

THE EFFECTS OF MARKET ACCESS AND LOGISTICS EFFICIENCY ON THE COMPETITIVENESS OF SALT FARMERS IN JENEPONTO REGENCY

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Abstract

Salt farming supports local livelihoods in Jeneponto Regency, yet farmers' competitiveness remains constrained by limited buyer options, price-information gaps, high distribution costs, inadequate storage facilities, and fragmented product flows. This study examines the effects of market access and logistics efficiency on the competitiveness of salt farmers. A quantitative explanatory survey was conducted with 100 active salt farmers. The three constructs were measured using a five-point Likert-scale questionnaire and analyzed through multiple linear regression. Market access had a positive and statistically significant effect on competitiveness ($p < 0.05$), indicating that broader buyer networks, timely price information, alternative marketing channels, and stronger negotiating opportunities improve farmers' ability to reach markets and sustain sales. Logistics efficiency also had a positive and significant effect ($p < 0.05$); reliable transportation, lower distribution costs, appropriate storage, proper handling, and shorter delivery times help preserve quality and reduce avoidable losses. The simultaneous test confirmed that both variables jointly affected competitiveness ($p < 0.05$). These findings indicate that increasing production alone is insufficient when farmers cannot reach profitable markets through efficient product flows. Collective marketing, transparent market information, shared storage, coordinated transportation, and direct relationships with processing industries are therefore essential for strengthening farmers' bargaining power and market performance.

Keywords: Market Access; Competitiveness; Logistics Efficiency; Salt Farmers; Supply Chain

1. INTRODUCTION

Salt is a strategic commodity used in household consumption, food processing, pharmaceuticals, chemicals, and various other industrial activities. However, the competitiveness of domestically produced salt in Indonesia is determined by more than

production volume. Variations in quality, seasonal production, fragmented marketing systems, and dependence on intermediaries affect the ability of small-scale producers to enter stable and profitable markets. Haendra et al. (2021) found that the national salt industry did not demonstrate comparative competitiveness during the period they examined, suggesting that higher production must be accompanied by stronger marketing and institutional strategies. This issue is particularly important for local producers because competitive pressure is reflected in prices, quality standards, supply continuity, and delivery reliability. Assessing the competitiveness of salt farmers must therefore extend beyond farm-level production efficiency to include the conditions that determine the movement of salt from ponds to buyers.

Jeneponto Regency is one of the salt-producing areas in South Sulawesi. It has approximately 104 km of coastline, and four subdistricts—Bangkala, West Bangkala, Arungkeke, and Tamalatea—serve as salt-production centers covering 828.6 hectares and involving 331 farmers. Salt production in 2024 exceeded 28,000 tons, a sharp decline from more than 83,000 tons in 2023. Salt farmers in Jeneponto generally operate on a limited scale and sell their output immediately after harvest because working-capital needs and inadequate storage reduce their ability to postpone sales. These conditions can place farmers in the position of price takers, particularly when access to price information is limited and marketing channels are dominated by intermediaries. As a result, farmers may receive unfavorable prices and face difficulties meeting the volume, continuity, and quality requirements of large-scale buyers (Maflahah et al., 2024). Improving competitiveness therefore requires a marketing system that provides reliable price and demand information, broadens channel and buyer options, maintains consistent quality, consolidates production volumes through groups or cooperatives, and coordinates transportation to reduce transaction and logistics costs (Negi et al., 2018; Abraham et al., 2022; Maflahah et al., 2024).

Market access refers to producers' practical ability to reach buyers and participate in transactions under terms that allow them to retain an adequate share of product value. It encompasses physical access to trading locations, information on prices and quality requirements, the availability of alternative marketing channels, relationships with buyers, and bargaining capacity. Transaction-cost theory explains that market participation is never entirely cost-free: farmers must search for information, compare offers, negotiate, coordinate deliveries, and ensure that agreements are fulfilled. These costs may impede participation or tie producers to a limited group of intermediaries (Key et al., 2000). Barrett (2008) likewise emphasizes that smallholder market participation depends on assets, institutions, and transaction conditions, while Fafchamps and Hill (2005) show that the decision to sell at the farm gate or transport products to market is shaped by the expected costs and benefits of reaching buyers.

