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Multi-Actors Capability in Meeting Fertilizer Needs in Maros Regency

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Abstract. *This study aims to analyze the capability of multi-actors in fulfilling fertilizer needs in Maros Regency through the perspective of collaborative governance and public value governance. The fulfillment of subsidized fertilizer needs is not merely a technical issue related to availability and distribution, but also a governance issue involving the interaction of government actors, business actors, citizens, and nonprofit actors in creating collective capability. This study adopts the strategic triangle perspective developed by John M. Bryson, particularly focusing on operational capability within multi-actor governance. The study employs a qualitative approach using phenomenological methods to explore the experiences, perceptions, and awareness of actors involved in fertilizer governance in Maros Regency. Data were collected through in-depth interviews, observation, and documentation involving the Regent of Maros, DPRD members, the Department of Agriculture and Food Security, agricultural extension workers, PT Pupuk Indonesia, PT Lampoko Ternak Indonesia, fertilizer agents, farmer groups, and HKTI Youth Farmers. The findings reveal that the capability of multi-actors in fertilizer governance remains fragmented and unevenly distributed. Government actors possess formal authority and normative capability but face limitations in technical and operational capability, particularly in digital data management, eRDKK implementation, and verification of farmer and land data. Business actors such as PT Pupuk Indonesia demonstrate strong technical and logistical capability, yet their effectiveness is constrained by weak data synchronization with local government institutions. Agricultural extension workers maintain strong relational capability with farmers but lack adaptive and technological competence. Farmers and farmer organizations remain structurally vulnerable because of low administrative capability and limited integration into decision-making processes. This study concludes that fertilizer governance in Maros Regency reflects fragmented capability rather than collaborative capability. Therefore, strengthening relational capability, digital integration, collaborative coordination, and participatory governance are necessary to create effective public value in fertilizer distribution.*

Keywords: *Multi-Actor Governance, Capability, Public Value, Collaborative Governance, Subsidized Fertilizer, Maros Regency*

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INTRODUCTION

The development of contemporary public administration demonstrates a paradigm shift from government toward governance (Bryson et al., 2014; Martinus, 2022; Margetts & Dunleavy, 2013; Akopian et al., 2024). Public governance is no longer understood as an exclusive domain of

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the state, but rather as an interactive arena involving multiple actors across sectors who possess different authorities, resources, and capacities. In the context of agricultural governance, especially fertilizer distribution, the interaction between government institutions, private companies, farmer groups, and civil society organizations becomes increasingly important because the effectiveness of public policy depends not only on formal regulations but also on the collective capability of actors involved in implementation processes.

The issue of subsidized fertilizer distribution in Indonesia has become one of the most complex governance challenges in agricultural policy (Akopian et al., 2024; Jamil et al., 2023; Harianto et al., 2025; Putra & Harahap, 2025; Warr & Yusuf, 2014). Fertilizer is a strategic production input directly related to food security, agricultural productivity, and farmers' welfare. In regions with strong agrarian characteristics such as Maros Regency in South Sulawesi, fertilizer availability significantly determines the sustainability of agricultural production systems. The government has attempted to ensure fertilizer access through subsidy mechanisms, allocation policies, and distribution regulations. However, empirical conditions demonstrate that fertilizer governance continues to experience serious problems such as inaccurate targeting, delays in distribution, inconsistent data systems, unequal access, and declining public trust (Arodha, 2024; Basri & Saptomo, 2024; Müller et al., 2021; Fabregas et al., 2019).

Maros Regency represents one of the agrarian regions in South Sulawesi with extensive agricultural land and high dependency on subsidized fertilizers. Although fertilizer allocation quantitatively appears sufficient based on national calculations, many farmers continue to experience fertilizer shortages. Such conditions indicate that the problem does not solely concern fertilizer quantity but also governance capability among actors responsible for fertilizer planning, verification, distribution, monitoring, and public communication (Smith & Siciliano, 2015; Nattassha et al., 2020; Martínez-Dalmau et al., 2021; Faisal, 2024).

