

Evaluation Of The Effectiveness of The Subsidized Fertilizer Distribution System In Bulukumba Regency

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ABSTRACT

The distribution of subsidized fertilizer plays an important role in supporting agricultural productivity and food security in Indonesia. This study aims to evaluate the effectiveness of subsidized fertilizer distribution among rice farmers in Jojjolo Village, Bulukumba District. Recognizing the strategic role of subsidized fertilizer in sustaining productivity and food security, the research aims to evaluate distribution performance across five accuracy indicators: type, quantity, location, price, and timing. The research employs a descriptive quantitative approach with data collection techniques including questionnaires, in-depth interviews, field observations, and administrative documentation. The sample consisted of 23 farmers actively involved in the fertilizer subsidy program. Analysis used frequency tabulation, percentage calculations for each indicator, and categorical grouping of effectiveness levels. The results showed that the distribution of subsidized fertilizer was fairly effective, with an average effectiveness score of 73.06%. Accuracy in type and location demonstrated the highest performance, at 91.3% and 87%, respectively, indicating that the RDKK-based needs planning system is functioning reasonably well. However, price accuracy (60.9%) and timing accuracy (52.2%) remain low, indicating challenges in price monitoring and distribution logistics efficiency. These gaps align with previous studies highlighting infrastructure issues, limited information technology, and weak coordination within the supply chain. This study concludes that while the distribution system demonstrates relatively good performance in some areas, improvements are still needed in logistics systems, price monitoring, and the utilization of digital technology. These findings provide important insights into agricultural input distribution in remote areas and serve as a foundation for future policy improvements.

Keywords: *subsidized fertilizer distribution, effectiveness, rice farmers, agricultural policy, remote villages*

BACKGROUND

Improving agricultural productivity in Indonesia remains a strategic national agenda in efforts to ensure food security, reduce rural poverty, and strengthen economic stability. One of the main policy interventions relied upon by the Indonesian government is the fertilizer subsidy program, particularly for staple food commodities such as rice. Several studies have extensively documented Evaluation Of The Effectiveness of The Subsidized Fertilizer Distribution System In Bulukumba Regency 147 (Mudatsir and Irwati, 2026)

the significant contributions of this policy to increased agricultural yields and farmers' incomes (Priyanto et al., 2023; Rusmayadi et al., 2024; Ashari et al., 2021). Subsidized fertilizer, especially NPK, has been proven to boost crop yields due to its essential macro-nutrient content for rice growth.

However, the effectiveness of fertilizer subsidy policies does not necessarily translate into linear and consistent productivity increases. Setiawan et al. (2021) show that despite a drastic increase in fertilizer subsidies of over 1,000% during the 2006–2015 period, agricultural productivity only increased by 14%. This disparity indicates that subsidy policies are not entirely proportional to productivity gains in the field, meaning that large subsidies do not guarantee equivalent increases in output. This suggests systemic barriers in the distribution and utilization of subsidies, including logistical inefficiencies, misdirected distribution, and weak oversight at the implementation level. In addition, local dynamics such as the institutional readiness of farmer groups, differences in farmers' managerial capabilities, and agroecological variations also influence policy success. Thus, the effectiveness of fertilizer subsidies depends on a combination of macro policy accuracy and micro-level implementation suitability. Therefore, evaluating the effectiveness of subsidies must consider the local context, the capacity of implementers, and the synergy between actors in the distribution chain to ensure that subsidies have an optimal impact on increasing farmer productivity.

One of the fundamental challenges identified in the literature is the inefficiency of the subsidized fertilizer distribution system. Adiraputra and Supyandi (2021) emphasize that price deviations, smuggling practices, and shortages at the retailer level are serious obstacles to ensuring that fertilizer arrives on time, in the right quantities, and at the set price. Other studies highlight the need for efficient use of subsidies, considering budget constraints and fiscal challenges faced by the government (Putri et al., 2023). Additionally, Warr and Yusuf (2014) demonstrate that policy intervention strategies that do not account for inter-regional imbalances can widen the distribution gap of agricultural inputs. A study by Ashari et al. (2023) reinforces these findings by highlighting the lack of data integration and institutional coordination as the main causes of distribution inefficiencies at the local level. Furthermore, according to Ali and Kumar (2022), the burden of administrative compliance and regulatory complexity contribute to slow distribution processes and low private investment interest in agricultural logistics. These findings clarify that the distribution of subsidized fertilizer is a multidimensional problem encompassing policy, managerial, and technical aspects, requiring a cross-sectoral approach and coordination among stakeholders.

Indonesia's geographical context, consisting of thousands of islands with uneven transportation and logistics infrastructure, exacerbates the complexity of fertilizer distribution, particularly in remote areas. Balogun et al. (2022) noted that limited accessibility, poor infrastructure, and high transportation costs cause delays in fertilizer delivery and price increases at the farmer level. Neto et al. (2022) add that coordination failures among actors in the supply chain, as well as suboptimal information systems, are the primary sources of inefficiency in fertilizer distribution logistics.

