Income Analysis of Maize Farmers Under the Contract Farming Scheme in Pamekasan, Indonesia

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Abstract

Background: The contract farming system was chosen due to its potential to provide market certainty, access to agricultural inputs, and technical training for farmers. **Aim:** This study aims to analyze the cost components and income of maize farming conducted under the contract farming scheme in Pamekasan Regency. **Methods:** The research was conducted in Kadur District and involved 60 partner farmers selected purposively using a multi-stage sampling approach. Primary data were collected through interviews using structured questionnaires. The analytical method employed was farm analysis, which included calculations of fixed costs, variable costs, revenue, net income, and the R/C ratio. **Results:** The results show that the average total production cost incurred by farmers was Rp2,853,390 per planting season. Revenue from maize sales averaged Rp14,899,592, resulting in a net income of Rp12,046,202. The R/C ratio value of 5.20 indicates that the farming practice is highly efficient and profitable. Beyond economic benefits, the contract farming scheme also contributed to improved farmer access to production inputs, technical assistance, and guaranteed selling prices. **Conclusion:** The study concludes that contract farming is an effective alternative marketing strategy for increasing the income of smallholder farmers in rural areas. To support the sustainability of this program, policy backing from local governments, strengthening of farmer institutions, and enhanced transparency and fairness in contract agreements are essential. The findings of this study can serve as a reference for developing a more inclusive and sustainable agribusiness partnership model.

Keywords: contract farming; maize; marketing farmers; Pamekasan; partnership

Introduction

Maize is one of the agricultural commodities that plays a strategic role in supporting national food security in Indonesia (Setiani, S., & Wijayanti, 2025). In addition to being directly consumed by the public as an alternative staple food to rice, maize is also widely used as a raw material for animal feed as well as for food and non-food processing industries (Dwiartama et al., 2018). At the local level, especially in rural areas such as Pamekasan Regency, maize is a key commodity for farming communities. This is due to suitable agro-climatic conditions and the longstanding tradition of cultivating this crop passed down through generations (Syahrial, R., & Susanto, 2024). However, despite its high economic potential, maize farmers in Pamekasan are generally still classified as smallholders with limited access to land, technology, and production resources (Alta et al., 2021). They also face various structural challenges that lead to suboptimal yields and economic returns, which have not yet significantly improved household welfare (Hidayah, K., Nasyiah, I., & Fidhayanti, 2022).

One of the fundamental issues maize farmers face is the marketing of their harvest. Most farmers have only limited distribution channels, mainly through middlemen or local traders who tend to offer low and unstable prices (Prihantini, C. I., Hanani, N., Syafrial, & Asmara, 2024). This traditional marketing system places farmers in a weak bargaining position, as they must accept the sale prices determined by the market through

intermediaries. Furthermore, access to broader market price information and to large-scale buyers, such as maize processing companies, is very limited. This results in unstable farmer incomes and hampers economic advancement (Alta et al., 2021). In the long term, such price and market uncertainty can discourage farmers from continuing to plant maize, eventually reducing productivity and the competitiveness of the agricultural sector in the region (Sumartini, N. P., & Nasrudin, 2024).

To overcome these problems, an alternative marketing model known as contract farming has emerged. This model involves a formal partnership between farmers and agribusiness companies, where both parties agree on the rules regarding production processes, pricing, quality, harvest schedules, and distribution of yields (Dwiartama et al., 2018). In this setup, the company acts not only as a buyer but often also provides inputs such as high-quality seeds, fertilizers, pesticides, and cultivation training to farmers. This system is thus considered a solution to two major problems in small-scale agriculture: limited access to markets and production inputs. Additionally, having a clear contract can offer price certainty and reduce the risk of losses due to market fluctuations. Several studies also show that farmers who participate in contract farming schemes tend to have higher incomes and better productivity compared to non-participating farmers (Sumartini & Nasrudin, 2024; Alta et al., 2021). However, the success of this system heavily depends on how well the contracts are designed and implemented, as well as how well farmers understand and fulfill their agreed responsibilities (Prihantini et al., 2024).