The complexity of fertilizer governance in Maros Regency cannot be separated from the interaction among multiple actors. The local government possesses authority in determining fertilizer allocation and validating farmer and land data through the eRDKK system. Agricultural extension workers function as facilitators and mediators between government institutions and farmers (Chowdhury et al., 2014; Bakari et al., 2021; Wijaya & Offermans, 2019; Indraningsih et al., 2023). PT Pupuk Indonesia acts as the primary supplier responsible for production and national distribution networks, while fertilizer agents become the operational actors directly interacting with farmers at the local level. Farmer groups, HKTI Youth Farmers, and community organizations simultaneously function as users, advocates, and social controllers within fertilizer governance. However, the capability of each actor is unevenly distributed, causing governance fragmentation and weakening collaborative effectiveness (Huang et al., 2017; Zhang et al., 2017; Salminen, 2016; Bergsten et al., 2019).

John M. Bryson's Strategic Triangle framework provides an important analytical perspective for understanding governance capability in multi-actor systems (Bryson et al., 2017; Thabit et al., 2025; Höglund et al., 2021; Hoppe, 2017). Bryson expands Mark H. Moore's strategic triangle into collaborative governance by emphasizing the relationship among legitimacy and authority, operational capability, and public value creation. Within this perspective, capability does not merely refer to technical or administrative competence but also includes relational capability, adaptive capability, organizational coordination, and collective problem-solving capacity among actors (Zollo et al., 2016; Schmidt & Foss, 2025; Huang & Li, 2017; Kraemer-Mbula et al., 2019; Lopez et al., 2018).

Previous studies concerning subsidized fertilizer governance in Indonesia generally focus on distribution efficiency, policy implementation, or subsidy effectiveness (Nur et al., 2020; Hajad et al., 2024). Most studies emphasize structural and technical dimensions while paying limited attention to collaborative capability among actors. In addition, studies discussing fertilizer governance in local government contexts remain limited, especially those integrating public value

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governance perspectives into agricultural governance (Dahal et al., 2020; Rodorff et al., 2019; Zinngrebe et al., 2020; Rist et al., 2007). Therefore, this study contributes theoretically by examining fertilizer governance capability through a multi-actor governance lens and operational capability perspective within Bryson's strategic triangle.

This study specifically investigates how government actors, business actors, citizens, and nonprofit actors demonstrate capability in fulfilling fertilizer needs in Maros Regency. The study identifies capability gaps, organizational weaknesses, relational limitations, and technological challenges that shape fertilizer governance. Furthermore, this research explores how fragmented capability among actors affects the creation of public value and public trust within subsidized fertilizer distribution systems.

The significance of this study lies in its contribution to understanding collaborative governance capability in local agricultural governance. By emphasizing capability fragmentation and relational governance, this study offers a conceptual and practical framework for strengthening collaborative public value governance within fertilizer distribution systems. The findings are expected to support policy reform, institutional integration, digital governance improvement, and participatory governance mechanisms in agricultural administration.

METHODS

This study employed a qualitative research design using a phenomenological approach to explore the experiences, perceptions, and interpretations of actors involved in fertilizer governance in Maros Regency. The phenomenological method was chosen because this study seeks to understand how actors construct meaning regarding capability, coordination, and governance processes within subsidized fertilizer fulfillment. Qualitative inquiry enables a deeper understanding of governance dynamics that cannot be adequately explained through quantitative indicators alone. The research was conducted in Maros Regency, South Sulawesi, Indonesia, which represents an important agricultural region with extensive dependence on subsidized fertilizer systems. The selection of Maros Regency as the research locus was based on several considerations. First, Maros has a significant agricultural sector requiring continuous fertilizer support. Second, empirical observations indicate recurring problems in fertilizer distribution, data verification, and governance coordination. Third, the region reflects broader governance challenges occurring in decentralized agricultural systems in Indonesia. Data collection was conducted through in-depth interviews, field observations, and documentation studies. Interviews were carried out with key actors involved in fertilizer governance, including the Regent of Maros, members of the Regional House of Representatives (DPRD), officials from the Department of Agriculture and Food Security, agricultural extension workers (PPL), PT Pupuk Indonesia representatives, PT Lampoko Ternak Indonesia representatives, fertilizer agents, farmer group leaders, and HKTI Youth Farmers. These actors were selected purposively based on their direct involvement in fertilizer planning, allocation, distribution, monitoring, and advocacy processes.