The role of information and communication technology (ICT) is also beginning to gain attention in improving the agricultural input distribution system. Parwez (2022) emphasizes that the integration of ICT in the fertilizer supply chain can improve transparency and efficiency of information flow, but its implementation is still hampered by limitations in digital infrastructure, especially in rural areas.

Environmental factors such as extreme rainfall, mountainous geographical conditions, and vulnerability to disasters also pose challenges in managing a reliable supply chain (Warr & Yusuf, 2014).

Complex regulatory frameworks and financial constraints exacerbate this situation. Ali and Kumar (2022) note that high compliance costs and regulatory uncertainty can act as barriers to logistics investment and distribution capacity enhancement. This reality highlights that the effectiveness of subsidies cannot be separated from strong governance and distribution management aspects. To measure the effectiveness of subsidized fertilizer distribution, the “five rights” indicator approach right type, right quantity, right place, right price, and right time has been widely adopted in evaluative studies. Rukka et al. (2021) used this approach to assess distribution effectiveness in South Sulawesi and found that RDKK-based distribution and HET monitoring provide a useful framework but still face implementation challenges. Ashari et al. (2023) in a study in Karawang integrated various data sources field, policy, and stakeholder consultations to assess the fertilizer logistics system and emphasized the importance of price affordability and supply availability.

In addition to descriptive quantitative approaches, other evaluative models such as the double-hurdle model (Ricker-Gilbert et al., 2011) and the DEA model (Lazíková et al., 2019) offer methodological insights into understanding the factors influencing fertilizer use and production efficiency. The double-hurdle model allows for the separation between the decision to use fertilizer and the quantity used, which is particularly useful in understanding economic constraints and farmers' behavior in accessing subsidies. On the other hand, DEA provides an objective, non-parametric approach to measuring relative efficiency among farmers in converting fertilizer inputs into crop output. Macro approaches such as the multisectoral general equilibrium model used by Warr and Yusuf (2014) link fertilizer subsidies to national economic dynamics, including their impact on market prices and inter-sectoral economic balances. However, a microspatial approach remains necessary to assess effectiveness from a more contextual local perspective, as aggregate policies often fail to capture local variations in accessibility, distribution capacity, and farmer responses. In this context, a deep understanding of the local context, as emphasized by Ashari et al. (2023), is key to designing more inclusive and efficient distribution strategies.

Amid these challenges and complexities, this study aims to evaluate the effectiveness of subsidized fertilizer distribution for rice farmers in Jojjolo Village, Bulukumpa Sub-district, Bulukumpa District. This area was selected because it represents distribution challenges in remote areas with unique geographical and socio-economic characteristics. This study uses an evaluative approach based on five appropriate indicators to identify the successes and constraints of the distribution system in the field. Thus, this study is expected to provide empirical and practical contributions to efforts to improve subsidized fertilizer distribution policies.

The novelty of this study lies in the micro context explored quantitatively, as well as the integration of technical, institutional, and farmer perceptions of distribution effectiveness. This study also reinforces the importance of synergy between fertilizer needs planning, farmer data collection in the e-RDKK system, distribution chain monitoring, and the role of local institutions such as farmer

groups and extension workers. By providing data-driven evidence from the village level, this research adds a sharper evaluative perspective on the effectiveness of fertilizer subsidy policies in Indonesia.

RESEARCH METHODS

This study uses a descriptive quantitative approach that aims to evaluate the effectiveness of subsidized fertilizer distribution to rice farmers based on five main indicators, namely the right type, right amount, the right place, the right price, and the right time. This approach enables researchers to measure and describe the performance of fertilizer distribution in the field and identify the obstacles faced by farmers in obtaining subsidized fertilizer. This method is consistent with the approach used in similar studies by Rukka et al. (2021) and Ashari et al. (2023), which emphasize indicator-based evaluation and the integration of field data.

The research location was selected purposively, namely in Jojjolo Village, Bulukumpa Sub-district, Bulukumba District. The selection of this location was based on the village's characteristics, which reflect common challenges in the distribution of subsidized fertilizer in remote areas, including limited accessibility, dependence on local retailers, and low penetration of information technology.

This village is also a local rice production center, making it a relevant context for studying the effectiveness of fertilizer distribution. The population in this study was all rice farmers who were members of farmer groups in Jojjolo Village.

Sampling was conducted purposively, considering criteria such as active involvement in the fertilizer subsidy program and at least two years of experience in rice cultivation practices. A total of 23 farmers were selected as respondents. Although limited, this sample size was considered sufficient to describe distribution phenomena in a micro-community context, as emphasized by Ashari et al. (2023) in their community-based study.

Data collection was conducted using several techniques, including structured questionnaires, in-depth interviews, field observations, and administrative documentation related to subsidized fertilizer distribution. Questionnaires were used to obtain quantitative data on farmers' experiences in accessing subsidized fertilizer, while in-depth interviews were conducted to explore subjective perceptions and challenges not captured by the questionnaires. Observations were used to verify the physical conditions of distribution in the field, such as the presence of official retailers and accessibility of locations. Documentary data were obtained from farmer groups, retailers, and local agricultural offices, covering data on fertilizer allocation and distribution realization.