Although contract farming schemes have been widely implemented in many developing countries and have proven to offer economic benefits to farmers, their application in Indonesia particularly in regions such as Madura Island remains relatively limited (Setiani & Wijayanti, 2025). The lack of documentation and academic research on contract farming practices for maize in this area presents a critical gap in developing policies and strategies to strengthen local agricultural systems (Dwiartama et al., 2018). Additionally, there are still concerns among farmers about the strictness of contract terms and uncertainties in fulfilling agreements, which may pose risks for small-scale farmers. Therefore, it is important to conduct in-depth, field-based studies to understand how this system truly affects the economic conditions of farmers especially in terms of production cost structures and the income received by maize farmers involved in contract farming systems (Syahrial & Susanto, 2024).

Methods

This study was conducted in Kadur District, Pamekasan Regency, East Java Province. The location was deliberately selected (purposive sampling) based on the consideration that this area is one of the centers of maize cultivation and has implemented a contract farming system between farmers and partner companies. This partnership system has been actively operating in several villages, making the location relevant for examining contract maize farming operations.

Respondents were also selected purposively, namely farmers who were directly involved in the contract farming scheme during the most recent planting season. To ensure adequate variation and representation, a multi-stage sampling approach was used. The first stage involved selecting the district (Kadur), followed by selecting villages with contract partner farmers, and finally determining the farmer respondents. The total number of respondents in this study was 60 maize farmers actively engaged in farming under a contract scheme with agribusiness companies.

The type of data used in this research is primary data obtained through direct interviews with farmers using structured questionnaires. The data collected included information on land area, types of inputs used, quantity and price of inputs, labor costs, production yields, selling prices, and the contract system the farmers were engaged in. Additionally, secondary data were obtained from the Department of Agriculture, literature sources, and partner company documents to support the analysis. According to Soekartawi, Suhardjo, A., Dillon, J. L., & Hardaker (1986), income is defined as the difference between the revenue earned from the business and the production costs incurred in farming. The income level is described by the following mathematical formulas:

$$TC = TVC + TFC$$
$$TR = Q \times P$$
$$\Pi = TR - TC$$

Note

Π	=	Income (Rp)
TC	=	Total Cost (Rp)
TVC	=	Total Variable Cost (Rp)
TFC	=	Total Fixed Cost (Rp)
TR	=	Total Revenue (Rp)
Q	=	Production (kg)
P	=	Price of Production (Rp/kg)

Result and Discussion

Contract Farming System Overview

In the contract farming partnership between maize farmers and partner companies at the research site, each party has specific rights and obligations to fulfill. The partner company is primarily responsible for providing the necessary cultivation inputs for farmers, such as seeds, fertilizers, and pesticides (Patrick, 2004; Simmons, P., Winters, P., & Patrick, 2025). Additionally, the company offers extension services or technical training to ensure that farmers carry out cultivation according to established standards (Harianto, H., Kusnadi, N., & Paramita, 2019). Throughout the planting and harvesting period, the company also monitors and inspects the production process in terms of both quantity and quality (Natawidjaja, R. S., & Ikeda, 2022). At the end of the harvest, the company is obligated to purchase the farmers' yields at the price agreed upon at the beginning of the contract (Minot, N., & Sawyer, 2016).

On the other hand, partner farmers are required to carry out the cultivation process according to the guidance and standards set by the company and are only allowed to sell their harvest to the partner company (Nurjati, E., & Wiryawan, 2023). To facilitate the collection of harvests in the field, the company usually appoints agents or representatives responsible for visiting farmers. These agents act as intermediaries between the farmers and the company regarding the purchase of maize yields (Eaton & Shepherd, 2001). The selling price of maize is generally predetermined in the initial agreement, so farmers have price certainty. This arrangement benefits farmers by shielding them from market price fluctuations (Rehber, 2018). However, since the contract is binding, farmers must also ensure that the quality of their maize meets the company's specified standards. If the

quality requirements are not met, the company may reject the harvest or renegotiate the purchase price to a lower rate than initially agreed (Susilowati, K. D. S., & Rachmi, 2018).