The interviews explored several dimensions of capability, including technical competence, organizational capability, digital capability, relational capability, coordination mechanisms, adaptive capacity, and governance challenges. Interview sessions were conducted semi-structurally to allow respondents to explain their experiences and interpretations in detail. Field observations focused on fertilizer distribution practices, interaction among actors, verification procedures, and coordination activities at local agricultural offices and farmer group levels. Documentation analysis included regional policy documents, fertilizer allocation reports, eRDKK documents, agricultural statistics, fertilizer distribution records, and regulatory frameworks related to subsidized fertilizer governance. These documents were analyzed to understand institutional arrangements, governance procedures, and operational mechanisms shaping fertilizer governance in Maros Regency. Data analysis employed phenomenological reduction, thematic coding, categorization, and interpretive synthesis. The analysis process involved

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identifying significant statements from interview data, grouping themes related to governance capability, and interpreting patterns of interaction among actors. The findings were subsequently interpreted through Bryson's strategic triangle framework, particularly focusing on operational capability within collaborative governance. To ensure data validity, this study applied triangulation techniques through cross-checking interview findings, observations, and documentation data. Member checking was also conducted with selected participants to confirm the consistency and accuracy of interpretations. Ethical considerations were maintained throughout the research process by ensuring informed consent, confidentiality, and voluntary participation.

RESULTS AND DISCUSSION

Government Capability in Fertilizer Governance

The findings indicate that government actors in Maros Regency possess relatively strong normative and formal capability because they are supported by legal authority and administrative mandates in fertilizer governance. The local government, the Department of Agriculture and Food Security, and agricultural extension workers formally hold responsibility for determining fertilizer allocation, validating farmer and land data, supervising distribution, and coordinating implementation processes. However, despite this formal authority, technical and operational capability remains limited. The Regent of Maros explained that inaccurate farmer and land data continue to become one of the most serious problems in fertilizer governance. Data collection processes are still partially conducted manually and lack layered verification systems. As a result, the projected fertilizer demand frequently differs from actual conditions in the field. The government also faces difficulties in calculating fertilizer needs based on land size, crop characteristics, and planting patterns (Bouwman et al., 2017; Wang, 2022). Such conditions demonstrate weak operational capability within public governance systems.

The capability limitations become more visible in the implementation of digital governance systems such as eRDKK. Although the eRDKK system was designed to improve data accuracy and transparency, many agricultural officers and extension workers still lack adequate digital competence. Several extension workers admitted difficulties in operating digital mapping systems and geospatial verification applications. Consequently, data verification processes are often delayed, inconsistent, and dependent on manual coordination. The shortage of agricultural extension workers also weakens governance effectiveness. In several districts within Maros Regency, one extension worker is responsible for multiple villages simultaneously. Such workload conditions reduce the intensity of farmer assistance, monitoring activities, and field verification processes. The imbalance between workload and institutional support weakens adaptive capability within government institutions. The study also found that government institutions tend to operate within sectoral administrative boundaries rather than collaborative governance frameworks. Coordination between the Department of Agriculture, extension workers, fertilizer agents, and private companies remains fragmented. Data systems are not fully integrated, and institutional communication frequently depends on informal coordination mechanisms. In Bryson's perspective, this condition reflects weak relational capability within public governance.