The research instruments were developed systematically with reference to five main indicators of fertilizer distribution effectiveness established by the Ministry of Agriculture, namely: (1) Appropriate Type is defined as measuring the suitability of the type of fertilizer received (urea, NPK, SP 36, ZA) and proposed in the RDKK and recommended for rice fertilization. For each farmer, the type of fertilizer proposed in the RDKK is compared with the type of fertilizer exchanged based on the receipt and respondent confirmation; (2) Appropriate Quantity indicates the suitability between the kilograms or sacks of fertilizer exchanged with the RDKK quota and the agronomic requirements per area of land. For each type of fertilizer and farmer, the accuracy ratio is calculated as the realized

quantity divided by the RDKK quota; (3) Accurate Location refers to the suitability of the exchange point with the nearest official retailer and logistical accessibility. Validation depends on the list of official retailers, proof of exchange, and GPS coordinates of the phone recorded during observation. The distance from the farmer's residence or land to the retailer and the associated travel time are measured; (4) Price Accuracy evaluates whether the price paid by farmers is in line with the applicable Maximum Retail Price (HET). The official MRP value per type is obtained from the latest decision, while the actual price is taken from the receipt. (5) Timeliness assesses the alignment between fertilizer availability or redemption and the planting calendar and fertilization stages (basic, first fertilization, second fertilization). Planned planting dates and fertilization schedules are obtained from interviews and group records, while actual availability or redemption dates are obtained from retailer records and questionnaires. For each stage, delays (in days) are calculated by subtracting the planned requirement date from the actual date. assesses the timeliness of distribution in relation to the planting season schedule. These five indicators serve as the foundational framework for developing closed-ended and semi-open questionnaire items, as well as guidelines for in-depth interviews. The questionnaire includes a Likert scale and factual questions, while the interview guidelines are designed to explore farmers' experiences, perceptions, and constraints related to fertilizer distribution. The instruments were developed taking into account content validity and readability to ensure that respondents understood the meaning of each item.

Data analysis followed a descriptive quantitative approach using frequency tabulation and percentage calculations to summarize the level of achievement of fertilizer distribution effectiveness. Questionnaire responses were coded and cleaned prior to analysis to identify response patterns and dispersion within each indicator. The composite percentage score for each indicator was then classified into five categories: highly effective (81–100%), effective (61–80%), moderately effective (41–60%), less effective (21–40%), and ineffective (0–20%). The choice of cut-points is justified on two grounds. First, the bands are anchored to an evaluative scale widely used in agricultural program assessments (Adiraputra and Supyandi, 2021), which treats 80% as a practical performance benchmark indicating that most implementation elements are met. Second, the thresholds were contextually calibrated through preliminary testing in the study area: pilot scoring with farmers and retailers showed natural clustering of indicator scores around the 20-point intervals, and local stakeholders recognized $\geq 80\%$ as the minimum acceptable service level given the cropping calendar and price ceiling rules. To assess robustness, a sensitivity check using alternative cut-points (± 5 percentage points around the 20-point boundaries) produced the same ranking of indicators and no change in village-level conclusions, supporting the stability of the chosen classification for this research context.

In addition to descriptive analysis, the tabulated results were also linked to qualitative findings from in-depth interviews and field observations to strengthen data interpretation. This approach allowed for triangulation between quantitative and qualitative data to produce a more holistic understanding of distribution effectiveness. Data processing was carried out using simple statistical software such as Microsoft Excel and basic SPSS, which were used to calculate average values,

frequency distributions, and compile illustrative graphs to support the analysis. This step was taken to ensure the transparency, accuracy, and reliability of the research results.

Data validity is maintained through triangulation of methods, namely by comparing questionnaire results with interviews, observations, and documentary data. In addition, data credibility is strengthened through cross-verification with farmer group leaders and agricultural extension officers in the area. This validation is important to ensure that the evaluation results are not only statistical but also reflect the factual reality in the field.

With this methodological design, the research is expected to provide an accurate, objective, and comprehensive picture of the effectiveness of subsidized fertilizer distribution in the study area and identify evidence-based policy recommendations tailored to local needs.

RESULT AND DISCUSSION

This section presents the main findings of the study on the effectiveness of subsidized fertilizer distribution based on five indicators, including the right type, right amount, right place, right price, and right time. Data were obtained through questionnaires, interviews, observations, and documentation, and analyzed quantitatively and descriptively. The findings are presented based on each indicator with an analytical discussion of each result.