Once the maize is purchased from the partner farmers, the company then distributes the harvest to large factories that are part of its business network. These factories are typically food processing and animal feed producers that require a stable supply of high-quality maize (Santoso, P., & Irianto, 2005). Through the contract farming system, both parties are expected to benefit: farmers gain easier access to inputs and guaranteed selling prices, while companies secure a steady and quality-assured supply of maize for industrial use. In this way, the scheme not only helps increase farmers' incomes but also strengthens the agribusiness supply chain as a whole (Minot, 2018).

Income Analysis of Maize Farming under the Contract Farming Scheme in Pamekasan Regency

This section presents the results of the income analysis for maize farmers involved in the contract farming scheme in Pamekasan Regency. The analysis was carried out by calculating all components of production costs, from fixed costs such as land rent and equipment depreciation to variable costs such as seeds, fertilizers, pesticides, and labor (Rahmadona, L., & Azlansyah, 2024). The farmers' revenue was then calculated by multiplying the total harvest with the selling price agreed upon in the contract. The difference between total revenue and total production costs was used to determine the net income earned by the farmers. These results are expected to provide a concrete picture of the economic gains farmers obtain from the partnership system and serve as a foundation for evaluating the effectiveness of contract farming in improving the welfare of maize farmers in rural areas (Firdaus et al., 2024).

Table 1. Income Analysis Contract Farming Maize in Pamekasan

No	Descriptive Cost	Average	
		Quantity	**Price**
1	**Fixed Cost**		
	Land Tax/Rent (Ha)	0.67	Rp669,333
	Equipment Depreciation		Rp 218,500
	Total Fixed Cost	Rp887,833	
2	**Variable Cost**		
	Seed (kg)	4.69	Rp454,901
	Labor (hok)	14.32	Rp501,323
	Pesticide		Rp220,417
	Fertilizer		Rp788,917
	Total Variable Cost	Rp1,965,557	
3	**Total Cost**	Rp2,853,390	
4	**Revenue**		
	Production	3173	Rp14,899,592
5	**Income**	**Rp12,046,202**	
R/C Ratio		5.2	

Based on Table 1, it is shown that the total production cost of maize farming under the contract farming scheme in Pamekasan Regency consists of fixed and variable costs. Fixed costs include land rent at Rp669,333 and equipment depreciation at Rp218,500,

bringing the average total fixed cost per planting season to Rp887,833. Meanwhile, the variable cost components include the purchase of seeds (4.69 kg) with an average cost of Rp454,901, labor for 14.32 man-days (Rp501,323), pesticides (Rp220,417), and fertilizers (Rp788,917). In total, the variable costs amounted to Rp1,965,557, making the overall production cost (fixed and variable) Rp2,853,390. Similar cost structures were also observed in East Java and Lombok, with variable costs dominating the expenditure (Ridwan, R., Muhsin, M., & Solihah, 2023).

The analysis shows that maize farmers in the contract farming scheme in Pamekasan Regency earned an average net income of Rp12,046,202 per planting season. This figure is the result of subtracting the total production cost (Rp2,853,390) from the gross revenue (Rp14,899,592). These production costs consist of fixed costs (land rent and equipment depreciation) of Rp887,833 and variable costs (seeds, labor, pesticides, and fertilizers) of Rp1,965,557. The data indicate that variable costs constitute the largest component of production expenses. The significant income earned by farmers serves as an initial indicator that the partnership system offers positive economic impacts and is worth expanding to other regions (Prasetyo, A., & Prasetyowati, 2022).