Capability of Agricultural Extension Workers

Agricultural extension workers represent one of the most important actors within fertilizer governance because they directly interact with farmers and local agricultural communities. The findings reveal that extension workers possess relatively strong relational capability due to their social closeness with farmers. Farmers generally trust extension workers more than bureaucratic institutions because of continuous communication and direct field engagement. However, despite strong social legitimacy, extension workers face significant technical limitations. Many extension workers admitted lacking mastery of digital systems such as eRDKK and geospatial mapping technologies. The rapid transformation of agricultural governance into digital systems has not

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been accompanied by continuous training and institutional adaptation. As a result, extension workers often rely on manual methods and informal verification processes.

The limitations of extension workers illustrate a contradiction between social legitimacy and technical capability. On one hand, extension workers are trusted actors within rural communities. On the other hand, their limited adaptive and technological competence weakens governance accuracy and operational performance. This imbalance significantly affects fertilizer verification processes and contributes to inaccurate allocation systems. From a collaborative governance perspective, extension workers potentially function as relational bridges connecting government institutions, farmers, and private companies. Nevertheless, the absence of integrated governance systems and continuous institutional support prevents extension workers from maximizing their relational capability. Therefore, strengthening extension workers' adaptive and digital competence becomes essential for improving collaborative governance capability.

Business Capability in Fertilizer Distribution

The findings demonstrate that business actors possess stronger technical and logistical capability compared with government institutions. PT Pupuk Indonesia has developed modern production systems, national distribution networks, warehouse infrastructure, and operational logistics capable of supporting fertilizer supply chains effectively. The company also utilizes national-level information systems for planning fertilizer allocation and distribution (Mushi et al., 2024; Baker et al., 2024). Despite strong technical capability, business effectiveness is constrained by weak data synchronization with local government institutions. PT Pupuk Indonesia depends heavily on fertilizer demand data submitted by regional governments. However, these data are frequently inaccurate, delayed, or inconsistent with field conditions. Consequently, the company's organizational capability cannot be fully optimized. The supervisor of PT Pupuk Indonesia explained that the company already possesses strong operational systems, but governance effectiveness remains dependent on data quality from regional institutions. The lack of synchronization between national systems and local governance structures creates inefficiency within fertilizer planning and allocation mechanisms.

Fertilizer agents also play important roles as operational actors directly distributing fertilizers to farmers. The findings indicate that agents possess relatively strong relational capability because they maintain daily interactions with farmer groups. However, agents face structural limitations such as inadequate storage capacity, inconsistent supervision systems, and weak integration into governance coordination. PT Lampoko Ternak Indonesia represents another business actor providing organic fertilizer alternatives. Nevertheless, this company faces legitimacy challenges because many farmers continue preferring subsidized chemical fertilizers. Farmers often perceive organic fertilizers as less effective or incompatible with agricultural production needs. Such perceptions weaken the company's social legitimacy despite its potential contribution to sustainable agriculture. The findings illustrate that business capability alone is insufficient without collaborative integration among governance actors. Strong technical systems cannot produce effective public value if relational coordination, data integration, and participatory governance remain weak.

Citizen and Farmer Capability

Farmers represent the primary beneficiaries of subsidized fertilizer policies, yet they simultaneously occupy the most vulnerable position within governance structures. The findings indicate that many farmers possess limited administrative capability, particularly in understanding eRDKK procedures, digital registration systems, and subsidy mechanisms. Several farmers admitted difficulties in updating land ownership information and administrative documents required for fertilizer access. Limited digital literacy among farmers also contributes to governance exclusion. Farmers often depend on extension workers, farmer group leaders, or fertilizer agents to access information regarding fertilizer quotas, registration systems, and

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distribution schedules. Such dependency reflects weak participatory capability within governance processes.

Farmer groups and gapoktan institutions theoretically function as collective governance actors supporting coordination and representation. However, the findings indicate that many farmer organizations remain administratively weak and organizationally fragmented. Internal coordination among farmer groups is often inconsistent, while participation in policy formulation processes remains limited. The study also found declining trust among farmers toward government institutions. Many farmers perceive fertilizer distribution systems as unfair, politically influenced, and administratively complicated. Such conditions weaken governance legitimacy and reduce citizen engagement within collaborative governance processes.