Right Type

The analysis shows that the majority of respondents (91.3%) stated that the type of fertilizer received was in accordance with what was proposed in the Definitive Group Needs Plan (RDKK), especially NPK and urea. This finding indicates that the allocation of fertilizer types was in line with farmers' needs. This success reflects relatively orderly administrative implementation in the fertilizer needs planning process. This is in line with the findings of Rukka et al. (2021) and Ashari et al. (2023), who found that RDKK-based distribution systems tend to be more effective in ensuring the accuracy of fertilizer types.

Furthermore, the success in this aspect also indicates the existence of effective coordination mechanisms between farmer groups, distributors, and local agricultural agencies in identifying and determining the actual fertilizer needs of farmers. The suitability of fertilizer types to the specific needs of crops such as rice is crucial because each nutrient element in NPK and Urea fertilizers plays a different role in supporting plant growth. As explained by Priyanto et al. (2023), the selection of the right fertilizer can significantly increase nutrient uptake efficiency by plants, which ultimately impacts crop yields.

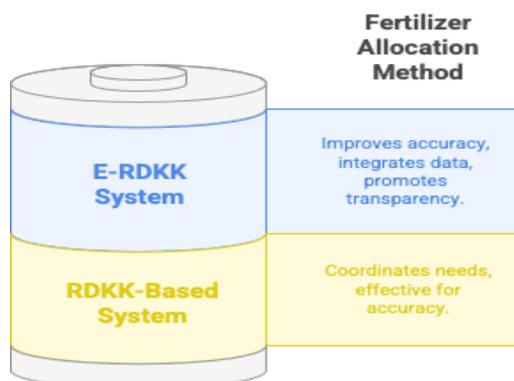


Figure1. Fertilizer allocation methods

In addition, the digitalization mechanism through the e-RDKK system has also begun to play a role in improving the accuracy of fertilizer types requested by farmers. This digitalization enables better data integration and stricter monitoring, as revealed by Ashari et al. (2023), indicating that the application of information technology in fertilizer requirement planning systems can minimize input errors and promote transparency in allocation. Thus, these findings underscore the importance of strengthening institutional capacity and technology application in fertilizer requirement planning systems to ensure the accuracy of agricultural inputs.

Appropriate Quantity

73.9% of respondents stated that the amount of fertilizer received was in line with the allocated amount. The remainder reported receiving less than the specified amount, attributed to distribution restrictions by retailers and delays in restocking. This discrepancy in quantity indicates disruptions in the logistics process or uneven distribution at the farmer group level. As noted by Adiraputra and Supyandi (2021), disproportionate quota distribution often occurs due to discrepancies between data on needs and actual implementation.

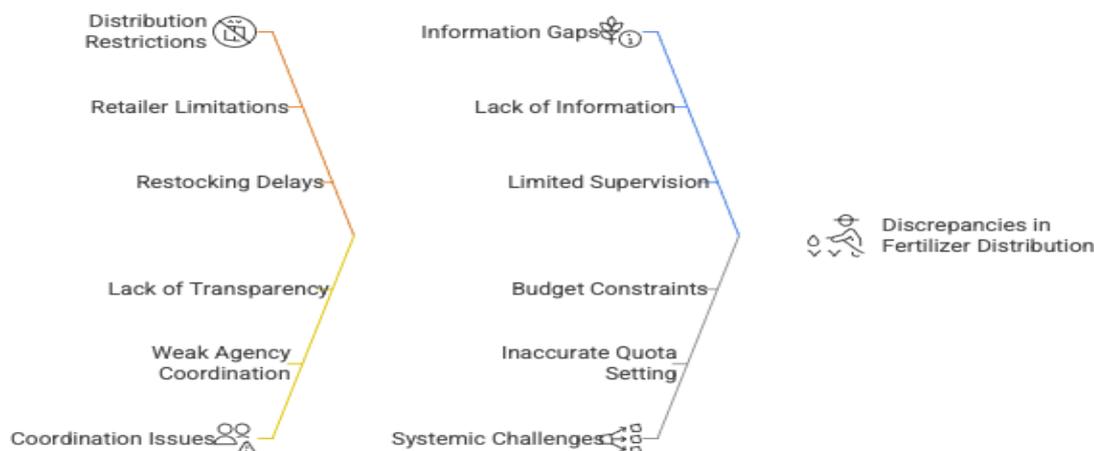


Figure 2. Analyzing Fertilizer Distribution Discrepancies

Inaccuracies in the amount of fertilizer received also indicate weak coordination between distribution agencies, distributors, and retailers. Some farmers stated that they did not know exactly how much fertilizer they should receive, indicating a lack of information or transparency in the allocation system. This condition is exacerbated by the limited supervision of the local agricultural office in verifying the amount of fertilizer distributed in the field. These results are in line with the findings of Ashari et al. (2023), who noted that in some areas, discrepancies in fertilizer quotas often stem from an allocation system that is unresponsive to changes in farmers' actual needs due to weather or market dynamics. Additionally, Putri et al. (2023) emphasized that budget constraints for subsidies and fluctuations in supply at the national level often lead distributors to rationalize the amount of fertilizer sent to regions.