For salt farmers, weak market access is reflected in dependence on collectors or intermediaries, limited information on market prices, difficulty selling salt directly to processing industries, and a limited ability to classify products according to standards or quality grades. These conditions weaken farmers' bargaining position because intermediaries tend to exert greater influence over the price and quality of traded salt (Dillah & Suprpti, 2023; Maflahah et al., 2024; Kusairi & Prasetyo, 2025). Kusairi and Prasetyo (2025) demonstrate that information asymmetry, negotiation costs, and institutional

constraints can prevent small-scale salt farmers from accessing processing companies directly, thereby reinforcing their dependence on intermediaries. Under such conditions, even technically efficient producers may remain uncompetitive because they cannot convert production into better commercial returns. Conversely, broader market access can increase the number of potential buyers, improve price discovery, strengthen bargaining power, and encourage compliance with quality and volume requirements. Market access is therefore expected to improve competitiveness by sustaining sales, reducing vulnerability to monopsonistic relationships, and enhancing farmers' ability to respond to demand.

Logistics efficiency is the second mechanism linking production to competitiveness. Logistics coordinates transportation, handling, storage, inventory, information, and delivery so that products reach buyers in the required condition, place, and time. Christopher (2016) argues that logistics performance creates value through availability, reliability, speed, and cost control, while Mentzer et al. (2001) position logistics coordination as an integral component of supply-chain performance. These principles are highly relevant to salt because poor handling and inadequate storage can expose the product to moisture, contamination, weight loss, and inconsistent quality. Long waiting times, repeated loading, small shipment sizes, and unreliable transportation also increase distribution costs. When these inefficiencies are passed on to farmers through lower farm-gate prices, competitiveness declines even when farm-level output is adequate.

The preceding analysis underscores the importance of logistics at the local level. Hiola et al. (2026) identified a long, fragmented, and poorly integrated small-scale salt chain in Arungkeke, characterized by limited storage facilities, inadequate postharvest procedures, and strong dependence on collectors. Their process-flow analysis showed that logistics bottlenecks reduce quality, delay distribution, and weaken farmers' bargaining power. Viewed through global value-chain theory, this pattern resembles a chain governed by dominant buyers or intermediaries that control critical information and market relationships (Gereffi et al., 2005). The implication is that logistics cannot be treated as a neutral activity occurring only after production. It determines who controls product flows, who bears risks and costs, and how much value remains with producers.

In this study, competitiveness is understood as farmers' ability to offer salt with market-acceptable quality, price, delivery reliability, sales continuity, and bargaining strength. This interpretation extends Porter's (1985) logic of cost and differentiation to the smallholder context: farmers become more competitive when they can control avoidable costs while meeting market requirements more consistently than under fragmented individual arrangements. Market access and logistics efficiency are analytically distinct but mutually reinforcing. Access to higher-value buyers is difficult to sustain without reliable delivery and quality protection, while efficient logistics provides only limited benefits when farmers remain confined to narrow marketing channels. An integrated model is therefore needed to explain how commercial connectivity and product-flow performance jointly shape farmers' competitiveness.

Although previous studies have examined national salt competitiveness, transaction costs, marketing institutions, and logistics constraints, quantitative evidence linking market access and logistics efficiency to the competitiveness of salt farmers in Jeneponto remains limited. This study addresses that gap by testing the effects of both factors using survey data

from 100 salt farmers. Three hypotheses are examined: market access has a positive effect on competitiveness; logistics efficiency has a positive effect on competitiveness; and both factors jointly affect competitiveness. The study focuses on farmers' perceptions and market experiences rather than the technical efficiency of salt production. Its contribution lies in combining market-participation theory and logistics performance within a single empirical framework suited to small-scale salt enterprises, thereby providing evidence for policies that integrate market information, institutional strengthening, storage, transportation coordination, and buyer relationships.

2. RESEARCH METHOD

2.1 Research Design and Study Area

This study employed a quantitative explanatory design to examine the relationships among market access, logistics efficiency, and the competitiveness of salt farmers. A cross-sectional survey was selected because the study aimed to compare farmers' perceptions and commercial experiences at a single point in the production and marketing cycle. The unit of analysis was the individual salt farmer operating in Jeneponto Regency. The study area was selected because Jeneponto is one of the principal centers of small-scale salt production in South Sulawesi.