In Bryson's framework, citizen capability is not limited to technical competence but also includes participatory and deliberative capacity. However, fertilizer governance in Maros Regency continues to position farmers more as policy objects rather than collaborative governance subjects. Consequently, relational trust and collective ownership within governance systems remain fragile.

Nonprofit and Organizational Capability

Nonprofit actors such as HKTI Youth Farmers possess potential adaptive capability, particularly in advocacy, communication, and digital engagement. The organization actively facilitates farmer aspirations, agricultural discussions, and public advocacy regarding fertilizer problems. HKTI Youth Farmers also demonstrate greater adaptability toward digital communication systems compared with traditional farmer organizations. Nevertheless, nonprofit capability remains institutionally limited because these organizations are not formally integrated into fertilizer governance systems. Their involvement frequently depends on informal coordination and ad hoc participation rather than institutionalized governance mechanisms. As a result, their potential contribution to collaborative governance remains underutilized. The findings suggest that nonprofit organizations could strengthen participatory governance and relational capability if formally integrated into multi-actor governance frameworks. Such integration could support communication transparency, farmer participation, conflict mediation, and social monitoring within fertilizer governance systems.

Fragmented Capability and Collaborative Governance

One of the most important findings of this study is that fertilizer governance in Maros Regency reflects fragmented capability rather than collaborative capability. Each actor possesses different strengths and limitations, but these capacities are not effectively integrated into collective governance systems. Government institutions possess formal authority but weak technical adaptation. Business actors possess strong logistical systems but depend on inaccurate local data. Extension workers possess social legitimacy but lack technological competence. Farmers possess experiential knowledge but limited administrative and participatory capability. Nonprofit actors possess adaptive potential but lack institutional integration.

Such fragmented capability weakens governance effectiveness because actors operate within separate institutional logics and coordination systems. Collaborative governance requires not only individual competence but also integrated relational capability capable of connecting resources, information, authority, and social trust among actors (Buuren, 2009). The findings therefore support Bryson's argument that operational capability within public governance must be understood collectively rather than individually. Public value cannot be effectively created when governance systems remain fragmented and sectorally isolated. Instead, collaborative capability, relational integration, and adaptive governance become essential foundations for effective public administration. This study also demonstrates that governance capability is deeply connected with legitimacy and public value creation. Weak capability contributes to inaccurate data systems, delayed fertilizer distribution, declining public trust, and governance

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dissatisfaction. Therefore, improving governance capability simultaneously strengthens governance legitimacy and public value outcomes.

CONCLUSION

This study concludes that the capability of multi-actors in fulfilling fertilizer needs in Maros Regency remains fragmented and unevenly distributed. Government institutions possess strong normative and formal authority but continue experiencing limitations in technical capability, digital governance, and operational coordination. Agricultural extension workers maintain strong social legitimacy and relational closeness with farmers but face serious limitations in adaptive and technological competence. Business actors such as PT Pupuk Indonesia demonstrate strong technical and logistical capability, yet their effectiveness is constrained by weak synchronization with local governance systems. Farmers and farmer organizations remain structurally vulnerable because of limited administrative capability, low digital literacy, and restricted participation within governance processes. Nonprofit organizations such as HKTI Youth Farmers demonstrate adaptive potential but lack formal institutional integration within fertilizer governance systems. Consequently, governance capability in Maros Regency reflects fragmented capability rather than collaborative capability. The findings indicate that effective fertilizer governance requires strengthening relational capability, collaborative coordination, digital integration, participatory governance, and institutional adaptation. Governance reform should not only focus on administrative procedures but also emphasize collective capability, social trust, and collaborative public value creation among actors. This study contributes theoretically to public value governance and collaborative governance literature by emphasizing relational capability and fragmented capability within local agricultural governance systems. Practically, the study provides recommendations for strengthening integrated data systems, improving digital competence among extension workers, institutionalizing collaborative coordination forums, and increasing farmer participation in fertilizer governance.

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