The implications of these findings indicate the need for improved accuracy in quota setting through better data integration between the central and regional governments, as well as transparency in communicating quota information to farmers. The development of a digital monitoring system based on e-RDKK could be a relevant solution to improve distribution accuracy and strengthen oversight of the actual amount of fertilizer distributed in the field.

Right Place

Most respondents (87%) obtained fertilizer from official retailers appointed by the government. However, some farmers were forced to obtain fertilizer from more distant locations because retailers in their areas did not have stock. This indicates that although the institutional structure is in place, the availability of supplies at the local level is not yet fully guaranteed. In line with the findings of Neto et al. (2022), limited coordination between distributors in the supply chain remains an obstacle to the effectiveness of distribution in remote locations.

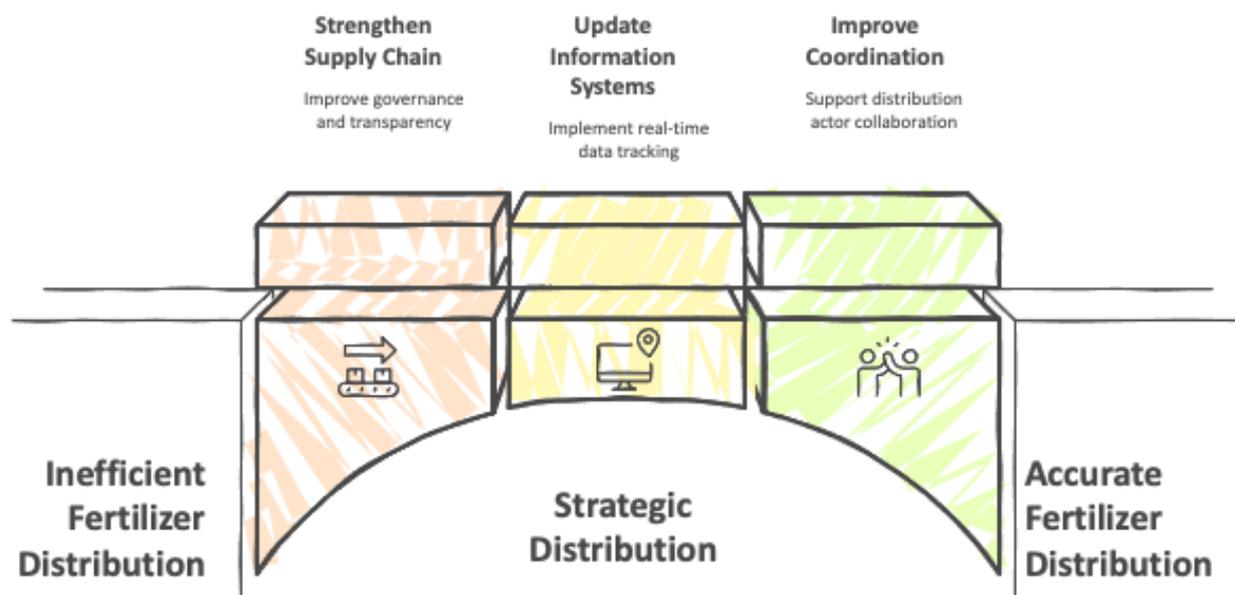


Figure 3. Improving Fertilizer Distribution for Farmers

The inaccuracy of fertilizer collection locations is also closely related to the suboptimal efficiency of the distribution network. Some official retailers experience obstacles in obtaining supplies on time from distributors, which affects the frequency of stock availability. This can also create a situation where farmers depend on retailers outside their administrative area, thereby increasing transportation costs and excessive travel time. As stated by Balogun et al. (2022), physical access to agricultural inputs in remote areas often depends on road infrastructure conditions and the availability of adequate transportation modes.

Furthermore, sourcing fertilizers from outside the region poses the risk of unregulated informal distribution, which can open opportunities for price manipulation or allocation diversion. Parwez (2022) notes that in situations where distribution systems lack transparency and accountability, distribution oversight becomes very weak, especially in areas far from administrative control centers. Therefore, strategic placement of retailers and logistics distribution based on real-time data are essential. Thus, although most farmers obtain fertilizers from official sources, accurate distribution has not been fully achieved. Strengthening supply chain governance, updating distribution information systems, and providing institutional support to improve coordination among distribution actors are needed to ensure the availability of fertilizers that are evenly distributed and accurately targeted.

Accurate Pricing

Only 60.9% of respondents stated that they purchased fertilizer at prices in line with the HET. The remainder reported that prices exceeded the HET set by the government. Causal factors include additional distribution costs from retailers, local stock shortages that prompt farmers to purchase from outside their regions, and mark-ups by third parties without official authority in the distribution of subsidized fertilizer. These findings indicate that price control in the field is not yet optimal, as emphasized by Adiraputra and Supyandi (2021). This price distortion harms farmers and weakens equitable access to production inputs.