The analytical framework specified market access and logistics efficiency as the independent variables and farmer competitiveness as the dependent variable. The research design did not define competitiveness solely in terms of production volume. Instead, competitiveness was assessed through farmers' ability to maintain product quality, control market-related costs, secure buyers, sustain sales, and negotiate from a stronger position. This approach is consistent with the view that smallholder competitiveness emerges from the interaction between internal production capacity and external market coordination.

2.2 Population, Sample, and Data Collection

The study involved 100 salt farmers as respondents. Respondents were purposively selected from active salt-producing communities in Jeneponto Regency based on the following criteria: direct involvement in salt production, experience selling salt during the relevant production cycle, and knowledge of the marketing and distribution processes for their output. These criteria ensured that responses reflected direct experience with buyers, price information, transportation, handling, storage, and delivery. The sample size provided sufficient observations to estimate a multiple regression model with two predictors and to identify the direction and statistical significance of the proposed relationships.

Primary data were collected using a structured questionnaire. Each statement was rated on a five-point Likert scale ranging from strongly disagree to strongly agree. The questionnaire was organized around three constructs and used operational language that farmers could readily understand. The instrument emphasized observable conditions, including the number of accessible buyers, the speed of obtaining price information, transportation availability, delivery timeliness, storage adequacy, quality consistency, and bargaining capacity. Before regression analysis, responses were checked for completeness and coded so that higher scores consistently represented better market access, greater logistics efficiency, and stronger competitiveness.

2.3 Variable Measurement

Market access was measured through access to alternative buyers, price and demand information, market reach, direct-selling opportunities, and bargaining capacity. These indicators reflect the transaction-cost and market-participation literature, which links information, distance, channel options, and institutional arrangements to farmers' ability to participate in markets (Key et al., 2000; Barrett, 2008; Fafchamps & Hill, 2005). Logistics efficiency was measured through transportation reliability, distribution-cost control, storage adequacy, handling quality, and delivery timeliness, drawing on the logistics and supply-chain principles discussed by Mentzer et al. (2001) and Christopher (2016). Competitiveness was measured through cost efficiency, product-quality consistency, price competitiveness, sales continuity, and bargaining position. After instrument assessment, these indicators were aggregated into composite scores.

Table 1. Operationalization of Research Variables

Variable	Operational definition	Indicators
Market access	Farmers' practical ability to reach and transact with buyers that offer adequate returns.	Alternative buyers; price and demand information; market reach; direct-selling opportunities; bargaining capacity.
Logistics efficiency	The ability to move, handle, store, and deliver salt while minimizing avoidable costs and delays.	Transportation reliability; distribution-cost control; storage adequacy; handling quality; delivery timeliness.
Competitiveness	Farmers' ability to sustain sales and meet market requirements while retaining the economic value of their product.	Cost efficiency; quality consistency; price competitiveness; sales continuity; bargaining position.

Source: Key et al. (2000), Barrett (2008), Mentzer et al. (2001), Christopher (2016), and Haendra et al. (2021).

Data Processed, 2026

2.4 Data Analysis

Data analysis combined descriptive assessment with multiple linear regression. Descriptive analysis was used to examine response patterns for each construct and identify the commercial conditions represented in the sample. Instrument quality was assessed through item-validity testing and internal-consistency procedures before composite variables were formed. Regression analysis estimated the separate effects of market access and logistics efficiency on competitiveness and evaluated their joint effect. The model was specified as follows: Competitiveness (Y) = α + β_1 (Market Access) + β_2 (Logistics Efficiency) + ϵ .

The partial test (t-test) was used to determine whether each regression coefficient individually differed significantly from zero, whereas the simultaneous test (F-test) was used

to assess the joint significance of all predictor variables in explaining the dependent variable. Statistical decisions were made at the 5% significance level ($\alpha = 0.05$). An effect was considered statistically significant when the probability value (*p-value*) was below 0.05.