One of the indicators of business efficiency used in this study is the R/C Ratio, which reached a value of 5.20. This means that for every Rp1 of production cost, farmers earned Rp5.20 in revenue. This high ratio indicates that maize farming under the contract farming system is highly efficient and profitable (Rahmadona & Azlansyah, 2024). Additionally, the average yield achieved by farmers was 3,173 kg per planting season, reflecting a relatively high level of productivity. The partnership with the company contributed significantly to these results, particularly due to the support provided in the form of input supplies, technical training, and guaranteed purchase of the harvest (Ridwan et al., 2023).

In the discussion context, the high income and farming efficiency achieved by partner maize farmers cannot be separated from the active role of the company in providing support throughout the cultivation process. The partner company supplied production inputs like seeds and fertilizers, offered technical training, and monitored the production process. This enabled farmers to cultivate more effectively and in line with established standards. The system also ensured price and market certainty, protecting farmers from fluctuations in open market prices (Firdaus & Nugroho, 2024). Collectively, these factors strengthened the farmers' production and marketing systems, which is reflected in their relatively high and stable income levels (Prasetyo & Prasetyowati, 2022).

Beyond direct economic benefits, contract farming also brings significant indirect impacts. Farmers who previously had limited access to quality inputs and agricultural knowledge now receive support from the company. This promotes a shift from traditional to more modern and productive farming practices. Technical assistance from the company also enhances farmers' understanding of good agricultural practices. These impacts are important in the long term, as they contribute to improving human resource capacity in the agricultural sector and building a more professional farming culture among smallholders (Rahmadona & Azlansyah, 2024).

However, the success of the contract farming system relies heavily on the commitment and transparency of both parties. Farmers must maintain the quality of their harvests according to company standards, while companies must ensure fairness in price setting, purchase commitments, and payment timelines. Conflicts may arise if there is an imbalance in contract implementation, such as when farmers fail to meet production

targets or companies unilaterally alter the agreements. Therefore, support from local governments, the strengthening of farmer institutions, and oversight of partnership practices are crucial to ensuring the sustainability and fairness of this system. In the long term, such partnership models can strengthen the position of smallholder farmers in the agribusiness value chain while promoting rural economic growth (Ridwan et al., 2023).

Conclusion

Based on the research findings, it can be concluded that the contract farming scheme for maize cultivation in Pamekasan Regency has a positive impact on farmers' income. The average net income of partner farmers reaches Rp12,046,202 per planting season, with an R/C Ratio of 5.20, indicating that this farming model is highly efficient and profitable. The support provided by the partner company in the form of production input supply, technical training, and guaranteed purchase of harvests contributes significantly to cost efficiency and increased productivity. This partnership system also helps farmers escape the price and market uncertainties commonly experienced under traditional marketing systems, while providing access to technology and cultivation information that was previously difficult to obtain.

To support the sustainability and expansion of the contract farming system, it is recommended that local governments and farmer-support institutions become more actively involved in facilitating partnerships between farmers and agribusiness companies. The government should promote regulations that protect the interests of both parties and provide mediation mechanisms in the event of contractual disputes. On the other hand, farmers should be encouraged to form organizations such as farmer groups or cooperatives to strengthen their bargaining position during contract negotiations. With these strategies, contract farming can not only serve as a short-term solution for increasing farmers' income but also become a key component of more inclusive and sustainable agricultural development in rural areas like Pamekasan.

References

Alta, A., Setiawan, I., & Fauzi, A. N. (2021). *Beyond fertilizer and seed subsidies: Rethinking support to incentivize productivity and drive competition in agricultural input markets*. EconStor.

Dwiartama, A., Morrison, M., Utami, R., & Patunru, A. (2018). *Food Processing and Value Chain Development in Indonesia.*

Eaton, C., & Shepherd, A. (2001). *Contract farming: Partnerships for growth. FAO Agricultural Services Bulletin 145*.