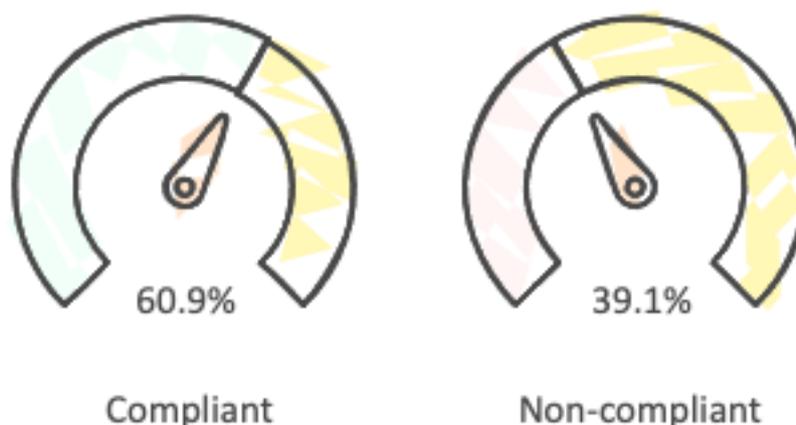


Figure 4. Fertilizer Purchase Prices Compliance with HET

Furthermore, limited supervision of fertilizer selling prices at the retailer level is one of the main causes of price discrepancies. Many farmers are unaware of the exact HET rates, which allows retailers to set prices above the stipulated rates under the pretext of additional distribution costs. A study by Putri et al. (2023) also shows that weak price monitoring and limited dissemination of HET policies lead to significant price variations across regions. Additionally, the presence of third parties or middlemen involved in fertilizer distribution further increases the likelihood of middleman practices and price manipulation. Middlemen often take advantage of scarcity conditions and low oversight capacity at the village level, as observed in the study by Ashari et al. (2021) on price discrepancies in several regions of West Java. This situation leads to unfair distribution and reduces the overall effectiveness of the subsidy policy.

A more integrated price control system is needed, involving village officials, farmer groups, and field extension officers to conduct regular monitoring. Additionally, the use of information technology, such as digital reporting of actual prices through a public monitoring dashboard, can be a strategic step to enhance price transparency and prevent manipulation by irresponsible parties.

Timeliness

The timeliness indicator recorded the lowest results. Only 52.2% of respondents stated that fertilizers were available according to the planting season schedule. Many respondents experienced delays that resulted in inaccurate fertilizer application and reduced productivity. This indicates weaknesses in the logistics system and distribution planning that are not responsive to the dynamics of the planting season. This condition is consistent with the findings of Balogun et al. (2022), which emphasized that transportation infrastructure limitations in remote areas are the main cause of delays in agricultural inputs.

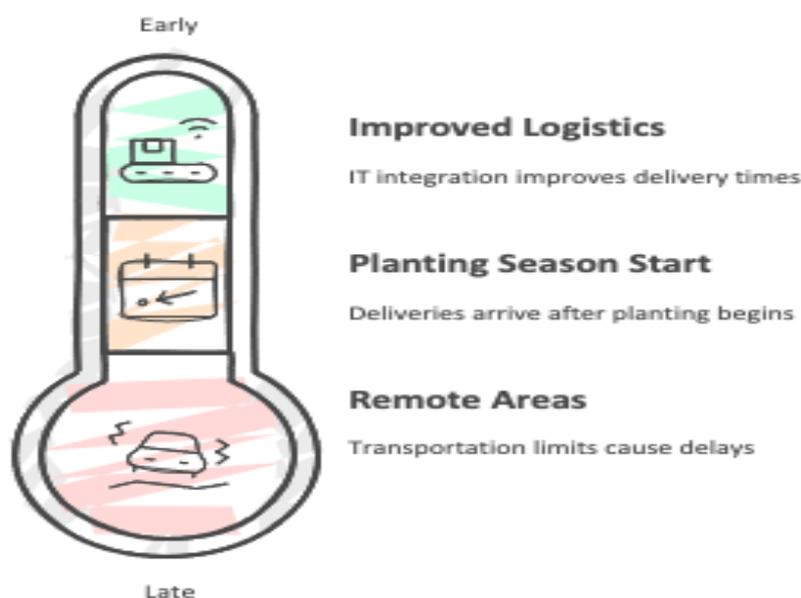


Figure 5. Fertilizer delivery timeliness ranges from late to early

Inaccurate timing also reflects weak integration between farmers' planting schedules and fertilizer distribution cycles from the center to the regions. Some farmers reported that fertilizer deliveries often arrived after the planting season had begun, significantly reducing the effectiveness of fertilizer application. In this context, early warning systems or digital monitoring are essential to align fertilizer distribution with local planting calendars. As noted by Parwez (2022), integrating information technology into agricultural logistics systems can significantly improve the timeliness of input deliveries.

Additionally, geographical challenges such as rugged terrain and long distances further prolong distribution times. Neto et al. (2022) noted that the lack of connectivity between central distribution points and end-user areas often constitutes the primary obstacle to timely input delivery. This is exacerbated by the scarcity of local transportation fleets and inadequate temporary storage facilities, which could serve as distribution buffers.

