans Antlöv, Anna Wetterberg, and Leni Dharmawan, "Village Governance, Community Life, and the 2014 Village Law in Indonesia," Bulletin of Indonesian Economic Studies 52, no. 2 (2016): 161–183, World Bank, Transforming Agriculture and Food Systems in Indonesia (Washington, DC: World Bank Group, 2020).

[39] Republik Indonesia, Undang-Undang Nomor 6 Tahun 2014 tentang Desa (Jakarta: Sekretariat Negara Republik Indonesia, 2014).

[40] Grimmelikhuijsen et al., "Behavioral Public Administration," 45–56.

[41] Cohen and Uphoff, Participation's Place in Rural Development.

[42] Ansell and Gash, "Collaborative Governance in Theory and Practice," 543–571; Emerson, Nabatchi, and Balogh, "An Integrative Framework for Collaborative Governance," 1–29.

builds social acceptance, and the dynamizer maintains the continuity of collective activities. This pattern indicates that the governance of the Greenhouse Program cannot be adequately explained solely through formal bureaucratic approaches. Relational dimensions, social learning, and continuous coordination form an innovation ecosystem at the village level.

A critical analysis of the findings also reveals structural limitations. Dependence on the intensity of village government involvement may serve as both a strength and a vulnerability. Programs operate effectively when village leadership is active and responsive, yet they may weaken when sustainability relies excessively on individual figures rather than institutionalized systems. Literature on rural innovation suggests that program sustainability is more secure when supported by institutional capacity, community skills, and stable supporting networks over the long term.[43]

From a theoretical perspective, the findings demonstrate that Sondang P. Siagian's theory of governmental roles remains relevant in explaining village governance practices. This relevance lies not in static role classification, but in its capacity to illustrate how governmental functions operate simultaneously within empirical contexts. The greenhouse program reveals that village government functions not merely as a policy administrator, but as an actor that drives community-based development transformation.

Empirically, these findings reinforce the place-based development approach, in which policies are formulated based on specific local characteristics. Regions such as Probolinggo face climatic challenges and water resource limitations that necessitate adaptive innovation. In this context, greenhouse systems are not merely production technologies, but represent local strategies that integrate adaptation, efficiency, and sustainability within village agricultural development.[44]

C. Conclusion

The analysis of the implementation of the Greenhouse Program in Klasemen Village demonstrates that the role of the village government is articulated through an institutional configuration encompassing the functions of facilitator, regulator, motivator, and dynamizer, which operate simultaneously and reinforce one another. The facilitator role is reflected in the village government's capacity to provide material and administrative support while opening access to external networks that accelerate the transfer of agricultural knowledge and technology. This support establishes the foundational conditions that enable communities to adopt greenhouse-based

[43] OECD, Enhancing Rural Innovation in OECD Countries.

[44] Food and Agriculture Organization, The State of Food and Agriculture 2021: Making Agrifood Systems More Resilient to Shocks and Stresses (Rome: FAO, 2021), OECD, Enhancing Rural Innovation in OECD Countries.

agricultural systems as an innovation that was previously beyond their independent reach.

The regulatory function illustrates the village government's capacity to construct program governance through the establishment of rules, role distribution, and supervisory mechanisms that maintain implementation consistency. The clarity of operational norms provides certainty for farmer groups in conducting structured production activities, while minimizing the potential for conflict that could disrupt program sustainability. This dimension underscores the importance of regulatory aspects in optimizing the utilization of collective resources.

At another level, the motivator function plays a crucial role in addressing social resistance to agricultural innovation. The village government contributes to building trust, encouraging shifts in mindset, and fostering community readiness to transition from conventional practices to more modern, technology-based approaches. This process reflects a cognitive and social transformation that constitutes a key prerequisite for successful innovation adoption at the local level.

The dynamizer function highlights the village government's capacity to sustain program continuity through ongoing involvement, the strengthening of collaborative networks, and the maintenance of social cohesion among farmer groups. Such engagement preserves the rhythm of program activities while fostering collective learning processes that enhance community capacity in managing greenhouse systems.

The synthesis of these four functions indicates that the effectiveness of the Greenhouse Program is determined not solely by the presence of technology or the availability of resources, but by the ability of the village government to integrate administrative and social functions in a balanced manner. This configuration of roles illustrates how village government operates as a strategic actor in promoting agricultural innovation, strengthening food security, and developing community capacity in a sustainable manner within the context of locally based village development.

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