3. RESULTS AND DISCUSSION

Overview of the Analysis and Farmers' Market Conditions

The analysis involved 100 salt-farmer respondents. The survey captured experiences at the interface between salt production and commercialization, including access to price information, buyer options, transportation, storage, handling, and delivery. This focus is important because the competitiveness of small-scale salt enterprises is realized only when output can be sold in a condition and at a time acceptable to the market. Farmers may produce adequate volumes, but limited channel options or inefficient distribution can reduce the prices they receive, increase losses, and weaken their negotiating position. The empirical model therefore evaluated competitiveness as a market outcome supported by commercial access and logistics execution.

Hypothesis testing produced a consistent pattern. Market access had a positive and statistically significant effect on competitiveness, logistics efficiency also had a positive and statistically significant effect, and the simultaneous test confirmed that both variables jointly affected competitiveness. These results supported all hypotheses at the 5% significance level. Table 2 summarizes the statistical decisions.

Table 2. Summary of Hypothesis Testing

Hypo	Relationship	Effect	Sig.	Result
H1	Market access → farmer competitiveness	Positive	<.05	Supported
H2	Logistics efficiency → farmer competitiveness	Positive	<.05	Supported
H3	Market access and logistics efficiency → farmer competitiveness	Positive	<.05	Supported

Source: *Data Processed, 2026*

Discussion

Effect of Market Access on Farmer Competitiveness

Hypothesis testing showed that market access had a positive and significant effect on the competitiveness of salt farmers in Jeneponto Regency, with a significance value below 0.05. The first hypothesis was therefore supported. This result indicates that the better farmers' access to price information, buyers, market demand, and marketing channels, the greater their ability to compete. Effective market access enables farmers to compare prices, select more suitable buyers, understand market requirements, and determine a more appropriate time to sell.

For salt farmers in Jeneponto Regency, market access concerns more than the distance to a selling point. It also includes the ease of obtaining price information, understanding buyers' quality standards, building marketing networks, and having alternative sales channels. When farmers have more information and a wider choice of buyers, they do not

have to accept the first price offered by collectors. This condition can strengthen their bargaining position and help them obtain selling prices that more closely reflect the quality of the salt they produce.

This finding is consistent with Rambe Kamarul Zaman et al. (2025), who showed that improved market access can strengthen business competitiveness. Broader market access enables producers to reach more consumers, obtain information on market needs, and expand their choice of sales channels. These conditions help producers reduce dependence on a single buyer or marketing channel, thereby strengthening their bargaining position.

These empirical findings are relevant to the circumstances of salt farmers in Jeneponto Regency. The broader farmers' access to price information, buyer networks, market demand, and marketing channels, the greater their opportunity to sell products at more favorable prices. Market access also enables farmers to adjust production quality and volume to consumer requirements. The ability to understand market demand and select alternative buyers is an important component of competitiveness because it allows farmers to make more rational sales decisions and reduces their complete dependence on collectors.

Effect of Logistics Efficiency on Farmer Competitiveness

The second hypothesis test showed that logistics efficiency had a positive and significant effect on the competitiveness of salt farmers, with a significance value below 0.05. The second hypothesis was therefore supported. This finding indicates that farmers' ability to compete is determined not only by the amount of salt they produce but also by how effectively the product is stored, handled, transported, and delivered to buyers. The more efficient the logistics process, the greater the opportunity for farmers to reduce costs, preserve product quality, and meet buyers' demand on time.

Although salt is less perishable than most agricultural commodities, its quality and market value can still decline when logistics processes are poorly managed. Exposure to moisture, inadequate packaging, contamination, open storage, and repeated loading and unloading can affect the cleanliness, weight, and quality of salt. When product condition does not meet buyers' expectations, farmers risk receiving lower prices. Likewise, transportation delays and uncoordinated small-volume deliveries can raise unit costs and make supply less predictable. These problems ultimately reduce farmers' income and can also undermine buyers' confidence.