Therefore, there is a need to improve integrated logistics systems based on region and weather, as well as provide buffer stocks at the village or sub-district level. Institutional interventions are also important to ensure that retailers and distributors have a uniform understanding of the urgency of timely fertilizer distribution. Closer training and coordination between field implementers and higher-level planners would greatly help in creating a distribution system that is adaptive and responsive to the real needs of farmers.

Overall Effectiveness

Based on the average calculation of five indicators, the effectiveness of subsidized fertilizer distribution in Jojjolo Village is classified as “moderately effective” with a score of 73.06%. The assessment was conducted based on five main aspects, namely correct type, correct quantity, correct location, correct price, and correct timing. The following table presents the scores for each indicator.

Table 1. indicators of the effectiveness of subsidized fertilizer in Bulukumba District

Indicator	Percentage Score (%)
Correct Type	91,3%
Correct Quantity	73,9%
Correct Location	87,0%
Correct Price	60,9%
Correct Timing	52,2%
Average	73,06%

The highest scores were found in the right type (91.3%) and right place (87%) indicators, indicating that most farmers received the right type of fertilizer for their needs and were able to obtain it from relatively nearby official locations. Conversely, the lowest score was found in the right time indicator (52.2%), indicating that many farmers did not receive fertilizer according to the planting season schedule. This assessment provides a comprehensive overview of fertilizer distribution

performance based on efficiency and accessibility parameters measured from the perspective of farmers as end users.

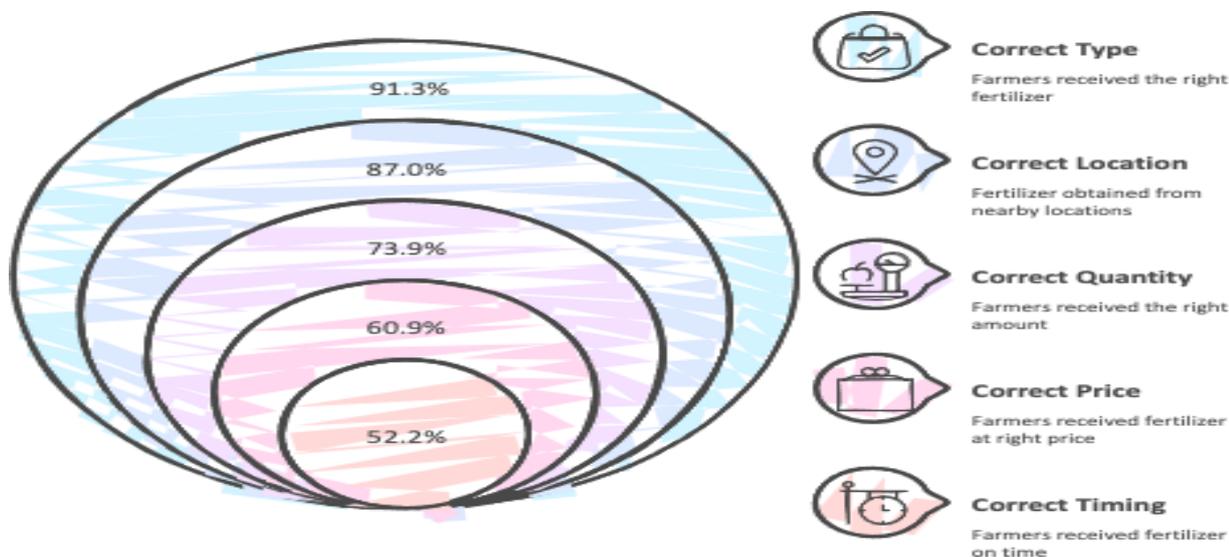


Figure 6. Subsidized Fertilizer Distribution Effectiveness

Overall, the discussion shows that the fertilizer distribution system in Jojjolo Village has been running quite well in terms of needs planning (RDKK) and the availability of retailers, but still faces challenges in terms of price and distribution timeliness. Untimely and inappropriate distribution indicates gaps in the implementation of subsidy policies in the field, which can reduce the positive impact of subsidies on farmer productivity, as revealed by Priyanto et al. (2023) and Rusmayadi et al. (2024). Inaccurate pricing and timing not only affect the effectiveness of fertilizer distribution but also influence farmers' perceptions of the fairness of the subsidy system. Delayed fertilizer delivery leads to reduced crop yields, and prices that do not align with the HET force farmers to incur additional costs. This has the potential to exacerbate economic disparities among farmers, particularly those with limited working capital.

The causes of inefficiency identified in this study align with various logistical challenges highlighted in the literature, such as inadequate transportation infrastructure, insufficient integration of technology in the distribution system (Parwez, 2022), and weak oversight of the supply chain (Neto et al., 2022). In addition, the limited institutional capacity of farmer groups in monitoring and reporting distribution further exacerbates this condition. The absence of real-time data in fertilizer monitoring, as well as information gaps between the central and village levels, creates distribution inconsistencies that can lead to supply buildup or shortages.