Firdaus, M. W., Syafrial, S., & Nugroho, T. W. N. (2024). Faktor-Faktor yang Berpengaruh terhadap Keputusan Adopsi Padi Organik dan Perbandingan Pendapatannya di Jawa Timur. *Jurnal Pangan*, *33*(1), 44–55.

Harianto, H., Kusnadi, N., & Paramita, D. A. (2019). The impact of vertical integration intensity on broiler farms technical efficiency: The case of contract farming in West Sumatera. *Tropical Animal Science Journal*, *42*(1), 100–107.

Hidayah, K., Nasyiah, I., & Fidhayanti, D. (2022). *The evaluation of warehouse receipt system object regulation: a perspective study of commodity goods concept in Indonesia.*

Minot, N., & Sawyer, B. (2016). *Contract farming in developing countries: Theory, practice, and policy implications. In: Innovation for Inclusive Value Chains. Google Books.*

Minot, N. (2018). *Contract farming in developing countries: patterns, impact, and policy implications (6–3).* Cornell University.

Natawidjaja, R. S., & Ikeda, S. (2022). The sustainability of contract farming with specialized suppliers to modern retailers: Insights from vegetable marketing in Indonesia. *Agriculture*, *12*(3), 380.

Nurjati, E., & Wiryawan, F. S. (2023). The sustainability of contract farming model: A case study of an agribusiness company. *Jurnal Ekonomi Pembangunan*, *22*(1), 34–43.

Patrick, I. (2004). *Contract farming in Indonesia: Smallholders and agribusiness working together.* ACIAR.

Prasetyo, A., & Prasetyowati, K. (2022). Feasibility Analysis of Hybrid Corn Farming in Karanganyar Regency. *IOP Conference Series: Earth and Environmental Science*, 1114(1), 012023.

Prihantini, C. I., Hanani, N., Syafrial, & Asmara, R. (2024). *Improving maize variety adoption and food security: Case of Madura Island. Preprints.org PDF.*

Rahmadona, L., & Azlansyah, M. (2024). Income Analysis of Zea mays L. Farming Business in Rumpin District, Bogor Regency. *Journal of Agri Socio Economics and Business*, *3*(1), 45–54.

Rehber, E. (2018). *Contract farming in practice: An overview*. Ageconsearch.

Ridwan, R., Muhsin, M., & Solihah, Z. (2023). Feasibility Analysis of Corn Farming with a Partnership Pattern in Pringgabaya District, East Lombok. *Implikasi: Jurnal Ilmu Sosial Dan Sumber Daya Manusia*, *6*(2), 101–110.

Santoso, P., & Irianto, B. (2005). *Supply Chain Management Assessment to Improve the Performance of Contract Farming between a Multi-National Company and Smallholders in East Java.* Acta Horticulturae.

Setiani, S., & Wijayanti, D. E. (2025). *Determinant of Maize Farmers Household Food Security in Dry Land Madura Island, Indonesia.*

Simmons, P., Winters, P., & Patrick, I. (2025). An analysis of contract farming in East Java, Bali, and Lombok, Indonesia. *Agricultural Economics*, *33*(s3), 513–525.

Soekartawi, Suhardjo, A., Dillon, J. L., & Hardaker, J. B. (1986). *Ilmu Usaha Tani dan Penelitian Untuk Pengembangan Petani Kecil, Universitas Indonesia. Jakarta.* Universitas Indonesia.

Sumartini, N. P., & Nasrudin, R. (2024). *Does contract farming participation promote household's food security for smallholders? Empirical evidence from Indonesia.*

Susilowati, K. D. S., & Rachmi, A. (2018). Contract farming partnership for sustainable supply. *International Journal of Management*, *12*(2), 56–66.

Syahrial, R., & Susanto, H. (2024). *A Strategic Model to Fulfil the Food Security of Farming Families in Madura.*