The findings confirm that logistics is not merely a technical activity after production but an important component of competitiveness. Christopher (2016) explains that reliability, responsiveness, and cost efficiency are major outcomes of sound logistics management. Mentzer et al. (2001) likewise emphasize that logistics coordination is closely related to overall supply-chain performance. For salt farmers, these principles are reflected in reliable transport, planned collection schedules, protected loading, appropriate storage, and timely delivery. When these elements function effectively, farmers are better able to deliver salt in the agreed quantity, quality, and time. Such consistency can strengthen their reputation and encourage repeat transactions.

This finding is consistent with Septika's (2025) study of logistics management and competitiveness at Indomaret in Pangkalpinang City. Based on interviews, observations of distribution activities, and an examination of inventory management, the study showed that

logistics efficiency supports competitiveness through route planning, delivery accuracy, inventory control, and reductions in transportation and storage costs. Better delivery and distribution-route management also reduces delays and additional costs, enabling firms to maintain more competitive prices.

Joint Effects of Market Access and Logistics Efficiency on Farmer Competitiveness

The simultaneous test showed that market access and logistics efficiency jointly had a significant effect on the competitiveness of salt farmers, with a significance value below 0.05. The third hypothesis was therefore supported. This finding confirms that farmers' competitiveness depends not only on their ability to identify markets but also on their capacity to meet market requirements consistently. Market access creates sales opportunities, while logistics efficiency ensures that those opportunities can be converted into profitable transactions.

The relationship between the two factors is evident in farmers' daily activities. A farmer may learn of a buyer offering a higher price, yet the transaction may not occur if the farmer cannot meet the required volume, quality, or delivery schedule. Conversely, a farmer may have adequate storage and transportation, but the benefits remain limited when salt is still sold to the same buyer without alternative marketing channels. Market access and logistics efficiency should therefore not be treated as separate concerns. They complement one another in strengthening farmers' position within the marketing chain.

This result receives strong empirical support from Hiola et al. (2026), who specifically examined product flows, logistics constraints, and relationships among actors in the smallholder salt supply chain in Arungkeke Subdistrict, Jeneponto Regency. Their study found that salt distribution operates through a long, fragmented, and poorly integrated chain. Limited storage facilities and weak postharvest handling reduce salt quality, while restricted marketing networks leave farmers highly dependent on collectors as buyers, sources of price information, and links to wholesalers. Farmers' weak bargaining position is therefore caused not only by limited market access but also by logistics constraints that reduce their ability to preserve quality and sell to alternative buyers.

These results align with the present findings by showing that market access and logistics interact in determining the value farmers can retain. Hiola et al. (2026) explain that a large share of economic value is concentrated among downstream actors, particularly collectors and wholesalers. Farmers undertake nearly all production activities yet receive a relatively small share of value because of limited price information, restricted channel options, inadequate storage, and weak distribution capacity. Improving market access without logistics support is therefore insufficient to strengthen farmers' position. Similarly, better logistics facilities without an expanded buyer network may not alter the established pattern of dependence.

4. CONCLUSION

This study demonstrates that market access and logistics efficiency are important determinants of the competitiveness of salt farmers in Jeneponto Regency. Based on tests involving 100 respondents, market access had a positive and significant effect on farmer competitiveness. Easier access to price and demand information, buyers, and multiple marketing channels strengthens farmers' ability to select markets, improve their bargaining

position, and secure more favorable sales outcomes. Logistics efficiency also had a positive and significant effect. Better storage, handling, transportation, and delivery management helps farmers reduce distribution costs, preserve salt quality, meet buyers' requirements, and maintain timely and continuous supply. The simultaneous test further confirmed that market access and logistics efficiency jointly had a significant effect on competitiveness. Market opportunities cannot generate optimal benefits when farmers are unable to meet the required quality, volume, and delivery schedules; conversely, an efficient logistics system cannot create maximum added value when farmers remain dependent on a limited buyer network. Improving the competitiveness of salt farmers therefore requires an integrated strategy encompassing transparent market information, broader buyer networks, stronger collective marketing, shared storage, quality-based product grading, and coordinated transportation and delivery. Farmer groups or cooperatives must also be strengthened so that farmers can aggregate production volumes, reduce logistics costs, comply with buyer standards, and negotiate from a stronger position. The findings confirm that salt-farmer competitiveness depends not only on production capacity but also on the ability to connect output to markets through an efficient, coordinated, and reliable logistics system.

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