The implications of these findings indicate the need to strengthen price monitoring systems, improve local logistics capacity, and involve information technology such as the e-RDKK system and real-time distribution dashboards. Efforts to improve the capacity of retailers and farmer groups are also needed to create a fair and responsive distribution system. Training for distribution actors and field facilitators will support the adaptation process to digital systems and encourage higher accountability. Institutional support from local governments and transparency in budget allocation are also crucial elements for improving fertilizer distribution effectiveness.

To strengthen the empirical basis of policies, it is recommended that the scope of the study be expanded to areas with different geographical and socioeconomic characteristics, and that mixed methods involving more in-depth quantitative and qualitative analysis be used. For example, in-depth interviews and case studies of different farmer groups can uncover contextual factors that are not captured by quantitative surveys. This is important given the complexity of distribution challenges in remote areas, which are highly influenced by local contexts.

Thus, although the effectiveness of subsidized fertilizer distribution in the study locations has not yet reached an optimal level, this study provides an important empirical basis for policy evaluation and improvement of fertilizer distribution systems in rural Indonesia. This research also contributes to the literature on agricultural distribution policy by emphasizing the importance of accuracy in the five aspects of distribution and the integration of data, technology, and coordination between institutions as the foundation for effective and sustainable distribution.

CONCLUSION AND SUGGESTION

This study evaluates the effectiveness of subsidized fertilizer distribution in Jojjolo Village, Bulukumba District, using a descriptive quantitative approach based on five main indicators: right type, right amount, right place, right price, and right time. The findings show that the effectiveness of distribution is quite effective with an average score of 73.06%. The indicators of right type and right place showed the best performance, at 91.3% and 87%, respectively, while the indicators of right time and right price recorded the weakest performance, at 52.2% and 60.9%. The gaps between these indicators provide a strong signal of logistical constraints and price distortions in the field that require more focused and adaptive policy attention and intervention.

Overall, the distribution system demonstrated success in terms of needs planning, which was carried out through the Definitive Group Needs Plan (RDKK). Digitalization through the e-RDKK system and the involvement of farmer groups have proven effective in supporting the accuracy of distribution types and locations. However, the effectiveness of implementation still faces significant structural constraints, including price discrepancies due to weak oversight at the retail level and distribution delays that disrupt synchronization with the planting season. These findings are consistent with literature highlighting logistical challenges, limited infrastructure, and institutional capacity gaps between the central and local levels.

Inaccurate prices and distribution timing not only affect agricultural efficiency but also farmers' perceptions of the fairness of public policies. Farmers who experience delays in delivery or prices above the HET are at risk of economic losses and loss of trust in the subsidy policy itself. In the long term, this can lead to a decline in farmer participation in subsidy programs and widen the gap between regions. The policy implications of this study point to the importance of improving local institutional capacity, integrating technology-based monitoring systems, and strengthening price and distribution supervision. In addition, periodic evaluations based on quantitative indicators need to be implemented nationally to provide a more accurate and comprehensive map of distribution effectiveness. With such

a map, policy interventions can be designed to be more contextual and adaptive to the specific challenges in each region.

The main contribution of this study is the provision of empirical evidence from a rural micro-context, which enriches academic discourse and public policy on subsidized fertilizer distribution in Indonesia. This study emphasizes the importance of an indicator-based approach as a useful diagnostic tool for assessing policy implementation at the grassroots level. Thus, the results of this study are not only relevant to the study area but can also be replicated in other areas with similar characteristics. Additionally, the findings of this study highlight the need for a cross-sectoral approach in fertilizer distribution management, including coordination between agricultural agencies, local governments, agricultural extension officers, and farmer groups. Institutional innovations and the utilization of real-time agricultural logistics information systems are crucial to addressing distribution accuracy challenges.

For future development, similar studies need to be expanded geographically to include areas with different social and ecological conditions. A mixed-method approach combining quantitative and qualitative data can also be used to explore non-technical factors such as actor behavior, local distribution culture, and power dynamics that influence the distribution of subsidized fertilizer. Research with a longitudinal dimension is also important to observe trends in distribution effectiveness over time. In conclusion, the effectiveness of subsidized fertilizer distribution is not only determined by budget availability or the existence of programs, but also by the synergy between needs planning, logistics systems, price monitoring, and the involvement of local institutions.

This study emphasizes that improving distribution effectiveness must be accompanied by institutional reform and system digitization to create a fair, efficient, and sustainable fertilizer distribution system in rural Indonesia. As a suggestion, the researchers recommend that local governments strengthen price monitoring systems through the direct involvement of village officials and farmer groups in the process of reporting actual prices in the field. Additionally, the establishment of district-level fertilizer distribution centers with independent buffer stocks can help address delays. Intensive outreach on farmers' rights and obligations under the subsidy program, along with training on digital application use for extension workers and distributors, are also crucial for enhancing overall distribution effectiveness.

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